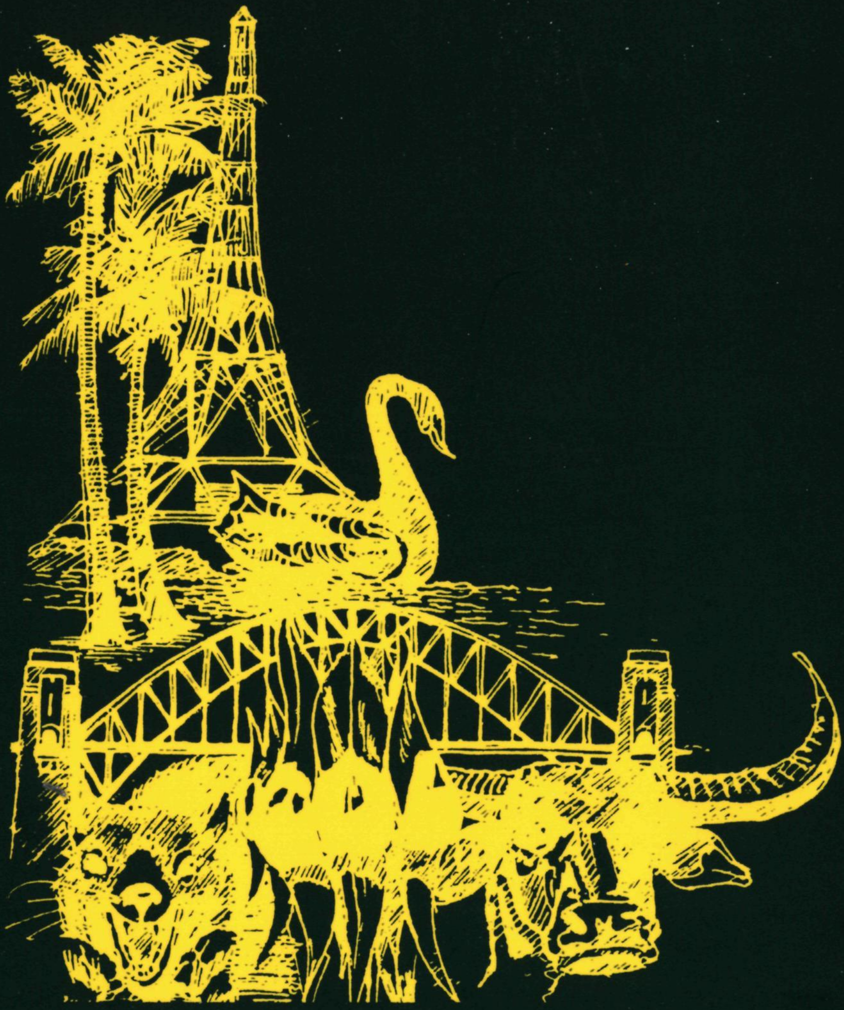
"YOU GET A BIT WOBBLY..."

Exploring Bilingual Lexical Retrieval Processes in the Context of First Language Attrition



T. Ammerlaan

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"MY DUTCH IS LIKE RIDING A BIKE.
YOU NEVER FORGET IT BUT
YOU GET A BIT WOBBLY".
(Subject 12)

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Exploring Bilingual Lexical Retrieval Processes in the Context of First Language Attrition

Een wetenschappelijke proeve op het gebied van de Letteren

PROEFSCHRIFT
ter verkrijging van de graad van doctor
aan de Katholieke Universiteit Nijmegen,
volgens besluit van het College van Decanen
in het openbaar te verdedigen op
24 januari 1996
des middags te 1 30 precies

door
T Ammerlaan
geboren op 10 februari 1960
te Venlo

Promotoren Prof Dr C L J de Bot
Prof Dr Th J M van Els

Co-promotor Dr E D J Schils

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Nijmegen, January 24, 1996 T. Ammerlaan

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TABLE OF CONTENTS

Page

OUTLINE

This dissertation examines the nature of variables influencing first language (L1) attrition The study concentrates on the lexicon of long-term Dutch expatriates living in Victoria (Australia) It was investigated whether particular word types were more susceptible to language attrition than other types as suggested by emigrant Dutch[1] The aims were to determine whether subjects' ideas on having "forgotten their mother tongue" are empirically verifiable, which types of Dutch words tended to be difficult to remember and whether specific aspects of speech production played a role In particular, the effect of various types of lexical similarity on access and retrieval processes was investigated These effects were studied in a picture-naming experiment involving emigrants who no longer used their L1 in Australia

Chapter 1 is a theoretical exposition of the approach taken towards investigating lexical L1 attrition An outline is provided of previous sociolinguistic (§ 1 2) and linguistic (§ 1 3) research on lexical variables in language attrition research in general This approach may account for phenomena which appear to suggest selective attrition of Dutch in Australia Integration of the various findings is provided through psychological research on forgetting (§ 1 4) that not only allows specification of the term 'attrition' and the nature of important variables, but furthermore suggests that retrieval processes play a crucial role in selective attrition It is therefore suggested that psycholinguistic research is better able to determine if the emigrants had not "lost" their Dutch as some had claimed or if their observations about selective lexical attrition could result from interference by similar Australian-English (AE) words which affects their access and retrieval processes in Dutch

Chapter 2 provides a review of psycholinguistic studies on the nature of retrieval processes After a brief characterization of the language processes identified in monolingual research and the test paradigms used (§ 2 2), a review is given of research on what is known about bilingual lexical processing (§ 2 3) Specific attention is given to bilingual speech production, particularly bilingual lexical retrieval processes Insights about these processes are derived from research on bilingual code-mixing and processing and interpreted through Levelt's framework of monolingual speech processing (1989) Findings from various types of bilingual studies on the effects of types of *cross-linguistic similarity* are used to predict how this characteristic affects the retention of types of words Such research on lexical processing suggests that cross-linguistic interference depended on the perceived nature (*e g* similarity, complexity) of the items, the type of task and the linguistic background of the subjects (*e g* learning context, fluency, proficiency) These variables influence how a word is accessed and retrieved, and thus whether it can be successfully recalled or recognised with or without the influence of Australian-English

Chapter 3 lists the implications of the literature reviews in Chapters 1 and 2 for an investigation of the "loss of Dutch" and specifies the paradigms of the project on Dutch-Australian emigrants (§ 3 2) The impact of cross-linguistic similarity in L1 attrition was investigated in an experiment involving emigrants varying in background variables To calculate the effect of similarity on lexical attrition within this group of Dutch native speakers in Australia, the experiment was complemented by tasks that assessed the biolinguistic background information of the Dutch emigrants These tasks are described in § 3 3

Chapter 4 outlines the linguistic situation of these emigrants as based on a questionnaire that established when, where, and why they used which language (§ 4 1) and on objective and self-assessment of their proficiency and fluency (§ 4 2) Interrelations between the various data types are given in § 4 3

The picture-naming and identification experiment is described in Chapter 5 This experiment investigated whether certain types of Dutch words were more easily retrieved than others by measuring the effect on bilingual processing of variables such as word length, frequency of occurrence, and form-similarity in conjunction with various biolinguistic background characteristics More specifically, the experiment aimed at determining the relationship between bilingual recall and recognition of certain Dutch words ranging in similarity in lemma and lexeme to their English translation equivalents Whether retrieval processes had affected non-cognates more than cognates, low-frequency words more than high-frequency words, multi-stem more than single-stem words, and morphologically dissimilar words more than morphologically similar, and phonologically dissimilar words more than phonologically similar words was investigated by comparing naming and identification sessions of a picture-naming experiment in Dutch If subjects were unable to provide the target name, they were subsequently presented with the same picture accompanied by six written names If subjects were unable to identify the L1 correct name, this suggested loss Chapter 5 also provides the results of a pretest of the experiment conducted by monolinguals

The findings of the bilingual experiment are discussed in Chapters 6 and 7 Chapter 6 gives the results of the experiment on the so-called 'dormant' Dutch-Australian bilinguals, starting with the strategies used (§ 6 2) Determined next is the measure to be used for proficiency effects (§ 6 3) This is followed by analyses of the error distribution in the naming and identification sessions (§ 6 4) and the distracters used (§ 6 5) in conjunction with the extent of the emigrants' residual proficiency in Dutch

Chapter 7 summarizes the various findings and discusses their relevance in combination to earlier research on L1 attrition (§ 7 2) In addition to discussing the implications of the reported research for bilingual lexical processing, this chapter offers suggestions for further study of L1 attrition and Strutch (§ 7 3) from various perspectives A list of the abbreviations, the references used, and the appendices to each chapter are given in the final part of this dissertation

CHAPTER ONE
SELECTIVE LANGUAGE ATTRITION AND LEXICAL RETRIEVAL IN EMIGRANT DUTCH

" *Het is hard om je talen niet op te mixen* " [It is hard not to mix up one's languages][2]

1 1 Introduction

The aim of the project is to investigate differential or selective 'attrition' of words from a disused first language (L1) Language attrition is a kind of forgetting It can be characterized as negative change (*i e* decline, decrease) in linguistic knowledge (competence) and/or control over that knowledge (performance), based on a comparison of two situations[3] (Ammerlaan, 1987a) The result of this negative change is often interpreted as *loss* or as *decay* in communication (*cf* Lambert & Freed, 1982) Negative change appears to result from a gradual or abrupt break in the linguistic/cultural tradition of a subject or community (Anderson, 1982) Those who experience attrition perceive that they have adopted a different norm than more competent and fluent speakers or than what they used to have as norm The term 'language attrition' as used here is thus different from 'language shift' the latter denotes 'partial' or 'total' replacement of one language by another, usually in a generation rather than in an individual (Ammerlaan, 1991, Tandefelt, 1992)

Types of attrition

Several types of attrition have been distinguished, depending on the pre-attrition norm adopted and the nature and context of study (*cf* Buckley, 1988, Seliger & Vago, 1991a, Van Els, 1986, Waas, 1990, 1993, Weltens, 1987) One typology is based on the possible *causes* These range from pathological (*e g* aphasia) to non-pathological (*e g* non-use) (Obler & Mahecha, 1991) Within the latter type, De Bot & Weltens (1985) distinguish between varieties according to the type of language involved (*i e* first or second language) and the type of environment (*i e* second or first language context)

A second distinction refers to attrition within an individual's life-span (*i e* intra-generational) and attrition between generations (*i e* inter-generational) Another distinction concerns the *effects* of attrition on 'form' and/or 'function' (Munsterman & Hagen, 1986) Form attrition refers to the decreasing accuracy and use of certain language structures, often resulting in reduced diversity (*cf* Hinskens, 1986) Function attrition refers to a decline in the range and use of communicative functions of that language (*cf* Appel & Muyskens, 1987) Both types refer to apparent decline in linguistic knowledge

Attrition studies also vary in the *topic* of investigation (*e g* syntax, lexis, phonology) In particular, retention of the lexicon is investigated, since lexical items appear to be the key to language production and since specifically the use of words influence a person's perceived level of language proficiency (Van Ginkel, 1988) Attrition processes are most apparent in the size and nature of the lexicon used (*cf* Dorian, 1988, Weltens & Van Els, 1986) Several aspects of the lexical features of a word may be 'lost", depending on its form, function, and meaning (Cohen, 1986, Nation, 1990)

Language shift in emigrant Dutch

In the project that is the subject of this report, non-pathological intra-generational L1 attrition was investigated in Dutch emigrants in Victoria (Australia) Studies of Dutch emigrants suggest that, despite this being the fourth largest ethnic group in Victoria, emigrants rarely use their L1 in comparison with other north-western European emigrant groups in Australia (Clyne, 1977b, 1995, Clyne & Jaehrling, 1989, Duyker, 1987, Smolicz & Secondo, 1979) As a result of this language shift, the Dutch are often characterized as ethnically "invisible" in Australia (*cf* Bouma, 1995, Walker-Birckhead, 1995) This shift to English is particularly apparent in the avoidance of reading and writing in Dutch (Clyne, 1980a, Pauwels, 1981, 1985) In the 1986 Census 97 8% of Netherlands-born males and 96 9% of Netherlands-born females (all above the age of 15) reported to be highly proficient in English, whereas 38% of Netherlands-born people over the age of 5 years reported speaking Dutch in the home domain (Profile-1986, 1989, Clyne, 1991a) More recent data from the 1991 Census shows that between 1986 and 1991 the total number of Netherlands-born Australians who reported using Dutch at home decreased even more (*cf* Ammerlaan, 1994i, Overberg, 1995a) Language shift appears to be widespread in this invisible ethnic community Possible reasons for this shift away from L1 use are listed in Ammerlaan (1990b, 1990c) and Walker-Birckhead (1988)

Language attrition in emigrant Dutch

In addition to language shift, language attrition of emigrants' Dutch appears to be common Previous studies of Australian-Dutch (called "Strutch", from '(Aus)*Strine*'[4] and 'Dutch') suggest that not all the linguistic levels and linguistic skills are affected equally though Apart from avoidance and overgeneralization, some Dutch forms tend to remain intact, whereas others are replaced by English or other Dutch forms (*cf* Clyne, 1977b, 1979, 1980b, Nijenhuis, 1967). An example of a story in emigrant Dutch illustrates the use of English and non-standard Dutch structures[5], with retrospective comments ({}) added, the English in between '', and the, capitals indicating emphasised syllables and the experimenter's comments between slashes (//):

> "Nou d'r was- Er was 'n kleermaker. /yeah?/. en een. Op 'n dag d'r kwam 'n. 'n knIJn naar binne /yep/.. En Heet 't "knijn" of "kOnijn"?. "kenIJn" "'knijn'" 'is just picks the area where I come from ' /yeah/ En die vroeg om 'n.. 'What's a "pleated skirt"'? Dats 'a- It's a' rOk /yeah?/ 'Erm'...*{But it's a tYpe of .'rok' ,isn't it?..yeah . I wouldn't TO WIFE: What what would you call "a pleated skirt"? (WIFE: "'plooi'") "'n plooi.. plOOirok'" /yeah/. I tell stories like- in Dutch, like a like a fifteen-year-old (WIFE "or younger") or younger }* 'Got no idea what the sort of'- 'N... Die vroeg om 'n rok /ahum?/
> Ennn .de kleermaker, die zegt "Nee...die maak ik niet "
> Volgende dag kwam de knijn wEEr binnen
> .. v vroeg wEEr om om zo'n rok, en erm 'He' De kleermaker zei weer "Ik..Ik heb 'm niet."
> En..dus zei- Hij dacht "Nou..tzk!..he?. Ik- ik maak d'r, ik maak d'r maar een "/ahum/
> Dus 'en dan maakt d'reen, ging 'm in .*{/"He decided to expand his range of clothes "/ ahum. , I'd forgotten about that /ahum/ I couldn- I couldn't erm.. Couldn't think of the translation of the word either. and "he was sorry for the rabbit"... What is that in Dutch? Erm Nop No 'Hij Hij voelde 'n beetje voor 'em.' /ahum/}* 'shop window'. in 't raam /yep/
> En de volgende dag kwam de knijn weer binnen, vroeg weer om die rok
> .en zeg "Ja, ik heb d'reen "
> En erm 'then' toen zeg die knijn, die zeg "Wel er- wel erg hard om- erg.. moeilijk om te strijken" /ja!/ *{He "he smiled" What is that in Dutch?.." "Hij glimlachte" /yeah/}*" (Subject 33)

Various studies based on corpuses of emigrant Dutch show similar changes in Dutch. Semantic transfer occurs (*e.g.* "het is hard om te strijken"/'It is hard to iron', instead of "moeilijk") as well as overt use of English (Klatter-Folmer, 1995; Nijenhuis, 1967). Code-switching and mixing occurs, which according to Clyne (1967) is most common in small closed-class words in emigrant speech (*e.g.* "in andere woorden"/'in other words', "De huis is mine"/'het huis is van mij'). Clyne (1980a, 1991b, 1992) and Slangen (1990) noted, for instance, that English verbs are used in emigrant Dutch with Dutch morphemes in blends (*e.g.* "het clearen"/'het rooien', "om te shoppen" /'in order to shop') or remain unmarked (*e.g.* "wij eet_" 'wij eten/we eat'), English-based auxiliaries are used (*e.g.* "Die hebben niet naar school gegaan"/'they have not gone to school'), Dutch nouns are given a unified article irrespective of their similarity to English (*e.g.* "de probleem"/'the problem', "de oudste meisje"/'the eldest girl') or an English plural ending (*e.g.* "boeks"/'books'). English nouns are Dutchified (*e.g.* "shoppings"/'boodschappen') and *vice versa* (*e.g.* "geeter"/watering can') or mixed (*e.g.* "countryplaatsje"/'country town'). Dutch verbs show influence from English (*e.g.* "bekomen" instead of 'worden') and semantic confusion (*e.g.* 'begrijpen, verstaan'). Syntactically discontinuous structures are closer together (*e.g.* "Als wij spreken in het Hollands"/'if we speak Dutch') than in standard Dutch ('Als wij Hollands spreken'). These data types illustrate that specific structures and words appear vulnerable.

This variety in between English and Dutch is felt by some emigrants and language purists as a precursor of *selective* attrition of emigrant Dutch. It is unclear whether this interlanguage (IL; Selinker, 1972) is permanent (*e.g.* because the knowledge of Dutch has been "lost"), or reflects difficulties in producing Dutch (*e.g.* due to slips in speech production, cross-linguistic influence of English or communication strategies). On the one hand, Dutch words that have acquired new meanings as a result of the use of English and new concepts acquired in the L2 context may create the feeling of a 'gap' in the emigrants' Dutch lexicon, when in fact these Dutch words were never present. It is also possible that the presence of compromise forms shared by both languages (*e.g.* cognates, shared morphemes, shared syntactic structures) increases the potential for code-switching (Clyne, 1992) that is communicatively successful. On the other hand, the emigrants may still 'know' Dutch but find it difficult to use it, as is clear from the comments below:

- ."'No mate, I'm sorry I'm afraid I lost my Dutch ' 'I could not speak it if I wanted to ' /Not even give it a go?/ 'No, no way It would be gibberish if anything.' 'A mix of Dutch and my Australian.' 'Nah, that belongs to the past, to a world I left behind.'...erm."

- "..'God, this [= speaking Dutch] takes ages!' .... 'Sorry, but I need more time to think of words before I can say em in Dutch '. 'It's that English slips in first, before I can get hold of the Dutch ones.' /ahum/ 'This happens to me all the time ' 'By the time I have understood what my [Dutch] rellies are talking about and have thought of a sentence in Dutch, conversation has moved on ' ..... 'It is a lot easier just to talk in English' "

- " 'Sometimes the English words pop up in my Dutch, you know, but that does not seem to be a problem.' 'Gee, if I say 'huis' or 'house', 'wat' or 'what', that does not matter, people understand it! They are both very similar'. "

- " .'You know, English gets in the way of my Dutch. /ahum/ I try and speak Dutch, but English is much faster, much easier to speak in ' 'I don't look like a fool who's lost for words or who stumbles over his own tongue' ..'Dutch is much harder to get to.'.. /yeah/". (Dutch emigrants in a pilot study)

Both code-switching to English, mixing, and other forms of linguistic divergence from standard Dutch could be intentional, for instance "as a strategy for survival" to help maintain the functions of the minority language (*cf.* Pandharipande, 1992 for this argument). This dissertation investigates to what extent emigrant Dutch reflects "loss of Dutch". In the literature, several explanations of this apparent selective attrition of emigrant languages have so far been offered, using the perspectives of sociolinguists and linguists (*cf.* Seliger & Vago, 1991a; Fase, Jaspaert & Kroon, 1992).

Phenomena such as the mixing of emigrant and host languages, meaning extension, simplification and uncertainty about what constitutes the norm in the disused language are not restricted to Dutch in Australia; similar deviations from the norm and incorrect sentence structures were found in, for instance, Dutch emigrants in the USA (Daan, 1987, Jaspaert & Kroon, 1992), German emigrants in Australia (Waas, 1993), and Italian emigrants in the Netherlands (Jaspaert & Kroon, 1988) It also occurs in the written Dutch of emigrants (Folmer, 1991) Therefore, the general literature on minority languages and language contact was consulted to investigate arguments that could account for the quality and causes for Strutch

1 2 <u>Sociolinguistic Variables Affecting Lexical Attrition</u>

Sociolinguists generally argue that specific forms are maintained because the *domains* of their use are preserved (Fishman, 1978) Selective attrition is related to selective *use* as disused skills and linguistic forms are intuitively more likely to deteriorate (*cf* Andersen, 1982, Appel, 1983, Clyne, 1979, 1985, Hakuta & D'Andrea, 1992) Sociolinguistic research shows that language use in domains is related to socio-psychological or 'biolinguistic' variables such as age, education level, gender, language attitudes, status of the group in society, the group's birthrate, its geographical dispersion, and the ideologies of the host country (Edwards, 1992, Fishman, 1978)

With respect to the Dutch emigrants, sociolinguists found that, compared with other ethnic groups in Australia, Dutch emigrants are exceptional in their *shift* to English and non-use of Dutch in social domains (Clyne & Jaehrling, 1989, Clyne, 1991a, 1995) Contact with Dutch is restricted to the home and to (older) relatives and friends in Dutch societies and clubs (Overberg, 1984, 1986, 1995a) Second-generation Dutch-Australians employ Dutch even less often (*cf* Bennett, 1992, Hamer, 1995) A number of variables have been found to influence the use of Dutch by the Dutch emigrants in Australia (*cf* Ammerlaan, 1990b, 1990c, Clyne & Jaehrling, 1989) The Dutch were primarily economic emigrants, arriving in Australia at a time when assimilation to a monolingual Anglo-Australian culture was considered compulsory (Cnossen & Apperloo, 1954) Emigrants were advised "not to harm their children's chances in the new country" by using their L1 (Overberg, personal communication 1985) Using Languages Other Than English (LOTE) in public was considered a sign of lack of assimilation and therefore un-Australian LOTEs were tolerated for communication, but were 'illegal' for the identification function of a language until the late 1970s when multiculturalism emerged (Ozolins, 1988) There are few churches or other organizations which supported the use of Dutch (Bouma, 1988, Clyne, 1982, Cough, 1963) It has been argued that the presence of many dialects in the Dutch-Australian community (40% originated from 'nonstandard Dutch' speaking provinces) make maintenance of standard Dutch difficult (Pauwels, 1983, 1986) Another variable is that the Dutch settled in cities all over the continent, where minority languages are generally less likely to survive than in rural communities (Menken & van der Schaaf, 1979) In addition, they live dispersed over these cities, thus preventing the formation of linguistic and cultural "islands" where Dutch could be maintained (Watt, 1980, 1988) Apart from the Frisians, the Dutch also have little experience in maintaining their language (Elich, 1985) In addition, Dutch emigrants do not consider the use of Dutch to be vital to being Dutch (Foster, Lewis & Rado, 1980, Pauwels, 1980, 1990) They are aware of the limited use of Dutch worldwide and consider shifting away from Dutch as a move up the societal ladder (*cf* Ammerlaan, 1994i) Clyne (1982) adds that cultural and linguistic similarity between Dutch and English together with exogamous marriages among Dutch-Australian emigrants (Pauwels, 1984) and their geographical dispersal contributed towards the shift from the use of Dutch towards Australian-English even in personal domains such as the home Cultural and linguistic assimilation to Australia was relatively easy to achieve without great changes at home

Arguably, the sociolinguistic background of the emigrants may suggest that, for instance, spoken words associated with non-home domains are most likely to be 'forgotten' But this conclusion is premature, the overall effect (*i e* maintenance or otherwise) of each of these sociolinguistic variables depends on the nature and their relationship to other variables as *perceived* by individual users (Allard & Landry, 1992, Berko-Gleason, 1982) Since members of a minority language community differ in the way each perceives the world around them, they differ in their linguistic and cultural assimilation This implies that contact between languages does not necessarily result in attrition in one language Boyd (1986), for instance, found that when languages operate in strictly specified domains the less prestigious language can be successfully retained No single key sociolinguistic variable may therefore predict the outcome of language contact (Gardner, 1982)

The *complexity* and subjective nature of variables affecting language maintenance also prevents the application of previous findings to the current study in a direct fashion The complexity and subjective nature of language contact implies that each individual and each language community must be assessed for sociolinguistic characteristics and language use in specific domains (Jamieson, 1980) and that findings from one particular study may *only* be applied under certain conditions to other language contact situations (*cf* predictions in Fishman, 1968 and Clyne, 1982) Studies suggest that the perceived context of acquisition (*e g* formal *vs* informal, domains, community policies), the characteristics of the period of use (*e g* duration, extent of contact, domains), and the characteristics of the language and users themselves need to be assessed anew for each study of language attrition, as well as their relationships because these too vary with each language contact situation

Sociolinguistic reasons do not offer the sole explanation for selective attrition Sociolinguists generally make few references to the role of the linguistic nature of the forms as if, for instance, the type of words or their similarity have no effect on retention and use (see Munstermann & Hagen, 1986 for an exception) Thomason & Kaufman (1988 15) even argue that social factors overrule structural factors However, language shift and language attrition have common symptoms that are interrelated

1 3 Linguistic Variables Affecting Lexical Attrition

Linguistic research shows that at all linguistic levels elements appear vulnerable to language attrition (Van Els, 1986, Schmidt, 1985), but not always to the same extent Linguists studying attrition generally investigate the structural regularities in the forms which are selectively used and have come up with observations like those in § 1 1 Observations in other contexts suggest some general trends For instance, linguists argue that obligatory rules become optional, stylistic variation in vocabulary is reduced and formulaic expressions are more frequently used (Andersen, 1982, Berman & Olshtain, 1983, Dorian, 1981, 1982, Dressler, 1981, 1991, Hinskens, 1986, Schmidt, 1991) Other common linguistic observations are that agreement rules are simplified (Andersen, 1982, Clyne, 1977a), free morphemes replace bound morphemes, other-language elements and strategies are extensively used in the disused language, and less rapid decline of morphologically 'simpler' words than of more complex ones (*cf* Dressler & Wodak-Leodolter 1977a, 1977b) On the whole, the result is more analytical syntax of the declining language (see Andersen, 1982, Maher, 1991 for further details) Attrition was found to result in increased permeability in the disused language, particularly in language-specific structures and meanings Other simple, unmarked structures that are acquired earlier than more marked ones are less readily 'lost' (*cf* Brewer-Bomar, 1981, Clyne, 1992) Lambert and Moore (1986) claim that selective lexical attrition is affected by an interplay of variables such as regularity, distinctiveness, and pragmatic load of the words, suggesting that 'inherent importance' for the structure of that language is the key reason Linguistic studies of attrition have also used the term 'complexity' in accounts of selective decline of the structure and vocabulary of disused languages (*cf* Seliger & Vago, 1991b) This term and others are, however, used in diverse ways (*cf* Rutherford, 1982) On the one hand, complex is used in the sense of structurally "irregular", "opaque/non transparent" (Schachter, 1974, Gass, 1979, Maher, 1985), infrequent', perceptually non-salient , 'language specific (Corder, 1973, 1981), and "ambiguous' On the other hand, complex means "containing many embedded elements (Clark & Clark, 1978) and 'requiring much processing effort (Sharwood Smith, 1983a) In this 'constructional' sense, complex forms which require reconstruction of many components may break down, especially as a result of their lack of use Language users have some notion of processing complexity that they use to avoid difficult forms (*cf* research by Klee & Legge, 1980)

This ambiguity of "complexity" and "use' appears to be due to the interrelationship between *changes in competence* (what is known) and *changes in performance* (what is used) in language contact Competence is defined as the linguistic knowledge a person possesses, performance is the use of this knowledge (*cf* Sharwood Smith, 1986) Since research has shown that gaps in knowledge affect use and lack of practice affects linguistic knowledge (Corder, 1973), the two notions are difficult to distinguish This makes it hard to identify a linguistic trend as crucial or epiphenomenal, temporal or permanent Most often it is argued that competence changes are more *permanent* than performance changes, with the latter being context-dependent (Sharwood Smith, 1983a)

Another factor inhibiting easy identification of structural trends is the already mentioned fact that, in bilingual contexts, between-language and within-language changes occur *simultaneously*, resulting in what is called an inter-language (IL, Adjémian, 1976)

The result is that 'absent' or 'incorrect' forms in language attrition data are difficult to categorize unambiguously as 'non-acquisition', 'loss', or 'change', instead they may be the result of inter-lingual processing The simultaneous between-language and within-language change makes it problematic to attribute a phenomenon to (L1) attrition (*cf* Buckley, 1988, Gardner, 1982, Olshtain, 1986), unusual words or phrases could be due to performance slips, influences of the second language (L2) or to gaps in knowledge

As in current inter-language research (*cf* Kellerman, 1987, Odlin, 1989), analyses of languages in attrition contexts should therefore discuss not only the errors, but *total* performance, *i e* should not study only transfer of similar or distinct elements, but cross-linguistic influence in the languages in contact

1 3 1 <u>Cross-linguistic Influence</u>

Findings and methods from this research on cross-linguistic influence (CLI) in learners may be applied to language attrition, assuming that the mechanisms of change are similar, in both acquisition and attrition contexts, language users go beyond their knowledge to achieve their communicative aims by routine and non-routine solutions (such as transfer, simplification, and overgeneralization)

CLI research has shown that both gaps in competence and lack of performance skills may result in the use of inappropriate language elements from that language or another language at all the linguistic levels (*cf* Kellerman & Sharwood Smith, 1986, Odlin, 1989) Some performance-related reasons found to promote systematic intrusion are greater prestige/status of foreign words, less ambiguity, and greater communicative acceptability (*i e* language-external reasons) It was also found that foreign words may interfere because they occur more frequently or are less marked

Studies show that CLI is affected by the language-learner's *perception* of the *linguistic characteristics* of a form (*cf* Kellerman & Sharwood Smith, 1986) If forms are perceived to be regular, structurally simple, transparent, etc (*i e* less marked) and universal to the languages in contact (*i e* similar), they are more likely to be transferred (Andersen, 1987, Gass, 1979, Kellerman, 1987) Both the linguistic nature of words and the bilinguals' relative *experience* in that language influence perception Less proficient subjects tend to assume that words of similar form indicate the same concept and share the same distribution restrictions Kellerman (1987) and Walsh (1983) used the term 'U-shaped behaviour" to characterize the direction of change in learners' intuitions as a result of increasing language experience Frequent interchanging use of typologically similar languages was found to promote CLI (Clyne, 1982, Sharwood Smith, 1983a)

CLI findings suggest that selective attrition of forms is influenced both by the subjects' proficiency/fluency and their perception of the nature of a form These perceptions may also change, as languages are continually in transition, involving adaptation of old elements and acquisition of new ones, while superseded elements are subject to attrition

CLI studies suggest that the mechanisms that link knowledge and use of this knowledge need to be considered for investigations of language change (positive or negative) since form and function are related Combined sociolinguistic and linguistic investigation needs to be conducted into the origin of IL forms in language attrition and into the nature of L1 attrition whether it entails permanent decay of *knowledge* and/or disappearance from *use* (due to, for instance, temporary retrieval problems) (*cf* Sharwood Smith, 1983a) Such combination is, for instance, used by Andersen (1982), Clyne (1992) and Weltens & Grendel (1989)

An integrative approach to L1 attrition

In this project on emigrant Dutch it is ascertained which sociolinguistic and cross-linguistic variables in the context of L1 attrition refer to changes in competence and which to memory performance, and whether non-use of certain words and non-native use of others reflects attrition or incomplete acquisition The latter distinction determines whether 'forgetting' is permanent or temporary (*cf* Sharwood Smith & van Buren, 1991) In other words, the study is concerned with which information is 'lost' and which 'irretrievable' *i e* which of the comments in § 1 1 reflect what has happened to L1 Dutch in Dutch-Australians The issue is whether attrition affects the *procedural* knowledge of a disfluent L1 speaker during reactivation of words or whether actual knowledge of Dutch itself has deteriorated In using a psychologically oriented study I intend to investigate the impact of underlying mechanisms involved in producing a 'dormant' language on the nature of L1 attrition and the influence of cross-linguistic similarity Such an approach permits integration of explanations of lexical attrition involving what is affected (linguistically) and where and when (sociolinguistically) In the past, linguistic studies seldom explicitly mentioned the influence of use, *i e* practice in processing, on selective maintenance This is probably due to distinct research traditions Studies of the *linguistic* variables affecting attrition of "forms" tend to investigate attrition in the *L2* context, while studies on *social* variables in attrition of 'functions' primarily study *L1s* Consequently, relationships between use, structure, and processing have not been defined in a mechanism of language attrition, despite the common observations that certain words 'disappear" before others A basis for such a model of language attrition is derived from psychological research on 'forgetting'

1 4 Psychological Studies of 'Forgetting'

Psychologists investigating 'forgetting' argue that the processing of information is crucial to investigations of information retention Results from experiments point to a distinction between permanently 'lost' information (*cf* loss of competence) and temporarily 'unavailable' information (*cf* performance difficulties) (Altman-Fuld & Buschke, 1976, Craik & Lockhart, 1972, Loftus, 1980, Reynolds & Flagg, 1983) Experiments testing theories of selective forgetting found that variables of learning, use, and test context affect the depth of encoding and the remembering processes (Glass & Holyoak, 1986, Summers, Borland & Walker, 1989) The three groups of variables are addressed below

A Learning

The extent of initial analysis and encoding is affected by variables that determine the strength of the relationship between a cue and its related target information Encoding involves storing only the core properties of an event into a 'schema', which during remembering is used to reconstruct the original information, together with various sources of information including bias (Bartlett, 1932, Bourne, Dominowski, Loftus & Healy, 1986) Remembering is thus by nature reconstructive The degree of reconstruction determines the degree of confidence in the recovered information (Wagenaar, 1988) Some variables that affect encoding are

- the subject's motivation to remember the information,
- the time available for analysing the information,
- the period of retention the longer the interval between encoding and recovery, the more the initial information is reduced to what are considered its essentials (*cf* Craik & Lockhart, 1972, Engle & Mobley, 1976, Smith, 1971, Saegert, Hamayan & Ahmar, 1975)
- the level of the subject's knowledge and analytical skills (*cf* Ceci & Howe, 1978, Ritter, Kaprove, Fitch & Flavell, 1973), which generally are greater in older subjects than younger ones,
- the nature of the information and previous experience Transparent new information is analysed to a greater depth, and concrete words remembered better than abstract words (Klee & Legge, 1980),
- similarity In experiments, considerable agreement between new and stored information results in interference as the new and old data are confused (Adams, Marshall & Bray, 1971, Anderson, 1976) However, Altman-Fuld & Buschke (1976) found that similar information was recalled more successfully than dissimilar, suggesting there is a point at which similarity ceases to assist memory performance and instead interferes with it

B Use

Variables of use are related to practice in recovering the original information These variables influence the automation of the processes involved in recovering the target information and hence improve subsequent recovery of information using the same processes (Allen, Mahler & Estes, 1969, Graf & Mandler, 1984, Klee & Gardiner, 1980, Tulving, 1983) Cohen (1986) points to learning strategies like rote learning as well as learning through associations The latter can involve structural association (analysing the target word into the root and affixes), semantic association (fitting the word into a network of related information), and mnemonic association (*e g* via a translation link)

Not only the *learning* of more recent "similar" information but also subsequent *recall* of similar information was found to affect the recall of the original information (*cf* Anderson, 1976, Bourne *et al*, 1986) Similar information may interfere retroactively with the original information In experiments, several types of interference were found, such as cue confusion, unlearning and reconstruction errors (*cf* Glass & Holyoak, 1986) It is unclear, however, whether this interference also occurs to the same extent in real-life situations, since most psychological studies used list-learning tasks which tap episodic memory only (see below)

C Test context

A third group of variables is related to the memory tests used Similarities between the encoding conditions and the conditions of recovery improve memory performance (Ehrlich & Phillippe, 1976, Tulving & Thomson, 1973) Tulving (1983) reasons that the manner in which particular information is learned and used is retained with the information itself for a certain period of time and hence functions as an effective recovery cue The cue used is thus a critical factor in remembering success

The nature of forgetting also depends on the *type* of memory task and on how such memory tests are influenced by fatigue, guessing, response strategies, type of test items (*e g* their automation, similarity, and transparency), norms, skills used, and conditions of encoding For instance, comparison of the results of the often-used recall and recognition paradigms shows that unrecalled information is not necessarily forgotten as it sometimes surfaces in subsequent recognition tasks (Blake, 1973, Hart, 1965) or Tip-of-the-Tongue (TOT) states (Rubin, 1975, Tweney, Tkacz & Zaruba, 1975, Reason & Lucas, 1984), indicating that the information targeted is accessible even though not fully 'recallable' In general, however, forgetting is found to be slower and less pervasive in recognition than in recall tasks (Shephard, 1967, Thios & d'Agostino, 1976) Parallel findings from research on the paradigm effect are found in studies on attrition like Bahrick's (1984a, 1984b) He found that recall of L2 Spanish was worse than recognition by American-Spanish bilinguals after a period of disuse[6] Other findings from research involving these paradigms are that recognition is more successful over a longer interval than recall (McCormack & Carboni, 1973), that similarity in cues and context between encoding and remembering influences recall more than recognition (*cf* Summers *et al*, 1989), and that high frequency words are recalled better than low-frequency ones, but low-frequency words are recognised more easily than high-frequency words

Differences between recall and recognition tasks

Theories on the different results from recall and recognition tasks suggest that the nature of the *processes* in each task determines what information does or does not emerge (Mackay, 1982, Tulving, 1984) In recognition tasks, lexical priming processes are predominantly used, as opposed to activation processes in production tasks Priming assumes automatic and simultaneous transmission of information, whereas activation is time-consuming and always results in overt behaviour Recall and recognition tasks must use the same "memory accessing processes", as "recallability" is a good predictor of "recognisability" (Rabinowitz, Mandler & Patterson, 1977) Recall tasks differ from recognition tasks in that the former more prominently involve *cue generation*, access of *all* information in a lexical entry and *articulation* processes (Adams *et al* , 1971) In recognition, access of lexical information requires a lower threshold, since the cues are given and no detailed response is needed (Morton, 1969), all that needs to be determined is whether the information has been encountered before[7] In recognition tasks, the cues needed to perform the memory search only need to be derived from the given target information In recall tasks search cues must be specified in detail and often need to be translated from other cognitive systems (*e g* perception) before being used in searching the mental lexicon to retrieve the target[8] On the other hand, recognition tasks mainly involve *accessing* and post-access *decision* processes (Rabinowitz *et al* , 1977) As a result, they tend to assess intuitions, whereas recall tasks tend to assess actual performance

1 4 1 Theories on 'Forgetting'

How does forgetting work? Two types of theories on forgetting have been proposed on the basis of these experimental findings *Trace decay* theories, which state that repeated use results in stronger memory traces, are less popular They do not account for context-dependent recall, the reappearance of unrehearsed information, or selective re-emergence *Interference* theories argue that new information influences old information related to it ('retroactive' interference), and *vice versa* ('proactive' interference) The influence of new on old information may result in inhibition or facilitation of memory performance Within this type of theory it is claimed that the more fully the information is encoded (*i e* greater depth-of-processing), the more resistant it is to interference, and the more often new information is used, the more likely it may affect stored related information Thus, the deeper the information is originally learned and encoded, and the more remembering is practised, the more that information is likely to be remembered at a later stage (Gotz & Jacoby, 1974, Loftus & Cole, 1974)

Superficially analysed information is considered to disappear more easily from memory (*i e* be lost) (*cf* Glass & Holyoak, 1986) The depth-of-processing influences not only the relative *permanence* of retention (Graf & Mandler, 1984, Dark & Loftus, 1976), but also the *nature* of the recall errors The deeper the analyses of new information, the fewer recall errors resemble the target information in superficial form characteristics (Hogan & Kintsch, 1971, Moscovitch & Craik, 1976, Loftus & Loftus, 1976) The latter type of theories predict that similarity of disused/old information in memory to frequently used new information influences the outcome of memory tests, and that elements learned first disappear first Causes of recall interference in experiments thus include inability to interpret the cues, association of the cue with multiple related responses, inability to recognise the accessed memory information during a decision stage prior to recall, and closer association of new or more frequently used information with the cue than with the target (*cf* Graf & Mandler, 1984) Thus, interference with processing during encoding and remembering may result in non-appearance (*e g* non-recall) of permanently stored information (Loftus, 1980) Such information is therefore considered to be merely *temporarily* unavailable (Bourne *et al* , 1986) By analogy, one could argue that L1 attrition is the result of interference during testing or during the period of retention, when newly encountered related information alters the existing old information in memory

1 5 Implications of a Psychological Approach for Research on 'Strutch'

Psychological research is used to guide the current study on language attrition in natural context Experimental findings are not directly applicable, however Psychologists concentrate on the measurement of information retention and loss, and concentrate less on the relationships of the test items to other items within the structure of a language Despite claims of investigating "retention of languages", studies mainly employ *isolated concrete words* and often only involve minimal use of language skills, so that experimental findings may not be totally relevant to language attrition as such Most experiments particularly measure retention of *word-lists* over a *brief* interval and only employ a *single* post-learning test As a result of the paradigms, results mainly relate to episodic memory rather than more permanent semantic memory In semantic memory, disuse may result in loosened relationships between the types of linguistic information This may lead to increased permeability of certain structures to new information from a frequently used language

Furthermore, test results are not absolute. Psychological experiments have shown that what is recalled in a test need not have been stored in the subjects' memory, it may be the result of low-level rules rather than remembering Problem-solving or other reconstruction processes operating on the key features (schema) of the original information may influence performance (Neisser, 1984) Here *bias* may interfere with the reconstruction (Bartlett, 1932, Norman & Bobrow, 1979, Nelson, 1971, Reder, 1982) Test results indicate the strength of the relationship between a cue and the target, and only indirectly reflect what is stored in memory Patterns in the types of information recalled thus reflect not only the structure of the memory banks (as is sometimes claimed), but also the strategies and processes involved in re-activation of stored information

Stringent experimental control is not always possible in language attrition research Psychological experiments have also shown that the types of paradigms used influence which information is remembered and which is not General similarity between the conditions of encoding and those used during reproduction in the experiments results in better memory performance than when the contexts differ (*cf* Nelson, Geiler & Narens, 1984) In attrition research, however, the nature of the encoding conditions of a language may often only be inferred, and rarely be controlled

<u>Some implications of research on forgetting for language attrition</u>

Psychological studies suggest how the effects of linguistic structure and use may be related in language attrition, and which causes may underlie non-performance in a memory test The models on forgetting suggest how processes of encoding (acquisition), use, and remembering (attrition) are interrelated

As discussed, a distinction can be made between *failure to acquire* and *true attrition* or permanent unavailability at any time (Andersen, 1982) Psychological research has added a third *failure to perform* This term covers instances where target information is absent in one task but demonstrable in another On the basis of psychological theories forgetting of *permanently* stored information is not due to the passing of time (trace decay) but due to *process* interference, either during initial processing that resulted in misplacement, or to newly acquired information affecting remembering The variables affecting processing during storage and reactivation of information are therefore central to language attrition research, as they suggest how the distinction between temporary "forgetting" and permanent "loss"[9] may be investigated and in what way acquisition and attrition interact The many variables mentioned in psychological research (§ 1 4) do imply that, since the nature of encoding and practice (learning and use) may only be determined approximately in natural contexts, it will be difficult to identify a *single* underlying cause for selective attrition of Dutch

Psychological theories specify the relationships and differences between language shift and language attrition Research on forgetting (*e g* Loftus, 1980) suggests that the extent of *analysis* during encoding determines whether the information is fully recalled, partially recalled or confused with related information In addition, the extent of *practice* in subsequent remembering is shown to contribute to memory success only in that specific context The types of L1 words which are subject to attrition thus depend on when, where, and how often these are used (function) as well as how these are linguistically perceived (form) and how retention is tested Of particular interest in this study are variables influencing speech processing of words from what psychologists call 'long-term memory' Both sociolinguistic and linguistic variables are important, as languages involve both procedural (skills) and declarative (factual) knowledge A number of contextual, psychological, and information-specific variables affect forgetting These resemble sociolinguistic and linguistic variables found to affect attrition

The depth-of-processing theory and variables of learning and use based on experiments suggest how variables related to language structure and use, such as learning context, frequency of use and similarity determine, first, whether forgetting is permanent or not, second, which information (words, structures) is forgotten, and third, how information is remembered in an attrition situation The finding that elements which were analysed deeply and remembered frequently in the past are those which are recovered best, can be applied to attrition research One may expect that more extensive exposure and longer use in the L1 context prior to emigration will improve remembering Linguistic research, however, is far from clear on this (*cf* Altenberg, 1981, Godsall-Meyers, 1981, Olshtain, 1986, Scherer, 1957) nor on the influence of minimal threshold competence or physical/cognitive age on the extent of skills transfer from the dominant language (*cf* Verhoeven, 1994) It therefore needs to be established whether memory performance in recovering Dutch words depends on the number of years of exposure to Dutch prior to emigration

In addition to language-external variables (learning and use), it was found that performance is affected by the nature of the target information, *i e* language-internal variables such as cross-linguistic similarity in use and form In psychological studies perceived similarity in form and use to more recent information interfered with processing of the less deeply stored form information Interference may result from subsequent recall and/or accessing of similar information, implying that L1 information similar to the L2 is likely to be affected in memory (competence) by L2 use, but that similarity also improves recall of this L1 information on the basis of analogy to the L2 forms as a result of 'spreading activation' (see Chapter 2). Well-rehearsed language structures and component skills would not necessarily be unaffected by the emigrants' shift to English. Subjects who claim to be "rusty" in their L1 could be least certain of the form characteristics of the disused L1 words since the depth-of-processing theory suggests this is used least. Primarily the (less language-specific) meaning of the disused L1 words is activated by analogy to the more frequent use of English translation equivalents, but not the Dutch (oral/written) form of the disused words. This suggests that difficulties in remembering L1 words mainly arise in Dutch words that are partially similar in form to their English translations. For these words, the use of partially related L2 translations may affect the way the L1 words are stored and accessed, and not assist their reactivation based on analogy. There is some indication for this in Hoeks (1988), who found that fluent Dutch-Australian bilinguals were more confused in their acceptability assessments on Dutch and English idioms the more they used Dutch. Extensive language mixing (especially if this is socially and communicatively tolerated as indicated in comments by a Dutch emigrant) may alter the processing routines used during retrieval, or even competence as such.

In addition, psychological research claims that the *nature of the type of task* used in a test may influence whether attrition, maintenance or acquisition is observed (*cf.* performance, § 1.3), since the language test itself determines which information is found. Tasks do not supply complete proof of the presence or absence of information in memory. Consequently, what is measured is not actual linguistic competence itself, but the *accessing* processes and the *application* of competence in a specific test context. Most research on attrition to date has tested the presence of information only *once*. Therefore, most of these results (*cf.* overviews in Weltens, 1987; Williamson, 1982) must be considered to pertain to disfluency rather than permanent attrition[10]. In this context, the nature of (intra-generational) attrition is the subjects' *assessment* of an association between the cue and the information required at a particular time and place which in a previous context was perceived to be successful but which currently is not (*cf.* § 1.1). This assessment may either be merely perceived or also be measured. This definition captures the difficulty in providing absolute proof of attrition, just as 'acquisition', and 'retention' are not absolute terms. The term 'loss' is usually used to refer to a perceived negative change in competence.

This means that by comparing intuition-oriented and performance-oriented tasks, one may investigate the distinction between *temporary unavailability* (disfluency as a result of language-processing problems) and *permanent unavailability* (loss) in an attrition context For instance, by comparing performance in a number of different tasks, instances of temporary attrition (when reactivation processes are defective) may be identified The use of various paradigms can provide a better understanding of L1 attrition The absence of linguistic information of an L1 is likely to be due to lack of control over the procedural knowledge rather than attrition of the appropriate knowledge The psychological experiments suggest that, given the nature of L1 learning and use, perceived problems in emigrant Dutch and 'deviant' regularities in Strutch are, in the context of L1 attrition of Dutch after migration, likely to be *mainly* the result of interference during remembering and lack of practice ("disfluency") in remembering Dutch It is less likely that changes to L1 competence may have occurred as a result of L2 use (*cf* findings in Galbraith (1981) on adverb placement) 'Being rusty' is more likely the cause for the majority of comments like those in § 1 1 For this reason, psycholinguistic investigation of language processing is essential in L1 attrition studies

In this dissertation on Strutch, this comparison of decline in procedural and/or declarative L1 knowledge involves *recall* and *recognition* tasks of Dutch words Recall tasks emphasise production processes and therefore closely reflect the relative proficiency and fluency with which dormant-Dutch bilinguals *perform* in Dutch Results of recognition tasks provide evidence on accessing of *competence* because these rely less on production processes than recall tasks In this way, differences in attrition of productive and receptive skills (as found in Bahrick, 1984b, Cohen 1989) as well as qualitative differences (*i e* competence or performance, specific word types) may be investigated Given the findings that learning and use affect storage, and that Dutch emigrants now mainly use receptive skills, one can predict that the emigrants will be less successful in recalling Dutch words as compared to other verbal memory tasks

Potential 'process attrition' of Dutch is thus the topic of this psycholinguistic project Process attrition refers to the possibility that reduced linguistic co-ordination and control results in incorrect execution of processes involved in, for instance, language production Insights from CLI studies may be applied to language attrition Awareness of processing complexity on the one hand, and cross-linguistic similarity on the other, may equally affect the use of transfer from the more fluent language in the attrition contexts Here it operates both as a stop-gap and as an accelerator of language attrition when 'foreign' elements are used

(Ammerlaan, 1987b) CLI research suggests how 'linguistic similarity' can be specified, a concept shown to be influential in psychological research on forgetting (§ 1 3) Initial research by Altenberg (1981) in a judgement task shows that phonetic similarity increases the vulnerability of L1 verbs to attrition

The present study focuses on speech processing of words in the context of non-pathological L1 attrition in a L2 environment within one generation The study examines whether L1 attrition involves permanent loss of information and/or difficulties in retrieval, and which linguistic variables influence bilingual retrieval processes during reactivation of the L1 Olshtain & Barzilay (1991) and Hakuta and D'Andrea (1992) argued that rusty retrieval processes could well be a prominent feature of natural L1 attrition

Since psychological theories argue that reconstruction is inherent to remembering, the psychological approach implies that the nature of *retrieval* processes during remembering is crucial in determining whether a Dutch word appears in the speech of an emigrant who has not used this language for some time, but who used to have native proficiency in Dutch Retrieval processes are specified in Chapter 2 on psycholinguistics, but one may simply characterize them here as those lexicalization processes which access stored linguistic information for use in the speech mechanism in order to produce an utterance (*cf* Bradley & Forster, 1987, Levelt, 1989) Retrieval processes thus include accessing processes The next chapter reviews what is known about linguistic retrieval processes and how this evidence has been gathered

1 6 <u>Pragmatic Considerations</u>

Research on the attrition of Dutch is important for reasons other than development of models on language attrition and bilingual processing Since the emergence of multiculturalism in Australia and the resulting 'legalization' of interest in one's non-Anglo roots, the Dutch community in Australia has become more concerned about being 'rusty' in one's native tongue (Clyne, personal communication, 1985, Stracke, 1995c) Lively debates have ensued between first-generation Dutch emigrants about the quality and use of their Dutch (*cf* Ammerlaan, 1989a, 1994f, Stracke, 1995b) In a workshop in 1987 called "*Dutch emigrants in Australia victims of assimilationist policies*" a variety of sentiments were verbalized most clearly Some emigrants claimed that they had "lost their Dutch" and preferred to use English, whereas others stated that these claimants were either "putting on a show" or merely felt "their Dutch was not up to the same standard" as the one used in the Netherlands, or could not communicate the same concepts as well in Dutch as they could in English because they had "never learned Dutch properly" Others stated that perhaps their perception of inability is based on Australian concepts or extensions to Dutch meanings for which they "naturally don't know the Dutch words" It was even suggested that the idea of "loss of Dutch" reflected the Australian policies towards LOTEs, a "desire to have English spoken here only' Such comments by emigrants indicate that 'forgetting' and 'remembering' are two ends of a continuum rather than dichotomous terms In addition, the comments show that an assessment of background knowledge on the current and past linguistic proficiency in Dutch is vital, as is a description of current patterns of use

Besides assessing these claims, it is important to establish whether emigrant Dutch is 'lost' or merely 'rusty' and for which types of bilinguals this is the case, given the extent of regression to emigrants' mother tongues as a result of aging, as reported by ethnic community workers in Australia (*cf* DACA, 1993a, 1993b) Although Dutch emigrants (particularly those in their 'career years') in the eyes of the majority community in Australia still have a reputation for being linguistically and culturally 'invisible' (and therefore of experiencing widespread L1 attrition), there are indications that this "excellent assimilation" is merely superficial (Ammerlaan, 1994a, 1994f, 1994h, Bouma, 1995, De Kruyf, 1995, Taft, 1960b, 1961, Wiseman, 1974) Although De Bot and Clyne (1989, 1994) found no empirical evidence for changes in the extent of CLI within the constraints of their study, social workers in this community claim to notice more widespread regression to Dutch culture and language in the elderly (apparent L2 attrition) in recent years (Neeleman, 1995, Vaartjes, 1995, Vlam, 1995, Vreugdenhill, 1995) If the latter are right, there is a need for more Dutch-specific facilities in the future (Ammerlaan, 1994c, 1995d, Grüter, 1995, Rowland, 1991) if the L1 is merely dormant

Apart from general interest in aging effects on language processing (Clyne, 1977a, 1988b, De Bot & Lintsen, 1986, De Bot & Weltens, 1991, Poon *et al*, 1980), more knowledge about the extent and nature of L1 attrition in the Dutch community will allow better preparation for the various consequences of the restricted use of Dutch in a rapidly aging Dutch community (Ammerlaan 1994g, Bogers & Lenny, 1985, Cahill, 1995, De Bruin, 1994, Stracke, 1994) Since most emigrants arrived in the 1950s when they were around the age of 20, they are now retiring *en masse* A better understanding of the linguistic and socio-psychological variables that affect the use of Dutch can provide insight into the nature and extent of attrition of Dutch and how it is reactivated It can also provide information on the extent to which the methods used and the findings on the emigrants tested may be generalized to the entire Dutch emigrant population in Australia and to other LOTEs (Clyne, 1995)

For the above reasons, extensive background data were collected not only on the use of Dutch and English but also on the views of Dutch-Australian emigrants who are 'dormant' in their L1 about Dutch and English and their integration in Australia[11] The latter could not be included in this dissertation The emigrants dormant in their native language will be referred to as 'dormant emigrants'

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[1] The term 'emigrant Dutch' will be used to refer to the type of Dutch used by Dutch emigrants in Australia It is sometimes referred to as "Strutch", a combination of Australian English (or 'Strine') and Dutch

[2] Unless stated otherwise, text within square brackets indicates the author's translation Translations from Dutch into English were kept to a minimum and expressed as literally as possible All translations have been counter checked by a second certified translator of the National Accreditation Authority of Translators and Interpreters (NAATI) In case of any errors or omissions, they are the author's responsibility

[3] Whether this change is temporary or permanent is not specified

[4] Strine Colloquial 1) Australian English, humorously and affectionately regarded 2) The form of it which appeared in the books of Alastair Morrison, pen-name 'Afferbeck Lader', where it was written in scrambled form to suggest excessive assimilation, metanalysis, ellipsis, etc (Macquarie Dictionary, 1991 1680)

[5] This is a version by subject 33 of the following English story which the subject was invited to re-tell in Dutch
Once upon a time there was a tailor One day a rabbit entered his shop "Goodday tailor", he said, "Do you happen to have pleated skirts?"
"No", the tailor said, "I haven't got any "
"Oh well", the rabbit said, and left
The next morning he again entered the shop "Good morning tailor, do you have pleated skirts?"
"No, I'm sorry" the tailor said
"All right" the rabbit said and left again
The tailor felt sorry for the rabbit and he decided to expand his range of clothes with a pleated skirt The next morning a pleated skirt hung neatly on a coathanger in the shop window, and when the rabbit entered the shop and again asked for a pleated skirt, the tailor happily said "Yeah, sure, now I have one "
The rabbit just grinned and said "They're really hard to iron, aren't they?"

[6] However, the task formats were not fully compatible and involved few items, whereas very little was known about Bahrick's subjects other than information from self-reports

[7] Therefore, high-frequency words are recognized with difficulty as there are many potential candidate words which also occurred recently (Anderson & Bower, 1973)

[8] This may explain the frequently heard observation by Dutch emigrants that speaking a disused language in the community of origin is easier, but that this ceases once they have returned to Australia from their holiday Both the more appropriate context and the use of the L1 by others will have produced richer recall cues than the Australian setting

[9] Loss in this sense is the permanent unavailability at any time of particular information and skills which were available at a previous time

[10] The term 'Retain' is used here in the sense of 'to be demonstrable to exist in memory performance' Some influence of guessing, deduction and response strategies on the results can never be completely ruled out Recall and recognition of words can be the product of access and retrieval processes as well as the fortuitous result of problem-solving strategies or reconstruction Only if the item (*e g* word) is remembered more often than what would happen by chance can it be said to be remembered from memory (Nelson *et al*, 1984)

[11] Approximately 400 emigrants in Greater Melbourne were interviewed on the telephone about when, where, how often and why they used Dutch Social and pastoral workers, academics, and Dutch clubs and societies were visited in order to gain a sense of the issues in the community in Victoria and New South Wales where most Dutch emigrants live
A taped pilot study on 20 odd dormant emigrants in 1986 was transcribed and their background information analyzed
In addition to the tasks and experiments reported here, the emigrant subjects (N = 76) took part in a lexical decision experiment in each language, performed a task in which they had to retell 4 English short stories in Dutch with the help of cartoons, and were interviewed in Dutch on emotional issues related to their youth in the Netherlands and their current situation in Australia All 76 taped 'story retell tasks' and interviews were transcribed and annotated with retrospective comments that had been given by the subjects on their Dutch

CHAPTER TWO
Characteristics of Retrieval Processes

' *'It is like erm when I try and speak Dutch my speech gets deRAILed, like erm the cogs automatically move to ENGlish cogs, you know Wrong transmission /ahum/ Or I get trapped for words As if if they all wanted to get through the same door, Dutch and English, and then got erm jammed /yeah/ Dutch words come with more difficulty /hmn/ erm I suppose you can say I am inCREdibly rusty in Dutch* '" (Pilot M)

2 1 Introduction

The emigrants' problems in the recall of Dutch words could be the result of difficulties in speech production processes Retrieval processes involved in recall are important to research on attrition of Dutch since, first, many insights from past research on attrition are based on experiments involving the production of language and second, the emigrants' perception of attrition of Dutch also appears to be based on their experience in speaking Dutch (*cf* comments in § 1 1) This chapter on language production reviews research on the effects of various variables on bilingual lexical retrieval The emphasis is on the effect of 'similarity' of English and Dutch words, since in the previous chapter about research on forgetting and language contact this variable was found to influence retroactive interference and CLI

This chapter starts with an outline on monolingual retrieval processes in language production (§ 2 2), based on data from research of monolingual speech slips (§ 2 2 1) and experiments (§ 2 2 2) Specific attention is given to picture-naming The monolingual outline is used to interpret past studies on bilingual speech processing, such as code-mixing research (§ 2 3 1) and bilingual memory experiments (§ 2 3 2) This bilingual outline is used to guide an investigation into bilingual lexical retrieval processes in Dutch emigrants

2 2 Characteristics of Retrieval Processes Monolingual Speech Production

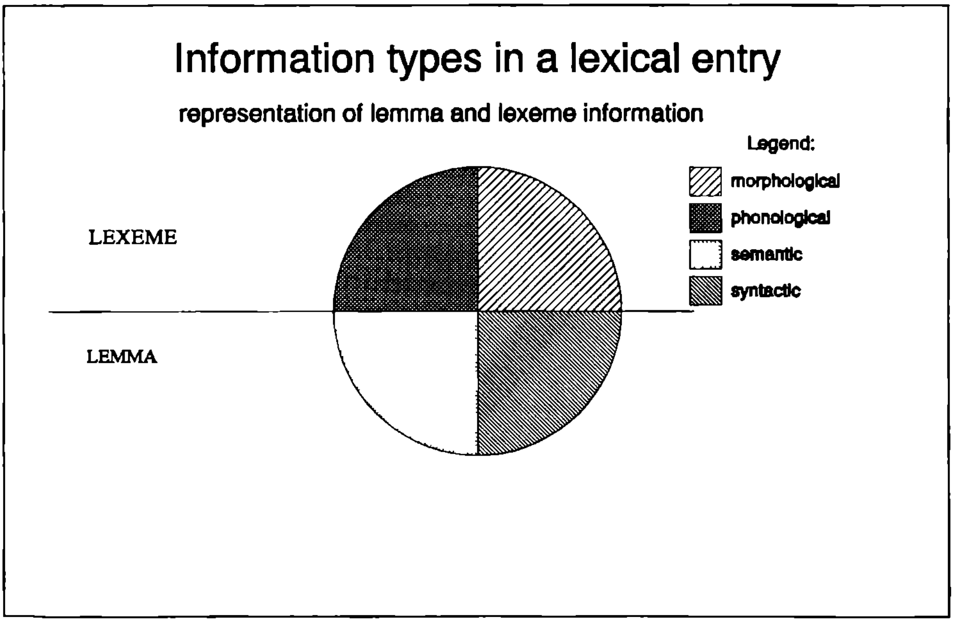
The term *retrieval* denotes lexicalization processes aimed at accessing linguistic information in memory for speech production Retrieval encompasses a number of component processes that need to be executed successfully in order for speech production to occur (cf Levelt, 1989, 1992) These take place after generation of particular information that the speaker wishes to communicate, *i e* the 'concept' or 'message' This preverbal message forms the input for language processes that access the lexicon in order to locate the necessary words to express the message Subsequent processing of lexical items during retrieval involves at least *four types* of information, all of which are stored in a lexical entry for a word: meaning, syntax, morphology, and phonology.

Lexical representation

Each lexical entry encompasses a number of characteristics that indicate these four types of information (*cf.* Roelofs, 1992). For instance, some characteristics refer to *meaning* relationships, based on inherent similarity between the concepts (*e.g.* bread-bun), acquisition in the same contexts, or frequent co-occurrence (*e.g.* bread-butter) (*cf.* King & Anderson, 1976; Kleimann, 1980; Meyer & Schvaneveldt, 1971; Seidenberg, Tanenhaus, Leiman & Bienkowski, 1982). Sets of lexical entries that share a number of semantic characteristics in the lexicon are called semantic fields (*e.g.* utensils, appliances, colours). *Phonological* characteristics indicate the phonological information of words (*e.g.* the same initial or final speech sound) and *morphological* ones the morphological relationships. These relationships are evident from certain types of speech errors (see below, Fay & Cutler, 1977). *Syntactic* information is also assumed, based on speech error data and agrammatism in aphasia (*cf.* Butterworth, 1992). The relationship between entries may be direct or via an intermediate entry in the lexicon.

It is assumed that semantic and syntactic information are represented as a so-called *lemma* unit (Figure 2.1).

Figure 2.1. Semantic and syntactic information (lemma), and morphological and phonological information (lexeme) in a lexical entry, after Levelt (1989).



Morphological and phonological information is represented as as a *lexeme* (or word form representation) and additional information (*e g* pragmatic, stylistic) is also represented Lemma information specifies, among other things, its meaning and the syntactic structures in which a specific word may occur in the language at hand Not all the words are represented by equal proportions of these types of information For instance, it appears that closed-class words (*e g* articles, conjunctions) mainly convey syntactic information (*i e* primarily serve to connect open-class words in the surface structure of a sentence), whereas open-class words convey mainly semantic information This is most apparent in concrete words that denote objects (*cf* Nation, 1990)

Research also suggests that some words do not have separate lexical entries, activation of information in the lexicon can also activate *lexical encoding* rules which, for instance, provide the capacity to combine words and add morphemes to a stem when less common multimorphemic words are retrieved (Levelt, 1989, Zwitserlood, 1994a) Research has also shown that the lexicon stores frequently used multi-stem words and common phrases and idioms, which need not be completely re-assembled when these are retrieved[1] (Levelt, 1989)

<u>Connections</u>

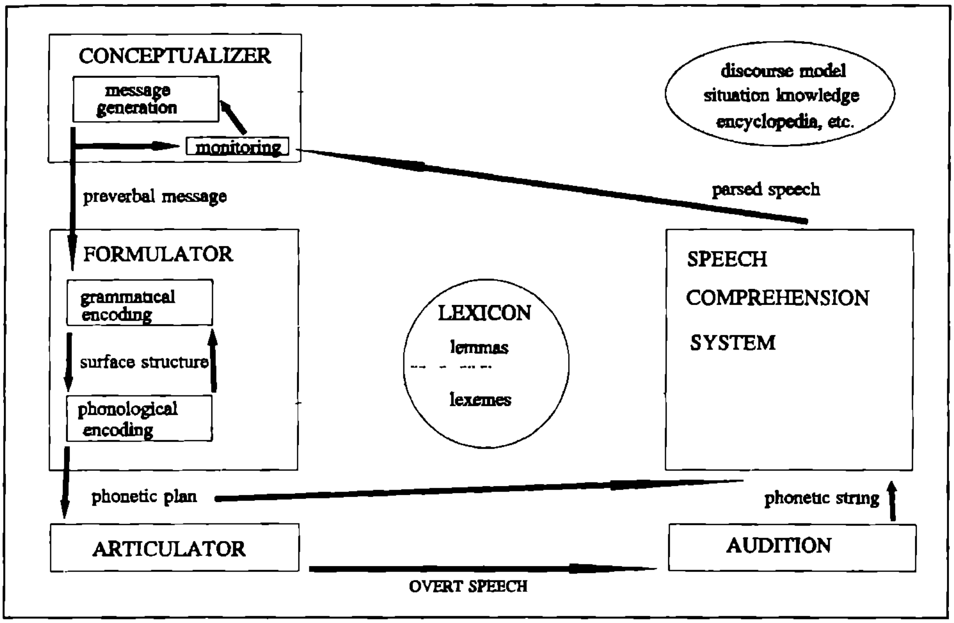
Various studies provide evidence that the types of characteristics in lexical entries are interrelated within a word as well as between words (*cf* Levelt, 1989) Levelt (1989, 1992) assumes that, *within* an entry, semantic and syntactic characteristics (*i e* content) are more closely related to each other than phonological and morphological characteristics (*i e* form) because these two types of data are activated during semantic and phonological stages during lexical access (Levelt, 1992 3) In Levelt's framework of language production (below), semantic and syntactic access is processed first, whereas in comprehension phonological and morphological access occurs initially

The relationships (similarities and differences) *between* words can be expressed in the lexicon through links or arcs between the characteristics of lexical entries (representing words) The entries can be viewed as being connected in interrelated multiple networks of nodes (Rees, 1979, Schriefers, Meyer & Levelt, 1990) For related words, activation spreads along the arcs to similar entries

<u>Modular language production</u>

In the course of production, the various types of lexical information are processed in several subsystems, each operating independently The term 'retrieval' refers to lexical component processes that each operate on their own processing unit (*e g* concepts, syllables, morphemes, or phonemes). A simplified diagram is given in Figure 2.2 Details can be found in Levelt (1989; 1992) and Bierwisch & Schreuder (1992).

Figure 2.2. Schematic representation of the main component processes in speech production (based on Levelt, 1989). Dotted lines indicate possible access of information from the lexicon during retrieval.



Conceptualizer

In the case of production, initially there is the communicative intention of the *message*. This consists of the propositions the speaker wishes to express in the utterance. It may be an association to a cue or a chain of thoughts/concepts. After generation of a *conceptual structure* of the message, lemmas are selected that together express the message within the syntactic and morphological constraints of the language chosen. This lexical selection process is looked at in more detail.

Grammatical encoding

After activation of the target concept, skeletal information is accessed through spreading activation, using the characteristics of lexical entries. A pre-search, on the basis of a few cues, determines the potential success of this memory search. If the search is considered successful, these cues in turn activate the remainder of the information (*cf.* Levelt, 1989:320). During this stage the appropriate lemma information (*i.e.* the meaning and syntactic information of lexical entries) of main open-class elements in the utterance is activated This results in a *speech plan* These accessed elements or 'lemmas' must meet the semantic conditions in the message Lexical selection thus 'drives' grammatical encoding The lemmas form a specific syntactic framework of an utterance in accordance with syntactic rules This stage is called '*grammatical encoding*' Access of the major constituent lemmas (*e g* of nouns and verbs) provides information with respect to the possible relationships in the utterance framework and the meanings involved These lemmas in turn activate lexical entries of minor categories (mainly bound closed-class) that together produce the *syntactic structure* of an utterance Levelt calls this output of grammatical encoding the surface structure It contains the pointers to the words needed in the lexicon and features of each (*e g* their case, number, pitch) in an abstract form The retrieval of the appropriate lemmas for the concepts to be expressed (semantic) and the insertion of the lemmas in the right order (syntactic) occurs independently of the phonological information in lexical entries Grammatical encoding is language-dependent For instance, certain languages tend to express relationships mainly via word and phrase order (*e g* English) whereas others primarily use case-marked morphology (*e g* Warlpiri, Hungarian), or both forms (*e g* German) (Frauenfelder & Schreuder, 1992)

<u>Phonological encoding</u>

After lexical selection, the lemma information activated during grammatical encoding in turn activates *morphological* information (such as closed-class morphemes) and *phonological* information (including the prosodic pattern) associated with the activated lexical entries, which in turn governs articulatory programming During this second, '*phonological encoding*' stage, the forms or 'lexemes' corresponding to the activated lemmas are processed as these become available, often proceeding from the beginning to the end of the word (Shattuck-Hufnagel, 1979) At this stage, syllabification and word stress assignment occurs (Meyer & Schriefers, 1991) Roots are provided with affixes or, in the case of compounds, other words, to ultimately form words (Monsell, 1984) Phonological encoding involves combining and selecting sublexical units which together form the lexeme, whereas the lemma is retrieved as one unit (Schriefers *et al* , 1990)

<u>Articulator</u>

Processing of the phonological structure results in a *phonetic structure* that specifies how the internal representation should be articulated Phonetic plans are also assembled, rather than stored as units since the speaker can in the last instance substitute, for example, 'him' for 'the man' if the referent is obvious in "He sold the car to him" The phonetic plan is then sent to *articulatory* programmes where it is executed as speech

Processes in production at lower levels usually require little resource capacity and little attention, rarely result in speech errors due to interference, operate in parallel rather than serial order, and are difficult to suppress or control (Humphreys, 1985) This type of processing is called automatic Processing continues *independently* until information at one level is converted into particular output for another level, or until the utterance is produced (*cf* Butterworth, 1980a) This allows well-rehearsed processes to be executed quickly Language processing is also *incremental* once processing in one component has reached its target, processing of that completed element on the next level starts automatically, irrespective of whether other elements of the same utterance have also reached the same processing stage (Kempen & Hoenkamp, 1984) Incrementality adds great speed to processing (though also the risk that incorrect items may slip in involuntarily) Within each processing stage, however, units of the same *category* appear to be retrieved simultaneously (*e g* all the nouns together, all the prepositions, etc)

In addition to the constraint that processing can only proceed if the output of one subsystem is appropriate for the system using it as input, a monitor checks the output for communicative and semantic appropriateness (*e g* relevance, ambiguity) and linguistic aptness (*e g* grammaticality, intelligibility) before and after muscle activity has produced the speech sounds or the graphemes

Characteristics of lexical access

Since grammatical encoding is *lexically* driven, knowledge on how lexical information is accessed is crucial for language production (and *mutatis mutandis* for lexical attrition when oral assessments are used) Lexical access involves activation of both lemma and word-form (lexeme) information (*cf* Garrett, 1976, Levelt & Maassen, 1981) On the basis of many experiments a number of different theoretical viewpoints have been brought forward as to how lexical access takes place (*cf* Carr & Pollatsek, 1985) Logogen type theories seem most comprehensive in explaining the experimental effects of certain word-characteristics on processing (Morton, 1969, 1979) These direct access theories assume relationships between entries or 'logogens' in a lexical *network* (*cf* Dell & Reich, 1980) Its central characteristic is that the entries "fire" (make themselves available) as a threshold level of matching is found between the characteristic of an entry and the input During searching, activation spreads along the arcs in networks to related entries in a decreasing gradient, or stops if intervening activity takes place (Anderson, 1982) Scanning of the entries continues until time expires or information equivalent to that in the cues is found in one entry (Baars, 1980a, Thorndyke & Bower, 1974) Once such a matching entry is encountered, its activation exceeds a 'threshold' and its information is made available to a response mechanism (*cf* Roelofs, 1992) Thus, the highest activated node is processed further Once the information in an entry is passed on to another processing level, activation of the other partly-suitable entries is inhibited to prevent these from blocking further processing The most highly activated node is selected, and its related information is made available for subsequent processing to produce the response In this way, lexical access involves two steps semantic activation to threshold and phonological activation once the logogen has fired

The actual scanning of the lexical entries is thought to involve two interacting processes apart from the above-mentioned automatic *bottom-up* search from features to an entry, the language user can also to some extent guide the search in a particular direction, based on his/her expectations (Schneider, Dunais & Shiffrin, 1984, Vaid, 1986) This '*top-down*' or knowledge-based processing limits the semantic fields scanned, thus potentially saving time Expectations can be influenced by previous experience or perception of the nature of the memory task (*cf* Clark & Wilkes-Gibbs, 1986)

Sections § 2 2 1 and § 2 2 2 below describe how some of the data supporting Levelt's theories on monolingual processing were gathered and interpreted

2 2 1 Speech Slips and TOT States

Levelt's framework accounts for the speed and flexibility of language production as well as for regularities in occasional speech slips Assumptions on the two stages in accessing and using separate units in each subsystem are to a considerable extent based on studies of speech errors (Cooper, 1980, Cutler, 1980, 1982, Fromkin, 1973, 1980) Studies of monolingual speech errors show that slips can be the result of *exchanges* (where elements in a language unit are put in the wrong order) and *intrusions* (where elements not part of the unit become available before the target element) (Berg, 1987) Slips occur at *all* the levels of processing, from features (*e g* [+voice] in "Derry and Chulia" /Terry and Julia) to word substitutions (*e g* 'He arrived late" /early) These units are therefore thought to be involved in language production

Slips are the result of inadvertent problems in a subsystem during language processing This leads to errors in the transmission of information from one stage to the next Causes of these inadvertent hitches in retrieval processes may be performance influences such as distraction, association, inhibition failures, and greater availability or automatization of other similar linguistic information at various stages in the retrieval processes (Shattuck-Hufnagel, 1979) Linguistic units were found to interfere with other units, for instance, as a result of greater frequency and close similarity (*i e* many shared features between the entries) (Green, 1986)

The regularities or 'constraints' in speech slips suggest that retrieval processes occur in steps Slips often reveal the simultaneous activation of near-synonyms or closely associated words ("like wild flower"/like wild fire) of the same syntactic type, syllable pattern, and stress pattern In terms of Levelt's framework, word blends like ("flish"/flake-fish) suggest that equally appropriate, semantically related lemma nodes are activated to a similar extent, and are erroneously phonologically encoded into one word form Normally, once one lemma has "fired" activation of the other decreases, and only lexeme information appropriate to the selected lemma is accessed

Tip-of-the-tongue (TOT) states occur if, for some reason, activation of information in an entry is not possible or incomplete after the pre-search TOT studies support the two-step access hypothesis of word production If the lemma is accessed first (as in production), subjects are able to produce semantic and syntactic information related to the lemma in their TOT reports, but not sound related information If form properties are accessed first (as in comprehension), morphological and phonological information are reported (*cf* Jones & Langford, 1987) The characteristics reported during TOT states of the unrecalled word (such as its meaning, syntactic class, length, first syllable, syllable structure, prefixes and phonological form) are those used during the searching along the lexical entries for a match (Browman, 1978a)

Owing to the network relationships between lexical entries, there may be several routes in which lexical information can be accessed and compiled TOT studies illustrate how the reconstruction of a stored word into speech can occur via form-related and semantic routes (Wingfield & Byrnes, 1981) Examples (with the target in italics) are 'car-camp-*case*' for recovery via phonologically related items, 'alone-unaided-*initiative*' for recovery via meaning, or both sound and meaning 'absolve-acquit-*exonerate*' (from Bourne *et al*, 1986) The characteristics reported and the errors made indicate that, for instance, only part of the target word could be accessed, or that activation of related information inhibited complete accessing of the target Meyer (1991) shows experimentally that during production, morphological characteristics are generally retrieved before phonological ones

2 2 2 Experimental Evidence on Variables Affecting Lexical Processing

Experiments form another source of information on the nature of word retrieval processes In this section various findings from monolingual experiments are reviewed in order to speculate on the nature of bilingual processing of words in the context of tasks assessing L1 attrition The experiments generally show effects on word access of both task characteristics, such as modality, and word characteristics, such as word length, similarity, frequency, orthographic regularity, word-class, and morphological form (*cf* Garnham, 1984) These are discussed below

Semantic similarity effects

The finding that responses are faster in the case of a word that is related to a previously processed word (the 'prime') has been interpreted as suggesting that there are links between the semantic information in the mental representations (entries) of these words (*e g* Scarborough, Gerard & Cortese, 1984) Entries are related through activation spreading (*cf* Coltheart, Davelaar, Jonasson & Besner, 1977) for instance as a result of priming by other words, or expectations about the next word (De Groot, 1983) Responding faster to 'bread' when 'loaf' preceded it suggests a semantic link between their entries Semantic priming can also inhibit, mainly if there are short intervals between prime and target during accessing, presumably because accessing the similar lemma of the prime distracts attention from accessing of the target lemma Apart from semantic priming, other types of priming effects exist Some are listed in Forster (1990) and Neely (1991), such as the finding that letter-strings with the same phonological shape as the target facilitate responding to the following target (Meyer, Schwaneveldt & Ruddy, 1974) Where time pressure is less, only phonologically related primes and targets inhibit processing (Levelt, Schriefers, Vorberg, Meyer, Pechmann & Havinga, 1991) Together the effects illustrate that in general semantic similarity affects processing during lemma selection (grammatical encoding), while similarity in form affects processing during lexeme selection (phonological encoding)

Frequency of occurrence effects

Frequent words are responded to faster and more accurately than less common words[2] (*e g* Forster & Chambers, 1973, Whaley, 1978) Frequency of occurrence influences object-naming (Oldfield & Wingfield, 1965) and word recognition (Seidenberg, Waters, Barnes & Tanenhaus, 1984) In *recall* tasks, frequency influences the execution of articulatory processes and the likelihood with which all information in a lexical entry relevant for its production is automatically accessed (*cf* Glanzer & Ehrenreich, 1979) Frequency effects originate in name retrieval, whereas the priming effect illustrates accessing processes (Glaser, 1992) Frequency effects are weaker in naming than in lexical decision (Forster & Chambers, 1973) Monsell (1991) suggests is due to greater reliance on automated lexical assembly processes that in naming tasks reconstruct the phonological form of the written word Forster (1979) argues that the frequency effect suggests faster accessing of common words through a frequency-ordered lexicon Balota & Chumbly (1984) argue that frequent use also facilitates response output processes such as decision processes in lexical decision tasks[3]

Stimulus-length effects

The longer a word is, the slower it is read (*e g* Haberlandt, 1988) Although word length and frequency are closely correlated (*i e* longer words tend to be less frequent, Zipf, 1949) length effects are assumed to reflect accessing processes, while word frequency effects are assumed to reflect lexical retrieval processes Hudson, Bergman, Houtmans and Nas (1984) argue that slower naming of long (*i e* polysyllabic) words in naming tasks indicates that more information must be articulated and that speed of accessing the total word is slower than for shorter words In word-recognition tasks, length effects seem to reflect phonological recoding by means of grapheme-to-phoneme conversion rules prior to semantic access (Howard, 1991) Slower responses by skilled readers to longer words have been taken to suggest that phonological access codes are primarily used during the reading of the words (Frederiksen & Kroll, 1976, Glanzer & Ehrenreich, 1979) More recent evidence confirms this conclusion using different evidence (Lesgold & Perfetti, 1981, Lukatela & Turvey, 1994, Van Orden & Goldinger, 1994)

Word-type effects

Most psycholinguistic research involves monosyllabic or bisyllabic words Research on compounded or multi-stem words is rare and inconclusive compared with the available data on monosyllables (Zwitserlood, 1994a) Taft and Forster (1976) argue that the first segment of an English compound word (*e g* 'seaweed') forms the access code for that word in a lexical decision experiment More recent research, however, suggests that also the second segment can be used Zwitserlood (1994a) also claims that (for Dutch) compounds are processed as a morphologically complex entry Truly opaque compounds (*e g* butter + fly ≠ butterfly, klok + huis ≠ klokhuis) are semantically represented by a single node, whereas transparent compounds (sea + bird = seabird, kerk + orgel = kerkorgel) have a single representation and are semantically linked to their constituents

Word-class effects

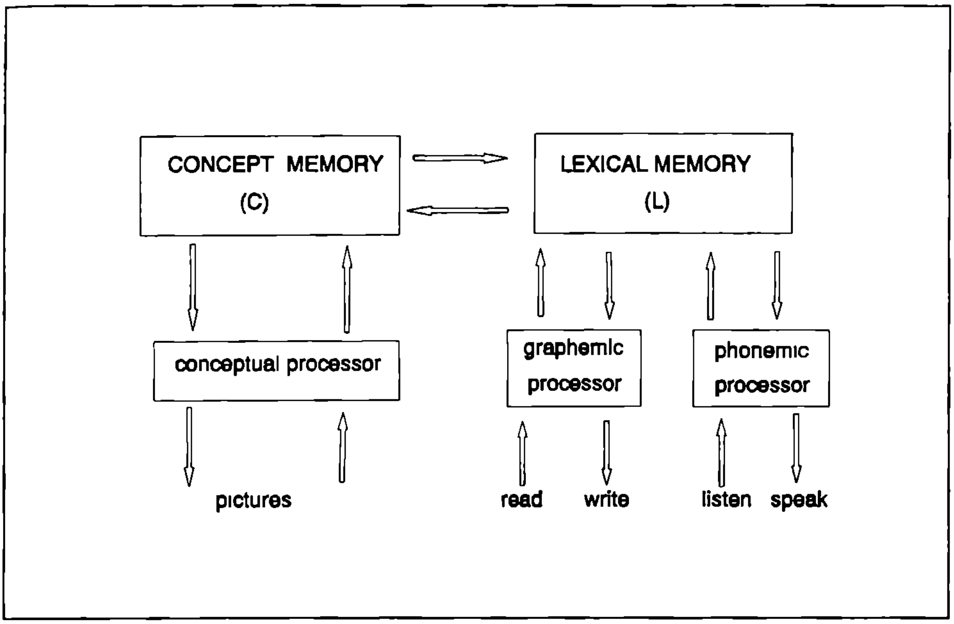
Not only are differences between processing open-class/content and closed-class/function words found in speech slips (§ 2 2 1), but the distinction also affects word-learning, responses in association tasks and learning-recall tasks (*cf* Bradley & Garrett, 1983, Glanzer, 1962), L1 acquisition (Bloom, 1970a, Gleitman & Wanner, 1982) and learning to read (Bruskin & Blank, 1984, Haberlandt, 1988, Umoda, 1977)

Interpretations of these word-class findings vary, however This is partly due to disagreement on the nature of each word-class The word-class difference is not clear-cut (*e g* Bradley, 1978, Saffran, Schwartz & Marin, 1980) nor does it involve the same types of categories in each language Word-forms are also often ambiguous as regards word-class (*e g* "over" preposition, noun) and membership of a syntactic category to open or closed class groups In terms of Levelt's work, accessing closed class vocabulary is not conceptually driven but generated through grammatical encoding (1992 6)

Modality effects

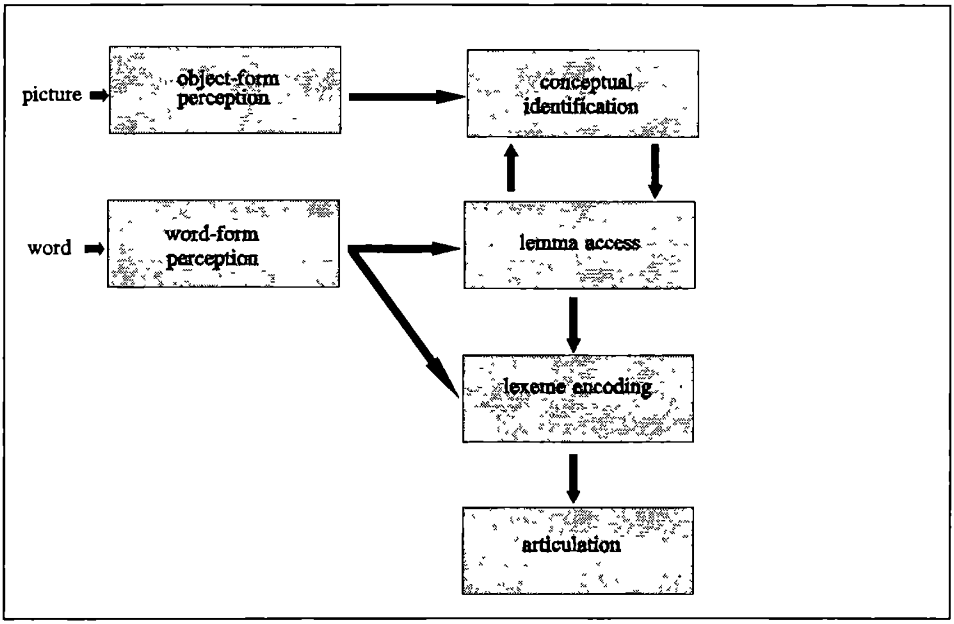
The term 'modality effect' indicates that it takes more time to name pictures than it takes words to be read aloud (*e g* Kroll & Potter, 1984, Potter, So, Von Eckhardt & Feldman, 1984, Seymour, 1979, Stewart & Kroll, 1994) Therefore the processing of pictures and words is argued to involve different subsystems one for verbal and one for pictorial information (*cf* Figure 2 3) Experiments established that in picture-naming, searching the lexicon most commonly occurs via activation of a conceptual entry by the picture, which in turn activates an appropriate lexical entry (*cf* Potter *et al*, 1984) Upon visual detection an abstract perceptual code is formed, which is compared with the stored perceptual codes in order to recognise the picture The activated code in turn activates its lexical code in the linguistic network, involving lexical access, lexical selection, phonological encoding and finally initiation of articulatory execution Semantic processing precedes retrieval of phonological forms in production (La Heij, Happel & Mulder 1990) Only the phonological form of the activated lemma is activated, not that of its neighbours (Levelt, Schriefers, Meyer, Pechman, Vorberg & Havinga, 1991) Various processing schemes have been developed, often accounting for the experimental findings by arguing for both verbal and pictorial codes in memory (*cf* dual-code theory, Paivio, 1971) Researchers have postulated central, amodal storage with separate subsystems for linguistic and perceptual operations (Biggs & Marmurek, 1990, Seymour, 1979, Snodgrass, 1984) More recently, evidence points to separate subsystems as well as separate mental representations for words and pictures, as illustrated in Figure 2 3 (based on Glaser, 1992,66) The blocks in this simplified presentation indicate related characteristics rather than distinct segments of the brain Figure 2 3 illustrates the findings that pictures have more direct access to the features in the concept store (C) than words (Potter *et al* , 1984)

Figure 2 3 Model of the processing pictures and words, based on Glaser (1992)



The linguistic component (L) provides storage and processing facilities for linguistic information beyond the concepts It contains all the morphemes a person knows, and depicts the graphemic and phonemic features that are part of the lexical representations, similar to the features of objects as components of their concepts Figure 2 4 below suggests that picture-naming involves at least four stages visual processing, activation of the conceptual characteristics, accessing of the lemma and lexeme characteristics of its name, and articulation of the lexeme information (*cf* Roelofs, 1992) Figure 2 4 shows that during processing, activation spreads to nodes on the next processing level Semantic processing (to select the appropriate lemma) precedes retrieval of phonological forms, before an articulatory programme is finally prepared (La Heij, Happel, & Mulder, 1990) Semantic information is activated indirectly following the activation of perceptual features Only the phonological form of the activated lexical entry is activated, not that of its neighbours and this phonological activation is initiated from the beginning of the word before its end (Meyer & Schriefers, 1991)

Figure 2.4. Stages of mental processing in picture and word naming, after Roelofs (1991).



The links may occasionally result in interference from other related words as a result of spreading activation (Dell, 1986; Neely, 1977), although spreading is restricted to each stage: once a node is identified, activation in that stage becomes inhibited for non-target candidates. Only once the lemma is selected does phonological encoding commence (Harley, 1993; Levelt *et al.*, 1991). Pictures have more direct access to the semantic system, faster than words. Amodal conceptual networks are accessed in picture-naming and word-naming tasks through independent subsystems (*cf.* Snodgrass, 1993). A common representation underlying each separate modality-specific store accounts for repetition facilitation within the same language and across skills (Scarborough *et al.*, 1984).

The picture-naming paradigm has been used extensively in experiments on accessing and retrieving individual words, because naming is an important component of speaking. Pictures are used because these are non-verbal cues for lexical access which allow the experimenter to control various types of lexical variables (Seymour, 1979) provided perceptual variables are accounted for.

Brief summary: Monolingual retrieval

In conclusion, monolingual studies suggest that language production is modular, lexically driven, and incremental. Lexicalization involves component processes, such as the construction of cues or access codes, selection of a domain or field within the lexicon, association of the search cue with a lexical entry, and a post-search check During production, the lexicon is accessed at least twice Usually lexical selection occurs first, activating semantic/syntactic information, which is then followed by phonological encoding, involving morphological and phonological activation A monitor compares the end result with the original message and prevents articulation of inappropriate responses

Information access involves activating lemma and lexeme information of potentially correct lexical entries, and then waiting for the first lexical entry to match the search cues Activation spreading to related entries can occasionally result in a speech slip as a result of transmission errors during processing Factors that can also affect the emergence of slips are distraction of attention and similarity to other entries Relationships to other lexical entries can be expressed by semantic features, and degrees of similarity by means of the number and nature of the features shared Content and form-based relationships between entries in the lexicon are based both on inherent relationships (*e g* similarity of meaning) as well as co-occurrence (*e g* distributional properties, frequency)

Occasionally malfunctions occur in the component processes of retrieval These illustrate which information is used and which subsystems operate different distributional properties of word exchanges and sound exchanges support the two-stage view of lexical access Evidence from verbal reports in TOT states indicate that piecemeal (re-)construction during lexical selection and phonological encoding also occurs for individual words Concepts in the message guide the search for lemmas, and lemmas activate word morphemes and metrical compositions, which result in the activation of syllables and word segments These in turn activate stored phonetic schemata to produce the target utterance

In monolingual experiments, variables such as frequency, length, word-class, modality, and regularity are found to affect lexical retrieval It is assumed that retrieval processes are most prominent in recall tasks where detailed information needs to be activated Picture-naming involves, among other things, activation of the associated concepts prior to access of the lemma and the lexeme information of the name In the next section, it will be shown that experimental studies on bilingual lexical processing generally show similar effects to monolingual studies

2 3 Characteristics of Retrieval Processes Bilingual Language Production

Bilingual language production involves processes similar to monolingual production There is disagreement, however, about the stages at which processing involves both languages and *how* variables influence cross-linguistic processing (*i e* how language-specific the processing of concepts, lemmas, and lexemes is) Empirical results are discussed in two sections, starting with § 2 3 1 on speech slips and code mixing

2 3 1 Bilingual Speech Slips and Code-Mixing

Some suggestions about the nature of bilingual retrieval processes originate from studies on performance features such as code-mixing and loans Examples from emigrant Dutch (*cf* § 1 1) are " dat **fit** niet fijn, hè?" (that doesn't fit well, does it?), "Het is hard je talen niet op te mixen" (It is difficult not to mix-up one's languages), and "Ik ga **shoppen in Ringwood**" (I'm going shopping in Ringwood) (Nijenhuis, 1967, Slangen, 1990) Also cross-linguistic exchange errors occur in bilingual speech, like English-Dutch "banaan-**tree**" (banana tree/bananeboom), word substitutions (*e g* "We aten toen **haar**" for haas/konijn/rabbit), sound substitutions (like English /g/ in Dutch "**g**ood" and Dutch /x/ in English "**g**ame"), additions (like "viejol**in**" (viool/violin), and deletions (*e g* "nijntje" for konijn/rabbit)

These types of code-mixes and loans show that, even though one language is the target, activation 'leaks' in from the other language during information transmission between the processing stages in production The circumstances under which these code-mixing and loans occur differ *Code-mixing* tends to occur under performance pressure and are considered unintentional by the speaker (Shannon, 1991) Only when other language forms are used so widespread that the speaker no longer considers this as CLI, can these interlanguage markers be considered part of the IL competence *Loans* or code switches tend to be intentional, introduced for reasons such as emphasising a word, indicating solidarity, showing off knowledge, better articulation of a concept, or not being able to (fully) access the appropriate word (*cf* Green, 1986) In these cases, the speaker has made a conscious decision to employ a language-specific meaning, and hence activated its appropriate lemma and lexeme Both types suggest the use of other-language units during production, and both are subject to constraints, like monolingual speech slips

As in monolingual research, inadvertent code-mixing is considered the result of a temporary problem in controlling the language production system, where in bilingual contexts information in one language is more available than in the other (Green, 1986, Shannon, 1991, Sharwood Smith, 1986) Like speech slips, this mixing can be interpreted as having occurred at a processing level, ranging from pronunciation to semantic distribution restrictions and word selection The systematic occurrence has been formulated in constraints

Constraints

A range of constraints has been formulated for the patterns observed in the instances of simultaneous processing (*cf* Nishimura, 1986, Poplack, 1979) Some constraints for the location where other-language forms may emerge inadvertently involve variables like degrees of cross-linguistic similarity, relative word frequency, syntactic and communicative contexts as well as the proficiency and fluency of the speaker in each language

First the similarity constraint is discussed Several types of perceived word *similarity* (which coincide with the four types of information of a lexical entry) were interpreted as influencing the occurrence of cross-linguistic slips (*cf* Clyne, 1970, Joshi, 1984, Wentz & McClure, 1977) For instance, Clyne (1967, 1980a) uses *trigger* words semantically, syntactically, morphologically, and phonologically similar proper nouns and names (cognates, see § 2 3 2) He argues that such trigger words promote cross-linguistic slips (*e g* English-Dutch 'so/zo' in "Dat is **zo** as it were " or 'what/wat' in "Ik weet **what** she is doing ") because bilinguals may perceive and process these as common to both languages Apart from similarity of form in these trigger words, Clyne also suggests that a *syntactic* similarity constraint operates Syntactic structures in the utterance in the inappropriate language tend to be similar to the target utterance in code-mixing (*cf* Clyne, 1987b)

Second, the context also affects the use of switches and mixing Conversations with monolingual speakers produce fewer instances than conversations with fellow bilinguals, as in the latter it is communicatively more appropriate to switch Continuing syntactic convergence between the English and Dutch used by Dutch emigrants in Australia appears to increase the potential for code-mixing (*cf* Clyne, 1992)

Third, as in research on monolingual slips, unintended erroneous activations may also be caused by higher *frequency* of the intruding element or by *associative* interference (§ 2 2 1)

Finally, other constraints are simultaneous availability during production of the units involved in the mix-up, and phonological well-formedness of the utterance that is the result of the mixing

Reinterpretation

A variety of psycholinguistic constraints on code-mixing have been formulated, each with their theory on how these function during bilingual retrieval. It is, however, unclear how the constraints are interrelated, and hence, how CLI affects bilingual retrieval processes. Reinterpretation of these constraints in terms of Levelt's framework and the argumentation from research on monolingual speech slips provides some clarification (*cf.* De Bot & Schreuder, 1993). I assume that the mechanisms that produce words and sentences (and occasionally result in speech slips) in monolinguals are the same as those that produce words and sentences (and occasional cross-linguistic code-mixing) in bilinguals.

In this reinterpretation, the message is presumed to be 'tagged' for the target language (*cf.* Dell, 1986, Grainger & Dijkstra, 1992). Such information on language membership of an entry (*i.e.* its language membership flag) stored in its lemma usually allows processing in each language to be kept separate. Choi and Bowerman (1991) add that, at the level of grammatical encoding and lemma retrieval, processing is language-specific as entries are tagged for language specific characteristics. The formulator specifies which types of lemma must be activated. In other words, a subset of lexical entries is labelled for one language as well as a subset of encoding rules.

From the speaker's perspective, this language-membership selection criterion for finding appropriate lemmas in the lexicon varies in importance. In contexts where code-switching is frequent and communicatively successful, the language constraint is weaker than in situations where only one language will be understood by the interlocutor.

In accounts for patterns in monolingual slips, searching for appropriate lemmas during the grammatical encoding stage is argued to involve spreading-activation and simultaneous activation of elements of the same linguistic category (see § 2.2). Similarly, in bilingual contexts activation can spread to entries tagged for the non-target language which was "active" (*cf.* Green, 1986, Shannon, 1991). If the non-target lexeme shares form-characteristics with the target lexeme, this non-target lexeme is more likely to be processed further, resulting in a code switch or slip.

Since the lemma represents lexico-syntactic information, this accounts for the constraints that interfering elements must be of the same syntactic category and must be simultaneously available during production. In a bilingual context, a whole-word "mix" or "slip" in an utterance suggests that for the item involved the lemma of a disfluent language is considered *semantically* and *syntactically* similar to the lemma in the other language. Subsequent accessing of phonological and morphological information simultaneously activates lexeme information from the fluent, though inappropriate, language (*e g* the meaning of Dutch "boodschappen doen" and English "go shopping", the meaning and form of "what" and "wat") If the result is morphologically and phonologically legal (*i e* there is perceived similarity to the target) or communicatively appropriate, the error is likely to escape detection by the monitor and a faulty product is delivered for articulation (although if the term faulty is strictly speaking incorrect if the norm has changed) Thus, the code-mixing constraint that 'all mixes appear to be phonologically well-formed' can be accounted for by monitor activity prior to articulation This constraint suggests that units have been processed incorrectly prior to articulation

In the reinterpretation, 'trigger words' such as cognates (*i e* both meaning and form-related words of the same syntactic category) provide locations in an utterance at which activation can spread from the L1 lemma to its L1 lexeme to the L2 lexeme and *vice versa* because of shared characteristics such involuntary transmission errors may not be detected by the monitor because of their close resemblance in form to the target language (*i e* , they share many characteristics) In addition, regular activation of the corresponding lexemes of cognates in one language will result in greater activation of other-language cognates than of non-cognate translation equivalents

The effect of *frequency of occurrence* on transmission errors between language subsystems can also be accounted for In terms of Levelt's framework, higher word frequency results in stronger links between the lexical entry and the search cues (*i e* lower threshold), and greater relatedness means that more characteristics of the lexical entries are shared This in turn raises the probability of establishing a match between cues and the target entry, and of activating the relevant mental data In a bilingual context, processing in a less frequently used language may be affected by processing in a more frequently used language because practice in the latter has resulted in faster and more efficient processing, even though the less frequently used language is the target (*i e* CLI occurs) When trying to use the disused language, lemma and lexeme information from the more automatized language may 'slip' in automatically and inadvertently without being inhibited When a target entry is located too slowly in the lexicon (because of time pressure) a less appropriate entry may be activated as the next-best choice This may be a related entry from the same or the other language Continued use of non-target entries could result in such low thresholds that activation-spreading triggers these entries before the target entries, unless specific attention is paid to the language membership criterion, in which case the speaker carefully monitors his/her speech The conversational norm (*i e* strictly one language, or communicatively appropriate switching) may thus co-determine the extent of CLI (§ 1 3) Frequent co-use may, according to Paradis (1981), result in the development of a lexical subset of entries that are considered common to both of a bilingual's languages This may be particularly true of cognates, because the corresponding lexemes are activated regularly Similarly, a disused language in a non-balanced bilingual may be difficult to activate, so that elements from the more fluent language cannot be sufficiently 'suppressed' or deactivated (*cf* Green, 1986, 1993) Furthermore, use of a between-language variety of both may remove the incentive to access only the exact lexical element in the disused language Considering Clyne's comments on convergence between English and Dutch in Australia, both accounts may apply to Strutch

<u>Limitations</u>

In the reinterpretation of the constraints, a transmission error in one of the subsystems of language processing occurs as a result of activation spreading to an item that is perfectly appropriate except for its membership of the non-target language system In the reinterpretation, the substitution errors quoted at the start of § 2 3 1 appear to suggest that malfunctions occurred after assembly of morphological units during the creation of a phonological representation, but prior to articulation (since the target syllable structure appears intact) Some cross-linguistic word slips and switches appear to suggest that CLI occurs at the level of accessing the lemma (semantic/syntactic) as a result of parallel processing in the two languages Mere foreignisations seem to illustrate CLI at the articulation level of the lexeme (phonological/ phonetic)

However, precise location of the cause of a slip is not yet possible Causes of CLI in code-mixing are difficult to deduce from the products alone, as these do not indicate whether the introduced element is part of the IL (*i e* Strutch) or accidental (*cf* Grosjean & Soares, 1986), and which component process was involved first Performance characteristics such as slips and communication strategies distort the picture of lexical areas affected by attrition Form and function of the Dutch words used, furthermore, may no longer coincide with those of competent native speakers, making interpretation difficult A number of studies suggest that the emergence of other-language elements is not always inadvertent but may be the result of shared processing by choice Bilinguals may resort to a problem-solving activity or communication strategy during their speech, choosing to abandon, alter or achieve their original communicative intention (Ammerlaan, 1984) The bilingual speaker may have decided that the other-language item is still appropriate for communicative reasons, hoping it may still convey the intended message If languages are often used interchangeably, such transmission 'errors' may become perceived as communicatively normal, and hence no longer considered errors[4] Dutch emigrants may choose to employ English words in their Dutch because they feel these may be communicatively interpretable for their interlocutors To separate deliberate from inadvertent CLI, intuitive data must be used in conjunction with performance data

The presence of many cognates and similar structures in closely related languages such as Dutch and English (*cf* Aarts & Wekker, 1987) makes it difficult to detect slips and to identify which unit was transferred in Strutch (*e g* 'in' or 'the' or 'the shop' in "dan we werken **in the shop**") In addition to the ambiguity of the errors, Meyer (1992) points to the limited applicability of analyses of errors for the study of error-free speech Slips and code-mixing should therefore not be the principal source of data in a study on bilingual retrieval processes, because the definitive locus of errors in the production system is uncertain (*cf* § 2 3 1) unless persistence in producing the same error is investigated in each subject Expected variability of error forms in an L1 attrition context, however, precludes specifying the weak spot in L1 processing on the basis of these data alone And finally, investigation of slips and code-switches says little about whether they are the result of the attrition of knowledge or process interference from the more fluent language Investigating lexical retrieval in dormant Dutch emigrants solely in terms of code-mixing and slips is, in sum, not efficient

Retrieval processes must therefore not be studied solely by means of spontaneously produced Strutch, because in such a natural context a number of variables cannot be simultaneously controlled Similarity effects on retrieval processes can better be investigated in a controlled study (experiment) on bilingual retrieval in Strutch in which both competence and performance are examined Lack of control over the cause of a mix-up means that the actual wording of responses in an experimental task must primarily be used to interpret the results

2 3 2 Experimental Evidence on Variables Affecting Lexical Processing in Bilinguals

Bilingual experiments traditionally investigate whether processing in the languages is shared or separate (*i e* "independent", "dual-code", McCormack, 1974, Paivio & Desrocher, 1980) and whether storage is "coordinate" (separate), "compound" (shared by both languages), or "subordinative" In the latter, one language is a subsystem of the other (Weinreich, 1953) Often the same techniques and variables are used as in monolingual studies, such as semantic priming, repetition priming, word length and frequency The aim is to investigate *where* during language production processing is shared and for which types of bilinguals such is the case (*cf* overviews in Kroll, 1993, Snodgrass, 1993) In particular, *cross-linguistic similarity* between words has been used to determine whether the storage and processing of words is "separate or shared" in a bilingual's languages

Effects of similarity are not consistently found in bilingual recall and recognition studies (*cf* Schreuder & Weltens, 1993, Snodgrass, 1993) Some studies show that various types of bilinguals process different types of words in different ways, which is interpreted as supporting the 'dual processing' of words (*e g* Altenberg, 1981, Gekoski, 1970, Jakobovitz & Lambert, 1961, Lambert, Havelka & Crosby, 1958, Lambert & Rawlings, 1969) Other studies do not find support for dual processing (*e g* Arkwright & Viau, 1974, Kolers, 1963) It is argued here that such discrepancies are the result of comparing studies that actually cannot be compared Several sources of discrepancy (1-8) can be distinguished

To start with (1), a range of interpretations of the *types of bilinguals* investigated ("coordinate", "compound", and "subordinative") is used Interpretations of Weinreich's distinctions (1953) vary (*cf* Diller, 1974, Hornby, 1977) There is considerable variation between studies in the extent to which subjects are 'bilingual' in the four language skills and in how the level in each skill is determined As a result, non-comparable subject groups are compared, for instance learners with interpreters, foreign language-learners with L2 learners, etc

(2) Another inhibiting factor is that researchers have reduced Weinreich's hypothetical differences in language processing between bilinguals to different ways of processing and storing *words*, especially *isolated written nouns*, thereby disregarding other language levels or lexical fields These, however, need to be taken into account in a theory on bilingualism (Hummel, 1993a, Saegert *et al* , 1975) For instance, Saegert *et al* show a difference between processing isolated words and those in sentence context Research, therefore, has so far mainly provided evidence on memory for a small subset of words (Kolers & Gonzales, 1980, Lopez, 1977)

(3) As far as the experimental procedures used are concerned, researchers have often underestimated the influence of *paradigm* characteristics on the results Findings from association, translation, lexical decision and naming tasks are often compared to validate a model of the bilingual lexicon, as if the nature of the different tasks did not matter Characteristics of the task must not, however, be neglected Varying results in experiments can, for instance, be due to subject-expectation effects interfering with the specific task requirements (*cf* Magiste, 1985, Ruke-Dravina, 1971, Snodgrass, 1993) Also, Durgunoglu and Roediger (1987) have shown how a number of task differences affect processing and the extent of a subject's control over processing They argue that, in bilingual contexts, conceptually driven tasks support single-

code representation of cognates Data driven tasks (which rely more on language and modality-specific surface forms) less often show between language effects (*cf* Kroll, 1993) Because in recognition tasks processing proceeds from form to meaning, evidence of semantic activation spreading to the other language was found only *if sufficient time* was available between recognition of one word and its translation equivalent (*cf* Forster & Davies, 1984, Snodgrass, 1984) Tasks with short delays between stimulus and response in the two languages involve processing of form characteristics (lexeme), and therefore by their very nature supported the 'dual processing' schemes (Vanderwart, 1984) Kroll (1993) describes how in lexical decision experiments influences other than those intended (*i e* post-access rather than access) were found to determine the results

The *nature* of the task affects the extent of control over CLI (*cf* Altenberg, 1981) Macnamara (1967a) suggests that in production bilinguals have most control over the use of the other language He argued that production tasks rely on knowledge-based processing, whereas in recognition the "input switch" (which distributes processing) appears to be controlled by the stimuli and hence allows less control by the bilingual (*cf* Blair & Harris, 1981, Chan, Chan & Hoosain, 1983, Ehri & Ryan, 1980, Guttentag, Haith, Goodman & Hauch, 1984, Preston & Lambert, 1969) Although access processes are often assumed to be the same in both types of tasks, the processes before and after access may be different In addition, presentation modality (aural or written) may result in differences in between-language repetition effects (*cf* Woutersen, De Bot and Weltens, 1995)

(4) Differences in intensity of the *subjects' language contact*, the languages' relative prestige and the various *domains* of the language pairs under investigation tend to be disregarded when evaluating the merits and demerits of studies supporting, for instance, the 'single' and 'dual-code' models

(5) Another source of inconsistency is the comparison of studies involving different *language types*, underestimating fundamental linguistic differences on relevant aspects (*cf* Cutler, Mehler, Norris & Segui, 1983, Vaid & Genesee, 1980, Grainger, 1993)

(6) Furthermore, most of the definitions of the subject types used disregard the occurrence of *changes* in lexical processing as a result of changes in the bilingual's language use and proficiency over time/exposure Such changes have been argued for by, for instance, Kerkman (1984) Kerkman suggests that, at lower levels of L2 *proficiency*, information common to cognates tends to be accessed together, whereas with increasing experience in the L2 accessing becomes independent of the L1[5] However, if used at all, assessment procedures measuring

proficiency vary between studies, as do the definitions of labels like 'poor', 'fluent' and 'near-native' proficiency Variation in language tests and labels for the results make comparison between studies difficult

(7) Also underestimated in the literature are the influences of the *word types* used (imageability, familiarity, available context, concreteness, cognateness, and frequency), the *polysemous* nature of words, and *dialectal* differences (*cf* § 1 1) Research has been restricted to only a few types of words which vary in their definitions For instance, it is not clear whether word-type criteria such as 'concreteness' and 'context availability' overlap In addition, not all potential influences are controlled for simultaneously, such as the interaction between word frequency and similarity De Groot (1992a) found that *high-frequency* words are more often translated via the conceptual node whereas low-frequency words are accessed direct. The low-frequency words are presumably considered more language-specific Apart from the frequency of the word form, the frequency of the meanings within each culture also appears to affect bilingual processing Culturally distinct words may be processed more independently because they occur less frequently and in distinct contexts, adding one more word characteristic which influences processing

(8) The *scalar* and *subjective* nature of the similarity characteristic was rarely taken into account (*cf* § 1 3). As a result, definitions of what 'cognates' are vary Words which De Groot, Dannenburg and Van Hell (1994) call 'cognates' would not be termed as such in studies that distinguish similarity using orthographic, phonological, and semantic characteristics In addition, what linguists may term 'dissimilar' on the basis of adding up lexical characteristics may be perceived as being more 'similar' by the bilinguals themselves (*cf* research on such learners' intuitions in Kellerman, 1987) There is also little apparent awareness that the often-used cognates form a small subsection of the total lexicon of a bilingual language user (*cf* Meara, 1980) Finally, other lexical characteristics, such as imageability, context availability and definitional accuracy, may have become confused with the similarity characteristic in studies with apparently conflicting results This possibility has only recently been considered (Snodgrass, 1993, De Groot *et al*, 1994)

Reinterpretation of experimental findings

The inconsistencies in the paradigms used, in the word types and in the languages investigated, and particularly in the descriptions of the subject types in respect of language-learning, usage and proficiency, prevent comparison of findings between studies, and hence hinder the construction of a general model of bilingual retrieval processes or representation Furthermore, most experimental research on bilingualism has concentrated on word recognition and has produced findings that need not always apply to language production processes Research on bilingual production has not yet resulted in a coherent model that can serve as a base for firm predictions for performance by Dutch emigrants The range of findings suggest that a single model for all the words and all language-contact situations is unlikely anyway De Groot (1993) suggests that processing and representation of the bilingual lexicon is probably a mixture of various systems (dual as well as single-code, dependent as well as independent, subordinative, compound, and coordinate)

Instead of providing a model, the experiments must be viewed as illustrating the effect of a number of variables on bilingual processing[6] In order to systematize what is known about variables affecting bilingual retrieval, I have reinterpreted the findings from previous research using Levelt's review (1989) of monolingual language production (*cf* Figure 2 2) This framework is used to provide a basic interpretation of a number of experimental effects on the processing of concepts, lemmas, and lexemes found in bilingual studies (*cf* Ammerlaan, 1990d, De Bot, 1992, Green, 1993) The re-interpretation clarifies which variables affect bilingual processing and in what way (and hence which ones may influence the selective attrition of L1 words) Findings in this type of research can then be used to set up an experiment that investigates lexical processing in Dutch-Australian emigrants If separate processing is found, this implies that in the case of the 'dormant' emigrants processing in the disused language is 'rusty' for *all* the Dutch words If partly shared processing is found, this implies that the processing of somewhat similar words are partly aided by the processing of related English words, and partly interfered with in the Dutch lexicon as a result of frequent use of these English equivalents

In Levelt's framework, information is stored in lexical entries combining four types of characteristics (semantic, syntactic, morphological and phonological) The entries are tagged for language membership, and the links between these that vary in strength express the relationships between entries within and between languages Because entries are tagged for language membership, processing in one language can be activated while processing in another (*cf* Green, 1993) The type and strength of relationship depends on inherent similarity and the context of learning as well as word frequency and co-activation (as influenced by the level of proficiency) Retrieval was not only found to be affected by these links, but also by top-down influences, which, for instance, can influence the activation level of certain entries

These influences depend on the type of task These characteristics of the framework are used to interpret past findings on cross-linguistic similarity

Similarity and bilingual lexical retrieval

What is known about bilingual retrieval centres on the contrast between cognates and non-cognates as tested in recognition paradigms Research found, among other things, that the activation of *semantically* related primes between languages leads to faster responses to the targets in another language (*e g* Caramazza & Brones, 1980, Kirsner, 1986, De Bot, Cox, Ralston, Schaufeli & Weltens, 1993) Such findings suggest that, for words with similar lemma and lexeme information, activation spreads to the other-language lexicon, for instance via shared arcs between the entries

A few studies have been conducted on bilingual picture-naming, but these studies primarily concentrate on comparing reaction times between translating words and naming their pictures (Abunawara, 1992, Chen & Leung, 1989, Kroll & Curley, 1988, La Heij, de Bruyn, Elens, Hartsuiker, Helaha & van Schelven, 1990, Tzelgov & Eben-Ezra, 1992) Potter *et al*, (1984) found that naming was faster in the L1 than the L2 in L2 learners Stewart and Kroll (1994) found in their experiment that, if other semantic representations are activated after picture presentation, interference affects the selection of the best lexical candidate There is directionality in this interference was mainly found from the most proficient to the less proficient language They claim that this reflects a different way of processing in picture-naming processing words from the more proficient to the less proficient language mainly requires concept mediation, whereas from the less to the more proficient language mainly lexical relationships are used Conceptual links between meaning and words, they argue, are stronger for the more proficient language than for the weaker language

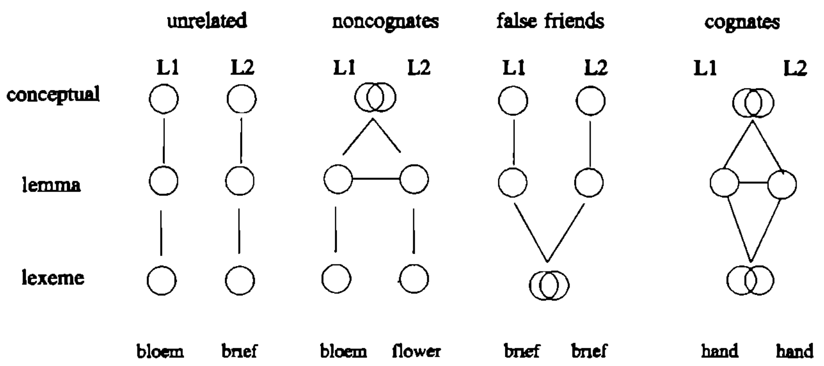
Most studies so far, however, have contrasted cognate and non-cognate stimuli Only a few studies have concerned themselves with the *gradual* extent of overlap in various types of lemma and lexeme characteristics, and hence with the extent of co-activation Variations in the similarity in respect of lemma and lexeme information affect the extent to which processing of one word will be affected by processing of a related word (*cf* Rees, 1979) In respect of gradual similarity in meaning, for instance, Jin and Fischler (1987) observed a semantic priming effect across languages for *concrete* words only, suggesting that abstract words are more language-specific as these are less likely to share conceptual information with translation equivalents, and probably primarily in balanced bilinguals only (*cf* also De Groot, 1992b, Koler, 1963, Taylor, 1976) Additional characteristics also affect bilingual processing, such as frequency (*cf* Snodgrass, 1993)

Reinterpretation of the experimental findings primarily suggests that the extent of co-activation varies (*cf* the variables 1-8) The literature on word recognition suggests that between-language processing of words depends on the 'lexicon-internal' word characteristics (such as cognateness, frequency, and abstractness) as well as on other task and subject-related variables The latter, entitled 'lexicon-external' variables, suggest that changes in each speech skill and linguistic level in lexical processing are a consequence of changes in proficiency and fluency levels and differences in language-learning background (Snodgrass, 1993) It is assumed that also applies to bilingual lexical production Findings on the processing of words differing in cross-linguistic similarity can be described as follows

<u>'Lexicon-internal' variables cognateness</u>

Most frequently investigated has been the *cognate/non-cognate* effect Findings from recognition studies suggest that, within concrete open-class words (and depending on the para-digm, proficiency-level and subject type), there is predominantly *shared* lexical access for cog-nates in the bilingual's languages and mainly *segregated* lexical access for non-cognate trans-lation equivalents (*e g* Cristoffanini, Kirsner & Milech, 1986, De Groot *et al*, 1994, De Groot & Nas, 1991, Gerard & Scarborough, 1989, Kerkman, 1984, Kirsner, 1986, Sánchez-Casas, Davis & García-Albea, 1992) Scalar differences in similarity between cognates and non-cognates are argued to illustrate that cognates share more of their representation than non-cognates, as illustrated in Figure 2 5 Cognate words are accessed via co-activation of the lemma (*e g* meaning) characteristics they share and, unlike the non-cognates, also by the form characteristics cognates share (although activation of form characteristics is more transient) In this way, activating the lexical entry of one word of a cognate pair spreads via lemma and lexeme characteristics to its translation equivalent Figure 2 5 below illustrates that, if balanced bilinguals access a word, its other-language cognate is also activated by spreading activation via the conceptual and lexical entry characteristics their representations share (*cf* Christof-fanini *et al*, 1986, De Groot, *et al*, 1994, Foster & Davies, 1984, Grainger, 1993) This spreading results in faster and more accurate accessing of the other-language word compared with non-cognates Both the concepts and the four types of information in the lexical entries of cognate concrete words are considered to share more characteristics with their partner than less cognate and more abstract words (De Groot, 1992b, 1993)

Figure 2.5. Simplified representation of different types of bilingual processing relationships between words at lexical (lemma and lexeme) and conceptual levels.



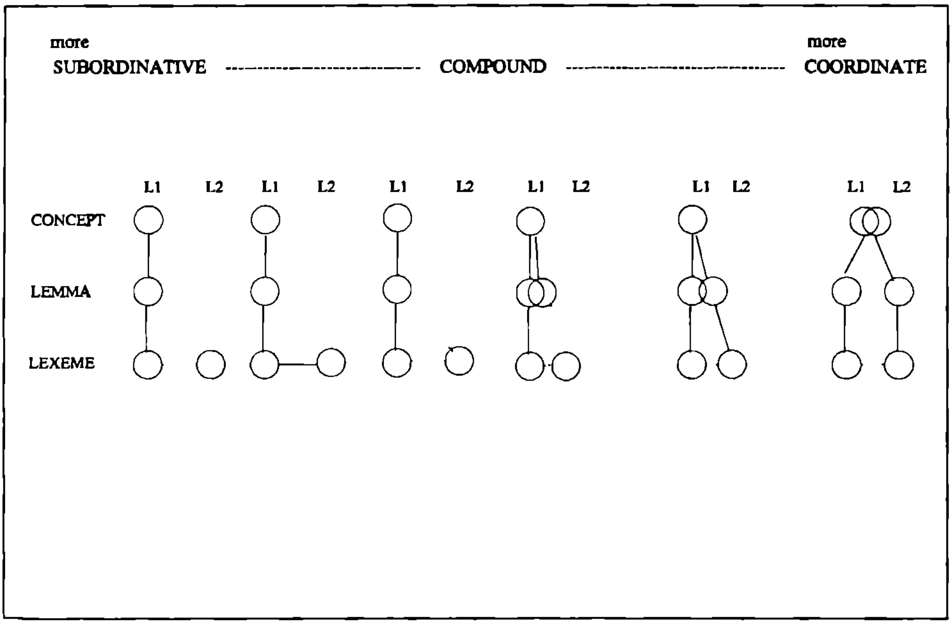
Note that circles indicate clusters of characteristics rather than distinct boxes of information, and that the distance between the circles and the solidity of the lines suggests the strength of links between the characteristics. No directionality (*cf.* De Groot *et al.*, 1994) has been indicated. Circles partly overlap in the case of similarity in order to take language-specific differences into account, as well as concept-specific information (*e.g.* episodic information on when, where and how the information was last used, see § 1.4)

The lemmas of cognates are assumed to have fewer language-specific semantic characteristics than those of non-cognates. The various scalar distinctions in the strength of the links between entries accounts, among other things, for greater within-language than between-language semantic priming for non-cognates (De Groot, 1993; De Groot & Nas, 1991). In addition, such non-dichotomous distinction accounts for the variation in the experimental findings with 'lexicon-external' variables (see below), such as the proficiency of the users, their linguistic background, and the frequency of the items. More proficient subjects develop more language-specific characteristics with increasing experience, not only as a result of separate experiences in distinct cultural settings. Similarly, the extent of use of a language skill will influence processing: primarily auditory processing of information heard will result in different links than when all four skills are regularly employed.

'Lexicon-external' variables

First, *proficiency.* Several studies on cross-linguistic similarity argue that, with developing proficiency, bilinguals shift along a continuum from processing involving the translation equivalent to processing that is more independent of the translation equivalent (Lambert, 1969; Macnamara, 1969; Mägiste, 1985; Paradis, 1977a, Woutersen *et al.* 1994). Overlap between the various levels of representation decreases with increasing proficiency. On the whole, the concepts are considered language-independent since most changes occur at the lexical level (*cf.* Chen & Leung, 1989; Chen, 1990; De Groot, 1995; Kroll & Curley, 1988; Potter *et al.*, 1984; Woutersen *et al.*, 1994). Figure 2.6 illustrates this hypothesized change from word-association to concept-mediation processing with increasing proficiency in the L2.

Figure 2.6. Possible changes in lexical processing with increasing L2 proficiency as far as concepts (top), lemma (middle) and lexeme (bottom) information in lexical entries are concerned. Solid lines indicate strong links, dotted lines weak links.



Note that, as in Figure 2 5, top circles denote conceptual information, middle circles lemma information, and the bottom circles lexeme information. The strength of the links depends on use; disuse results in weaker links

To be more specific, recognition experiments suggest that *near-native* bilinguals mainly access words via their conceptual entry rather than via the lemma or lexeme information of translation equivalents in the other language (Chen & Leung, 1989; Chen, 1990). For them, lemma and lexeme information is processed separately in each language ('coordinate'). These fluent bilinguals do not employ the other language when processing cognates and non-cognates in one language

Intermediate-proficiency bilinguals access words via the conceptual and lemma (meaning) links with the translation equivalent ('compound') Links exist between lemmas and lexemes in one language and their translation equivalents in the other With these subjects more priming effects are found for cognates than for non-cognates (De Groot & Nas, 1991)

Low-proficiency bilinguals may access words via the lexemes of other language words ('subordinative'), resulting in processing facilitation of cognate words only (*e g* Chen & Leung, 1989, Kroll, 1993, Potter *et al*, 1984) Beginning L2 learners translate from the L1 more often than more proficient learners, and more often assume that similarity of form implies similarity in meaning (*cf* Kroll & Curley, 1988, Singleton, 1993) Language use has a practice effect, and good levels of proficiency and fluency in turn promote use This change from initial over-use of cross-linguistic similarity by low-proficiency language users, via under-use when some distinctions are found with increasing proficiency, to a more experience-based use of similarity follows a 'U'-shape (§ 1 3 1) The most advanced users of the dormant language are more aware of the appropriate similarities, but may barely have to use them as processing is successful, involving primarily the semantic/conceptual network (*cf* Singleton, 1989) The finding of primarily semantic organization in L1 lexicons and phonological organization in L2 lexicons (*cf* Laufer, 1989, Meara, 1980) therefore appears to be an effect of language proficiency/experience very familiar items are relatively often processed semantically, whereas with less frequent words/structures form-focused processing prevails There may be a critical level of fluency and proficiency beyond which cross-linguistic links are sufficiently established to result in cross-linguistic priming (*cf* Mildred, 1986) A continuing problem for detailed comparison of the various findings on this variable, however, is that what is termed 'intermediate' in one study may be considered 'near-native' in another

Second is *acquisition context* Some studies on cognates account for their findings not in terms of subject differences in proficiency and fluency, but in terms of differences in the encoding/learning context of cognates For instance, Mildred (1986) reports that "late" or consecutive language learners (*i e* learning and encoding the languages in separate contexts) process cognate words separately She argues that her finding results from contextual information being remembered and accessed along with the lexical information itself (this is reminiscent of what Tulving, 1983, calls the episodic trace) As a result of use in different domains, the distributional meaning of the words differ Chen (1990) found differences in processing between subjects who had learned L2 vocabulary via L1 and those who had acquired L2 words via pictures[7] Similarly, De Groot & Nas attributed the between-language links found in their Dutch students to the paired-associate learning often used in foreign language education in the Netherlands (1991,116), although another strategy common amongst beginning language-learners, namely assuming that similarity in form implies similarity in meaning, is equally plausible (§ 1 3)

Third is *language use and domains* The extent of other-language use is also argued to account for observed differences in the processing of cognates and non-cognates For instance, Lanza (1988) argues that L2 use can interfere retroactively with L1 processing of similar words Other research suggests that CLI during access is more prevalent in subjects who interchangeably use both languages in similar domains than in bilinguals who virtually predominantly use one language (*cf* García-Albea, Bradley, Sánchez-Casas & Foster 1985, Graf & Mandler, 1984) In terms of the framework based on Levelt, frequent co-occurrence in cognates results in close association (*i e* greater experience in closely related processing) in conceptual meaning characteristics of the cognate word pair On the basis of co-occurrence (*e g* in regular code-mixing) the bilingual may become convinced of common distributional and processing properties in addition to similarity in form, resulting in more shared lemma characteristics than in contexts of segregated use

Fourth is *language distance* The perceived similarity/distance between the types of languages in contact influences the automaticity of language processes and hence the extent of control over CLI (Berg, 1987, Green, 1986, Vaid & Genesee, 1980) Within the reinterpretation, this distance influences the extent to which co-activated lemmas and lexemes provide an appropriate result if a language unit is perceived to be relevant at some stage, it may become partially active rather than remain dormant while the processes in the selected language (*i e* the language being used) operate on the selected units

Fifth is the *paradigm effect* Bilingual processing of cognates was also found to vary with the experimental paradigm For instance, the length of *delay* between prime and target in recognition tasks influences the results (Meyer & Ruddy, 1974) the longer the delay, the less similarity of form affects the results In terms of Levelt's framework, more time permits processing to go beyond lexeme to lemma entries, thus increasing the chance that semantic relations will affect processing It also varies with the *type* of processing of the prime (*i e* semantic and/or form Kirsner, Smith, Lockhurst, King & Jain, 1984, masked/unmasked De Groot & Nas, 1991) Both depend on the type of *task* (Goldstein, 1983)

Sixth is the *extent of cognateness* Different types of definitions of 'cognateness' have also resulted in varying findings (*e g* definitions in the various studies range in degree of etymological, orthographic, semantic, syntactic, and phonological 'high' similarity to identity, varying from sharing common derivation to similarity of form) In connectionist models, findings on several types of cognates can be accounted for by assuming different numbers and types of links between lexical entries Words vary within and between languages in the extent to which they share the same set of conceptual, syntactic and lexeme characteristics The degree of overlap in meaning characteristics (and probably syntactic properties) determines to what extent a word in one language is stored and accessed separately from words in the non-target language Most concrete words more commonly share syntactic and meaning elements between languages, presumably because in related cultures these share contexts and functions As a result such words are less likely to be considered language-specific (De Groot, 1995) Similarity in form (lexeme) further influences the extent of activation in the other language In addition, it was suggested that the learning context, fluency and proficiency affect processing

In the above outline of the effect of cognateness in mainly recognition experiments it is assumed that the nature of the effects in bilingual research is generally the same as in monolingual experiments Another common assumption is that the nature of bilingual lexical *access* in recognition and in production experiments is similar The more general picture of bilingual processing implies that bilingual retrieval exhibits aspects of both single-code and dual-code bilingual processing and storage, depending on the type of task, characteristics of the words, types of languages and bilinguals (*cf* groups 1 to 3 affecting memory performance in § 1 4) In short, a mixed-structure framework of the bilingual lexicon which involves compound, coordinate and subordinative relationships between the entries appears the most attractive (De Groot, 1993, 1995)

<u>Brief summary some characteristics of bilingual retrieval</u>

To sum up, the reviews in this chapter show that selective non-recall of words by bilinguals may be the result of various sources of influences on lexical retrieval processes Also, in bilinguals, malfunctions in component processes may halt or redirect language production processes at various stages, for instance as a result of activation of non target information On the basis of parallel findings, bilingual processing is assumed to be similar in nature to monolingual processing, although in a bilingual context the competing information may be part of the other language Studies on code mixing show that bilingual processing is often parallel

Processing in both languages boosts speed in switching between languages, but sometimes results in cross-linguistic slips and mixing Grammatical encoding appears to be language-dependent, suggesting that the lemma/lexeme of a lexical entry also contains information on the language system it belongs to Experimental studies on word recognition suggest that the emergence of non-target elements of another language in a bilingual's speech is influenced by the characteristics of the task (*e g* oral/written, production/identification), subjects (*e g* proficiency, fluency, learning background), and stimulus words (*e g* concrete/abstract, open/closed, cognate/non-cognate) All these need to be considered in a study of the retrieval of bilingual words Cross-linguistic overlap in meaning and syntactic functioning, often found with concrete and cognate words, results in greater opportunity for inadvertent simultaneous access, as does similarity of form

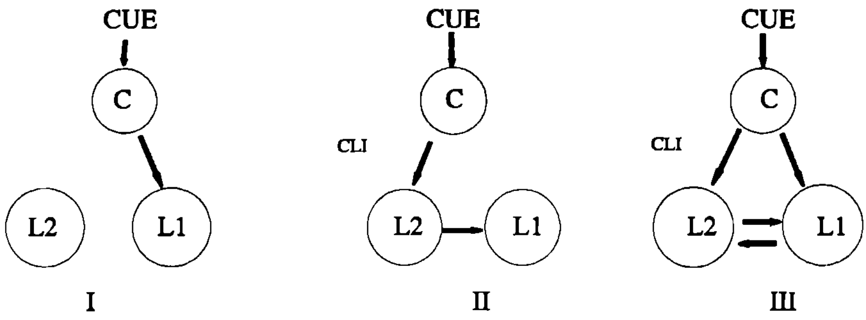
2 4 Some Implications for Bilingual Processing by Dormant Dutch Emigrants

Degrees of similarity in form and meaning (§ 2 2) have rarely been investigated in the context of L1 attrition, and almost never in the production context and in relation to extensive description of the sociolinguistic background of dormant (*i e* very non-balanced) subjects In the recognition study by Verkaik and Van der Wijst (1986) on attrition, *cognates* were used Similarity (cognate/non-cognate) was shown to affect recognition in L1 attrition Verkaik and Van der Wijst observed that dissimilar and low-frequency words produced the most incorrect responses There was only a marginally significant relationship between frequency and period of non-use responses to less frequent words were slower the longer the L2 had not been used Their study raises, however, some questions, particularly with regard to production First, Verkaik and Van der Wijst did not examine whether similarity effects found in their recognition experiment were also present in recall Second, it was not examined whether other word characteristics of their target words and degrees of similarity influenced their findings, and third, whether similarity and frequency were equally important Their study concentrated on the effect of cognates on recognition

I argued that possible process attrition could best be investigated by comparing production with intuitions On the basis of knowledge about the cognate effects in recognition tasks, my study investigates how bilinguals varying in their sociolinguistic background *produce* L1 words that differ in degree of cross-linguistic similarity, in relation to the context of L1 attrition Levelt's framework on language production helps to specify how different types of words (for instance, varying in cross-linguistic similarity) affect bilingual lexical retrieval (and hence influence which types of words may be more successfully recalled than others by emigrants who are disfluent in Dutch) The bilingual version of the framework can be used to suggest how lexical retrieval processing operates in 'dormant Dutch' bilinguals, that is, where other-language influences occur and how these may be assessed

It is assumed that there are various ways in which words may be retrieved from a lexical store, depending on the lexical links between words and between lexical networks In a bilingual context, access and retrieval of a disfluent L1 word can result either directly from the appropriate language store (I, Figure 2 7), or via the semantic and conceptual information perceived as common to both languages (II, Figure 2 7) if the cue (*e g* picture) does not directly stimulate the target entry in the appropriate lexicon

Figure 2 7 Schematic representation of the lexical and conceptual memories potentially involved in bilingual retrieval Each memory node represents a network of features



In order to communicate a message in Dutch, Dutch emigrants attempting to speak Dutch again (*i e* with a low proficiency in L1) may resort to what Green (1986) calls an 'active language' (in this case English) that operates in parallel, instead of the 'selected language' (in this case dormant Dutch) This change-over may be conscious, as part of a strategy to surmount problems in speaking Dutch, or subconscious As a result of being rusty in Dutch , processes in English may spread faster and more accurately, and as a result be difficult to de activate Such CLI when other language elements are activated faster (code-mixing) may occur deliberately or inadvertently In either case, CLI may involve activation of English lemma information and the corresponding lexeme Certain inadvertent foreignisations in Strutch such as the Dutchification of shoppen (for 'to go shopping/boodschappen doen') may illustrate that the co-activated English lemma has triggered Dutch form information In case of a foreign accent, CLI appears to be restricted to the phonetic plan

In the light of past research, a number of characteristics of the task, subjects, and words will affect CLI in bilingual retrieval processing by emigrants In order to determine how dormant Dutch emigrants in Australia attempt to retrieve Dutch words, these need to be experimentally controlled Previous bilingual research shows that attributing processing characteristics to one variable alone is difficult (*cf* Kerkman, 1984, Lanza, 1988, Mildred, 1986) Such psycholinguistically-oriented experimentation is needed to determine whether certain component processes in Dutch are more affected by disuse of Dutch or the use of English than others It is possible that dormant bilingual emigrants now process words in their L1 similarly to the way in which learners with a 'low' proficiency in their L2 processed words in this L2

On the basis of past studies, CLI in emigrant Dutch is expected to depend on paradigm characteristics, word type, conditions of learning (*e g* via translations) and current use, and the extent of automaticity and control over processing in the language All these depend on, for instance, the level of proficiency

Paradigm type

The *type* of experiment affects memory performance and the nature of lexical processing In the previous chapter it was concluded that in order to determine the nature of L1 attrition (*i e* either affecting the access of representations or their retrieval) recall to recognition needed to be compared (§ 1 5) Owing to the greater involvement of knowledge-based processing, process interference by the other language (*i e* CLI) is expected to be stronger in recall than in recognition tasks Possible reasons are that in recall tasks, formulation of the cues to access information and use of the monitor could be more susceptible to knowledge about perceived language/culture distance and language specificity In recognition tasks appropriate cues (*i e* the target word) are provided and need not be retrieved

I selected the picture-naming paradigm to test retrieval processes in dormant bilinguals in both recall and recognition contexts, the task involves language-neutral cues which do not guide access (recognition) and retrieval (recall) towards any particular language In addition, picture-naming is an often used paradigm in monolingual contexts, it allows control over many variables (*cf* Kroll, 1993, Snodgrass, 1993) and it provides a valid research context (*i e* if subjects used Dutch at all, the production of Dutch words for concrete objects is probably practised most often) The picture-naming paradigm resembles real-world language use (production) (Snodgrass, 1993), and performance in it was found to correlate closely with self-rated level of proficiency (Lemmon & Goggin, 1989) Aim of the experiment is to retrieve concrete words in the L1 lexicon, often learned in early childhood, by providing specific and language-neutral cues for word retrieval without biasing the search process from the outset towards one language (as would occur when L2 words are used as cues) It therefore provides an appropriate paradigm for investigating word type-specific phenomena in emigrant Dutch A recognition session can easily be added within this paradigm to investigate characteristics of lemma and lexeme activation, primarily used in connected speech, in the dormant L1

Background variables

Background or 'biolinguistic' variables (*e g* proficiency, fluency, and contexts of learning and use) were found to influence, among other things, the degree of *perceived similarity* (*e g* semantic, syntactic, morphological and phonological similarity) which in turn influences the extent of processing of information in the other language In the previous chapter, furthermore, the context of acquisition and use was described as important for the nature of L1 attrition (§ 1 4) These dependencies imply that detailed background information should be gathered on each emigrant subject

The level of *proficiency* should be assessed with care using valid and reliable measurements, and the resulting information should be used for comparison of subjects *within* the subject sample, rather than with other groups Ideally, a scalar index of proficiency should be taken into account when calculating the effect of similarity on performance in Dutch

Other background variables such as the *domains* and the *extent* of Dutch language use should be considered Rather than processing Dutch words via conceptual information shared with their English counterpart, direct links could be found when the English lexical entries are sought, rather like beginning L2 learners were found to process L2 words by assuming that similarity of form implies similarity of meaning Apart from the alternating use of Dutch and English in the emigrant community, Dutch emigrants may also always resort to co-activation of the English equivalents because the teaching methods for adult ESL at the time of their arrival involved grammar translation methods (Price, 1960) This could have strengthened their reliance during cross-linguistic processing on similarity of form which they would already perceive as a result of the cultural and linguistic proximity between Dutch and English

2 4 1 Considerations Specific to Attrition

One concern with such experimental investigation is that the interpretation of effects of variables on bilingual retrieval as described above could be different in the context of *attrition in L1* It could be that processes in the disfluent language *always* result in transmission to processes in the other more fluent language, particularly in view of the frequent code-switching reported in the literature on Strutch (§ 1 1) and the cultural and linguistic similarities between the emigrants' versions of Dutch and English The use of English in processing disused Dutch could have become standard among the emigrants (*i e* Strutch) Thus, Clyne (1982, 1992) argues that interference may result from interchanged use of the languages and the perception that code-switching is communicatively appropriate Other indications for this fossilization of emigrant Dutch come from Hoeks (1988) Dutch emigrants who employ both languages (*i e* fluent bilinguals) were less certain about the distinction between L1 and L2 idioms In the light of the convergence of Dutch and English into Strutch reported by Clyne, and the decreased proficiency/fluency in Dutch in the emigrant community, mixed processing between Dutch and English may have become the norm for the emigrants To establish whether processing in Dutch itself has deteriorated or whether Dutch lemma and lexeme information has become eroded, experiments that contrast competence and performance need to be used In addition, a norm is needed to measure the extent of deterioration in L1 proficiency and fluency and its effect on bilingual lexical retrieval (*cf* § 3 3)

How various word and task characteristics affect retrieval in such experiments on dormant Dutch bilinguals is the focus of Chapter 3 It centres on the possible effects of *degrees* of *cross-linguistic similarity of form* on lexical processing in various types of dormant bilinguals in a picture-naming and recognition paradigm

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[1] The lexicon in fluent English monolinguals appears to play a fairly passive role, but this does not imply that in other languages or bilingual contexts lexical encoding plays a similar part in grammatical encoding of an utterance (cf Levelt, 1989 186)

[2] The effect can be due to common occurrence which promotes automaticity, or, as Caroll and White (1973a) suggest, age of acquisition common words are learned earlier

[3] For instance, in Morton's model frequent words are recognized faster and more accurately because less information is needed to activate their entries above a threshold, whereas in Forster's model frequent words are encountered early in the search

[4] The use of a language item in its specific setting serves to strengthen its specificity in this setting This includes communicative appropriateness In contexts where the L2 is used as *lingua franca* (*e g* , among other emigrants as well as among Dutch emigrants in Australia), language switching and the use of marginal 'Strutch' forms can become so widespread that the group of words and structures considered both communicatively acceptable and common to both Dutch and Australian English is large, and as a result of their use These words become tagged as common (*i e* cognate) to both languages (*cf* arguments in Paradis, 1981, Green, 1986)

[5] Laufer (1989) and Meara (1980) interpreted such findings as suggesting that L1 lexicons are primarily semantically organized, whereas the structure of the L2 lexicons is predominantly phonological

[6] Since experiments, however sophisticated, involve lexical *processing*, it is argued that results do not indicate how information is represented, but rather how information is processed, *i e* independently or not

[7] However, Chen (1990) found that the impact of teaching method was short-lived After a number of learning trials the subjects switched to a different processing pattern

CHAPTER THREE
Testing Differential L1 Attrition

"'*So , what are you going to do now, Tom? Put electrodes on my scalp and fry me every time I get a Dutch word wrong?' LAUGH*" (Pilot A)

3 1 Introduction

Process attrition could underlie the selective use of English in emigrant Dutch This chapter introduces the methods used to measure whether attrition has affected retrieval processes of Dutch words in dormant Dutch bilinguals[1] It also specifies our expectations in respect of dormant lexical processing

Lexical retrieval processes are usually experimentally investigated in recall tasks such as picture-naming These tasks are considered to be mainly concept-driven (*i e* the semantic cues are given) and to provide results that reflect lexical performance (§ 2 2 2) Lexical access processes tend to be studied in word-recognition tasks such as lexical decision experiments[2] Word-recognition tasks are data-driven (*i e* there is less choice about how the stimuli are processed) and the results considered to reflect access of linguistic competence[3] more closely than recall tasks (Puff, 1982) The two paradigms were compared to determine whether non-recall in emigrant Dutch is the result of unfamiliar stimulus material or inaccessible L1 representations, or whether an error occurred at, for instance, the articulation stage in language production in Dutch In this study this comparison is made by presenting the picture if the appropriate name is not recalled, and asking the subject to identify the correct picture name from a list of distracter names

The nature of process attrition is investigated by manipulating lexical characteristics such as cross-linguistic similarity The *picture-naming and identification experiment* mainly investigates the effect of degrees in cross-linguistic similarity on retrieval processes in a disused L1, while taking into account background and task-related variables Although previous studies on attrition had suggested that other lexical variables (such as linguistic complexity, pragmatic load, irregularity, and frequency of reinforcement) could be relevant for linguistic research on attrition (*cf* Lambert & Moore, 1986), overlap between them prevents simultaneous study of all in a natural context

To avoid the danger of comparing noncomparable groups, statistical computations involving the commonly used multi-group design were enhanced by including detailed biolinguistic (*i e* biographical and sociolinguistic background) subject information in the analyses

Combination of both detailed background data and experimental results in the same design allowed better investigation of the effects of 'lexicon-external' variables (*e g* language learning, paradigm type, and use) and 'internal' variables (*e g* frequency, similarity) The overall design of the study on within generational L1 attrition was cross sectional

The aims of the combined experiment on name recall and name recognition are described in § 3 2 Considerations regarding the influences of biolinguistic variables such as differential encoding, language proficiency, and usage of Dutch are described in § 3 3, and the type of data in § 3 4

3 2 Empirical Investigation of Cross-linguistic Form Similarity Effects

In the picture-naming and identification experiment, subjects are required to name pictures in Dutch The use of *pictures* as retrieval cues for familiar concrete individual words was preferred, for instance, to conversational accessing cues because non-verbal picture cues provide more control over the specific target word and better identification of response strategies (as only one word is focused on) In addition, pictures specify the conceptual and syntactic information of the target without specifying particular lexeme information in one language only[4] The conceptual and semantic information is often common to both Dutch and English as a result of linguistic (*cf* Aarts & Wekker, 1987) and cultural similarity (*cf* Appleyard, 1956, 1963, Bell, 1981, Beltz, 1964, Hofstede, 1962, 1964, Stracke, 1995a) In this context, therefore, the subject's knowledge primarily determines which language and which strategies are used during recall of the Dutch names

As described in § 2 2 2, various processes are involved in naming a picture Therefore a number of variables need to be taken into account in our investigation of the effects of cross-linguistic similarity Provided perceptual variables are kept constant (*e g* image complexity, cultural specificity, and ambiguity), the language-neutral picture cues allow investigation of the linguistic variables that affect access and retrieval of L1 words

The study focused on the effect of *cross-linguistic similarity* on the retention and processing of emigrant Dutch Similarity was singled out because, first, in research on code-mixing and loans similarity affects cross-linguistic processing (§ 2 3 1) A second reason is that comparison of the findings of this experiment with past bilingual research on cognates/non-cognates (§ 2 3 2) permits better interpretation of the findings for bilingual processing A third reason is that theories on forgetting suggest similarity affects encoding and remembering (§ 1 4)

Although words vary in cross-linguistic similarity along several dimensions (§ 2.3.2), I chose to measure the effect of different degrees of similarity of *form* whilst keeping semantic similarity and syntactic similarity constant (*i.e.* the target words belonged to the same syntactic word class and denoted concepts shared in both cultures).

3.2.1 Word Form Similarity, Word Frequency, and Word Length

The account given in Chapter 2 for bilingual language production provided the basis for the experimental investigation of variables affecting the 'leaking' of activation between a Dutch emigrant's languages in the context of L1 attrition. Previous research suggests that non-target lemmas and lexemes can be activated inadvertently as a result of variables such as high degrees of cross-linguistic similarity in the target words, frequency of occurrence, the common context of learning and usage, and a limited degree of proficiency (§ 2.3.1). What is investigated here is whether such 'erroneous' transmission of information in the case of 'Strutch' occurs systematically in certain linguistic conditions during retrieval or whether this transmission between Dutch and English is part of accessing the emigrants' competence (as a result of changes in the access of knowledge of Dutch, due to, for instance, frequent code-mixing and converging of the norm for Dutch used by emigrants).

Cross-linguistic form similarity

Some indications of an effect of similarity were found in a pilot picture-naming study (Ammerlaan, 1987c; 1995c). Dormant Dutch emigrants occasionally took English words as a starting point during attempts to retrieve the Dutch target translations. This was either reported or apparent from the responses, as evident in the following transcripts:

- (saw/zaag) "'n. zAAg..'**I had to think of the English word and found a relationship**'." (PILOT F)
- (rubbish bin/vuilnisbak) "..COUGH 'n. vuilnisbak. /vuilnisbak? .Was dat moeilijk?/ Ja, want ik had 't woord '**bin**' al in me hoofd, en 't is gEEn doos maar 'n bak " [a rubbish bin /rubbish bin was that difficult?/ Yes, because I already had the word "bin" in my head, and it is not a box, it is a bin] (PILOT A)
- (switch/schakelaar) " .. 'n erm . n LICHT knop " [.a LIGHT switch] (PILOT D)
- (switch/schakelaar) " 'n....erm . swits electrische swits yeah " (PILOT M)[5]

Similarity between Dutch and English was sometimes used as a landmark for the memory processes (*cf.* Appendix 3.1 en 3.2)[6]. In the pilot study, English equivalents were occasionally adjusted (Dutchified) on the basis of the English lemma to (what subjects considered to be) the target Dutch words, as was possibly the case in the response "toad-stoel" instead of the target 'paddestoel' (Pilot R). As in TOT studies, pilot subjects also reported using phonological, semantic, and associative cues during their recall attempts, not all of them in English. Some words were reactivated via semantic routes within Dutch:

- (fork/vork) ".. hmn mes lepel VORK" [hmn knife .spoon fork'] (PILOT S).

Other attempts involved what are called 'phonological' recovery routes (*cf.* Bourne *et al.*, 1986, Wingfield & Byrnes, 1981). In most reports mainly lexeme-related information was given (such as "It sounds like ...").

- (toadstool/paddestoel) ". .'toad'-stoel? erm Nee .'toadstool? erm'.. nee, erm..... Vark? aardvark? aardvark. 'That word comes to me. For some reason or another'. Aardvark /aard-?/ 'I know that is an animal.. /yeah/ . but erm . The word has some something they have in common /ahum/ I don't know xx Oo .You know' aar .aard vark Aardvark . aardvark. . 'erm Just .This, thIS one should come to me erm ..And I think of erm Little Red Riding Hood always, and stories about fOrests . Things like that. /yeah/ .You know?............But I can't think of it. You know, when you tell me, I-' /"paddestoel?"/ Paddestoel pADDe, pAdde! padde /yeah?/ 'and' stoel Padde 'yeah, **I was looking for..the sOUNd**, ..see, becoz you know' aa aa aardvark..aar /ahum/ ..'But I knew it but it didn't come from there, right?' /OK/." (PILOT M)
- (toaster/broodrooster) ".. Ah' .'it is a erm..ah' 'It is a toAster, erm. an a erm' .'n tooster? /'A guess?'/ 'ERm, Is that, is that erm Yeah, Well, **I thought it sOUNded ..so good as if it could, yeah, yeah**' /Right/
- (ladder/ladder) " 'n lEEr .'Hang on' 'n leer.., **'That sounds right?'**" (PILOT T)

As these examples testify, similarity of form appears to affect processing in the L1. Varying degrees of cross-linguistic similarity in only the lexeme information (*i.e.* morphological and phonological) could influence memory success and the extent of CLI on access and/or retrieval processes in recall attempts because of inadvertent activation of English lexemes. Various variables influence this CLI.

<u>Degrees of form similarity</u>

It is expected that bilinguals who are disfluent in Dutch sometimes access lexical information from the frequently used English language before they access Dutch information. Psycholinguistic literature on word recognition suggests that especially morphologically and phonologically similar words (*e.g.* cognates) are co-activated in one language when the translation equivalents are accessed and retrieved in the other (§ 2.3.2). Cognate Dutch words may have an entry with a lower activation threshold as a result of partial (semantic) activation when the English equivalents are accessed. Words which are cross-linguistically very similar are therefore expected to be remembered best. Their lemma (and, in the case of cognates, lexeme) information is likely to be co-activated whenever the English equivalents are used. In addition, reconstruction efforts on the basis of similar information from the English translation of the target will improve memory performance as these efforts will result in production of the correct words.

In the case of pure cognates (*e.g.* hand-hand) it is, however, difficult to determine on the basis of the response whether the L1 or L2 name was produced, and whether phonological or morphological or both types of similarity are influential. This cannot be discerned in the phonological cross-linguistically identical L1 and L2 cognates. Words varying in their *degrees* of cognateness may therefore reveal more about the effect of non-use on the nature of production processes in a dormant language. Psycholinguistic studies so far suggest that cognates are accessed easily, while complete non-cognates are accessed with great difficulty. However, these studies are less clear as to the effect of partial similarity. Partial cross-linguistic similarity to English is expected to inhibit performance in Dutch, as indicated by psychological research on forgetting (§ 1.4). The literature on forgetting suggests that *identity* of new and old words reinforces the activation of the stored target word, that *dissimilarity* has no effect on the activation of the target word, and that *partial* semantic similarity may inhibit the processing of a word retroactively. This inhibition in partially similar words could occur at various processing stages in word production. Experiments involving partially similar words may reveal whether lemma and lexeme information from the fluent English language with a lower activation threshold may 'slip in/leak across' before the match to the appropriate lexical elements in Dutch is made because the English information cannot be deactivated. This could be evident from the fact that parts or the whole of the Dutch target concept are grammatically and phonologically encoded into English. Examples are:

- (duim/thumb) "....'n. ..duim**b**". (PILOT C)
- (violin/viool) "..'**violin**.. a viloin viloin' 'n vIejolin..viejolIn? /No/ Viejolin? 'That will do' " (PILOT M)

It is expected that similarity of form may facilitate memory performance during recall of Dutch-English cognates, and that it may impede performance in words that are only partially similar. Pilot data appear to illustrate this inhibition:

- (star/ster) "'**Sometimes when the words are similar to English.. You have to think.. because you think you're thinking in English**', xxx ster " (PILOT I)

Pilot data (Appendix 3.2) show that CLI can range from an English response, part English/part Dutch lemma (*e.g.* wind**mill, toad**stoel) or a morphologically Dutchified response (*e.g.* duim**b**) to an English-like pronunciation of an L1 word. Since CLI predominantly operates from more fluent, less permeable languages to more permeable languages (§ 1.3), finding similarity of form-effects in Dutch could be interpreted as process attrition of the L1. Inhibition of *accessing* processes would be evident in unsuccessful recognition of partly similar Dutch items.

To test the nature of the effect of degrees of similarity on lexical processing, the target words varied with respect to phonological and morphological cross-linguistic similarity (*i e* form) of Dutch words to their English translation equivalent Phonological similarity can be measured via the *phonemes* shared by the oral translations in Dutch and English Indexes for morphological similarity can be measured by equality in the number of *letters*, *syllables* and *stems* Lexical processing is expected to be affected by the number of syllables, as shown in psycholinguistic studies of monolingual language production and TOT states (§ 2 2) The syllable provides the organising framework for the phonological realization of an utterance (*cf* Dell, 1986, Shattuck-Hufnagel, 1992) In bilingual research, syllabic similarity can therefore be considered part of the "cognateness" of words, and be expected to affect processing I used this 'letter' versus 'syllable' distinction to establish which type of form-similarity is more influential

It is expected that Dutch words that are either morphologically or phonologically similar are remembered better than words that are dissimilar in both respects Less cognate words will be remembered less successfully, because activation spreading from related English words will be more limited, and because not all the information from the English translation equivalent will aid reconstruction attempts in finding the Dutch target word

In cases of partial similarity, the recall attempts of individual words are expected to be helped more by morphological similarity than by phonological similarity The reason is that in Levelt's framework, activation of morphemic information like, for instance, syllables provides the necessary information for the activation of phonemes during the production of single words In addition, compensatory strategies using appropriate morphological information are likely to result in reconstruction of the target Dutch word if the words that are morphologically similar are Dutchified

The foreignisations observed in the pilot study could be interpreted as indicating co-activation of English and Dutch morphological and phonological knowledge If so, comparison of information on Dutch intuitions in the identification task with performance in the naming task makes it possible to distinguish where similarity is most influential during speech processing in Dutch (access and/or retrieval, § 3 2 3 below) I expect that similarity of the target word and its translation equivalent can influence further processing If the emigrants' lexical knowledge of Dutch words is still present, this similarity may inhibit activation of English lemmas and lexemes in searching for the Dutch equivalent for specific types of words only If not fully present, or if the task strategy is to assume similarity between all the Dutch target words and English, then the emigrants may continually attempt to morphologically 'Dutchify' the names on the basis of activated lemmas from English.

Lexical characteristics other than cross-linguistic similarity, such as word frequency and word length are also expected to affect bilingual processing rather as they do in monolingual experiments (§ 2.2.2). Some reports suggest the possibility that pronunciation difficulties with the longer words (containing more clusters of letters and potentially infrequent letter/phoneme clusters) could affect the results (see Appendix 3.2):

- (gitaar/guitar) ".. gitaar .... /Was that a guess?/ 'I cannot pronounce the' "g" 'anymore..Is it' /x/? 'Well, I hoped for the best ' (PILOT X)
- (sneeuwpop/snowman) "'Snowman' Sneeuw-, Sneeuw- Oeh, 'that is a hard word!' Sneeuwman 'How do you actually say it?' /Sneeuwman/ Sneeuwman /See/ 'It is a hard word ' /Is it?/ 'Oh, it is a hard word to pronounce if you never use it ' Sneeu " (PILOT X)
- (neus/nose) "'Nose .oh shit'. .'It is' neus? Neus? /Yeah/ 'Yeah' /A guess or?/ 'No, I I knew it but was trying to think of the right way of pre- pronouncing it ' /Hmn/, 'And that is the case with some of those words, I think ' 'Well, I'm pronouncing it wrong, right or wrong ' /Well, it doesn't matter / 'Yeah afraid of getting it wrong, I don't want to be embarrassed by it.'" (PILOT U)

Word frequency is considered to affect speed of access. Word length reflects the amount of information to be accessed in a word. By controlling these characteristics one can, for example, assess whether less frequent and non-cognate words are remembered least successfully. In more detail this would mean the following.

Word frequency

Similarity of form is expected to be less important for words that are more frequent in Dutch because subjects will be able to retrieve these regardless of their cross-linguistic similarity (as a result of better encoding and more practice in access processes). Furthermore, the effect of the frequency of the English translation equivalent on performance is expected to be larger for the similar than for the dissimilar words because of the expected co-activation of similar words in the other lexicon. Possibly similar words are more affected by English frequency of occurrence than dissimilar words, since more frequent use of the English equivalent could have 'lowered the threshold' for activating the Dutch word. Thus, even though the Dutch word was not actively used, it could be more accessible than an equally frequent dissimilar word that would not receive this indirect activation. Words that are cross-linguistically similar and that are barely used in Dutch and English are expected to have influenced one another less because language mixing of these words in Strutch occurred less often As a consequence of this more language-separate use/practice, these low-frequency words may be considered to be more language-specific. Frequency of occurrence can also provide information whether the Dutch words of the disused lexicon have been "overwritten". If this has occurred, the effect of English frequency (*i.e.* its translation equivalent) on the recognition of Dutch words is more significant than the effect of Dutch frequency.

Word length

As in TOT studies, greater word length may be a lexical characteristic that demotivates a person to generate further secondary search cues to recall the target word (*cf.* Freedman & Landauer, 1966; Jones & Langford, 1987). An example comment is:

- (ironing board/strijkplank) "*...erm...'ironing board..... Bloody hell! I know what it is, but ... It's long..iron, board, Nope.* ***Too long****. Would never get that!'* (PILOT R)

Because longer words also tend to have a lower frequency of occurrence, the cause of this comment is difficult to identify. Longer words may be recalled less successfully as the risk of partial access or incomplete reconstruction is higher than for shorter words. This can be investigated by comparing recall and recognition results. If length effects are found in a naming context only, the emigrants can be considered being rusty in the phonological encoding of Dutch words.

Furthermore, if an effect of word length as well as word frequency is found on recall, this suggests that articulation processes of the Dutch words are very slow ("rusty"). A sole frequency effect suggests that access processes in Dutch are slower for less frequently occurring Dutch words. Comments in the pilot study shows that lack of speed is a possible consideration on the part of the emigrants:

- (lepel/spoon) .." 'It is' 'n vOrk, ..mES,...lEPel /yeah/ Lepel, 'that just came to me. That was a difficult one,' Lepel erm..'I knEw it, but erm it came slow, it took a while....I was talking to a Dutchman a while ago now, and I had to think of the world- the word "wheelbarrow", and could not think of' "kruiwagen" 'until a few weeks ago..And I had forgotten that word /ahum/ xxxxx I couldn't recall it,' "'n krUIwagen" 'you know, that was one word, well it was just-..I remember that well, /ahum/..thinking "Why don't I know' "'n kruiwagen?"' '"Why don't I know "wheelbarrow"? (PILOT S)

- (sled/slee) "....Wat is dat? ..Id dat iets van erm met de erm met de mEE te gaan met de snEEuw of zoiets. /ahum/ Een of andere erm...ding....Hmn..**tobOGgan**? Nee, dat is Engels, he? .... Het is zo'n dertig jaar geleden dat ik die erm.. dat ik erOP gezeten heb, ..en gezIEn heb. **yeah**...*it would take me ages to piece that together.* Als je het zEgt dan weet ik 't." [What is that?.. Something erm, to go with erm the snow or something. Some thing or other..hmn. Toboggan? No, that is English, isn't it?...It has been thirty years since I erm ...since I sat on one of them...and erm saw one of them...If you say it I will know.] (PILOT J)

Similarity in word length (*e.g.* in respect of the number of syllables and stems) may help a bilingual subject in the production processes of Dutch words since some morphological information of the target words can be derived from the English translations. In recall sessions, it is expected that equivalence in word length is more important for success in dissimilar word categories than in similar categories In the former, assuming similarity to English provides an incorrect cue

3 2 2 Multi-stem Words

In order to investigate the effects of phonological and morphological cross-linguistic similarity, word frequency, and word length on the processing of Dutch words, *single-stem* words were studied separately from the morphologically more complex compound or *multi-stem* words This distinction was made because, first, in multi-stem words the nature and interpretation of effects of variation in length, frequency, spelling, and similarity are less clear than in the single-stem word type (§ 2 2) Second, responses in the pilot study suggest that in multi-stem words other forms of similarity appear to affect performance, such as similarity in the components/meaning-carrying morphemes of a compound In the pilot data (Appendix 3 2), the English lemma information of a compound appeared to be used occasionally as a basis for reconstructing the Dutch word, leading to the access of English lexemes

- (toothbrush/tandenborstel) ' 'n tande erm Tandpasta, nee eh k weet niet hoe dat Ik weet niet 't erm /ahum/ eh 'tooth'-pasta, eh ik weet niet wat het Hollandse woord is voor 'paste , nee ' [teeth erm toothpaste, no, don't know what that is I don't know erm erm toothpaste, erm I don't know what the Dutch word is for paste, no] (PILOT H)

In this study, the multi-stem word types were used to investigate two form similarity characteristics The first is cross-linguistic *semantic transparency* of the word form and the second equivalence in the number of stems

Transparency

Semantically transparent Dutch compounds (*e g* potato/aardappel = earth + apple) are likely to be retrieved better than more opaque Dutch compounds (*e g* grasshopper/sprinkhaan = jump, rooster) that have no clear semantic links to their components Use of the intuition that the target word is transparent or opaque, or similar to English, could suggest what Dutch information is still available Since semantic links can occur between languages, activation of an English compound word with identical semantic components can lower the activation threshold for the disused but similar Dutch compound (*e g* doorknob/deurknop)

Transparency is expected to affect memory success in Dutch for a number of reasons First, transparent multi-syllabic words (in which the meaning components are apparent) are considered less "marked" for language membership than more opaque multi-syllabic (or 'compound') words as a result of earlier learning (*cf* § 1 4) Consequently, language users are more likely to assume that literal translation of English lexical information is a successful communication strategy for these words. Second, the Dutch emigrants perceive Dutch as being lexically more transparent than English (Ammerlaan, 1990a, 1990b). Together with rusty procedural knowledge, this could have the result that retrieval of Dutch words could primarily depend on lexical encoding rather than grammatical encoding. Third, in the context of language attrition, furthermore, strategies used to compensate for perceived lexical gaps employ the semantic information in the target word, dissecting it into semantic components for which words are then sought (Ammerlaan, 1987c). This may be the case both for multi-stem and single-stem words. In the pilot study, transparency of the target words appeared to play a role during reconstruction of the Dutch target words. More opaque words (*e.g.* ruler, skunk) were avoided and transparent words were 'assembled' in steps:

- (broom/bezem) "..... veeg. 'something' veeg...Veger, 'it's when you' . Veger, 'yeah'." [sweep.. something sweep .sweeper ..it's when you . sweeper, yeah] (PILOT I)
- (switch/schakelaar) "..'n switch, nee geen switch, erm..dit dit wat je iedere dag gebruikt. /yeah?/ ...electriciteit aan te- 't licht aan te...dat Nee, 'T woord kan ik me niet herinnere. . Hmn...'n knop?...lichtknop?.." [a switch, no not a switch. This is what you use every day... hmn a button? . light button?] (PILOT J)
- (rocking chair/schommelstoel) "..stOel..'chair?.... it is a rOCking chair ...'n rOCking chair .. A chair is' stoel.. 'Rocking. Rocking'-stoel..'rocking'stoel! ROkstoel 'No, not a' rokstoel .'Don't know'." (PILOT M)
- (toothbrush/tandenborstel) ". 'n ...tanden 'brush'...'No, that is not right'..Tanden ... 'What is a brush?' ..... Borg, brug, broos 'I don't know Forget it!'" (PILOT Z)
- (ruler/lineaal) " oh, 'ruler .I don't know, No I can't.. I don't think I ever used that word earlier'. . /Nothing?/...'Tape measure' Roele-band...'No, give up'" (PILOT M)
- (skunk/stinkdier) " 'AAh, a skunk, I wouldn't know, I don't know skunk'. /ahum/." (PILOT M)

By using problem-solving activities (PSAs, Ammerlaan, 1984) the emigrants could occasionally come up with analytical equivalents (*e.g.* "meetlat") rather than the target names (lineaal). This dissection could imply that, within the multi-stem test words, words similar in transparency in both languages (*e.g.* asbak/ashtray) are expected to be remembered better than words that differ (*e.g.* deegroller/rolling pin). Owing to the more prominent role of reconstructive processes in the recall of emigrant Dutch (as evident in the pilot study), semantically transparent words are expected to be recalled better than opaque words.

Stem agreement

The use of both semantic and form characteristics of the English translation equivalent to retrieve the Dutch target could also differentially affect compound words varying in cross-linguistic *agreement* in the number of *stems*. Agreement is expected to improve recall performance if the subject 'translates' the English lemmas. In addition, it is expected that multi-stem Dutch words with single-stem English equivalents (*e.g.* thimble/vingerhoedje) are recognised and recalled better than multi-stem English words with single-stem Dutch targets (*e.g.* butterfly/ vlinder). In the latter, analytical PSAs/communication strategies used to recall the problematic target could possibly mislead the subject into looking for Dutch equivalents of 'butter' and 'fly', as one subject did in the pilot study:

- (butterfly/vlinder) "....'ermm.. BUtter'- Nee, dat is erm Nee dat is niet 't goed woord de 'and an' dit dit de brood b- b- b- .'Butter'. boter?,..'fly' vloo- vlieg...'Butterfly' botervlieg. Maar dat is geen botervlieg LAUGHS.. Het is EEN woord Het is geen erm, net zoals in 't Nederlands, dat is EEN woord maar DAt weet ik wel....b- Nee " [butter, no that is not the correct word .this br bread Butter, flea, fly, butter-fly But it is not butter-fly. It is one word. It is not like in Dutch, that is one word, but, I know THAT.., b- No] (PILOT J)

3.2.3 Comparing Paradigms

The *recognition* session is added to the naming experiment for two reasons. First, it assesses to what extent the unrecalled Dutch words for pictures are no longer accessible in the Dutch lexicon. It could be that subjects merely report "not knowing" an unrecalled Dutch word. Knowledge attrition or "loss" of the L1 is, however, unlikely given the depth-of-processing model of forgetting: more likely are accessing problems. If, on subsequent presentation, an unretrieved name is identified, it appears that only production processes in Dutch (*i.e.* performance) have been affected by non-use: practice effects (or in this case, lack of practice of Dutch) are restricted to those component processes involved in the practice (*cf.* § 1.4). If the English name is pronounced before a Dutch response and the unrecalled Dutch word is identified correctly, naming failure can be ascribed to CLI in retrieval processes. I assume that words that are irretrievable in the recall session are more likely to be permanently unavailable if these words are also inaccessible in a recognition task.

Second, by cuing both the recall and the recognition of Dutch words in the same experiment, assessment is possible of potential differential effects of *e.g.* morphological and phonological similarity on the access and retrieval of individual words. Responses in the pilot study indicate that slips are possible on the semantic/syntactic level when accessing an English lemma which results in an English response (*e.g.* (put/well) "well"), or on the morphological level, when English and Dutch morphemes are mixed (*e.g.* (guitar/gitaar) **gui**taar), or at the phonological level (*e.g.* (appel/apple) "eppel"). Responding with an English name first may be inadvertent (a slip), it may be considered the correct name, or it may be that this served as an intermediate way of retrieving the Dutch equivalent. By comparing both sessions, the types of words that are affected most by attrition during bilingual retrieval or access can be determined.

Recognition performance is expected to be superior to recall for a number of reasons. First, during the recognition session the distracters provide very complete search cues and the response is simple (*i.e.* select the option). If only a few characteristics of the target word are retained (*cf.* § 1.3/4) these would suffice to identify the target, whereas in a recall context they could result in a TOT state or in Dutchification. Second, owing to occasional L1 listening and reading (§ 1.2), Dutch emigrants are expected to have some practice in accessing Dutch words, but they will be particularly 'rusty' in the transmission of information during the grammatical and phonological encoding during speech production. Third, recognition performance is also expected to be superior to recall because after the initial presentation the subject has seen the image cue twice (*cf.* Chapter 5) and has therefore received additional search cues.

<u>Similarity effects and the paradigm effect</u>

Words that are partly similar are expected to be affected by process attrition. Frequent use of English may interfere retroactively (§ 1.4) with those features of a disused Dutch word that are perceived as similar. If processing of information in phonologically similar Dutch and English words is shared, the stored information for the Dutch word is less accessible, although use of a performance strategy (PSA) such as transliteration/foreignisation of the English word can lead to recall of the Dutch target on the basis of its similarity. Comparing paradigms may assist in identifying the causes underlying memory performance (§ 3.2.3).

If retroactive interference has affected the *accessing* processes of Dutch, thereby always resulting in faster activation of the English lemma/lexeme, then the Dutch responses tend to be Dutchified to various degrees and English responses are given regardless of task or word category. Effects of similarity in both sessions may suggest that the access of the Dutch lemmas and lexemes has become so 'rusty' that the entries of English-language equivalents become activated first. If *retrieval* processes have been affected, then only in the recall session are effects of similarity expected.

CLI could affect access and retrieval processes differently as a result of the predominant use of Strutch in oral contexts (if L1 use has occurred at all). Morphological similarity is expected to affect recall performance more than recognition. If morphological information is correct, it is more likely that the remaining information of the Dutch word is also correctly reconstructed. Phonological similarity is expected to influence retrieval processes during recall to a lesser extent. Since in speech production access of morphemic information precedes access of phonological information whereas in recognition the reverse order occurs (*cf.* § 2.1), morphological problems affect subsequent processing in recall. Therefore, a morphological similarity effect is expected to be more prominent in recall than in recognition. The difference between the effects of morphological and phonological similarity on memory success in partly similar words is expected to be much smaller in the recognition session. In recall, mere morphological similarity is more important than mere phonological similarity, whereas in recognition morphological similarity may be less important as processing proceeds from form to meaning. An effect of both higher frequency and co-activation due to similarity is expected in both tasks, since access processes occur in both tasks (§ 1.4).

<u>Identification options</u>

In the recognition session, the subjects choose the target word from among a group of distracters (§ 3.1). The relative popularity of any particular type of option in the recognition task could provide additional information on the nature of L1 attrition, when it is assumed that subjects only select those options that they consider to be identical or similar to the target form (*cf.* Goodglass & Baker, 1976; Lhermite, Desrousné & Lecours, 1971). To maximize the plausibility of this assumption, the types of distracter options used were derived from responses given by similar subjects in similar paradigms (see Chapter 5 for details). Systematic selection of the distracters rather than the target suggests that the target Dutch words no longer match with the picture cues, and possibly that the Dutch words have become inaccessible. Bias towards a type of distracter furthermore could provide information about the nature of residual knowledge of Dutch. Persistent selection of distracters that are English-based in this identification session (together with verbal reports) could provide an indication that CLI has affected Dutch the accessing of 'competence' (*i.e.* Strutch reflects access deficiencies or even loss rather than attrition of retrieval processes). Some indications of faulty native speaker intuitions on L1 competence appeared in the pilot data:

- (drum/trom) "...drum ./drumʔ/. Drom?. Ja Zeg Ik d'r tegen /ahum/...IK ze daar "drum" tege Zegge ze in Nederland ook Trommel zegge ze ook, maar drum zegge ze ook. Trommel is meer erm. 'n klEiner. of nietʔ' /Jaʔ/. Drum is 'n grote die erm die erm. De grote tegenaan slaat, daar lijkt die nou op /Ja/" [Drum . dromʔ.. Yea, that is what I call it I call it a drum .. Is what they also say in the Netherlands' "trommel " they say as well, but drum they also say. 'Trommel' is rather the small one, isn't itʔ 'Drum is the big one which, which... The big one hits, that is what it looks like] (PILOT J)
- (drum/trom) ". .'n 'drUm in English,' and erm..in Dutch, it is erm' .drOm?..erm erm. 'drum' drom .'n DROM ...Is that rightʔ dromʔ /hmn/." (PILOT M)

If these English-based distracters are chosen equally frequently in all the word categories, the emigrants may have believed that *all* the Dutch picture names are similar to English.

The inclusion of distracter types that are solely semantically related may assist in obtaining information about whether lexical search in Dutch was semantic and/or form-based

(Bourne *et al* , 1986, § 2 2) Naming is assumed to involve activation spreading to related words If subjects particularly select a semantically unrelated distracter, I assume that a reduced semantic field for that word (Goodglass & Baker, 1976, 359) is responsible for the inability to name a picture

It is furthermore expected that the type of distracter chosen will depend on the characteristics of the target words (*e g* the perceived similarity of the Dutch word to English, the word type) and characteristics of the emigrants (*e g* learning experience and proficiency level) Use of residual knowledge on the similarity of the Dutch words could both be a remnant of the Dutch lexical entry and be stored with the English picture name as a result of transfer-based learning strategies of L2 English

3 3 Biolinguistic Variables

The restriction to a few psycholinguistic variables means that other sociolinguistic and linguistic variables need to be controlled or at least accounted for Individual variation in these background variables is expected to result in a wide range of responses Previous research points to a number of potential variables (§ 2 2)

The degrees of *proficiency* and *fluency* in Dutch (then and now) need to be assessed for each subject, for instance to determine whether subjects with the least proficiency in Dutch are least systematic in identifying the target words, and to investigate whether there are possible effects of proficiency level on the similarity effects More proficient and fluent emigrants may be more likely to remember Dutch words *per se*, and may (like more proficient L2 learners) borrow less regularly from the other language than less proficient emigrants Less L1 proficient emigrants may, first, be least successful in remembering the words, since for these subjects all the Dutch words are very low-frequency words Second, they may resort to English to activate *all* the Dutch words (*i e* subordinative processing) More proficient emigrants, on the other hand, may restrict this approach to words they know are similar (§ 2 3 2)

Differences in proficiency may result in various degrees of transfer/CLI in an attrition context There may be a threshold level of pre-attrition L1 proficiency below which Dutch has decayed rapidly because communication was limited in domains and structures In addition, because of more extensive experience in using both languages, emigrants who are more fluent in Dutch may nevertheless inadvertently slip in an English word, whereas less L1 proficient emigrants may do so intentionally Only a comparison of recall results with the intuitions in a recognition format in combination with an assessment of both proficiency level *and* extent of use in common domains may help to reveal the origin of the use of English in Dutch

Past research on language-learners suggests that the background of *language use* and the *conditions of encoding* (*e g* age of departure[7], degree of literacy in Dutch, context of learning, and contact with fellow expatriates) could affect lexical processing in the emigrants during re-activation (Bahrick & Karis, 1982) For instance, emigrants in the pilot study reported that the *age* at which English was learned (*i e* age of arrival in Australia) could determine the extent to which Dutch is associated with the person's identity, the size of the person's L1 vocabulary, the extent of practice in using it, and whether English was primarily learned simultaneously or consecutively with Dutch words. Sociolinguistic research adds that particular social characteristics of a group promote the use of L1 words in certain *domains* (§ 1 1), Clyne (1982) for instance found that women maintain an L1 better than men, and De Bot and Clyne (1989) investigated regression of emigrants to their L1 with aging In addition, words associated with the home domain (*i e.* deeply encoded and activated most often during the years after emigration) may be remembered best Psycholinguistic research supports some of the pilot subjects' comments in that it shows that consecutive learning and simultaneous learning have different effects on access in language-learners Similarly, emigrants who acquired both English and Dutch may share the access routes for both languages.

Background information was also needed to establish if responses reflect evolutionary changes in Dutch (as distinct from period of departure from the Netherlands in the 1950s) or post-emigration contact with English

<u>Baseline data</u>

Most research on attrition has difficulty in establishing the extent of linguistic knowledge by the subjects before attrition was tested for (*cf* De Bot, 1985; Jaspaert, Kroon & van Hout, 1986, De Vries, 1992). Attrition is a relative concept, detectable in relation to some (hypothetical or pre-morbid) norm Therefore, the *nature* of the norm determines the extent of attrition perceived In cross-sectional designs, large samples are required to obtain comparable groups on education, age, literacy, language acquisition history and current language use Several types of norm are possible, but few are feasible or available in this study

Using a "fully competent native speaker" as the norm creates the problem of defining this term accurately because, like the term "grammar", this is a hypothetical concept Using the knowledge described in grammars is not appropriate These are often prescriptive, dated, and not sensitive to the context of the language tests used in the attrition studies

Another potential norm is to compare present performance with performance by the same subjects measured in the past Unfortunately, the emigrants' Dutch language competence before emigrating to Australia was not formally assessed in the 1950s

Furthermore, establishing a Dutch 'fluent control group' in the country of origin is difficult since language change over time and language contact (§ 1 1) will have affected the original skills Dutch children of the same age now as when the emigrants left the Netherlands may have been exposed to a comparable number of years of Dutch, but they will possess a different quality of Dutch as a result of the emigration experience and aging in the emigrant subjects If this is disregarded, evolutionary change could be misinterpreted as attrition when comparing Dutch children with the emigrants[8] In addition, the emigrants will have acquired some concepts after childhood (*e g* "abortus/abortion", "verkeersdrempel/ramp") that they will know in English only Language development in the L2 may thus have affected language development in the L1, not just in respect of what is known

A further possible option is to employ a group of "fluent" Dutch emigrants They possess a norm similar in quality of Dutch to the "dormant" Dutch emigrants (*e g* as a result of shared history), but due to greater use of Dutch in the fluent group, more CLI of English on Dutch in these bilinguals may be responsible for different responses by the dormant emigrants Various studies show that language contact results in changes in language use that other bilinguals may consider appropriate but that monolinguals may consider "corrupted" (*cf* Rosen & Burgess, 1980) This implies that the norm differs from the dormant emigrant group in the extent of CLI Indications on whether the Dutch bilinguals regress to an "earlier" form of language processing as a result of attrition may, therefore, come from comparison of emigrants who are fluent with less fluent bilinguals but who are comparable in other respects (*cf* De Vries, 1992)

<u>Assessing background characteristics</u>

The context of language-learning and the relative levels of proficiency and fluency are assessed in a *questionnaire* (described in Chapter 4) The emigrants are assessed on their *reported proficiency* (reflecting the range and level of knowledge in Dutch), language-*learning context*, and frequency of *use* (affecting the speed and accuracy with which that knowledge may be activated to communicate in that language)

These *self-estimates* in the questionnaire, complemented with separate 'objective' *assessments* of proficiency and fluency in Dutch, are used to determine the subjects' relative proficiency and fluency (*cf* Chapter 4) Comparison of these two types of information, for instance, allows investigation within the subject group of a possible threshold level in proficiency, beyond which Dutch is maintained relatively well and below which Dutch has decayed rapidly and extensively (Bahrick, 1984b, De Bot & Clyne, 1989, Weltens *et al*, 1986)

In addition, the 'when', 'where', 'what', and 'why' of language use were documented of L1 users preferring to employ their L2 Comparison of self-estimates with the sociolinguistic data and the more traditional language assessments permits identification of variables affecting past and present proficiency and fluency in Dutch

The study concentrates on oral lexical skills, and restricts its scope to dormant Dutch emigrants Therefore caution should be taken when generalizing the findings to language attrition as such or to all the Dutch-English emigrants in Australia or bilinguals in general

3 4 Data Types in the Experiment

Various types of data can potentially be studied in an experiment Responses in the pilot study were accompanied by *strategies* and *verbal reports* (described in Ammerlaan, 1987c, Appendix 3 2) Later studies on L1 attrition also looked at strategies (*e g* Olshtain & Barzilay, 1991, Cohen & Aphek, 1980) Both reports and strategies have been used in the past in studies of recall and TOT states (Feldmann & Stemmer, 1987, Glahn, 1978, Read & Bruce, 1982, Zimmerman & Schneider, 1987, Williams & Hollan, 1981) These data types may illustrate the types of information network considered Thus, false starts such as the sequence "'chair' 'furniture' 'table' tafel" (Pilot B) could be used to suggest that semantically related concepts in English were activated to retrieve the Dutch word 'tafel' A sequence such as 'violin" to 'viejolin" to "viool" (Pilot M) could suggest (in terms of Levelt's framework) that the appropriate lemma had been accessed as well as morphological information, but that the transmission of the framework into phonological units had failed (as, for instance, the correct/target syllable structure and stress pattern appears to be present) and instead had been replaced by the co-activated English information As in the word blend example "duimb" (Pilot C), a phonological feature had gone astray in the transmission process One possibility is that control processes in the rusty L1 could have been corrupted for these pilot subjects, as the sequence of the various corrections above suggests that a Dutch language monitor was operating But another interpretation is equally likely the activated lemma information of 'viool' had in turn activated the lexeme information of both English and Dutch, and these blocked further processing, whereas the monitor prevented articulation of the inappropriate English picture name Being dormant could have resulted in increased noise in the transmission of information between component processes in speaking Dutch, if disruption is, however, permanent and systematic, the L1 processing mechanism itself has acquired a deficit

The observations in these verbal-report studies are selective, however, because conditions safeguarding their validity (Anders-Ericsson & Simon, 1980, 1984, 1987) were not met As a result, most verbal reports used provide limited insights, because only end-products of components of the access and retrieval processes are reported on Retrieval processes are particularly automatized (Baddely, Lewis, Eldridge & Thomson, 1984, Nisbett & Wilson, 1977) Although it has been argued that difficulties may slow processing down, reports in these cases appear mainly to reveal general problem-solving activities rather than processing properties of recall (*cf* Ammerlaan, 1993a) Therefore, I will investigate mainly the *errors* during the recall and recognition sessions and use strategies and TOT reports elicited under certain conditions to aid interpretation

Speed of response is not investigated because the pilot study showed that it was difficult to measure processing speed The pilot emigrants took a very long time (on average 2 seconds) to recall certain items, they lingered on certain words while trying to name the next, they occasionally offered several responses, and they used many strategies to remember the appropriate words In these circumstances, reaction times do not merely indicate processing speed Further details of the methodology and results of this picture-naming and recognition experiment are given in Chapter 5

Brief summary

In conclusion, Chapter 3 describes the aims of the picture-naming and recognition experiment and the arguments leading up to the hypotheses (summarized in Table 3 1) The experiment investigates the impact of cross-linguistic similarity in form on remembering Dutch names in two contexts Comparison of the two sessions allows investigation of the role of phonological and morphological similarity (syllables as well as stem agreement and semantic transparancy in multi-stem words) on the access and retrieval processes in dormant bilinguals

Comparison of the Dutch results of more fluent bilinguals to those of more rusty bilinguals will show whether attrition has affected the nature of processing of the Dutch words and whether the subjects' English judgements interfere with the recognition of Dutch words

In the light of previous research on bilingual processing, background information is used in computations of the lexical effects in order to determine which effects are due to attrition (*i e* comparing emigrants 'low' on contact with and proficiency in Dutch with those that are 'middle' and 'high') and which effects are specific to bilingual subjects as opposed to monolinguals (*i e* as a result of language contact as such) Because the assessments were identical for each subject, groups varying from 'low' to 'high' are comparable Information on the emigrants' language contact situation and proficiency and fluency can then help determine whether observed retrieval patterns are typical of that particular type of bilinguals or whether they vary qualitatively as a result of variation in the extent of L1 attrition Rather than compare subject groups across studies, an attempt was made to calculate *within one experiment* for each emigrant the influence of degrees of residual L1 proficiency/contact on the the type of words emigrants managed to remember

Table 3 1 Summary of the main expectations for the results of the picture-naming and identification experiment

Words cognate in Dutch and English will be remembered best
Words partially similar to English translation equivalents will be remembered better than dissimilar words
- Words which are morphologically similar will be recalled better than words which are only phonologically similar

- Multi-stem Dutch words will be recalled less well than single-stem Dutch words
- Semantically transparent multi-stem Dutch words will be remembered better than more opaque Dutch words
- Multi stem Dutch words whose stems agreed with the English equivalent will be remembered better than Dutch words whose stems do not agree
- Words with a single-stem in Dutch but multi-stem in English will not be remembered as well as words with multi-stem Dutch bases that are single-stem in English

- Recognition performance in the identification task will be better than recall performance in the naming task
- Words which are morphologically similar will be recalled better than they are recognized

- More L1 proficient emigrants will recall and recognise more Dutch words than less proficient subjects
- Emigrants using both languages frequently in shared domains will exhibit more instances of CLI in the processing of Dutch

[1] The term 'bilingualism' is appropriate here since the emigrants learned English as an L2 and occasionally reported having residual skills in their former native tongue Subjects here are very non-balanced bilinguals

[2] Due to the highly automatized and subconscious nature of access and retrieval processes there is little direct evidence (Baddely, Lewis, Eldridge & Thomson, 1984, Nisbett & Wilson,

1977, Schneider & Schiffrin, 1977) In addition, task-specific effects often prevent straightforward interpretation of results (Durgunoglu *et al*, 1987, Miller & Johnson-Laird, 1976)

[3] Characteristics of the paradigm and the influences of guessing, deduction and response strategies on the results prevent the 'non-storage' or 'permanent loss' being equated with failure to recognize an item

[4] Code-mixing occurs at the lemma and lexeme level, except in those instances where culture-dependent concepts are the communicative aim For instance, the 'utility van' or 'ute' and the 'esky' (cool box), as well as many flora and fauna terms, are unique to the Australian context and therefore would be encoded by a Dutch emigrant as 'loans' at the level of message production Similarly, the Dutch term 'gezellig' is only reluctantly used by Dutch emigrants in English because its translation equivalent 'cosy, homely' only partly captures the meaning (Overberg, personal communication, 1985)

[5] In the transcriptions, English words are typed in bold face, comments by the experimenter are marked by slashes //, emphasis is marked by capitals and translations into English by square brackets []

[6] The Dutch emigrants appeared to reconstruct the target Dutch words on the basis of a schema or core properties, in much the same as expectations guide the recall of complex stories (cf Bartlett, 1932, § 1 4)

[7] Although it is more common to use 'age of arrival' in migrant research, the pilot study showed that many Dutch emigrants travelled to other English-speaking countries and to Indonesia before eventually coming to Australia

[8] Note that recent spelling changes in Dutch were reported to be unfamiliar to assimilated Dutch emigrants These reported having 'difficulty in reading current Dutch due to its new spelling conventions

CHAPTER FOUR
DESCRIPTION OF THE SAMPLE

"..Nou ja, maar maar je..de die plAAtjes die erm. die zijn dus erm..van 'n zeker..erm moeilijkheid.. en erm.. tzk.. als jij dus hier erm HOllandse mensen erm. 'I- if you interviewed Dutch people here /ahum/ thEY will have a certain educational background, they will have been away from Holland for a certain number of yEARs, /ahum/ and that, and they will be..rEAding presently, and all that, ALL sort of are fACtors which erm will affect their reply, their response /yeah/ wouldn't it?.. "
[..Well, but those pictures, they are of a certain erm..difficulty and erm.. if you erm Dutch people, if you interviewed Dutch people here /ahum/ ....] (Pilot K)

4.1 Introduction

Chapter 4 describes some background characteristics of the group of Dutch emigrants tested, on the basis of data from (1) a *questionnaire* and (2) 'objective' *assessment procedures.* Both data types are used to determine the nature of the emigrants' bilingualism and the level of their proficiency and fluency in Dutch. Comparison of this data with the experimental results will permit investigation of the questions whether processing of Dutch words had changed in a situation of perceived L1 attrition (§ 2.2) and whether this is related to subject characteristics. The data provide information on both functional attrition (domain shift) and structural attrition (linguistic structures) within the 'first-generation' emigrants tested.

Questionnaire

(1) The questionnaire employs biolinguistic background variables drawn from general sociolinguistic studies on language attrition and maintenance and from previous work on Dutch-Australian emigrants (§ 1.1). It is used to obtain information on the subjects' pre-attrition and current *usage* of Dutch. This information makes it possible to, first, select a sample of subjects who had a certain degree of *pre-migration native speaker competence* in and exposure to Dutch, but who were/felt 'dormant' in their Dutch. The background information furthermore provides a sociolinguistic description of emigrants and their Dutch. Second, the information allows assessment of the subjects' *nature* of bilingualism in the various senses used in the psycholinguistic literature (*i.e.* through the subjects' language-learning background, estimated past Dutch proficiency, and estimated extent of current proficiency and use/fluency of Dutch. Third, the information permits identification of *key biographical and linguistic background variables.* These affect the subjects' present proficiency and fluency as measured in the Dutch assessment procedures, which in turn may influ-

ence the subjects' perception of attrition and their current lexical processing (*cf* § 1 2) Identifying key variables is a prerequisite for statistically processing the influence of the nature of bilingualism and the residual L1 proficiency on the effects on lexical processing during the experiments This can contribute to our understanding of specific variables which in one constellation can promote maintenance of a minority language, but in another context, in a different combination, can promote shift or attrition For instance, a variable like 'geographical isolation' was found to promote maintenance of a minority language if there are many co-users (in so-called language islands) but resulted in shift to the majority language if these users are absent (*cf* Barth, 1969, Dorian, 1988, Kloss, 1966)

The subjectivity of background variables and the complexity of relationships between them are such that previous studies on such variables in language attrition are not necessarily applicable to the current study For instance, in Jaspaert & Kroon (1987) variables such as *length of stay abroad* and *level of education* were the most important independent variables affecting proficiency, in De Bot, Gommans & Rossing (1991) the variable *extent of contact* determined whether the *length of stay abroad* was important, and Hakuta & D'Andrea (1992) point to the importance of attitudinal variables Positive attitudes to a LOTE tend to be a prerequisite for its maintenance (*cf* Allard & Landry, 1988, Gilhotra, 1985, Hakuta & D'Andrea, 1992, Smolicz, 1979b) Foster, Lewis and Rado (1980) found that Italian and Greek parents were more supportive of bilingual education than Dutch parents Since the relevance of each variable depends on the context of each study (§ 1 2), and given the influence of background variables on bilingual processing (§ 2 3 2), the findings from previous studies were mainly used as guidelines for the present investigation of the Dutch emigrants in Australia

The questionnaire data aimed at providing the most important predictors of past and present proficiency levels of Dutch For the purposes of the study it was sufficient to contact a group of emigrants who reported having lost their L1 Pragmatic considerations and changing conditions for Australian emigrants (*cf* § 1 6) justified a detailed description of the sample beyond its relevance for the experiment The extent of the shift away from the L1 within one generation of Dutch emigrants has been categorised as 'dramatic' in comparison to other emigrant communities in Australia This therefore warranted more detailed investigation of the *attitudes* of the emigrants towards Dutch and bilingualism, in the light of the findings above that this information was relevant to research on attrition

<u>Language assessments</u>

(2) 'Objective' *assessment procedures* serve to indicate the relative level of proficiency and fluency of a particular emigrant as compared with others in the sample, the self estimates in the questionnaire are less comparable across subjects when an absolute measure of proficiency is aimed at[1] The assessment scores both complement the self-estimates of global L1 proficiency in the questionnaire as well as validate them Validation of self-ratings of proficiency by the assessments appears to be needed because of disagreement in the literature as to the validity of the self-estimates, Grosjean (1982), Hoeks (1988) and Weltens (1989) suggest that self-estimates appear dependable, whereas Lieberson (1969) and Hakuta & D'Andrea (1992) argue that they are open to various interpretations, reference points used may vary from individual to individual

Global tests are used to assess language proficiency The alternative, a discrete point assessment of L1 proficiency, proved difficult to achieve since steps like establishing the Dutch elements most susceptible to attrition for use in tests and evaluating these tests for reliability and validity in trials were not feasible within the project[2] The global tests used are brief and assess both *Dutch* and *English* proficiency

Several *types* of global assessment procedures are used, varying in style, skills involved, content, and type of words This multiple assessment reduces the possible effect of procedure bias on the results, but also suggests that the results for each assessment can only be compared indirectly in order to provide information on the subjects' relative proficiency in these languages and/or their verbal ability in general Three types of tests are used The subjects' current global language proficiency is assessed in *Cloze* and *Editing* tasks A more specific lexical test was the 'continuous lexical association' or *Fluency* task that aims at assessing the subject's lexical fluency in each language This is expected to be most affected by disuse This procedure was added because it is oral and more language production-oriented (*i e* involving retrieval processes) than the Cloze and Editing tasks (which rely more on text-handling and reading skills)

Two Cloze tasks to assess Dutch are used to enhance the test-reliability of L1 proficiency The "short" second Dutch Cloze text is furthermore read aloud to allow assessment of the subjects' reading skills in Dutch and the possible influence of English on their pronunciation Assessment of L1 reading skills is necessary since this quality is likely to affect performance in all written assessments and in the experiment Retrieving correct responses depends, after all, on the cues, which in turn are based on understanding the context sentences in the assessments. All the procedures and the experiment reported on in this dissertation are listed in Table 4.1[3].

Table 4.1. Types and order of tasks and experiments presented to the Dutch-Australian emigrants (N = 76).

TYPE OF TASK	SECTION
- Questionnaire on subjects' background	4.3.1
- English Cloze	4 3 2
- English Fluency task	4 3.4
- Dutch Editing task	4.3 3
- Dutch Clozes	4.3 2
- Dutch Fluency task	4 3.4
- Dutch picture-naming and identification experiment (the dependent variables)	Ch 5

The sections below start with a description of the way the subjects were contacted and what information emerged in the process of screening Dutch emigrants (§ 4.2). This is followed by a description of the methodology of the various assessments (§ 4.3). The results of the questionnaire and the relationship between its variables are presented in § 4.4.1, on the basis of which the subject group can be described. The results of the assessment procedures are given in § 4.4.2. This information is used for a comparison of the results of the objective assessments with the information from the questionnaire. The aim of detailed analyses of the background information and assessment scores is to a establish statistical basis that lets the *data* determine which variables and test scores are the key indicators of the emigrants' present and past Dutch proficiency and fluency, rather than using *ad hoc* decisions or previous research based on other emigrants (§ 4.5). Throughout the discussion of these analyses, an outline is given of various steps aimed at obtaining a pure sample of Dutch emigrants who at the time of testing experienced attrition in their L1.

4.2 Contacting 'Dormant' Dutch-Australian Emigrants

Ideally, the 'dormant' Dutch emigrant aimed at for a study on L1 attrition would be a person with pre-emigration native speaker competence in standard Dutch (*i.e.* arrival at age 6 or older), with little contact with fellow Dutch expatriates or with the Netherlands soon after disembarkation in Australia, who married a non-Dutch partner, was not a member of a Dutch society or church, and not affected by influences due to aging or retirement (*i e* working and younger than 60) In addition, The subject sample would be restricted to Dutch emigrants who originally used a variety closely resembling *standard Dutch* ("Algemeen Nederlands") Frisian- and Limburg-speakers who occasionally but exclusively used their non-standard language at home and with fellow expatriates from their area would be excluded from the search for subjects (*cf* research by Pauwels, 1985) These ideal subjects, however, cannot be easily found in a direct way

The ideal subjects therefore needed to be contacted indirectly via other emigrants aware of their existence The search for dormant Dutch emigrants was launched via appeals on local radio programmes, via Dutch organisations (*e g* clubs, societies, churches) in Victoria and via advertisements in regional, ethnic and national papers This produced hundreds of volunteers These volunteers were also invited to "dobb in (= rope in) potential dormant subjects All the volunteers were screened on the phone This screening showed that few of the roped-in volunteers from the emigrant community were ideal 'dormant' Dutch emigrants, especially those contacted via Dutch societies, even though these societies are not Dutch language-oriented (Overberg, 1986), most volunteers still occasionally employed Dutch, despite having Anglicised their names and having adopted Australian citizenship Those emigrant volunteers who had arrived recently often used Dutch at home, in contrast to those who had arrived in the 1950s Some callers said they had "never learnt Dutch properly" because they had "arrived when they were very young" Although lateron this turned out to be an excuse, these subjects were excluded as well, especially because they had said their literacy skills in Dutch "were very poor"

Other comments during this subject selection stage suggested complex relationships between present and past proficiency in Dutch, the subjects' current age and their age of arrival in Australia (Ammerlaan, 1994c, 1994f, 1994j) Some commented that they had "forgotten" their childhood Dutch[4] Some older emigrants said they "had not lost their Dutch" but that they "frequently confused their languages" now that their English-oriented "children had left the house" This was not a barrier to communication when they lived in the Dutch retirement villages in Greater Melbourne (*e g* Beatrix, Providence, Dandenong) but it restricted communication with their offspring Some elderly emigrants in these homes reported being "better in Dutch now than, say, 20 years ago" when their English was better (*cf* Hearst, 1981 and Rowland, 1981 for similar comments on reversions to LOTE) Even in endogamous marriages emigrants rarely used Dutch in the home The chance that emigrants reported some age-related illness increased for subjects older than 60 (*cf* Australian Institute for Multicultural Affairs, 1983, 1985, 1986) All the subjects said that of late (*i e* 1988) they had had more contact with Dutch and the Netherlands owing to more leisure time, recent implementation of Australian language policy changes regarding migrants (*cf* Van Den Akker & Bunbury, 1988, Van Dersman, 1993) and the resulting increased presence of Dutch in the multicultural media (*e g* SBS-TV, 3EA, 3ZZZ)

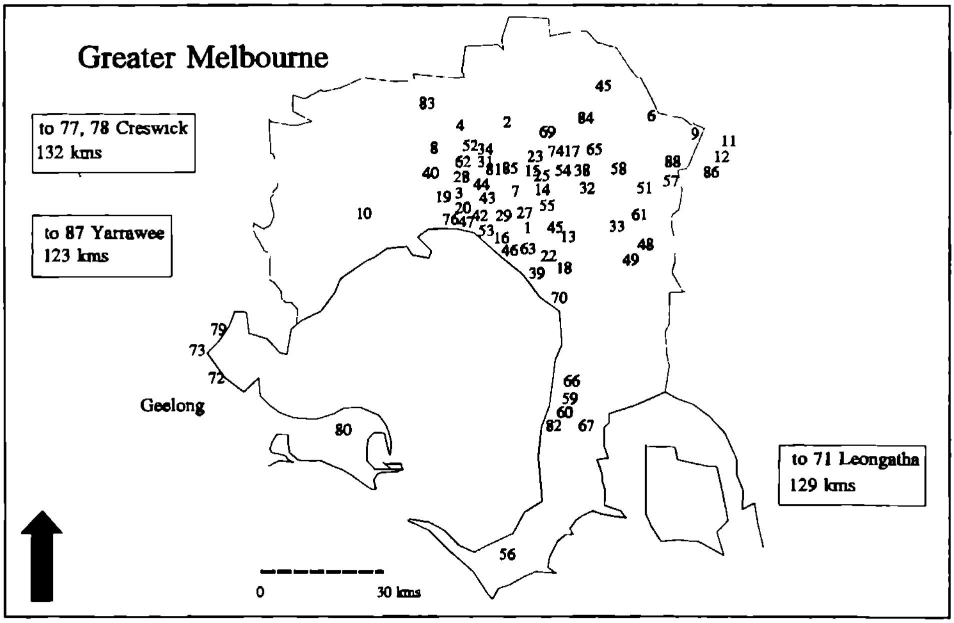
Age and aging

Other reports indicated that the emigrants' age of departure had affected assimilation in the 1950s older arrivals (then aged 20 plus) said that not using Dutch at all had meant laboriously adopting a "new personality on arrival"[5] and that they had experienced great difficulties during the first years as a result of peergroup pressure from monolingual Australians[6] Similar comments on the 'age' factor are reported in anthropological studies of the Dutch community by Walker-Birckhead (1988), Van Hoof (1985), and Van Wamel (1993) and in reports by social workers (De Kruyf, 1993, Vaartjes, 1995) Also sociolinguists argue that the emigrants' age is important for socialization and hence has consequences for language development In general, migration tends to have fewer negative influences on the L1 of a 10-year old than in a 7-year old where it causes stagnation of L1 development (Schrader, Nickles & Griese, 1979) In older children metalinguistic skills (*e g* literacy and pragmatic/communication) are transferred across languages whereas more language-specific skills (*e g* those related to the lexicon and syntax) are not (*cf* Skutnabb-Kangas & Touramaa, 1976, Verhoeven, 1994) In short, the comments that both the age of departure and the subjects' age now affected their current use of Dutch now had to be taken seriously These age-related comments led the experimenter to restrict his attempts at finding suitable candidates to emigrants younger than 60 and emigrants who had lived more than 6 years in the Netherlands

All the subjects reported employing English predominantly, because using Dutch was considered "inappropriate in the Australian context' and might "contaminate their English", because Dutch conjured up unpleasant childhood memories of the World War (*e g* endurance or collaboration), or because word-finding problems and mistakes in Dutch during previous attempts at speaking Dutch were considered to hinder communication and damage the subjects' self image (No way, I am not going to look a fool because of my stammering in Dutch") These types of remarks suggest that non-use of Dutch fuelled its own decline, lack of use meant frequent resort to English as a stop-gap for problems in Dutch, resulting in dissatisfaction with the subject's standard in Dutch, leading to further avoidance of Dutch (Ammerlaan, 1987b) These comments could suggest that subtractive bilingualism (*cf* Allard & Landry, 1992) is widespread and ethnolinguistic vitality low in the Dutch community in Victoria (Bogers, 1982, Muyskens, 1974, Smolicz & Harris, 1977)

Of all the remaining volunteers, 237 eligible emigrants were asked to participate However, almost two-thirds subsequently declined Reasons given were, "lack of time", on second thoughts "lack of interest" in the Dutch language and its community, suspicion because of a Dutch "researcher" who had visited some societies in 1984 and who later proved to be a Dutch tax inspector, and most frequently, reluctance to use or reactivate their Dutch "for the sake of the experimenter" while "running the risk of confusing the languages" and "reliving old memories"[7] (Ammerlaan, 1994j) The final sample consisted of 88 emigrants who appeared to be "emerging from a state of hibernation" into one of "curiosity about" their "level of Dutch" They were visited between October 1987 and February 1988[8] The data of 12 of these subjects had to be discarded as a result of equipment malfunction, literacy problems in both languages, history of a stroke, and incomplete results The 76 remaining participants were well-educated and from middle-class suburbs in Melbourne, particularly from the "Dutch belt" in the south-east (Map 4 1)

Map 4 1 Location of the volunteers tested in October 1987-February 1988 in Greater Melbourne whose data could be processed Numbers refer to the subjects



The emigrants were typically aware of their Dutch, although the level of consciousness varied per individual Limited finances prevented paying subjects and contacting many emigrants in more remote country areas around Greater Melbourne (or other states) outside the broadcasting range of ethnic radio and television (see Map 4 1)
The next step was to present the emigrants with the questionnaire and the assessment procedures Details of the methodology are given below

4 3 Methodology

A pre-attrition norm

As a measure of pre-attrition proficiency in Dutch, the results of comparable, more fluent emigrants were used within the same sample (§ 2 4)

In addition to testing the validity and reliability of the various assessments, it had to be determined how well fluent Dutch emigrants would perform However, an attempt to obtain the responses from a large sample of more fluent Dutch-Australian bilinguals failed[9] Therefore the target responses in the assessment procedures for Dutch were based on responses by adult native speakers in the Netherlands (*cf* Jaspaert, Kroon & Van Hout, 1986, De Vries, 1992) The 'norm' for the English tests was provided by Australian monolinguals

4 3 1 The Questionnaire

The questions (listed in Appendix 4 1) are based on general sociolinguistic literature (Boyd, 1986, Fishman, 1965, 1972, Foster, 1980, Giles, 1977, Grosjean, 1982, Haarmann, 1986, Maher, 1985, Olshtain, 1986) and on previous research on Dutch emigrants (*cf* § 1 2) I disregarded variables that were the same for all subjects (*e g* language political issues, cultural similarity), historical dimensions (*cf* Bell, 1981, Berevoets, 1975, Cahill, 1995, De Groot, 1984, Donaldson, 1981, Dugan, 1985, Juddery, 1978, Niewenhuysen, 1995, Nozeman, 1987, Van Bedaf, 1988) and information that could also be obtained from previous research on Australian migration (*cf* Bullivant, 1984, Cigler & Cigler, 1981, Jupp, 1988, Ozolins, 1988)[10] These types of information assist in outlining the situation of Dutch as minority language (*i e* domain shift) but do not differentiate between subjects

All questions were presented in English They consist of both open-ended and multiple-choice types They mainly relate to *personal* language-learning context and language use in both Dutch and English The questions are grouped into those on biolinguistic characteristics (*e g* age, gender, education, age of departure, reason for departure, *how* Dutch had been acquired in the past and to what level, *how often* and in which domains it was currently used) [questions q 1-29], self-estimates of the frequency of using Dutch, the L1 proficiency and perceived change in the four aural and oral skills in several domains [questions q 30-33][11], and questions on the subjects' attitude to Dutch, maintaining and teaching Dutch and bilingualism [questions q 34-36] This information on attitudes was based on Haugen (1956) and Hoeks (1988) (see Appendix 4 1 for all questions)

The questionnaire is deliberately "extensive" because, according to Census data, the experience of Michael Clyne (personal communication, 1985) and in a pilot study in 1986, the situation of Dutch emigrants in the early 1980s was unique According to this data and to social workers in the community, Dutch emigrants who migrated after the 1960s do not appear to have shifted to English to the same extent as those who emigrated shortly after World War II Efforts in the 1980s to boost multiculturalism and multilingualism among emigrant groups in Australia resulted in an increased preoccupation with the "roots", including for those emigrants who had denied their own origin for decades (§ 1 6) Since the population of "avoiders of Dutch" was expected to dwindle with increasing aging and spreading multiculturalism, a large number of variables were used These permit future in-depth study of the subject group for purposes not part of this dissertation

The emigrants were visited at home or at work The experimenter promised confidentiality, gave clarification where necessary and added relevant comments to the questionnaire

4 3 2 <u>The Cloze Procedure</u>

Cloze tasks in both languages were used to measure the global level of proficiency in Dutch and in English In Cloze procedures subjects have to insert the appropriate words in blanks in a script Cloze tests appear to correlate highly with other tests of language proficiency (Van Els, Bongaerts, Extra, Van Es & Jansen-van Dieten, 1984, 327-328), especially tests of syntactic and lexical knowledge (Klein-Braley, 1981), reading skills, and spelling ability (Oller, 1973)

Open-ended Clozes were constructed by deleting every 7th word, whilst avoiding creating gaps for the same target words (the variable-ratio method) and whilst keeping the total number of open- and closed-class target words equal The topic of the text was familiar to the subjects The scoring method involved accepting as correct those responses which the majority of a fluent control group (*cf* § 4 2) had inserted in the same blank ('exact scoring' method, Alderson, 1979) This method both provides a norm and reduces the effect of stylistic idiosyncrasies in the script

The English Cloze

The text used for the English Cloze version was based on an article in a national Australian daily on Australian suburbs Forty four words of various syntactic classes were removed (text and instructions in Appendix 4 2) The control group for this task were 34 monolingual native speakers of Australian English Their age ranged from 18 to 50, with an average of 34 Since all subjects were highly proficient in English, 'problematic cases' were genuine (*e g* with great variation in their replies) Their responses formed the basis of the target responses (Appendix 4 2)

The 'long' Dutch Cloze

The same variable-ratio method was applied to a text based on a humorous story by Simon Carmiggelt[12] This resulted in a "long" Dutch Cloze with 50 blanks (the Dutch original, the instructions, and the Cloze itself are all given in Appendix 4 3a) An attempt to obtain target responses from fluent emigrants failed (see § 4 2) Therefore the target responses were obtained from 28 monolingual adults in the Netherlands These controls, like the emigrants, came from a wide range of regional backgrounds and stated they had no or limited proficiency in ESL Their age ranged from 30 to 50, with a mean of 39 2 As in the English test, the target responses were those supplied by more than 90% of the native speakers (*cf* the targets are listed in Appendix 4 3b)

The 'short' Dutch Cloze

I used reading-aloud one of the Cloze scripts to measure the quality of reading skills of the emigrants in Dutch The level of skill could affect the processing of the written stimuli in the assessments and the experiment A second, shorter Cloze text is an additional means of examining the reliability of the assessment of Dutch proficiency

The text originated from the 1976 VCE (Victorian Certificate of high-school Education) exam in Dutch (see Appendix 4 4a for the instruction and text) Written in newspaper style, this humorous 'police report' is slightly more formal than the "long" Dutch Cloze The vocabulary in both Dutch Cloze scripts was evaluated as "basic" by three teachers of L2 Dutch in Australia They also judged syntax to be 'simple' and well within the competence of a Dutch primary school child

The variable-ratio method resulted in 18 blanks The target responses were again based on the responses by control subjects in the Netherlands The 36 native speaker controls (aged 30-45) reported having studied ESL not beyond high school level, as in the previous control group[13] The target responses are listed in Appendix 4 4a

The emigrants received the same instructions for both Dutch Clozes (see Appendix 4 3a) except that after completion of the short Cloze text they were unexpectedly asked to *read* aloud the original text of this Cloze and to paraphrase its contents (the text and instructions are given in Appendix 4 4b) Subjects were not given any prior indication of a rating of their reading nor of their paraphrasing Both the completion and reading sessions were tape-recorded and analysed away from the subjects

The level of the emigrant's reading skills in Dutch was assessed by tallying the number of misreadings, as well as the number of corrections, the reading speed and, via paraphrasing in English, the level of text comprehension for that individual (*cf* Goodman & Burke, 1972) Note that the latter is a rather indirect way of rating comprehension through paraphrasing skills

4 3 3 <u>The Dutch Editing Procedure</u>

An Editing procedure consists of a text to which a number of words have been randomly added in syntactically and/or semantically inappropriate positions Subjects are instructed to edit out (*i e* cross out) these superfluous words whilst reading through the text (Janssen-van Dieten & Van der Linden, 1983, Mullen, 1979, Van der Linden, Geurtsen, Janssen, Migchielsen & Reynaert, 1982) The Dutch Editing procedure was used to counter possible bias in the Clozes towards spelling skills In Editing tasks no verbal responses need to be spelled out correctly and therefore this procedure is less production-oriented than a Cloze It also does not provide immediate feedback (such as leaving a gap) and therefore makes the task less frustrating for less proficient subjects

The test (Appendix 4 5) used here was developed by the Centraal Instituut voor Toetsontwikkeling (Cito) (Van der Linden *et al*, 1982) Cito adapted a Turkish fairy tale 'Biz Bize' (Papendorp, 1979) by inserting words from 'De Kleedjeskoopman' every 5 to 12th word in every second line Controls for our study were 30 native speakers of Dutch in the Netherlands (aged 21-53, mean age 42) from a variety of backgrounds Agreement among the native speaker responses was very high The 47 words that 99% had crossed out (Appendix 4 5) were then marked on a master by punching holes in places where the controls had indicated a superfluous word Incorrectly deleted words were not included in the subject's score (Mullen, 1979)

Both the Cloze texts and Editing assessments are considered to provide close approximation of the level of the intuitive linguistic knowledge of the emigrants

4 3 4 Verbal Fluency

A common method for rating lexical fluency is to ask subjects to produce within a certain time-span as many words as possible that comply with a criterion or 'cue' (Puff, 1982, Summers *et al*, 1989). The number of responses to each criterion is used to rank the subjects with respect to their fluency Cues for this continual association tasks may be semantic/associative criteria (*e g* "Give as many words for plants as you can within 2 minutes") and phonological criteria (*e g* "Give as many words as you can starting with "T" within 2 minutes") These cues are used to derive secondary cues in order to generate appropriate responses (Blaxton & Neely, 1983) This "free-recall" or "free-association" procedure assesses subjects' readiness in their ability to access and retrieve specific linguistic and semantic areas in the lexicon Psychologists show that performance in the semantic task is influenced by the extent of activation and the size of the lexicon as well as a person's imaginative powers, concentration span and monitoring skill, (Grunewald & Lockhead, 1980) This suggests that the semantic task is not only an index of verbal fluency and the speed of remembering words but also an index of 'conceptual fluency' This affects how readily a subject can produce ideas for a sentence and communicate these To get the most accurate assessment of lexical fluency both types of criteria were used

Furthermore, by making the Dutch and English Fluency tasks *equivalent* in respect of the criteria, comparison of the scores could be used to identify subjects who have high general verbal skills irrespective of the language In addition, a comparison enabled to assess the extent to which certain bilinguals who had claimed to be 'dormant' in Dutch are more fluent and proficient in English than in Dutch (*i e* recall a larger amount and range of English than Dutch words) To obtain comparable versions in both languages, the phonological and semantic cues had to be *similar* yet not identical (to avoid priming each other) and equally *frequent* in both languages This was done as follows.

Phonological cues

The format was similar as used by De Bot, Gommans and Rossing (1991) in a study on attrition of L1 Dutch in France The same Dutch cues were used, with English equivalents added No relevant information on the frequency of Dutch phonological and orthographical symbols (letters/sounds) could, however, be obtained Therefore the measure for comparing the phonological criteria between Dutch and English needed to be derived from other sources This measure involved counting how often words with the same initial letter occurred in word lists To minimize the influence of corpus-specific information three English dictionaries were consulted, 'The Webster's New Twentieth Century Dictionary of The English Language' (1955), 'The Macquarie Dictionary' (1981), and Little, Fowler & Cowlson's (1973) 'The Shorter Oxford English Dictionary' The number of pages in each dictionary was taken as an index of the number of words in that language starting with that particular letter Random sampling showed that all pages roughly contained an equal number of entries Considerable agreement regarding the relative number of words starting with a particular letter was found amongst the dictionaries The English results were compared with the letter-frequency scores for English (Solso, 1979, Solso & Juel, 1980, Solso & King, 1976) Solso had used Kuçera and Francis (1976) and Francis and Kuçera (1982) as sources, and had excluded hyphenated words, words with apostrophes and written numbers from their counts (details are provided in Appendix 4 6a) Spearman correlations showed that this dictionary method of frequency assessment correlated well with Solso's count (Table 4 2)

Table 4 2 Spearman correlation coefficients between the frequency of initial letters in English in 3 dictionaries and the information from Solso's work

COUNT x DICTIONARY	r
Solso's x Webster s	88
Solso's x Macquarie	89
Solso's x Oxford	84

This suggested that this method provided a feasible alternative index for establishing the Dutch 'letter' criteria[14]

The frequency of letters in Dutch was based on 'Van Dale Groot Woordenboek der Nederlandse Taal' (Geerts & Heesterkamp, 1984), 'Wolters' Woordenboek Eigentijds Nederlands Grote Koenen' (Koenen & Drewes, 1986) and 'Van Dale Groot Woordenboek der Nederlandse Taal' (Kruyskamp, 1976)[15]

To identify the English equivalent to the Dutch 'P, F, L" criteria used by De Bot *et al* (1991), the three dictionary-based rank orders in each language were added up per letter and the mean rank calculated (Table 4 3)

Table 4 3 The mean ranks of Dutch and English letters in respect to the frequency with which these occur in word-initial positions. The Dutch letters used by De Bot *et al* are typed in boldface.

ENGLISH	Letter	DUTCH	ENGLISH	Letter	DUTCH
5 33	a	6 00	2 66	**P**	7 00
6 66	b	3 66	23 00	q	24 00
2 33	c	18 00	8 66	r	10 33
7 33	d	12.66	1.00	s	1 00
12 00	e	19 66	5.00	t	12 66
10.33	**F**	21 33	18 66	u	18.33
15 00	g	7 33	19 33	v	2 66
11 66	h	12 00	15 33	w	14 66
10 33	i	18 00	26 00	x	25.00
21 33	j	23 00	24 00	y	26.00
21.60	k	2 66	25 00	z	16.66
14 33	**L**	15 00			
8.00	m	11 66			
19 00	n	19 33			
17 00	o	5 66			

Table 4.3 shows that the equivalents of "P" (7.), "L" (15.) and "F" (21.33) for the Dutch sessions were "D" (7.33), "G" (15) and "J" (21.33) for the English Fluency sessions.

Semantic cues

Subjects also had to provide lexically subordinate members of a category presented in a semantic cue. These cues also needed to be equivalent between the two language conditions in respect of the size and activation of the semantic fields from which responses needed to be generated To achieve this cross-linguistic comparability for the semantic criteria, Battig and Montague's (1969) measure of category potency *(f)* was used for English[16] The total number of responses listed there was used as an index for selecting equal category names. No comparable measure was available for Dutch, but since the two cultures are related, six equivalent categories were selected from Battig *et al.* and randomly assigned to the Dutch and English versions (Table 4.4). The categories were of a general nature common to both the Dutch and Australian cultures, were not gender-specific and did not involve words used in the experiments. The semantic categories ranged from those with a restricted number of members to those with a very large set of members (Table 4 4)

Table 4 4 Frequency values *(f)* from Table 1 in Battig & Montague (1969) for the semantic criteria used in the Dutch and English Fluency tasks

	DUTCH	f	ENGLISH	f
restricted set	unit of time	8 81	relatives	9 29
I	a metal	6 63	weather phenomena	6 58
more open set	a toy	6 15	occupation/profession	6 19

During the sessions, subjects were given 2 minutes to provide as many responses as possible in accordance with each of the criteria above (the English instruction is listed in Appendix 4 6b)[17] All responses were recorded on audiotape The number of responses (without the repetitions) form the basis for ranking the subjects in respect of their fluency

4 3 5 <u>Task Sequence Effects</u>

Pilot testing (N = 26) revealed task sequence effects and lexical priming, performance in Dutch improved as more testing was done and subjects "warmed up", as illus trated in the excerpt below (capitals indicate emphasis)

> Its funny, but you know as I sort of sEE all these Dutch things, its it erm you are sort of bringing up a whOle Dutch train of thoughts again (Pilot K)

In addition, starting with production tasks rather than comprehension was more likely to result the tests being abandoned because the pilot subjects got disheartened However, the order of the tasks could not be varied during the actual testing to counter for this sequence effect over the entire subject group because of the expected variation in emigrants' backgrounds Instead, all the tasks were presented in the same order to each subject Only the order of the cues in the Fluency tasks and the items in the experiments was varied (*cf* Table 4 1)

The actual order of tasks and experiments progressed from English to Dutch, from written to spoken, from recognition of words to recall of words and sentences, and from assessing lexical knowledge to assessing syntactic/morphological knowledge of Dutch Receptive skills in Dutch were assessed first (through the Editing task) before the less often-used productive skills (*cf* § 1 1) were assessed (in the Cloze and Fluency tasks) English versions preceded the Dutch to familiarise the subjects with the procedures, and therefore obtain a better picture of the subjects' proficiency in Dutch Fluency tasks (*i e* more productive in nature) preceded the experiment so that subjects could not 'borrow' words from the experimental stimuli An interview in Dutch and a story-retell task (not discussed here) concluded the data gathering All tasks were presented in quick succession as to prevent subjects as much as possible from preparing for a Dutch version of an English task

This fixed task-sequence implied that, first, performance in the production tasks used was better than outside the test format Having less demanding tasks first ensured that sufficient data were generated A second consequence was that the words used in each task had to be selected carefully to avoid instances of Dutch words being activated twice Third, the Dutch and English versions could strictly speaking not be fully compared (as there is a practice effect for the Dutch session which is absent in the English counterpart) This, however, was less relevant in the present context as the study aimed to investigate Dutch emigrants who were expected to perform more poorly in Dutch and to predominantly use English

4 4 Results

Owing to the length of the procedures, subjects frequently insisted on coffee breaks, which provided useful comments on the tasks, the subjects' Dutch, their personal history, and their views on Dutch in Australia (*cf* Ammerlaan, 1994k) All the sessions and breaks were tape recorded, and these together with additional notes helped to interpret the responses The data generated by the questionnaire and assessment procedures are described in the 4 4 sections First, the results of the questionnaire for the total subject sample are given (§ 4 4 1) Next, correlations are computed for a selection of background variables and a subset of dormant emigrants who were assumed to have initially had native-speaker competence in Dutch Detailed description of the sample using correlations between individual variables preceded computations of the factors underlying them, as is evident from principal component (PC) analyses The data from the assessment procedures are presented in § 4 4 2 This provides an index of their current residual proficiency and fluency in Dutch Correlations are used to investigate relationships between the scores

Ultimately, the aim was comparison of the questionnaire profile with the results of the objective assessment procedure and with the experiments to obtain information on the relative influence of variables such as past and current language use, domains of use and type of learning on process attrition of the Dutch lexicon Sections 4 5 onwards describe how the application of statistical procedures results in the removal of atypical outliers, using information that became available during the investigation itself Section 4 5 describes the various steps involved in finding the relationships between the background and performance by the dormant emigrants in the assessments and experiments First, emigrants are identified who do not fit the overall pattern of the dormant group (§ 4 5 1) This is followed by § 4 5 2, which presents the results of further computations aimed at identifying relationships within the questionnaire data and identifying key variables affecting proficiency and fluency that may be used to interpret the experimental data

As will become clear in the data analyses below, a number of adjustments needed to be made to the data and the subject sample for two reasons First, to deduce from the background information the relevant variables in this context (§ 1 2) and limit the number of variables to key variables (§ 4 1) given the research aim and the size of the subject group Second, to establish which subjects were very different from the majority of the group of dormant Dutch emigrants One consequence of the computations was that the subject sample was reduced from 76 to 64 subjects

4 4 1 Results of the Questionnaire

The emigrants reported that most attempts to converse in Dutch were in reality "one-way" they responded in English to Dutch questions to "avoid looking like a wog"[18], "avoid looking helpless", "reduce the generation gap to the children", "disassociate themselves from their countrymen" and because "Dutch is basically useless", "shallow in meaning" and "clumsy" Various comments suggested that "frequent Dutch visitors and contact with fellow expatriates", recent "return visits" and the "age at which subjects left their parental home" were the important variables determining the "loss of Dutch" Subjects also freely commented on omissions and ambiguities perceived in the questionnaire (*e g* having immigrated from a third country, having re-emigrated in the past, having formerly been married to a Dutch partner, sometimes talking in Dutch to elderly Dutch clients)

Data treatment

The questionnaire variables were adjusted in several ways Firstly, the variables using WH-questions were adjusted Some of these (such as the questions on *who* and *what* (q 30e - q 33e), *where* (q 30f-q 33f), and *which topics* (q 30g-q 33g) for the four skills) were combined into a total score by adding up how many items in these questions were ticked for each language skill Also computed were the average scores of the estimates over all four skills for *change in Dutch*, *proficiency in Dutch* and *frequency of using Dutch* (questions 30 33a, b & d), the average of the subjects' *attitude to bilingualism* in various domains (q 36), the average of the *type of contact emigrants had with the Netherlands* (q 18), and *the total number of languages known by the subject in addition to Dutch and English*

Secondly, other variables were adjusted on the basis of the comments made by the emigrants (for details, see Appendix 4 7a) For instance, reports suggested that the response to *total years in the Netherlands* was based on *age of departure* (q 11) adjusted for additional years spent in established Dutch communities (*e g* bulb farms) *Knowledge of German* was separated from *knowledge of other languages* (q 26) since subjects remarked during the interview procedures that using German helped them in interpreting and producing Dutch because of the many similarities The variable *number of years in Australia* was derived from the subjects' age (q 3) and their age at departure (q 11) *The number of years since the Netherlands was last visited* (q 17) as well as the *number of visits* and *length of the return visits to the Netherlands* (q 18) were calculated, as was the *use of Dutch in private context* (arithmetics and/or prayer, q 23-24) Additionally, a distinction was made between the subjects' *level of education in the Netherlands* (q 25) and this *level now*

Thirdly, open-ended questions on the arguments given for the attitudes (q 34b, 35b, 36) were categorised to allow statistical processing (for details, see Appendices 4 7b to 4 7d) Thus category 1 (q 34b) entitled 'inherent dislike' comprised arguments such as "I don't like the sound of Dutch" and "Dutch sounds clumsy", whereas category 7 entitled 'inherent liking', comprised responses such as "knowing Dutch is useful for studies of other languages", "knowing an extra language is an asset", and "Dutch is a colourful, expressive language"

The number of questionnaire variables will be reduced, but prior to this relationships between the variables are described on an individual level The resulting set of questionnaire variables used to describe the sample is listed in Table 4 5 Most of these are related to contact with Dutch then and now

Table 4 5 Variables available for the description of the Dutch-Australian emigrants visited, including their codes and their meaning

Variable	Meaning of variable
SAGE	Current age of the subject
SEX	Gender of the subject
STAT	Marital status of the subject
BIRTH	Birth place of the subject
BIRENV	Region in the Netherlands where subject was born
YROZ	Number of years subject lived in Australia, derived from their age now and the age at which they left the Netherlands

TOTDUT	Total years the subject lived in the Netherlands
DEPT	Age at which the subject left the Netherlands
COUN	Types of countries in between migrating to Australia
JOBD	Level of occupation in the Netherlands
JOBOZ	Current level of occupation in Australia
REAS	Reasons for migrating to Australia
EDDU	Level of education attained in the Netherlands
EDU	General level of education now
NOLANG	Total number of other L2s known by the emigrant
PROG	Estimated level of proficiency in German
ENVG	Environment where German was learned as a second language
PROL	Estimated level of proficiency in other second languages than German
ENVL	Environment where other second language(s) was/ were learned
DUT	Attendance of formal classes in Dutch in Australia
ENG	Years of ESL study in Netherlands prior to emigration
CLUB	Frequency of visits to a Dutch club, society or church
LAPRIV	Dutch used as private language (praying/ mental arithmetic)
LAEMOT	Dutch as language of emotion (swearing too)
FLSPO	Married to Dutch-speaking spouse
DSPOU	Married to Dutch-born spouse
WKVIS	Total number of weeks on holiday in the Netherlands
YRVIS	Years since the person last visited the Netherlands (*i.e.* as measured in 1988)
TYPCO	Contact with the Netherlands
FRECO	Frequency of contact with the Netherlands
OTHCO	Frequency of contact with other Dutch people in Australia
RECCO	Frequency of contact with recent emigrants
UNTOP	Number of topics heard about in Dutch
SPTOP	Number of topics spoken about in Dutch
RTOP	Number of topics read about in Dutch
WRTOP	Number of topics written about in Dutch
UNWHO	Number of persons addressing the subject in Dutch
SPWHO	Number of persons the subject speaks to in Dutch
RWHA	Number of items the subject reads in Dutch
WRWHO	Number of persons the subject writes to in Dutch
UNWHE	Number of contexts where the subject is addressed in Dutch
SPWHE	Number of contexts where the subject speaks in Dutch
RWHE	Number of contexts where the subject reads in Dutch
WRWHE	Number of contexts where the subject writes in Dutch
TOTFRE	Average self-estimated frequency of using Dutch
SPFRE	Self-estimated frequency of speaking in Dutch
UNFRE	Self estimated frequency of being addressed in Dutch
RFRE	Self-estimated frequency of reading in Dutch
WRFRE	Self estimated frequency of writing in Dutch
TOTPRO	Average Self-estimated proficiency of using Dutch
SPPRO	Self estimated proficiency of speaking in Dutch
UNPRO	Self estimated proficiency of being addressed in Dutch
RPRO	Self estimated proficiency of reading in Dutch
WRPRO	Self estimated proficiency of writing in Dutch
TOTCH	Average self-estimated change in using Dutch
SPCH	Self-estimated change in speaking in Dutch
UNCH	Self estimated change in being addressed in Dutch
RCH	Self-estimated change in reading in Dutch
WRCH	Self-estimated change in writing in Dutch
ATTD	Nature of the subject's attitude to the Dutch language
REASD	Reasons given for the nature of the subject's attitude to Dutch
ATTEA	Nature of the subject's attitude to teaching the Dutch language to the second generation
REAST	Reasons given for the nature of the subject's attitude to teaching Dutch
TOTATT	Nature of the subject's attitude to bilingualism, averaged over 6 contexts (at work (ATWRK) within the family (ATFAM), in social life (ATSOC) in religious life (ATREL), in cultural life (ATCUL), in intelligence (ATINT))
REASD	Reasons given for the nature of the subject's attitude to bilingualism

4 4 1 1 Description of the Subject Sample

In Appendix 4 8 the scores are given for a selection of questionnaire variables considered to be directly relevant for language attrition These summary statistics show that on the whole the group of 76 Dutch-Australian subjects were of career age (70% was 30 50 years old) Compared with the Census data (Profile 1986, 1989) on the entire Dutch population in Victoria, the present sample is much younger than the average in the Dutch community (24 3% between 38 and 50)[19] On average, the 76 emigrants had *departed the Netherlands or Dutch Indonesia* at the age of 12, just after primary school One could therefore assume that the group as a whole had acquired Dutch as native speakers to native speaker level On average, the emigrants had lived more than 31 5 *years in Australia* Three-quarters had spent 31 38 years in Australia, which is more than the 50 2% of the average Dutch population in Victoria (Profile 1986, 1989) Subjects reported having been back for only 8 7 weeks during that time, with the last *return visit* 5 years earlier on average This supports Clyne's claim (1991a) that for emigrants in the 1950s emigration was the final step, removing the stimulus to retain the L1 or to return This finality was reported to result partly from the 'Assisted Passage' agreement between the Dutch and Australian governments' (Subject 4) This meant that emigrants had to stay for a "minimum of ten years or pay for their passage Those emigrants with secondary education tended to have had *L2 English training* prior to arriving in Australia Dugas (1980) has argued that such pre emigration knowledge of the host language tends to promote shift Most subjects continued their education in Australia, as the reported general *level of education* is higher now than when they arrived This will have increased the quality of their contact with English The variables on *formal training in Dutch* and *frequency of visiting a Dutch society or church* may be disregarded for later analyses as most emigrants reported "none'

Usage of Dutch was restricted 51 3% 'never' had contact with the Netherlands There was also infrequent *contact with other Dutch emigrants* (61 3% 'never' had contact) and even less with *recent Dutch emigrants* (96 1% 'never') Despite the fact that most volunteers lived in the "Dutch belt" of Greater Melbourne (Map 4 1) they reported making very little effort to visit fellow expatriates, even in their own street This was also reflected in the finding that 94 7% 'never' went to *Dutch clubs societies or church services*[20] Some emigrants gave as the reason the fact that they wished to disassociate themselves from their "arrogant" fellow countrymen (see below) 86 9% of the subjects were *married*, but not to a spouse who knew Dutch (82 9% 'not fluent in Dutch') This agrees with

76.2% endogamy in the Dutch community in Victoria (Profile-1986, 1989). English is used predominantly, even in this personal language activities as praying and mental arithmetic (63.1% used English and Dutch, 22.4% 'English only') though less frequently than in emotional outbursts (80.3% English and Dutch, 13.2% English only). In the Census data, half the Dutch population in Victoria stated they used English only (Profile-1986, 1989). The emigrants thus tended to have very little practice in using Dutch, which will not have stimulated their offspring to use Dutch in a variety of communicative contexts

If used, speaking and understanding Dutch were estimated being more *frequently* employed skills than reading and especially writing Dutch. Note that Clyne (1991) suggests that ratings on literacy skills tend to indicate ability as such rather than quality of use. The emigrants used most conversation skills in the homes of other Dutch emigrants, whereas literary skills were used at home Conversations and letters tended to be about the family.

In the light of the above, it is no surprise that, over all four skills, 65 8% of the emigrants considered their Dutch to have *changed* for the *worse*. Speaking (55.3%) and writing (55.3%) in Dutch were estimated to have *deteriorated* most, followed by understanding (42.1%) and reading (40.8%). This points to a perception of L1 attrition by the Dutch emigrant group (*cf.* § 1.5).

In the self-estimates of *proficiency*, subjects considered their writing and speaking skills in Dutch to be worst ('poor' 32.9% and 51.3% respectively). The subjects lacked confidence in their skills in Dutch, as only 17.1% considered their proficiency in Dutch to be 'good' and 0.0% at 'native speaker' level over all skills. Very few subjects estimated any skill in Dutch to be at "native speaker" level; most of the subjects' self-estimates involved the 'fair' to 'good' scale positions. Although it is possible that subjects were reluctant to use the extreme ends of the rating scales, or that this result reflects an awareness of "merely using 1950s Dutch" (Subject 22), this finding also suggests possible "erosion" of L1 Dutch.

Of the emigrants, 57.9% expressed a 'positive' *attitude towards Dutch*, using these arguments as "I want to maintain the link to my own Dutch background", "Dutch enables me to communicate with elderly emigrants whose English is poor" and "Dutch is a colourful, expressive language.". The *attitude towards teaching Dutch* was also 'positive' (52.6%) on the whole: the remaining 47.4% were spread over the 'Don't know' and 'negative' categories. The type of reasons given ranged from "negative attitude to bilingualism" to an urge to "maintain Dutch" On the whole subjects were convinced that bilingualism in the six domains is an asset The computed sum variable *attitude towards bilingualism* was less often 'negative', mainly "no effect" (46 1%) or "positive" (28 9%) answers were given These views could suggest that a positive attitude may be only one prerequisite for maintenance of a LOTE, or indicate the reason why the subjects volunteered

Possible reasons for reluctance to employ Dutch

The subjects used similar arguments to those in the literature to explain why they had chosen not to use their L1 (Ammerlaan, 1990b, 1990c, Walker-Birckhead, 1988) Briefly, the monistic policies towards emigrants rather than multi-cultural ones at the time of arrival influenced both Dutch authors writing about emigration at the time (*cf* Bakkers, 1963, Bevan, 1954, Broeze, 1988a, 1988b, Cnossen & Apperloo, 1954, De Maar & Rempt, 1952) and the views of the emigrants themselves towards LOTEs Being identified as Dutch was felt to be a "social stigma" Another frequent argument was that "two languages cannot be used simultaneously without one suffering" Therefore Dutch was avoided even at home Shift was promoted by widespread exogamy and bilingualism in the Dutch community, the voluntary nature of migration and the low ethnic pride and low prestige of Dutch A further reason was that Dutch "sounded harsh" and "childish" to the emigrants, as if the L1 had "not kept up with" the emigrants' personal development, and consequently appeared inferior Influence by English was furthermore felt to affect the quality of the emigrants' Dutch, which together with the limited education in standard Dutch may have given rise to the notion that the emigrants' L1 was "unfit" for passing on to their second generation Another cause given was that Dutch was considered to belong to a "geographically distant culture", so that for some emigrants reading Dutch became a struggle since the world depicted was "too hard to associate with" Access to Dutch in the Netherlands was furthermore restricted in the 1950s (Citroen, 1951, Dugan & Szwarc, 1984, Horne, 1971, Taft, 1960a) Other factors promoting the shift to English appeared to have been the fact that during the emigrants' career years their children were in their teens, and hence most "vulnerable to peer group pressure from English-speaking children" Emigrants furthermore considered the use of Dutch world-wide as "too limited" to deserve much teaching effort English on the other hand was "a world language" as well as "the language of customers", considering the economic motivations for migrating (*cf* Hellman, 1988a, 1988b, Hofstede, 1958, Kruiter, 1981) a more influential argument than nostalgia Economic motives reported in other research tend to be a powerful variable for language shift

(Bratt Paulson, 1992) For more details on the Dutch emigrants' comments on assimilation (see Ammerlaan, 1994g, 1994i)

4 4 1 2 Correlations between the Sociolinguistic Variables

Relationships between the questionnaire responses were investigated next for two reasons (*cf* § 4 2) First, to determine the nature of relationships and possible overlap between the variables Because of the complex interrelations between the variables on past and present proficiency and language use, a constellation of variables rather than a single variable was expected to determine whether attrition or maintenance of Dutch occurred (§ 4 1) Second, correlations were used to attempt to investigate specific claims made by some emigrants during the initial subject screening stage These claims concerned issues such as the alleged regression of older subjects to Dutch, the claim that greater initial com petence was related to more contact with Dutch in Australia, the statement that emigrants who had arrived at an early age had a limited emotional link to the country of origin, and the assertion that subjects who had arrived around the ages of 6 to 10 were less frustrated about their level of Dutch, despite dramatic loss Some emigrants had suggested that older arrivals had more Dutch to lose and more contact with fellow emigrants

Selecting relevant background variables

To allow the computation of the correlations and to simplify interpretation, variables providing incomplete, redundant and less important information for language contact were excluded from the group in Table 4 5 Disregarded were variables in which no variation occurred, such as *attendance of formal Dutch classes* (DUT), the *context where English had been learned* (WHERE), the *frequency of visiting a Dutch club society or church* (CLUB), the *frequency of contact with recent Dutch emigrants* (RECCO) and *the environ ment at birth of the subjects and their parents* (BIRTH, BIRENV)

Other questionnaire variables were omitted because these were expected not to be directly relevant to the language-contact situation information on *where languages other than Dutch and English* (ENVL) had been learnt, *reason for migrating* (REAS), and *current marital status* (STAT) These probably provide information on general linguistic skills rather than specifically on the two languages which were the present focus Related groups of variables such as the average estimates over the four skills in the *frequency of use* (TOTFRE), *proficiency now* (TOTPRO) and *change* (TOTCH) variables were combined and used to aid interpretation of correlation coefficients

The remaining variables were expected to influence the nature of L2 *learning* and *use* and hence the individuals' level of proficiency and fluency as well as the nature of lexical processing in dormant Dutch

Establishing a threshold for minimal competence in Dutch

In addition to trimming the number of variables, the restriction to the most 'ideal emigrants' resulted in a more homogeneous group of subjects (*cf* Tabachnick & Fidell, 1989) The group of 76 subjects covered a wide range of backgrounds Since this study investigates L1 attrition, subjects were excluded who had possibly acquired (most of) their Dutch after emigration in an L2 context through formal learning This was done by establishing a age-of-arrival threshold Such a threshold not only serves as an index of minimal proficiency, but also as an index of how likely emigrants were to have shed their L1 subjects are more likely to adopt a new language prior to adolescence than after school socialization (*cf* Boeschoten, 1992)

The interviewees suggested that the ideal benchmark or 'cutoff' was the "number of pre-emigration years in the Netherlands" all other indexes such as the 'frequency of contact with Dutch now' and the subjects' performance in the assessments were suggested by subjects to be the product of a "combination of post-migration influences" One may assume that after emigration the development of the subjects' Dutch stagnated and proficiency barely expanded, unless formal training in Dutch or lengthy visits had taken place The closest questionnaire variable is *the age at which subjects departed the Netherlands* (DEPT) In between this initial level and the current level of Dutch, the length and extent of contact with Dutch in the past and now affects performance in Dutch Although literature supports this choice, it disagrees on *how many* years are needed in the L1 environment to attain 'native speaker competence" (Klein, 1986, Singleton, 1989) Crucial for this study, however, was the age when the lexical elements in the tests had been acquired (§ 4 2) No data on the use and usage of the Dutch words and structures targeted in this study prior to emigration were, however, available in Australia at the time of testing Therefore, the intuitions of the emigrants themselves were used to determine the cut-off

As a working definition, emigrants suggested a minimal *age of departure* of six Around this age, subjects had just started primary school and begun to learn reading skills At an age *beyond* primary school, the emigrants stated they had acquired more literacy skills in Dutch and closer association to the Netherlands This resulted in ongoing contact with the home country and language Six-year-olds have just started to "widen their horizon" from their parents and family to the community and culture (Claessens, 1972) in the L1 Selecting a higher age threshold would reduce the emigrant sample beneath a statistically acceptable level

Older emigrants reported that they were more concerned with Dutch and the Netherlands now than before their retirement In order to control for any effects of aging (*cf* § 1 6) a ceiling value of *50* years old was set for inclusion in the subject sample After this, retirement would affect the use of Dutch Both restrictions leave a sufficiently large sample of 67 dormant subjects who are assumed to have once been fully competent in the Dutch words tested and who have once acquired and used Dutch unaffected by knowledge of English

4 4 1 3 Correlation Results

The set of questionnaire variables was subsequently subjected to Pearson correlations over the 67 remaining dormant subjects, using SPSSx (SPSSx Inc , 1986) Appendix 4 9 presents the full correlation matrix for all selected variables At a later stage, the correlations between the variates in the data will be given (§ 4 5 4) In what follows, primarily the results are discussed for correlations with a significant coefficient of 3 or higher This implies a severe level of significance (1%, two-sided), which given the number of coefficients, is a good measure for reducing the possibility of type-1 errors

Initial exposure to Dutch

The results indicate that the length of the pre-emigration period in the Netherlands of the 67 emigrants affects both past and present proficiency and fluency in Dutch As expected, *the total years in the Netherlands* (TOTDUT) was often almost identical to *the subject's age of departure* (DEPT) Subjects who had lived more *years in the Netherlands* had been exposed to Dutch in higher *levels of education in the Netherlands* and had more *pre-emigration training in English* and *other languages* The more *years in the Netherlands*, the higher the level of *occupation in the Netherlands* and *Australia*

The calculations support the comments that *age of departure* could be a key threshold or "cut-off" variable for initial L1 proficiency Emigrants whose *age of departure* was high tended to estimate their current *proficiency* in *writing*, *reading*, *speaking* and *understanding* Dutch (-PRO) to be high as well as, and communicated on many *topics* in Dutch (-TOP) It is no surprise, then, that *departure at a later age* was correlated with high *level of education in the Netherlands* and more frequent *writing to people in Dutch* and more *topics* The older the subjects were when they departed, the more *frequently* they now *wrote in Dutch* (WRFRE), suggesting that the estimated quality of literacy skills was more related to the subjects' pre-emigration experience in the Netherlands than to current skills in L1 High *level of education in the Netherlands* (EDDU) was correlated with high *level of pre migration English* and high *pre-migration occupations in the Netherlands* The level of *occupation in the Netherlands* and *pre emigration level of English* were closely correlated In general, the correlations show that the extent of contact with Dutch and the Netherlands depends on the initial level in Dutch on the basis of the years of exposure (DEPT) the higher this level, the more likely it is that opportunities to converse in Dutch are taken up, and the more personal links there are with the country of origin Several indications were found supporting the comments that emigrants who had left at a later age were emotionally more attached to the Netherlands than those who had come to Australia as young children more pre-emigration *years in the Netherlands* (TOTDUT) was correlated with longer *visits to the Netherlands* and *more visits* These emigrants with a higher *level of education in the Netherlands* (who were older now) *wrote in Dutch to more people*, in more *domains* about more *topics*, and *visited the Netherlands* more often and for *longer* During these return visits they primarily improved their speaking and reading skills in Dutch, the more *recent the last visit*, the higher the *estimated proficiency in reading* and *speaking Dutch* Frequent *return visits* is significantly correlated to more frequent *contact with fellow emigrants*, more *types of contacts in the Netherlands* and more frequent *estimated use of written skills in Dutch*

Other correlations suggested that, over the years in Australia, contact with Dutch diminishes The more *years the subjects had spent in Australia* (which tended to coincide with lower *age of departure*) the shorter their *return visits*, and the lower their *estimated proficiency in writing*, *reading* and *speaking* Similarly, the more *years in Australia* (YROZ) the subjects had lived, the lower their estimated *frequency of speaking* and *writing* Dutch However, there was no significant correlation with *estimated change* variables, suggesting that it was not the number of years abroad but the extent of contact during those years which affected the subjects' perception of L1 attrition (*cf* De Bot *et al*, 1991) Note that the subjects who had lived longest in Australia also had left the Netherlands at an early age

Self-estimates

Self-estimates on *where* (-WHE), *how often* (-FRE), on *which topics* (-TOP), *how proficient* (-PRO) and with what *change* (-CH) the four skills were used were interrelated (*cf* Appendix 4 9) Uncorrelated were only the estimates of *speaking* and *writing frequency*, which could be due to the infrequent use of these skills The suggestion by the emigrants during the screening that *estimated frequency* in using Dutch (q 30a-33a) is related to *estimated proficiency in Dutch* was supported in the correlations More pre-migration *years in the Netherlands* were to some extent correlated to the *self-estimate* that *spoken Dutch* had now *changed* for the worse It appears that subjects with more prior experience in Dutch were more critical of their current standards in Dutch Subjects who did not have as much experience and knowledge of Dutch in the Netherlands appear less inclined to consider their spoken Dutch to have deteriorated over the years

Attitudinal variables

Subjects with a positive *attitude to Dutch* (ATTD) was related only to a higher estimate of their *proficiency in speaking* and *understanding Dutch* There was also a relationship between positive *attitude to Dutch* and the estimate that *speaking Dutch* now was considered *better* The *attitude to teaching Dutch* (ATTEA) was correlated to the *estimated frequency of speaking Dutch* Positive attitudes to *bilingualism in the six domains* (TOTATT ATWRK to ATINT) tended to be correlated to *older* subjects, more *frequent contact with the Netherlands* and *frequency of writing* to many people in Dutch Subjects who *often* used their *writing skills* tended to have a more positive opinion of *bilingualism in the six domains* This supported the comment that the use of Dutch was affected by how well the emigrants considered their own version of Dutch Some subjects reported that if they had only acquired a socially and regionally marked version of Dutch there was "little incentive to retain' or "expand" this The degree of sensitivity of the emigrants to their version of Dutch appears to influence their use and the promotion of the L1

Dutch use

Emigrants who had often *visited the Netherlands* (NOVIS) had a higher *estimate of overall skills in Dutch*, except for speaking Dutch Emigrants who frequently *visited the Netherlands* also used their Dutch *writing* skills more often, there were no significant correlations with the other self-estimates of frequency Longer visits (WKVIS) provided more opportunity to use Dutch and regain confidence in using the L1, the longer *the return* *visits*, the higher the subjects estimated their proficiency in all fours skills (-PRO) Similarly, more *visits* meant more *topics spoken* and *written* about Language contact thus influences proficiency ratings More frequent *contact with Dutch in the Netherlands* (FRECO) as such is correlated to greater *estimated proficiency* in *understanding*, *speaking*, *reading* and *writing* Dutch, as well as the number of domains *where* (-WHE) and on the number of *topics* (TOP) these skills were used *Frequency of contact* is also correlated to a greater *estimated frequency* in *understanding, speaking, reading* and *writing in Dutch* as well as estimated improvements ("change") in *reading* and *writing*

Contact with fellow expatriates (FRECON) was correlated to living with a *Dutch spouse* and many *contacts with the Netherlands* *Contact with the Netherlands* was also correlated to *Dutch in private domains*, higher estimated *frequency in the four skills*, higher estimates of *average frequency* of using the L1, *speaking* and *understanding Dutch* in many domains, being addressed in Dutch about more *topics*, and being addressed by many *people in Dutch* *Living with a Dutch spouse* was, however, not correlated to *estimated proficiency*, suggesting that Dutch partners did not always use Dutch

Gender differences

The female subjects (SEX) were younger and had *departed the Netherlands* at an earlier age with a lower *level of Dutch education* Despite this reduced L1 experience, female emigrants in the sample had more *frequent contact with the Netherlands*, *spoke to* and were *addressed by more people in Dutch*, and estimated that they spoke *frequently in Dutch* However, there was no significant correlation to the estimates of current proficiency They also rated themselves to be better now in *L1 reading* only

Effects of endogamy

Emigrants who lived with a *Dutch partner* (DSPOU) more often had *contact with fellow expatriates* (*e g* in-laws) and partners who were *fluent in Dutch* (FLSPO) They estimated that they frequently *spoke* and *wrote* in Dutch As a result, emigrants *living with a Dutch spouse* perceived *changes* for the better in their *written Dutch* since their arrival and considered themselves to be proficient in *written Dutch* now as a result of *writing to more people* Living with a *fluent Dutch-speaking spouse* is related to a greater overall estimated proficiency and overall frequency, specifically *speaking*, *writing* and *understanding* proficiency and *estimated frequency in writing* and *speaking* The low correlation coefficients illustrate that living with a Dutch spouse only results in a tendency towards greater use of Dutch

Aging and L1 proficiency

There are only some trends in respect of the variable SAGE, but because of the frequency of the claim about elderly Dutch some observations are nevertheless made *Older* emigrants (SAGE) tended to speak more *Dutch in private contexts* and to estimate their proficiency in *understanding* and *reading* Dutch to be high The elderly also tended to estimate a positive *change* in their *spoken Dutch* These correlations, although significant, were below 0 3 It furthermore emerged that high estimates of proficiency in itself do not indicate 'regression to L1 by elderly emigrants" in the sample, as had been claimed by some subjects (§ 1 6)[21] Having lived more *years in the Netherlands*, after all, meant having a higher initial *level of Dutch education* As a result these emigrants had obtained a high level of pre-emigration Dutch on arrival This may have affected their judgements

The correlations are used in § 4 5 in which the underlying factors of the variables in the questionnaire data are investigated by means of principal component (PC) analyses The resulting factors are considered to "reflect underlying processes that have created the correlations among variables" (Tabachnick & Fidell, 1989, 597)

4 4 2 Results of the Assessments

The assessment results are summarised in Table 4 6 Comparison with results by the native speakers in the discussion of each task shows that, on the whole, the 67 emigrants had not completely lost" their Dutch and were very proficient in English (Table 4 7)[22] Most subjects reported that they were "surprised by how much" they "knew'

Table 4 6 Means (percentages) and standard deviations of correct responses given in the various objective assessment procedures (N = 67)

ASSESSMENT	mean std dev	
English Cloze	59 4% (4 8)	
Dutch Editing	84 5% (9 4)	
Dutch Long Cloze	50 5% (10 7)	
Dutch Short Cloze	41 9% (3 6)	
reading pace	266 50 (83 2)	
reading errors	6 66 (4 38)	
corr reading errors	2 71 (1 98)	

comprehension	2 26 (0 73)	
		Range
English Fluency task (average)	21 6 (4 70)	13-34
English letter cues	17 9 (6 12)	7-35
English word cues	25 3 (4 57)	15-35
Dutch Fluency task (average)	10 0 (3 82)	4-23
Dutch letter cues	10.8 (5 41)	3-29
Dutch word cues	9 2 (2 95)	3-18
average of both Fluency tasks	15 8 (3 64)	8-27

Verbalizations during the written tasks suggest that the use of detailed syntactic knowledge of Dutch was absent or dormant: only the overall message of the text was understood. All written assessments of Dutch tended to be voluntarily read out aloud "in order to understand the texts" and to determine if the response "sounds right". The introspective data suggests both limited automaticity in the processing of Dutch, as well as the predominant use of *oral* L1 skills, if the emigrants used Dutch at all.

English Cloze

In the English Cloze primarily difficulties were experienced in selecting semantically correct responses when the content of the text appeared ambiguous (*e.g.* responding with "all" or "half" in gap 2). The Cloze score of 59.4% correct responses suggests that the emigrants had a considerable knowledge of English when compared with the 87% correct by native speakers (Table 4.7).

Table 4.7. Means and standard deviations of correct responses the Editing test, Dutch Clozes as conducted on Dutch controls and bilinguals.

Editing	N (subjects)	n (items)	mean	std.dev.
native	30	47	97 6	3.6
bilinguals	67	47	84.5	9.4
Short Dutch Cloze	N	n	mean	std dev.
controls	16	18	87.2	2.0
bilinguals	67	18	41.9	3.6
long Dutch Cloze	N	n	mean	std.dev.
controls	12	54	92 1	5.2
bilinguals	67	54	50.5	10.7
English Cloze	N	n	mean	std dev.

controls	18	44	84 8	2 6
bilinguals	67	44	59 4	4 8

Dutch Clozes

For the emigrants the Dutch Clozes were more difficult than the English Cloze (*cf* 50 5 and 41 9% correct) During these tasks subjects also freely commented on the text and their search for responses Subjects who reported having difficulties with reading Dutch and understanding the content tended to report filling out the first word that appeared to fit syntactically, on the basis of an incomplete understanding of the cues Low proficiency subjects read the text words mainly by form rather than content, occasionally without realising that a word was missing and unsure of the spelling of their responses, particularly if they felt they had "learnt this least well' (Subject 70) Subjects exhibited greater variation in their responses in all written Dutch texts than in the data of the control groups (Table 4 7) This could be due to retrieval difficulties and recourse to related semantic fields (*cf* Ammerlaan, 1987c, Olshtain & Barzilay, 1991) More proficient subjects tended to borrow responses from previous sentences The subjects tended to be insecure, asking for the meaning of context words and formulating a response in English first As a result of the use of translation, English affected performance in Dutch improper subject-verb inversion was often a cause of an incorrect response

Editing procedure

The Dutch Editing assessment was considered easy by the emigrants and this was reflected in the score (84 5% correct) Here, too, most subjects spontaneously read the text aloud to make sense of it' The verbal reports showed that subjects marked not only the inserted target words, but also words that were unfamiliar to them, such as the non-target "fronst" (line 18, Appendix 4 5) These incorrectly crossed out words (often the neighbours of the target item) were not scored as these were not considered to add information to the error score, in such cases usually the target had not been marked The overall agreement between the high number of correctly marked words in the Dutch control and emigrant groups suggests the task was simple (Table 4 7)

Fluency tasks

Subjects reported that these tasks were difficult as there was 'little practice" in lexical recall from talking to more fluent fellow Dutch expatriates Subjects rarely conversed in

Dutch and during these attempts there was limited experience in recalling specific words because more fluent Dutch speaking emigrants "always prompted" the dormant emigrants when a word seemed difficult to recall" Performance in these tasks was furthermore found to be subject to response strategies, especially in the Dutch session One strategy in the case of the letter criteria was to work down an alphabetical list of clusters with the same initial letter Another strategy was looking around the room, or imagining objects around the house that could comply with the criteria Third, disfluent subjects tried to translate English responses into Dutch during the Dutch sessions This response strategy was most successful in the semantic tasks, as orthographic differences between Dutch and English were least disruptive here (*e g* initial ph/f) As a result of these strategies, it is likely that the speed with which appropriate concepts can be imagined influenced the scores as well (*cf* § 4 3 4)

Only those responses which complied with the specific criterion were scored The results in Table 4 6 above show that more English than Dutch responses were given, implying that the emigrants were more fluent in English (especially given the fact that the English session preceded the Dutch) There was a tendency for more responses to the semantic cues (25 2) than the phonological/orthographic cues (19 4) in the English session, while phonological search was more successful (10 6) than semantic search (9 1) in Dutch It is possible that the semantic criteria used in the Dutch session had more to do with childhood experiences (*e g* toys) and as such were "buried deeper" in memory than the semantic criteria used in the English session, or that the strategies could have been more successful in the letter criteria, because for Dutch, sound was relied on more in determining the appropriateness of the responses

<u>Reading aloud the Dutch short Cloze</u>

During the reading of the short Dutch Cloze, some emigrants reported that the meaning of some Dutch words read "came slowly or not at all" Subjects read laboriously and 'mechanically', with many errors standard weak forms (*e g* " 't" for "het") and reduction of word-final "-en" to " e" were often absent, English phonemes replaced Dutch (notably /r/, /l/ and /w/), and errors occurred such as reading de" as "die", "bleek" as English "bleak" and "20" as English "twenty" The types of error suggest that phonological recoding of the visual input (§ 2 2 2) occurred in Dutch, as often found in beginning readers

The analyses of the recordings (below) were based on Goodman and Burke (1972) and Segalowitz (1986) Details of the measures are given in Appendix 4 10

The subject's *reading pace* was measured by the number of words read by each subject in two minutes (*cf* Goodman & Burke, 1972). Subjects who had read the text in less than two minutes had their score after one minute doubled to obtain a score comparable to that of slower readers The average uncorrected reading pace for the group of dormant Dutch-Australians was 266 5 words per 2 minutes[23]

Reading errors were reading slips such as pronouncing "het" as "de" or "riool" as "royaal", even if these were followed by self-corrections Hesitations and absent "weak forms" were not counted Self-corrections had been included in the measure of reading pace because subjects who wanted to read fast might have done so at the expense of accuracy Mispronouncing a word was 'penalised' by adding words to the scores except when subjects attempted to correct this In this way the pace-of-reading score was calibrated to obtain a score for fast and accurate readers On average, emigrants made 6 6 reading errors in the passage of 244 words and 2 7 corrected errors

Comprehension of the text was assessed via the paraphrases The experimenter categorised these English paraphrases of the Dutch text into one of 4 categories ranging from 'understood', 'partially understood', 'poorly comprehended' to 'not understood' It was expected that faster reading than the subjects' natural pace would result in a less accurate paraphrase The average comprehension score was 2.3, with 2 indicating 'partially understood'

4 4 2 1 Test Reliability

The analysis of the responses first aimed at measuring the reliability of the assessments Second, it investigated whether the emigrants provided more aberrant replies in the Dutch Clozes than in the English Clozes as a result of poorer comprehension of the context sentences Both the type of responses and the subjects' introspective comments recorded during the Cloze and Fluency tasks were analysed These could also determine what the extent of knowledge of Dutch was when a subject had failed to fill out the target response in the assessments The reliability measure used was Cronbach's Alpha calculated for the tests over the types of responses given Because responses in the Editing test were merely 'correct/incorrect', scores from this procedure were excluded from the analysis of the incorrect replies More differentiated syntactic and semantic knowledge could only be determined for the Cloze tests where more than two options could be supplied

For this analysis, all responses to the Cloze procedures were categorised into ten response types: the correct target, a correct non-target, and eight incorrect responses, varying from 'no response', Dutch or 'English-based', 'semantically' and/or 'syntactically incorrect' responses. The types are 0 (no reply), 1 (the target response), 2 (sem. + / syn. +), 3 (sem. + / syn. -), 4 (sem. - / syn. +), 5 (sem. - / syn. -), 6 (Eng. sem. + / syn. +), 7 (Eng. sem. + / syn. -), 8 (Eng. sem. - / syn. +) and 9 (Eng. sem. - / syn. -).

Inter-rater reliability of this response rating was established by employing double-blind scoring by the experimenter and by comparing this with the scores of a second linguist. Calculations of the Kappa coefficient for inter-rater agreement (*cf.* Rietveld & Van het Hout, 1993) showed values of .872 for the long Dutch Cloze, .830 for the short Dutch Cloze and .940 for the English Cloze. Landis and Koch (1977) describe these Kappa coefficients as indicating excellent inter-rater agreement.

Analysis of the types of responses using SPSSx Reliability (SPSSx Inc., 1986) showed that the tests were reliable when the target responses (type 1 'target') were contrasted with all other responses (types 0 'no reply', 2 'alternative', and semantically and/or syntactically incorrect types 3, 4, 5, 6, 7, 8, 9) in the Clozes (Table 4.8.). In the Editing task only 0 'no reply' and 1 'target' were contrasted.

Table 4.8. Results of reliability analyses of the two response types (type 1 *versus* the rest) given in the written assessment procedures (N = 67)

ASSESSMENT	Nsubj	nitems	mean	std dev	α
Eng. Cloze	67	47	27.91	4.85	.66
Dut. Editing	67	48	40.54	9.37	.97
Dut. long Cloze	67	54	27.30	10.69	.94
Dut. short Cloze	67	18	7.55	3.57	.77

Similar Reliability analyses that included both the correct target (1) and the possible alternative response (2) types against the remaining types of incorrect responses (0, 3, 4, 5, 6, 7, 8, 9) also showed that the Clozes were reliable (Table 4.9).

Table 4.9. Results of reliability analyses of the two response types (types 1 and 2 *versus* the rest) given in the written assessment procedures (N = 67)

ASSESSMENT	Nsubj	nitems	mean	std dev	α
Eng. Cloze	67	47	27.91	4.85	.57
Dut. long Cloze	67	54	27.30	10.69	.95
Dut. short Cloze	67	18	7.55	3.57	.83

The lower value for Alpha (for instance, for the English Cloze) is probably the result of the lesser variation in the sample as compared with the Dutch tasks (*cf* Schils, Van der Poel & Weltens, 1993) On the basis of these results there was no need to alter the number of Cloze items used for the score Using the original target as index of the number correct in the Cloze provides the best score

Distribution of the response types over the assessments

The distribution of the types of Cloze responses could also be used to determine which written task resulted in the largest number of aberrant responses (*cf* Appendix 4 11) The percentage of the replies taken up by each type is given in Table 4 10 below This shows that, in the Dutch Clozes, around 65% was a correct or acceptable reply (more than 80% in the English Cloze were types 1 and 2) and that the most frequent types of incorrect replies consisted of syntactically *and* semantically incorrect answers in both languages

Table 4 10 The percentage of the replies in each response type (N = 67) in three Clozes

	Eng Cloze	Long Dut Cloze	Short Dut Cloze
0 no reply	3 84%	14 59%	13 02%
1 target item	61 10%	51 96%	42 29%
2 Sem + Synt +	22 03%	15 39%	20 15%
3 Sem + Synt	3 78%	3 48%	2 82%
4 Sem Synt +	3 65%	6 99%	8 13%
5 Sem - Synt	5 59%	5 67%	9 04%
6 Eng Sem + Synt +	n a	1 05%	3 23%
7 Eng Sem + Synt -	n a	0 52%	0 25%
8 Eng Sem - Synt +	n a	0 22%	0 58%
9 Eng Sem Synt -	n a	0 11%	0 50%
Σ	100%	100%	100%

In these cases it appeared the cues (*i e* context) had not been properly processed and used When the differences in the number of slots are taken into account (English Cloze 47, long Dutch Cloze 54, short Dutch Cloze 18) the mean percentages in Table 4 10 indicate that in the more difficult Dutch Clozes 'no reply' was given more frequently, at the expense of acceptable alternative responses (type 2) Syntactically incorrect responses seemed to occur less often in the English Cloze In the short Dutch Cloze syntactically aberrant responses were more likely than in the long Dutch Cloze In the short Dutch Cloze English replies that appeared semantically and syntactically possible occurred more frequently than in the long Dutch Cloze

On the whole, subjects performed well in the Dutch assessments The achievement of reasonable scores in these assessments, however, does not imply absence of L1 attrition

4 4 2 2 Correlations between the Proficiency and Fluency Assessments

The scores in the various procedures were correlated to investigate possible interrelationships and to pave the way for subsequent PC analyses Prior to this, 3 subjects who turned out to behave extremely atypical in both English and Dutch Cloze procedures as well as in the experiments were removed from the sample of 67 subjects A detailed explanation of the calculations used and why these emigrants were removed is given in § 4 5 1

To facilitate interpretation, the scores from the two Dutch Clozes were combined into a total Dutch Cloze score (TOTDUT) for the remaining 64 emigrants The two Cloze were both closely correlated and the distribution of response types was similar In addition, means for the Fluency tasks over all criteria were established (LFLE, WFLE, LFLD, WFLD)

The results of the correlations computed between the various assessment scores (listed in Appendix 4 12) show there was a significant correlation between editing a text in Dutch (REDD) and filling out responses in each Dutch Cloze task (RDUI, RDUC) It appears that both task types tap similar areas of written proficiency in Dutch The significant correlations between the well-tested Editing procedure and the other written Dutch tests also illustrate the validity of the Clozes As expected, the oral Fluency and written proficiency tasks were significantly correlated in each language Only the number of responses to the Dutch letter criteria (LFLD) was correlated across language to the English Cloze score It was also found that the English Cloze results (RENC) were correlated to the Dutch Cloze scores, but not to the Editing task The results show that closer correlations exist between the assessment scores within languages than across languages

The correlations between the reading scores revealed the usual trade-off between speed (RPACE) and accuracy (RERR) The correlations involving reading errors also suggest that the errors were not related to a poor understanding of the overall content of the text instead, local problems in understanding the context-sentence of each gap appear more influential The reading pace score for the Dutch text was correlated to the English Cloze score (RENC), possibly pointing to dependence on a common reading skill Other reading scores were related to the Dutch Cloze scores the more errors were made and the slower the texts were read aloud, the worse the performance in Dutch The 'reading pace' score is probably a better index of reading skills than the 'comprehension' score, as in this study comprehension involves production processes The degree of comprehension of the 'short' Dutch Cloze (RCOMP) was correlated to performance in the Dutch Editing test only No relationships were found between reading scores and the English Fluency task, but only with the Dutch one, slower readers who made many errors produced fewer Dutch words[24] The correlations calculated here were used to interpret PC analyses of the combined set of questionnaire and assessment data below

4 5   <u>Establishing Principal Components in the Data</u>

Section 2 3 discussed studies suggesting that biolinguistic characteristics like the context of language learning, language use and levels of proficiency and fluency co-determine linguistic processing in fluent bilinguals A multitude of questions and assessment data had therefore been collected As indicated in § 4 2, the assessment tasks objectively measured the subjects' current proficiency and allowed cross-subject comparison Information obtain ed via the questionnaire indicated the past history of learning Dutch and English, current use and estimated proficiency in Dutch for each subject Both data sets need to be combined first, to determine how well subjects estimated their proficiency in Dutch, second, to determine which biolinguistic variables affect proficiency and fluency in the dormant language, and third, to calculate the effects of background predictors on the dormant emigrants' performance in the experiments

In order to achieve these aims and interpret the results, it was necessary to further reduce in number the 60-odd questionnaire variables and 15 assessment scores (in the light of the sample size) and homogenise their nature (§ 4 5 1 - 4 5 3) The result not only pro vides information about the relationships between the variables that form factors, but also will allow investigation of possible covariance of the measures of global proficiency and characteristics of the subjects' linguistic background with the experimental results, to be reported later in this study

4 5 1 <u>Removing Aberrant Subjects from the Sample</u>

General methodological difficulties in language attrition research revolve around on the often absent pre-attrition measure and the huge variation among the subjects tested

(Jaspaert *et al* , 1986, Grendel, 1993) The former problem was initially tackled at the subject selection stage by adopting a threshold of at least six years in the Netherlands (§ 4 4 1 2) Within this group there was still considerable heterogeneity The reliability analyses of Cloze response types (§ 4 4 2 1) showed that some subjects performed extremely poorly (*e g* many omissions, English-based replies, syntactically inappropriate responses) Since these poor performers could distort the overall pattern in the experiments[25], it was decided to identify and remove the outliers

On the basis of the Cloze response-type analyses, Chi-square based measures of deviation from the subject group in the assessments were calculated for each subject Careful investigation of both the frequency of aberrant responses in the inappropriate responses to the Clozes and the calculation of Chi-squares to measure the distance of each subject to the frequencies of the overall pattern allowed 3 atypical subjects (ID = 49, 60 & 86) with very high Chi-square values to be identified These 'atypical' turned out to be emigrants who left many blanks, primarily used English instead of Dutch, and often inserted semantically and/or syntactically incorrect responses in the Dutch texts The subjects who performed poorly in both the English Cloze *and* the Dutch ones were considered to be unfamiliar with the Cloze format or to have limited literacy skills Using *both* these language scores reduces the possibility of eliminating only those outliers who had suffered most from attrition in their Dutch The results for the remaining 64 emigrants on the assessments and the questionnaire were subsequently investigated for principal components

4 5 2 Finding Subsets of Assessment Variables

A range of 15 assessment scores was available on the emigrants' fluency and proficiency in Dutch and English, and their reading abilities in Dutch (*cf* Table 4 6) Only those 11 variables that were not linearly dependant on each other were used in a PC analysis This investigated how these variables form subsets that are relatively independent of one another In this way a large number of observed variables were reduced to a smaller number, a desirable aim considering the size of the emigrant group and the number of variables

The results of the PC analysis of the assessment scores (SPSSx Inc , 1986) are the variates in Table 4 11 A Scree-test convincingly outrivalled the "Eigen value > 1" criterion in determining the number of underlying factors (Cattell, 1952) This shows that the assessment scores are clustered in basically two variates TASK1, which loaded on the scores of most Dutch assessments, and TASK2, which comprised the scores of the English sessions. Irrespective of whether the raw scores or correct-per-minute scores were used, or whether the scores from the reading task were removed or not, the results showed the same two principal factors divided over language.

Table 4.11. Principal component factor analysis with varimax-rotation for the assessment scores (N = 64).

VARIABLES	FACTORS		
	Task1	Task2	Task3
RDUC	8249	1063	1541
RDUI	8164	.1072	.2723
RPACE	8010	1860	0300
RERR	- 7673	1092	2369
REDD	.7155	- 0401	2788
WFLD	7079	2529	0702
LFLD	6697	5402	- 0647
LFLE	0072	.8148	- 0010
WFLE	.0634	.8006	.1060
RENC	.1668	7458	0232
RCOMP	1610	.0722	.9353
Eigenvalue.	4 60	1 89	1.02
Perc. of var	41 9	17.2	9.3

RDUC :	raw number of errors in the "long" Dutch Cloze
RDUI :	raw number of errors in the "short" Dutch Cloze.
RPACE·	reading pace
RERR .	number of errors during reading aloud
RCOMP.	rating of comprehension of the "short" Cloze
REDD	raw number of errors made in the Editing test
WFLD .	number of responses for Dutch word criteria
LFLD ·	number of words given for 3 Dutch letter criteria.
LFLE	number of words given for 3 English letter criteria
WFLE .	number of words given for 3 English word criteria
RENC ·	raw number of errors made in the English Cloze test.

The PC analysis showed that the combination of Dutch scores (TASK1) is the most consistent finding. Therefore TASK1 will be used to represent the relationships between the questionnaire variables and the subjects' residual proficiency and fluency in Dutch in the future pages of this dissertation.

4.5.3 Finding Subsets of Questionnaire Variables

A number of background variables had already been excluded from further consideration on the basis of earlier studies regarding variables for research on language attrition (*cf.*

§ 1 1), on the basis of the correlations found between the variables (*cf.* § 4 4.1 2) which had shown redundancy in some variables and had suggested combination of other variables (§ 4.4), and on the basis of the lack of variation found in some questionnaire variables (*cf.* § 4 4.1.2)[26]. Further reduction of the number of background variables and identification of 'key' variables was mainly conducted through statistical means. This is considered preferable to solely intuitively selecting the 'key' variables that represent past and present fluency and proficiency in the L1. PC analyses of the questionnaire data were used to identify the key biolinguistic variables in this group that determine present and past proficiency and fluency in the emigrants' Dutch.

PC analysis of *all* remaining biolinguistic variables *simultaneously* was avoided, as in the current heterogeneous variable set (*e.g.* both nominal and ordinal, both dichotomous and polytomous) the resulting combinations of variables are likely to be co-influenced to an unknown degree by agreement or disagreement in the format used (*e.g.* combining all 5 point scales, all 7 point scales, all 9 point scales). In addition, simultaneous analysis of all variables does not do justice to the smaller number of 'background'-related variables (*e.g.* on context of learning, bilingual experience) in the mass of 'contact'-related variables. For these reasons, separate PC analyses were conducted on rationally based subsets of variables, to which two variables were added (Table 4.12).

Table 4.12. The questionnaire variables used for separate PC analyses (N = 64).

BIO DATA	questions related to subject characteristics (status, education etc.).
	questions related to the language level (original and current)
	questions related to language use (now)
ESTIMATES	questions on where, when, which topics and how often, how well Dutch is used and whether there has been any change in proficiency over the years
ATTITUDES	questions on attitudes to Dutch, teaching Dutch and bilingualism.
PERSCON	remaining variables relating to personal contact with Dutch and the Netherlands then and now: *the subject's age of departure* (DEPT), *the total number of years the subject lived in the Netherlands* (TOTDUT), *the extent of pre-emigration training in English*, (ENG) *the level of education obtained in the Netherlands* (EDDU), *the subject's level of occupation in the Netherlands* (JOBD), *the estimated proficiency in German* (PROG), *the estimated proficiency in other L2s* (PROL), *the number of years the subject lived in Australia* (YROZ), *the length of return visits* (WKVIS), *the number of weeks of the return visits* (NOVIS), *the type of contact with the Netherlands* (TYPCO), *the frequency with which the subject was in touch with the Netherlands* (FRECO), *the frequency with which the subject was in touch with fellow expatriates* (OTHCO), *the subject's language in emotional situations* (LEMOT), whether *the subject lived with a Dutch-born partner* (DSPOU) and whether this partner *speaks Dutch fluently* (FLSPO).
SEX	
SAGE	

The bio-data and the self-estimates were analysed separately because of their different nature and format differences. Estimates of *change in Dutch* and *proficiency in Dutch* were compared separately with the assessment and experimental results to test the accuracy of the subject's intuitions Interpretation of the self-estimates (-WHO, -WHE, -WHA, -TOP, -PRO, -FRE, -CH) was improved by computing the totals over all responses (*cf* Table 4 5) In each response category of the WHO, WHE, WHA and TOP variables, the number of domains where Dutch was used (WHE), the people who used Dutch (WHO/WHA) and the topics were added up (TOP)

The three questions on attitudinal variables (ATTD, ATTEA, TOTATT) were also analysed separately These variables are difficult to interpret regarding their effect on Dutch proficiency/fluency In addition, these relate to the subject's general assessment of the bilingual situation Variables on the *reasons for attitudes* (REASD, REAST, REASON) were not used as these scarcely form a scale, but rather a list of categories

Two variables that were judged important on the basis of the subjects' comments yet not necessarily directly interpretable as to their effect on language contact were considered separately The information on the *subject's age of departure* (SAGE) was used in separate analyses to further examine if there is a possible effect of aging on L1 attrition and to test whether regression with aging had occurred The information on *the subject's gender* (SEX) was also investigated separately from the effect of contact-related variables on the assessments and experiments Aim was to study if women are less susceptible to L1 attrition than men, as some subjects had claimed (*cf* comments in Ammerlaan, 1994a)

Those questionnaire variables that did not relate specifically to each skill were used in a distinct PC analysis Although doubt existed initially as to the appropriateness of PC analysis owing to format differences, various cluster analyses using different criteria and measures resulted in similar groups of variables Given this consistency, it was decided to employ the results of the PC analysis, as in the analyses of the other questionnaire variables Inclusion of these so-called 'personal contact' (PERSCON) variables ensured that as many relevant variables as possible had the opportunity in the calculations to show their potential influence on the TASK scores and, ultimately, the experimental scores

4 5 3 1 <u>Results of Principal Components Analyses of the Background Variables</u>

<u>Clustering the self-estimates</u>

First, PC analysis of the self-estimates, followed by Varimax rotation, showed 5 SE (self-estimate) factors (Table 4 13) PC analysis resulted in five factors, accounting for 66 4% of variance Factor 1 (SE1) combined variables on *conversational use of Dutch*, factor 2 (SE2) represents *written use of Dutch* and factor 3 on *estimated change in Dutch competence*, factor 4 (SE4) combines all *self-estimates of proficiency*, and factor 5 primarily dealt with estimates on *reading Dutch*

Table 4 13 Varimax-rotated factor matrix from a principal component analysis on a selection of self-estimates (N = 64)

VARIABLES	FACTORS				
	SE1	SE2	SE3	SE4	SE5
UNFRE	7480	1666	1627	1106	1740
SPFRE	7395	0021	0494	2431	1729
SPWHE	7250	2135	2093	1195	1213
SPWHO	6927	- 0100	0237	2443	2674
UNTOP	6770	2218	- 0761	1368	0446
SPTOP	6150	3866	2135	0106	1010
UNWHO	5444	- 1084	- 0019	3459	3374
WRWHO	2060	8428	- 0080	2389	0384
WRTOP	1096	8323	0132	1223	3229
WRFRE	1484	7690	0320	3230	- 0174
WRWHE	0836	7508	- 0578	0402	3556
WRCH	0474	1302	8690	1529	0716
SPCH	1603	- 0475	8642	0066	0394
UNCH	1115	- 0695	8223	0987	1364
RCH	0120	0259	8084	1507	3166
SPPRO	2060	1015	2216	8132	- 0365
WRPRO	0593	2920	0957	7964	1288
UNPRO	2590	1095	0866	7380	0896
RPRO	- 0488	2903	0568	7062	4450
RWHE	5147	0849	0178	0743	7059
RWHA	0876	2204	2799	1812	6439
RTOP	3001	4056	0584	0040	5549
UNWHE	2852	1163	1520	1056	5402
RFRE	2913	3273	1709	1241	4043
Eigenv	7 90	2 88	3 43	1 74	1 17
Percen	32 9	12 0	9 7	7 2	4 9

Attitudinal clusters

The second PC analysis of the attitudinal information on Dutch, the teaching of Dutch and bilingualism in 6 domains resulted in two main factors that account for 46 9% of the variance (Table 4 14) The components were centred around *attitude to Dutch* (ATT1) and attitudes towards the *use of Dutch in bilingual context* (ATT2).

Table 4.14. Varimax-rotated factor matrix based on a principal component analysis of the replies to the attitudinal questions by 64 Dutch-Australian bilinguals (N = 64).

VARIABLES	FACTORS	
	ATT1	ATT2
ATINT	6464	0419
ATCUL	6384	2701
ATFAM	6128	2439
ATTEA	5978	- 1670
ATSOC	4675	.7048
ATWRK	- 0187	6531
ATTD	.4570	- 5815
ATREL	1711	5620
Eigenv	2 30	1 46
Percen	28 7	18.2

Finally, the clusters of the background variables (PERSCON) are discussed as listed in Table 4.15 below.

Clustering background information

Four interpretable clusters emerged from the various PC analyses, explaining 75% of the variance (Table 4.15).

Table 4.15. Varimax-rotated factor matrix from a principal component analysis on a selection of 'personal contact' background variables (N = 64).

VARIABLES			FACTORS		
	BIO1	BIO2	BIO3	BIO4	BIO5
DEPT	.9472	.0989	.0856	.0633	0380
AGE	.9404	1247	.0837	0725	0136
TOTDUT	.9364	1058	0757	0739	0491
JOBD	8376	1735	1781	.0584	- 0768
ENG	8235	2175	- 0317	.0533	- 0746
EDDU	7698	-.0501	-.1066	- 0130	.1634
PROG	5303	0921	- 2273	.4285	3077
NOLANG	.5175	.0537	- 2171	.4956	.1416
FRECO	0138	.8504	-.0489	2943	1527
TYPCO	.0330	.8383	- 1389	2475	1399
WKVIS	2159	.7740	1556	-.1289	0836
NOVIS	.2127	.7210	2151	-.0493	-.1376
FLSPO	0556	.1406	.8744	-.1623	- 0184
DSPOU	0491	- 0095	.8736	1181	.2148
LAEMOT	0797	1625	0566	8000	- 0649
OTHCO	-.0777	0044	.3197	.1608	.7709
YROZ	-.2669	- 3307	.0968	2926	-.6301
Eigenv :	6 03	2 49	1.93	1 24	1.0
Percen.·	35 5	14.7	11.4	7 3	6.2

Factor 1, entitled (BIO1) *original level of Dutch*, clusters variables related to original exposure and competence in Dutch, centring around DEPT Factor 2, entitled (BIO2) *post-migration contact with Dutch*, comprises variables related to post-emigration contact with Dutch and the Netherlands, encompassing FRECO, TYPCO, WKVIS and NOVIS The first two clusters together account for half the variance in the data Factor 3, termed (BIO3) *private contact*, involves variables related to contact with Dutch within the family, such as DSPOU and FLSPO The variable related the language used in emotional situations constitutes BIO4, *language use in emotions*, which like BIO5 (OTHCO, YROZ) accounts for a small percentage of variance only BIO5 is known as *contact with fellow expatriates in Australia*

4 5 4 Correlations between the Biolinguistic Information and the Assessment Scores

The computed variates were used to measure the effect of biolinguistic variables on performance in the assessment procedures (and eventually in the experiment) A correlation matrix between the background variables and the variates underlying the assessment scores is given in Table 4 16 below (between subsets rather than within relative subsets, as the latter are zero-correlated of necessity)

Table 4 16 Correlations between the computed variates from the questionnaire and assessment data (N = 64)

	SE1	SE2	SE3	SE4	SE5	ATT1	ATT2	BIO1	BIO2	BIO3	BIO4	BIO5
Att1	22	21	12	14	14							
Att2	- 07	20	08	06	16	00						
Bio1	- 08	27*	32**	45**	- 03	03	16					
Bio2	43**	31*	10	13	01	11	12					
Bio3	24	17	25*	27*	- 14	10	- 03					
Bio4	02	18	02	10	19	11	01					
Bio5	33**	- 05	14	31*	- 00	12	14					
Sex	31*	- 05	20	09	- 07	19	- 10	32**	30*	09	07	22
Sage	20	15	21	22	10	04	37**	63**	- 05	- 11	18	- 11
Task1	26*	21	- 18	61**	33**	30*	12	52**	13	05	22	42**
Task2	- 11	- 11	09	01	20	13	- 07	- 17	- 18	04	40**	- 04

	SEX	SAGE	TASK1	TASK2
Sex	1 00			
Sage	34**	1 00		
Task1	08	24	1 00	
Task2	07	18	00	1 00

* = p < 05 ** = p < 01 (2-tailed)

Significant relationships were found between the self-estimates of conversation skills in Dutch (SE1) and the extent of contact with Dutch in Australia (BIO2) and contact with fellow expatriates in Australia (BIO5) The self-estimates on conversation skills (SE1) were to some extent related to the measured performance in the Dutch assessments (TASK1), and not the written use (SE2) Although less than 03, the correlation suggests that the emigrants were reasonably accurate at estimating their skills in the dormant language on the basis of oral/aural use Actual performance in the Dutch-language tasks was affected by reading skills in Dutch, as indicated by the significant correlation between SE5 and TASK1

This accuracy is also shown by the fact that the self-estimates of proficiency (SE4) were correlated significantly to the level of initial exposure to Dutch (BIO1) and the Dutch assessment scores (Task1) The estimates may have been influenced by current use also, as suggested by the marginal relationship between SE4 and private use of Dutch (BIO3) and contact with fellow expatriates (BIO5)

The estimates on written skills in Dutch (SE2) were solely related to the original exposure to Dutch in the Netherlands (BIO1) and the extent of post-emigration use (BIO2) This is probably due to literacy skills in Dutch that were mainly developed towards the end of the subjects' Dutch primary schooling in the 1950s

A significant relationship was also found between the estimated change in Dutch skills (SE3) and the level of pre-emigration exposure to Dutch (BIO1) the more years of exposure, the more likely the estimated performance in Dutch now had changed for the worse

A positive attitude to Dutch (ATT1) was related to better performance in the Dutch-language assessments (Task1) Performance in the Dutch assessments (Task1) was also strongly related to the level of initial pre-emigration exposure to Dutch (BIO1) and the extent of contact with fellow expatriates now (BIO5) Past and present skills affected how well the subjects performed in the Cloze, Editing and Fluency procedures Performance in the English-language assessments (Task2) was solely related to the use of Dutch in emotional situations (BIO4) the more Dutch was used, the worse performance in the English versions

The gender variable (SEX) was correlated to BIO1, BIO2 and SE1, suggesting that women in the sample had departed at a later age, had more contact with Dutch in Australia, and more often used conversation skills

Correlations between the age of the subject (SAGE) and other variables suggested that older people had departed the Netherlands at a later age (BIO1) and had a more positive attitude to Dutch (ATT2)

Analyses in this section, among other things, described the population The correlations showed that Task1 (the Dutch proficiency and fluency variate) was highly correlated to a number of other variates of both pre-emigration proficiency and estimates of current post-emigration skills in Dutch This information was used to determine whether questionnaire and/or task-related variables influenced performance in the experiments

4 6 Profile of the Emigrant Group Summary and Discussion

Sociolinguistic research on Dutch emigrants in Australia shows that they form a large ethnic group who used to have native- speaker proficiency in Dutch but who rarely used their L1 since their departure from the Netherlands (*cf* review in § 1 1) In the light of this language shift they are expected to primarily experience retrieval problems during attempts to communicate in Dutch, rather than problems in not knowing Dutch terms

The questionnaire data showed that the sample of 76 volunteers were not all totally 'dormant' in Dutch Subjects claimed they were less proficient in their literacy skills than in their oral skills, suggesting that they still had some practice in Dutch conversation This bias was partly due to the fact that it were mainly emigrants with some interest in Dutch who volunteered for the study Although some subjects admitted that, since being approached, they had practised Dutch in order not to look "foolish during the tests" and although others stated that they had begun watching Dutch-language programmes (note 8), the emigrant group on the whole had little contact with Dutch, either at home or at work[27] In general, subjects were not members of a Dutch society/club, not married to a Dutch partner, and had rarely been to the Netherlands since their arrival Relatively few emigrants estimated their own Dutch to be good Speaking and writing in Dutch were considered to have deteriorated most

Compared with the 1986 Census data the sample was similar to the rest of the Dutch-Australian community in Victoria (Profile-1986, 1989) My sample only differs from the Dutch emigrant population in Victoria by virtue of the fact that more emigrants are in their career years The other difference was that more subjects in our sample had spent between 31 and 38 years in Australia than the total group in Victoria The fact that the Dutch community as a whole in Victoria has spent slightly less time in Australia (according to the Census), however, could be the result of inclusion of 'recent arrivals' and 'temporary residents' such as exchange students and business people in the 1986 Census data

The comparison with the Census data was difficult as far as the use of Dutch and English was concerned Australian Censuses concentrate primarily on the use of English (Profile-1981, 1984, Profile-1986, 1989)

The data on the use of Dutch and English are more comparable with the results from Hoeks (1988, Chapter 8) on 60 more fluent Dutch bilinguals This indicates that the subjects in the present study were more reluctant to use Dutch

<u>Interrelations</u>

Correlations showed that there are two important variables affecting language attrition the level of *initial proficiency* and the amount of *contact* with Dutch now (not the time elapsed)

The age at which the Dutch emigrants departed from the Netherlands (and hence the total number of years they had spent in the home country) was shown to affect the level of pre-emigration Dutch and English and the degree of contact with Dutch in Australia The *age of departure* affects both the level of past proficiency and the estimated level of present proficiency and the extent of current use The passing of time while in Australia was a less important variable in language maintenance than the pre-emigration level of proficiency and the amount of contact with fellow expatriates from the 1950s The initial level of proficiency is closely correlated to the extent of perceived L1 attrition, 'loss' was more likely to be reported by subjects with many years of pre-emigration exposure to Dutch Contact with Dutch in Australia in conversations with expatriates primarily affects the self-estimates of current frequency and proficiency in Dutch Emigrants who were 'older' when they arrived more often availed themselves of opportunities to use Dutch and visit the home country 'Younger' emigrants appeared to have had less opportunity to build up and consolidate their knowledge of and skills in Dutch after migration to an English-speaking country Subjects who estimated that they had had a high level of proficiency in Dutch considered their Dutch to have deteriorated (possibly owing to prolonged use of English) whereas frequent contact with Dutch in the Netherlands (but not in Australia) tended to improve their level of Dutch (in the subjects' eyes) In other words, not the actual passing of time but what happens *during that period* affects attrition Whether 'age' indicated the minimal level of competence in Dutch or the extent of exposure to and use of Dutch is not clear Since no external measure was available as an index of the level of pre-emigration

Dutch, the *subject s age in the Netherlands prior to emigration* appeared to be the key to the subjects' past and present estimated competence in and use of that language in this study

The perception that Dutch was now 'worse' suggested attrition of Dutch skills The self ratings on the proficiency and frequency of Dutch (and changes in these) reflected the limited use of Dutch The attitudes appeared to be related to self-reported proficiency, rather as was found by Hakuta and D'Andrea (1992) in their study of Spanish in the USA They too found a relationship between language attitude and shift

The fact that older subjects had estimated that their overall skills in Dutch had improved did not suggest regression (*cf* Clyne, 1981) Instead, it was found that the older emigrants tended to rate their skills in Dutch more highly because they **knew more Dutch before migrating** Probably as a result of this they used their Dutch skills more freely in contact with fellow emigrants (*cf* De Bot & Clyne, 1989)

Subjects performed better in the assessments than had been expected on the basis of their comments during the telephone screening The strategies reported in the assessments suggest that, particularly in the written tasks, subjects mainly experienced difficulties in selecting and using the local contexts to derive the search cues The raw score was adopted as the index of performance in the tasks Correlations between these showed a close relationship between the Dutch Cloze and Fluency versions This supports the *language specificity* of these assessments Correlations with the questionnaire data suggest that lexical fluency depended on proficiency in two ways subjects with a higher initial level of proficiency in Dutch and more contact with Dutch in Australia and during visits to the Nether lands maintain Dutch better and hence are more fluent in Dutch Furthermore, more proficient subjects had had more practice in Dutch in the past If there is limited contact with that language, and fluency is reduced, any assessment will lead to a score that is less than the subjects' actual level of proficiency

PC analyses of the questionnaire and assessment data resulted in several variates, centring around the *age of departure*, the extent of *post-migration contact with Dutch, private contact with Dutch, conversation usage of Dutch, written usage of Dutch, estimated change* and *estimated proficiency in Dutch, attitude to Dutch*, and *attitudes to Dutch in bilingual context* These will be used in subsequent analyses to estimate the impact of present and past proficiency and language contact on the assessments and the experimental data

The self-estimates were found to be significantly correlated to the results of the Dutch assessments

This analysis also showed that the cluster of Dutch assessments (TASK1) indicates the subjects residual proficiency in Dutch at the time of testing, and therefore may be referred to as 'ResProf' in further chapters

To sum up, estimates of "language loss" were a function of the extent and quality of exposure to Dutch and its current use There was no indication that the length of the period of non-use (*years in Australia*) affected the estimated change in proficiency

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[1] Note that although the assessments were derived from paradigms which in previous research had been shown to be valid and reliable, no claim is made regarding the subjects' actual language proficiency Instead, the argument is used that proficiency effects are measured within the sample of subjects, rather than by comparison with some outside norm or study (which is generally not fully comparable)

[2] An attempt to set up a detailed test of Strutch failed It involved separate tests on articles, prepositions, nouns, verbs, adverbs and adjectives in 8 formats, based on the literature on Strutch, the experimenter's experience as a teacher of Dutch as a second language and written TESOL tests Formats were, among other things, gapfills/Clozes, sentence completion (multiple-choice and open ended) and a short writing task Pretesting on 17 high school students of Dutch (advanced) and 28 fluent-Dutch emigrants showed substantial variation in the responses Most difficult were prepositions and verb tenses, correct spelling and endurance Verbal reports revealed that more items needed to be included as well as more "easy items' to keep the subjects motivated Pretesting of this new version showed, however, that subjects needed 2 hours on average to compete this assessment In view of the time constraints while visiting the emigrants in their homes, 'global' assessments were used instead

[3] Experiments and tasks not reported on in this dissertation include lexical decision experiments, story-retell tasks and Dutch interviews These will be reported on in other publications

[4] Testing of 3 subjects who had arrived before the age of 6 and had had no contact with Dutch since leaving their parental home revealed very poor literacy skills and a small vocabulary These subjects were not able to read even the Editing task while understanding the content, and remembered only a few household words and some common phrases that their parents had used

[5] Migrants who had arrived in their teens frequently claimed they were basically 'Australian' However, on visiting them I noticed they often had a very Dutch lifestyle in a 'Dutch' household (e g indoor plants, birthday calendar, carpet on dining room table, teaspoon collection and a Dutch arrangement of furniture) which suggested that the Netherlands still had an influence on them Younger emigrants (arrival before 4) tended to live in more typically Australian households and claimed they felt less influenced by their Dutch-born parents

[6] Dutch emigrants arrived some time after large scale immigration by emigrants from Mediterranean countries These had not integrated into the Anglo-Australian culture, and media reports at the time stated that any subsequent wave of emigrants "should be encouraged not to make the same mistake" As a result, emigrants from north-western European countries were preferred, and clearly instructed to shed their own background (*cf* Cnossen & Apperloo, 1954)

[7] Some subjects reported an unhappy youth, for instance due to the Japanese and Dutch occu pation ("those terrible years"), a violent parent or other traumatic family experience, or dis-satisfaction with an old personality

> No, thanks No, I have moved beyond that now No more Dutch for me I think that is really something of the past

[8] Unfortunately, ethnic television in Melbourne (SBS-TV) then began screening "Say Aah", a Dutch soap ("Zeg eens Aa") Many emigrants, not only of Dutch origin, had begun to watch this, although most Dutch emigrants reported to "relying heavily on the English subtitles"

[9] A comparable group of fluent Dutch bilinguals was needed to select subjects from who were equivalent to those in the dormant group except for the frequency with which Dutch is used and the assessment scores The Dutch community was approached via a text in the 'Dutch Courier' (a monthly Dutch newspaper with 5,000 subscribers) Due to financial constraints, fluent Dutch emigrants could not be visited individually Therefore the assessments were presented as a contest in which prizes could be won by the person who submitted the "highest number of correct responses" before the next issue Informants were asked to indicate their age, the age at which they emigrated to Australia and the frequency with which they use Dutch and the time needed to complete the Cloze tasks, together with their responses
The results were disappointing Three months after the deadline only 16 forms had been returned These informants (average age 42) used Dutch weekly or even more frequently and had needed an average of 16 minutes to complete the Clozes Few mistakes were made in the short Cloze (87 % correct)
As a reason for their low participation emigrants stated that they failed to see the relevance of an investigation of their Dutch
The assessments of Dutch were subsequently presented to 13 learners of L2 Dutch at Dandenong High School (grade 8-12) The scores correlated well with alternative measures of proficiency in Dutch (r = 73 **)

[10] A bibliography on Dutch emigration in the pacific region is provided in the references on page 248 onwards

[11] After pilot testing, the phrase "since 10 years ago" was changed to "since you left the Netherlands" to disambiguate the self-estimate question on *Change in Dutch*

[12] Simon Carmiggelt was a well-known Dutch columnist and short-story writer who excelled in depicting typical Dutch homely scenes

[13] The short Cloze was also presented to 26 primary school children (aged 11-12) in the Netherlands These children had no difficulty in responses Few procedural errors were made, providing and responses were similar to those given by adult native speakers of Dutch

[14] The assessment by Van Den Broecke (1988) came too late and could not be used, as no differentiation is made between the positions in the Dutch words

[15] All dictionaries list the words in post-1947 spelling conventions No dictionary could be obtained of Dutch in the Indonesian context

[16] (*f*) is the mean total number of responses per verbal category (56) over the total sample of subjects used (N = 442) in Battig & Montague's study

[17] Unlike in De Bot *et al* (1991) subjects were not presented with a new criterion after 20 seconds of silence

[18] The term is a derogatory word used to indicate an uneducated, non-Anglo emigrant It is usually reserved for emigrants of mediterranean origin Dutch emigrants are occasionally referred to as "clog-wogs"

[19] Table 1 in Profile 1991 (1993) compares the data for the Netherlands born in the most recent censuses and shows increased aging, more emigrants outside the labour force and fewer emigrants who rated their English as good

[20] This may be a feature of Dutch emigration in general poor participation, limited identification on ethnic grounds, and poor social and political organization of first-generation Dutch emigrants is also common in other contexts, even in countries in close proximity to the Netherlands, such as France (*cf* De Bot, *et al* , 1994)

[21] Comparison of the 1986 Census with the 1991 Census points in the same direction for those aged 5 years and over, the percentage of the Netherlands-born who spoke English only increased from 48 1% to 57 6%, the percentage of bilinguals who spoke English "very well" dropped from 35 1% to 29 5%, and spoke "well' from 14 4% to 11 0%, although no qualitative data is available as to frequency and domains

[22] In addition to the 16 fluent Dutch emigrants who scored 87% of the short Dutch Cloze correct, 12 Dutch bilinguals had provided scores on the long Dutch Cloze (92% correct) Eighteen native speakers of Australian English scored 84% correct on the English Cloze

[23] A normal pace measured in a similar way for fluent monolinguals is 400 per 2 minutes (Segalowitz, 1986)

[24] The correlations were similar when the correct-per-minute score was used for the written tasks Fewer relationships were found no relationships between Dutch and English Clozes anymore Only relationships between English fluency score and English Cloze scores No significant correlations were found between comprehension and other variables

[25] Identification of atypical emigrant subjects was furthermore necessary because preliminary analysis of the experimental data showed unacceptable Z-scores of -5 in the error and reaction time analysis over 76 subjects

[26] As a result, mainly questionnaire variables of language contact are considered, although care was taken to ensure that these did not outnumber the other types of variables

[27] Watching Dutch programs on SBS-TV, however, is no guarantee of practice in listening to Dutch, as the subjects reported that the English subtitles provided an easy alternative way of understanding what was going on. Some emigrants stated that they watch Dutch programmes primarily to see pictures of the Netherlands, only occasionally concentrating on the Dutch spoken and reverting to English subtitles when attention slackens. Research by De Bot, Jagt, Janssen, Kessels & Schils (1986), however, shows that viewers use their oral skills in such situations, although they may not be aware of it.

CHAPTER FIVE
THE PICTURE-NAMING AND IDENTIFICATION EXPERIMENT

(squirrel/eekhoorn) ' *ernim erm da's zo'n klein beestje, weet je wel, dat is- wat zeg je in 't Hollands /ahum/ LAUGH de naam ben ik vergete /ja?/ Maar de nAAm ben ik vergeten xxxxx ik ik eekhoorn! SIGH* " [That is some a little animal, you know, what do you call it in Dutch I have forgotten its name I have forgotten its name xxxxx I I squirrel SIGH] (Pilot L)

5 1 Introduction

The aim of the study was to examine to what extent dormant Dutch bilinguals have difficulties in retrieving various types of Dutch words Additionally, I wanted to know which types of words that could not be recalled could still be recognised The different types of words were used to elucidate the role of morphological and phonological aspects in lexical attrition The background information on the emigrant subjects in Chapter 4 is used to interpret experimental data on their lexical retrieval processes and L1 attrition Memory performance is contrasted in recall and recognition contexts to determine whether dormant Dutch bilinguals had 'forgotten' concrete Dutch words and where difficulties occurred in retrieving Dutch words from memory after years of non-use (*e g* representation, access) The 'dormant' bilinguals were first presented with pictures during a *naming* session and asked to provide the Dutch target name This was followed by an *identification* session in which incorrectly named pictures were accompanied by the target word and distracters The subjects were asked whether they recognised the target name from the set of options

Analyses of the word type effects and session or 'task' effects concentrated on the errors made in the naming and identification tasks (*cf* § 3 4) The types of incorrect distracters selected were analysed separately

Outline

This chapter describes the methodology of the picture-naming experiment and the results of a pre-test Section § 5 2 describes the efforts made to control for variation in perceptual processing of the stimuli for the target words Section § 5 3 outlines how cross-linguistic similarity of form was investigated and which lexical variables were controlled for This is described first for single-stem words (§ 5 3 1) and then for multi-stem or 'compound' words (§ 5 3 2) In § 5 3 3 details of the nature of the identification task are given The actual method of presentation of the items is presented in § 5 4, and section §

5 5 deals with the analyses and results of a pre-test Chapter six discusses the bilingual results in the light of biolinguistic information on the emigrant subjects

5 2 Controlling Perceptual Processing

To allow investigation of the 'similarity of form' variable, the effects of other variables needed to be taken into account The principal aim was to control for possible effects of differences in cultural bias, visual complexity, and ambiguity/imageability between the picture stimuli that were used to remember Dutch words (§ 3 2)

To control for these variables, the experimental stimuli were derived from the standardised picture set in Snodgrass and Vanderwart (1980) Of these a selection was made of black-and-white line-drawn pictures of objects that were suitable in the emigrant context Items initially excluded were pictures that were considered ambiguous, that were considered to be typically American (*e g* "baseball bat"), and which Snodgrass *et al* (1980) found to be ambiguously named and identified[1] Some of the drawings were slightly adapted to their Australian prototypes (*e g* the "plug" was drawn with three pins). Subdivision of the pictures into specific semantic domains was avoided because a test of semantic categorisation of the words by 20 fluent emigrants showed too much variability in the semantic categories given[2]

This selection was tested for suitability in the Dutch-Australian context as well as codability (Lachman, 1973a) To obtain the target names in Dutch and Australian-English (AE), the 130 remaining drawings (3 x 5 cm) were presented on separate cards to 43 mainly monolingual Dutch speakers in the Netherlands (aged 17-45 years, mean age 36) and 30 monolingual students at Monash University (aged 17-30 years, mean age 19) The subjects were instructed (Appendix 5 1a) to name the pictures as quickly and accurately as possible, using a single name Any difficulties or queries were resolved in an item pretest trial

The results are listed in Appendix 5 1b Self-initiated verbal reports indicated that occasional problems were mainly due to failure to indicate the size of the depicted object (*e g* the difference between "grape" and "apple") In the majority of cases, subjects agreed on the most appropriate names for the picture stimuli, the mean percentage of subjects who used the same target name for an image was 91 7% for the Dutch session and 93 8% for the English session The close similarity to the American data suggested that the information on each picture in Snodgrass and Vanderwart could be applied The error percentages from the English pretest was stored under the variable name 'Pretest' for use in later analyses

In the actual experiment, only pictures that were given the same name in **90%** or more of the pretests were used These pictures are considered to represent **one** concept and to have only **one** appropriate name As a result, possible recall difficulties are mainly attributable to linguistic difficulties This restriction to a set of unambiguous pictures, however, confined the investigation to a limited range of word-type effects on lexical attrition Primarily investigated were the effects of a number of types of cross linguistic similarity on bilingual recall and recognition processes Measures to control for other lexical variables like the *frequency of occurrence* of the words, their *word length* and processing during the *task* (§ 5 3 1) were concentrated on this subset of unambiguous pictures[3]

5 3 Lexical Processing Assessing Cross-linguistic Form Similarity

The names of the pictures were divided into single-stem and multi-stem or "compound" words Within each word type (single-stem and multi-stem words) degrees of cross-linguistic similarity were assessed separately (*cf* § 3 1) In § 5 3 1 the categories of single stem words in both English and Dutch words are described, and the multi-stem words are described in § 5 3 2

5 3 1 Single-Stem Categories

Two aspects of cross-linguistic similarity of form among single-stem categories were investigated the target words are either phonologically and morphologically similar, or different in one respect, or different in both types of similarity of form

Single-stem items Assessing phonological similarity

Two procedures for assessing phonological similarity were used The first involved the use of *criteria* to assess the phonological similarity between the Dutch picture name and its English translation (based on phonemic transcription of the responses given by the monolinguals during pilot testing) Words with no dissimilarity or one different phoneme were labelled 'highly similar' (*e g* glass-glas), words with no or only one shared phoneme in the same positions in the Dutch and English names were 'phonologically dissimilar' (*e g* horse-paard), and names that shared one or more phonemes and had two or more different phonemes (*e g* snake-slang) were 'phonologically similar' One potential drawback of this 'objective' method, however, is that language users may not employ simply add up differences and similarities in their estimates of cross-linguistic similarity. Another is that phoneme qualities varied in bilingual speech and between Dutch-English bilinguals.

For this reason the accuracy of the above 'objective procedure' was assessed by comparing the results with *estimates* of word similarity, using lexical features reported in TOT studies in language production (§ 2.2)[4] and in TOTs during a pilot picture-naming study (Ammerlaan, 1987c). For each of these word features in a pair of names, two linguists awarded zero points for 'dissimilarity' per feature, two points for 'similarity', and one point for an ambiguous case. Inter-rater reliability was high ($\alpha = .98$). Note that if the stress placement differed between the word pair, many other features differed as well (such as the 'similarity in stressed syllable' and 'similarity in first letter of the stressed syllable'). Appendix 5.2a lists the results. The outcomes of the criteria and estimating methods were highly correlated (r = .84 **). Appendix 5.2b shows that the 'similarity in the number of syllables' and 'similarity in stress' features were not significantly correlated to the other features.

This rating method (Appendix 5.2a) also had its drawbacks. These result from varying pronunciations of the Dutch words by the Dutch emigrants because of their dialects and because of varying Dutch accents in the pronunciation of the English words by Dutch emigrants in the pilot study, which occasionally made some Dutch-English word pairs much more similar than the experimenter had expected. Therefore, the data of both methods was combined and stored as 'ObjecSim' with each picture.

Single-stem items: assessing morphological similarity.

The criterion for morphological similarity for the picture names of the same word class and with the same meaning was agreement in the number of *syllables* between the Dutch form and its English translation equivalent (§ 3.1). Examples where word pairs differ in the number of content morphemes are "as-pa-ra-gus/ as-per-ge" and "desk/bureau". Owing to the limited set of pictures, similarity in the number of letters could not be used because the number of items in some single-stem categories would otherwise have become too small, whereas data on letter clusters in Dutch was not available at the time of testing.

One bilingual linguist and one untrained monolingual for either language divided the words into syllables. Inter-rater agreement was 100%. The resulting word pairs were then divided into those that had the same and those that had a different number of syllables in Dutch and English.

Together with phonological similarity this categorization procedure resulted in four categories of items (listed in Appendix 5.3). To these a fifth category of 'identical' single-stem names was added, in order to investigate whether varying definitions of 'cognate' as used in previous studies on the cognate/non-cognate effect (*cf.* § 2.2.2) are reflected on processing differences (Kroll & Stewart, 1994).

<u>Single-stem items: other psycholinguistic variables</u>

Linguistic variables other than similarity of form (*cf.* Snodgrass, 1993) were controlled for. Efforts to make the word categories comparable in respect of these variables concentrated on word length and word frequency (*cf.* § 2.1).

<u>Assessing word length</u>

The literature disagrees on the best psycholinguistic measure of word length: the number of syllables, letters, and morphemes have all been used as indexes (*cf.* Hudson *et al.*, 1984; Snodgrass, 1993). In this study, word length in the single-stem categories was measured in *letters* since this was close to length-in-phonemes as a result of Dutch grapheme-phoneme correspondence rules (*cf.* De Groot, 1992b)[5], and since the greater range (2-12) than the number of syllables (1-5) was considered an advantage. An attempt was made to make the word categories equal in respect of length-in-letters. Potential effects of length-in-syllables were investigated by contrasting the single-stem with the multi-stem words (see § 5.3.2). The length-in-letters was stored as 'DuLeng' for Dutch and 'EnLeng' for English.

<u>Assessing word frequency</u>

In order to adequately measure effects of similarity of form, the frequency of the words[6] in the categories also needed to be comparable between the word categories. An approximation of the frequency with which the picture names occurred was derived from its frequency in a representative corpus of written Dutch and English (post-1950s) texts (Francis & Kuçera, 1982; Uit Den Boogaart, 1975). Used were the information on the word forms, and the syntactic functions of the word forms and of their lemma in the corpus from both frequency lists (*i.e.* the A1 list in Uit den Boogaart). Lemma lists were used following suggestions in Taft (1979) that the stem appears to be accessed before morphological affixes are added. In addition, this lemma frequency more adequately measures the frequency with which the meaning common to the various inflected word forms appears in each language, which was considered a characteristic that could influence CLI during processing.

Infrequent entries were avoided because the subjects might never have acquired these and because frequency lists are notoriously inaccurate in the low-frequency range As a result, the forms of the picture names in both languages were fairly commonplace, and the objects they denoted very familiar (in addition to the use of simple pictures) This increased the probability that at some stage, when the emigrants were fluent speakers of Dutch, they would have known the words[7] Unfortunately, not all the picture names needed for the similarity categories were listed in the frequency corpuses Since no additional Dutch corpus was available, differences in the size of the corpuses were compensated for by adopting the makeshift solution[8] of multiplying all the Dutch scores by 1 67[9] The information on word frequency was *averaged* (by dividing the total frequency score by the total number of items in the category) and used to arrive at an equal distribution of frequencies among the picture name categories The frequencies of the Dutch and English picture names in the sample were correlated (r = 77 **) 'DuFreq' and 'EnFreq' will both play a role in post-hoc analyses of the data from the experiment in attempts to correct for small differences in frequency between the categories

<u>Examples of items in the single-stem categories</u>

The picture names were selected in such a way that the number of words, the average length-in-letters and the mean and median 'average frequency' were as similar as possible for all the categories of picture names Owing to the many selection criteria it had become difficult to obtain an equal number of items in each single-stem category The resulting total set of test items (as listed Appendix 5 3) is summarised in Table 5 1

Table 5 1 Examples of the types of Dutch and English names for the single-stem images in the picture-naming experiment (n = 62) and a summary of the word characteristics in each category

CATEGORY	DUTCH EXAMPLE	ENGLISH EXAMPLE
1 Phonologically highly similar - Same num of syll	glas	glass
2 Phonologically similar - Same num of syll	zon	sun
3 Phonologically dissimilar Same num of syll	paard	horse
4 Phonologically similar - Different num of syll	asperge	asparagus
5 Phonologically dissimilar Different num of syll	bureau	desk

CATEGORY	1 Ident	2 Sim /Same	3 Diss /Same	4 Sim /Diff	5 Diss /Diff
number of items	14	11	13	10	14
mean objective similarity	1 79	1 60	0 46	1 24	0 28
mean Dutch frequency	28 9	37 2	25 5	12 9	23 3

mean English frequency	27 1	31 1	29 9	18 2	19 4
mean length (syll)	1 5	1 7	1 5	2 2	1 6
mean length (syll) Dut	1 5	1 7	1 5	1 9	1 7
mean length (syll) Eng	1 5	1 7	1 5	2 5	1 4
mean length in letters	4 7	5 5	5 0	5 9	5 0
mean length (let) Dut	4 5	5 4	4 8	5 7	5 3
mean length (let) Eng	4 9	5 6	5 1	6 1	4 8

Table 5 1 shows that the differences in mean frequency and length of the words in each category were small, except for Category 4 (*phon sim /diff syll*) the listed Dutch and English frequency is lower for Category 4 than for the other single-stem categories because some names were not listed in the corpuses This category also was longer (in letters) and had words with more syllables in Dutch than the other single-stem categories Least similar (on the objective scale) were Categories 3 and 5

Most relevant lexical characteristics were controlled for as much as possible Domain and culture specificity (*e g* Goggin, Estrada & Villareal, 1994) were controlled for by ensuring that all the pictures were common to both Dutch and Australian cultures Three items with evident culture-specific value could not be excluded without making the categories less similar in other respects These were "kangaroo" (cat 1), "tulip" (cat 4) and "windmill" (practice item)

5 3 2 Multi-Stem Categories Semantic Transparency and Stem Agreement Effects

Within the remaining set of unambiguous pictures in Snodgrass *et al* (1980), two other types of similarity were investigated These were *semantic agreement* or '*transparency*' of word-pairs that were multi-stem words in both Dutch and English (§ 3 2 2) and *stem agreement* of the Dutch words with their English translations (§ 3 2 3) Two linguists independently assessed the multi-stem words on the basis of these criteria For the sake of completeness, 'objective similarity' was also measured for the multi-stem words Word length, frequency, and domain and culture specificity were again held as constant as possible Unfortunately, many of the items (especially in Category 7) were not listed in the Uit Den Boogaart (1975) corpus Within the picture set only items which differed in either of the semantic components of multi-stem words could be found for Category 7

Examples of multi-stem categories

The multi-stem categories contained more meaning-carrying elements than the single-stem categories Within the multi-stem words there were differences in the similarity of the meaning components and nature of their form (details in Appendix 5.4), which are summarised in Table 5.2.

Table 5.2. Examples of the categories of multi-stem Dutch and English names (n = 16) used in the picture-naming experiment.

CATEGORY	DUTCH EXAMPLE	ENGLISH EXAMPLE
6 same-meaning components	tandenborstel	toothbrush
7 different-meaning components	sprinkhaan	grasshopper
8 single-stem in Dutch - compound in English	vlinder	butterfly
9 Compound in Dutch - single-stem in English	vingerhoedje	thimble

CATEGORY	6 Same Cps.	7 Diff Cps	8 Singl D /Multi E	9 Singl E /Multi D
number of items	4	4	4	4
mean objective similarity	1 04	0.32	0 32	0 43
mean Dutch frequency	3.3	0.0	12 0	3 0
mean English frequency	3 5	0 0	4.3	1.0
mean length in letters	10.5	10.0	7.4	8.7
mean length in let (Eng)	10 0	10 7	9.0	6 5
mean length in let. (Dut)	11 0	9 2	5 7	11 0

Within the limited set of pre-tested pictures that had satisfied all the criteria it proved difficult to find equal numbers of items per category that were comparable to the single-stem categories as well as equivalent in domain and culture-specificity and frequency without adding many new pictures to each category. Drawing many new pictures would have meant several rounds of extensive pretesting of many more pictures along much the same lines as Snodgrass & Vanderwart (1980)[10].

Word length and frequency were assessed in the same way as in the single-stem categories. Within this set, Dutch and English frequency were not significantly related (r = .34 ns), possibly as a result of the low (listed) frequency of occurrence of the multi-stem items and the missing information in the Dutch corpus for category 7. No further adjustment was possible within the set of pictures. This could affect performance in the experiment in view of the finding that name-agreement appeared to be lower for longer and less frequent words (*cf.* Goggin *et al.*, 1994).

5.3.3 Validation of Word Category Differences

Within the range of pretested pictures, the words in the categories turned out to be difficult to equate for all the criteria in view of the large number of criteria (*e.g.* ambiguity, length, frequency, domain, culture, types of similarity). In addition, the frequency of some of the picture names was not listed in the corpuses. To validate the category differences in frequency, a number of other sources on Dutch and English were consulted.

Additional information on word frequency and familiarity came from Krom (1990), who investigated to what extent Dutch children at several ages knew words from the 'Nieuwe Streeflijst Woordenschat', a list of 'Dutch words that ought to be known by Dutch children', compiled by primary school teachers (Kohnstamm *et al.*, 1981). Van Loon-Vervoorn (1985a, 1985b) used this information to investigate at which ages the words were actually learned. Krom combined the information from Kohnstamm *et al.* into 6 frequency lists for each group of Dutch children aged 4, 5, 6-7, 8-9, 10-11 and 12. Caroll and White (1973b) had found that age of acquisition affects naming.

To examine the appropriateness of the decision to investigate emigrants who had left their L1 environment after the age of 6, all the items were checked in the first 3 word lists in Krom (1990). Not all the items used in the experiments were listed in Krom's study, however. Therefore Staphorius, Krom & De Geus (1988) was consulted. This lists words found in a randomly selected sample of children's books and magazines for the ages 7 - 12 (200,000). Staphorius *et al.* (1988), however, did not distinguish word classes that have the same word form (*e.g.* English 'over' as noun or preposition), which makes the information less accurate. In addition, not all the words in the Dutch experiments are listed in this corpus either: for some (*e.g.* cherry/kers) only the plural form ('kersen') is given, whereas others are missing from the lists. The information from the various lists is given in Table 5.3.

Table 5.3. Types of frequencies of picture names in 9 word categories.

FEATURE	Ident.	Sim / Same	Diss / Same	Sim./ Diff	Diss / Diff.	Same Cps.	Diff Cps	Sing. D/ Mult. E	Mult D/ Sing E.	ALL
Uit den Boogaart	28.92	37.22	25.50	12.86	23.20	3.33	miss.	12.00	3.00	24.36
Aver. D/E freq	28.38	32.30	26.69	13.60	18.00	2.83	miss	4.16	2.00	21.32
Krom	4.23	4.09	4.00	4.33	4.28	4.00	5.00	4.50	5.50	4.25
Staphorius	9.23	17.00	11.08	3.60	3.84	2.00	1.50	6.00	missing	8.64

The means in Krom's study show that most words in the experiment should be known by Dutch children around the age of 4 Their frequency in children's literature (according to Staphorius *et al*) shows greater variation Unfortunately, the information in the Krom and Staphorius lists did not involve all the words The items in the categories were therefore not adjusted for these types of frequency information, instead, the information was used in *post hoc* analyses, referred to by the names 'Krom' and 'Staphor'

5 3 3 1 <u>Bilingual Estimates of Similarity and Frequency</u>

To further ensure comparability within the 9 categories and to determine whether the intuitions of the emigrants matched the corpus data, additional cross-linguistic similarity and frequency information was collected This involved using the intuitions of two groups of fluent Dutch emigrants

<u>Rating similarity</u>

To investigate how the division into 9 'similarity categories' compared to actual in tuitions on cross-linguistic similarity used in the Dutch community in Australia, several random orders of the picture names were presented to a group of 27 fluent Dutch-speaking emigrants (mean age 57) Subjects were asked to rate on a scale of 1-7 whether the single-stem and multi-stem words were "similar" (7) or dissimilar" (1) to their English equivalents They were instructed to consider both aural and written aspects of the word pair presented

Reliability analysis showed the ratings were consistent ($\alpha =$ 96) Both the verbal reports and comparison of the mean estimates with the types of categories (Table 5 4) show that, despite the instructions, the fluent bilinguals primarily employed phonological similarity in their estimates of word-pair similarity

Table 5 4 Average estimates of cross-linguistic similarity in 9 categories of picture names by fluent Dutch speaking emigrants (N = 27) and the average 'objective' similarity in features (§ 5 3 2)

CATEGORY	Rating	Std Dev	n	Feature
1 Identical	6 11	(0 91)	14	1 79
2 Phon Similar/ Same num Syll	5 50	(0 72)	11	1 60
3 Phon Dissimilar/Same num Syll	1 80	(0 26)	13	0 46
4 Phon Similar/ Dift num Syll	5 24	(0 74)	10	1 24
5 Phon Dissim / Diff num Syll	1 53	(0 37)	14	0 28
6 Same-meaning Components	4 04	(0 93)	4	1 04

7 Diff meaning Components	1 93	(0 32)	4	0 32
8 Single-stem in Dut /Multi stem in Eng	2 15	(0 28)	4	0 32
9 Single stem in Eng /Multi stem in Dut	1 70	(0 58)	4	0 43

The averages over the values in Table 5 4 also show that the single-stem categories were on the whole rated as cross-linguistically more similar (4 04) than the multi-stem categories (2 45) The results also show that, on the basis of the fluent emigrants' intuitions, Category 4 '*Phon sim /diff Syll*' was not as distinct from the other single-stem categories as had initially been suspected Dutch words in Categories 3 and 5 were again least similar to English Correlations between the similarity estimates based on the phoneme features and the estimates by the fluent bilinguals were highly significant over all the 78 word-pairs (r = 95 **), the single-stem categories (r = 95 **) and the multi-stem categories (r = 93 **) Correlations of the ratings with the features used in the objective similarity method were significant except for 'similarity in stress placement' No adjustments were therefore needed, and the similarity estimates were used in *post hoc* analyses as the variable 'SimRat'

<u>Rating frequency of occurrence</u>

Estimates of frequency were used to supplement the information on certain words missing in the corpuses A second group of fluent Dutch-speaking emigrants were asked to rate on a scale of 1-7 how often they thought the experimental words occurred in Dutch They were asked to consider both written and aural frequency of occurrence The average estimates over the 43 fluent Dutch-speaking subjects are listed in Table 5 5, together with the averages of the frequency of occurrence of the names found in the Dutch corpus

Table 5 5 Frequency information on the words in the picture-naming experiment based on estimates by fluent Dutch emigrants (N = 43), and means over the items listed in the Dutch Uit den Boogaart (1975) corpus

CATEGORY	Rating	Std Dev	n	Corpus
1 Identical	4 77	(1 13)	14	26 8
2 Phon Similar/Same num Syll	4 54	(1 02)	11	30 4
3 Phon Dissim /Same num Syll	3 99	(0 85)	13	23 5
4 Phon Similar/Diff num Syll	4 46	(0 47)	10	9 0
5 Phon Dissim /Diff num Syll	3 89	(0 84)	14	16 6
6 Same meaning Components	4 06	(0 89)	4	2 5
7 Diff meaning Components	3 52	(1 10)	4	missing

8 Single stem in Dut /Multi stem in Eng	3 17	(0 42)	4	3 0
9 Single stem in Eng /Multi-stem in Dut	2 69	(0 96)	4	0 7

Reliability analysis results were good (α = 98) As a result of this it is possible to simply calculate the mean over the ratings provided and compare this to the values listed This shows that the frequency of the items in Category 4 is similar to that of the other single-stem categories Correlations between the Uit Den Boogaart data and the ratings were significant (r = 48 **)[11] In *post hoc* analyses this information was used in the variable 'FreqRat'

Comments by the subjects suggested that similar words tended to be perceived as more frequent The data supported this more dissimilar categories were rated as more frequent whereas their objective frequency was smaller than that of the words in the similar categories Correlations between the results of the two estimate tests were significant (r = 44 **)

5 3 3 2 Category Differences

To investigate the significance of the differences in the various types of similarity between the word categories, Oneway analysis of variance (Anova) was used involving several relevant contrasts (SPSSx Inc, 1986) The results of these analyses showed, for instance, that the differences between Categories 1 ('*ident*') and 2 ('*Phon sim /same Syll*') were not significant

Category 2 ('*sim /same*') does not differ in length or frequency from Category 3 ('*diss /same*') except that it is more similar (ObjecSim t(69) = 10 04 p = 000/SimRat t (69) = 16 27 p = 000) Category 4 ('*Phon sim /diff Syll*') does not differ in length and frequency from Category 5 ('*Phon diss /diff Syll*') but is more similar (ObjecSim t (69) = 9 79 p = 000/SimRat t(69) = 14 54 p = 000), and Category 3 is only less similar than 4 (ObjecSim t(69) = 9 27 p = 000/SimRat T(69) = 14 54 p = 000) the mere differences in similarity make it possible to determine whether similarity in sound or syllables is a more important influence on processing There were no significant differences in the frequency in either language in the corpus data for the Categories 2 to 5 There was a significant difference in estimated frequency (FreqRat) between 3-5 and 2-4, however, suggesting that the phonologically dissimilar Categories 3-5 were less frequent in the bilingual context of fluent Dutch-speaking emigrants (t(69) = 2 33 p = 026) Categories 3-5 are also phonologically less similar than Categories 2-4 (ObjecSim t(69) = 15 20 p = 000/SimRat t(69) = 20 14 p = 000)

Words in Category 3 ('*Phon diss /same Syll*') are more similar than 5 ('*Phon diss / diff Syll*') but also acquired earlier according to Krom (1990) (Krom t (63) = -2 28 p = 040) Other differences were not significant The other category pair that differs in syllable similarity is 2 ('*Phon sim /same Syll*') and 4 ('*Phon sim /diff Syll*') Category 4 was less similar than Category 2, but only in feature similarity (ObjecSim t(69) = 2 76 p = 013) In the rating of similarity these did not differ significantly (t(69) = 0 83 p = 414), apparently because of the primarily phonologically-based estimation by the fluent Dutch bilinguals Category 4 words were also less ambiguously named in the pencil-and-paper pretests

The differences in similarity in the number of syllables (Cat 4-5 *versus* Cat 2-3) was reflected in the ObjecSim measure (T(69) = 3 59 p = 001) There was, however, no significant difference in the similarity ratings by the fluent bilinguals (SimRat t(69) = 1 55 p = 133) This was expected as fluent emigrants estimated the items on the basis of phonological similarity

Single-stem categories are significantly more similar (SimRat T(69) = 9 35 p = 000 /ObjecSim t(69) = 9 10 p = 000) than multi-stem categories Naturally they were also shorter and more frequent in Dutch Multi-stem words were also less frequent according to the Staphorius data, although not all the items were listed (Staphor t(51) = 2 50 p = 026)

Category 6 ('*Same Cps*') is only less similar than Category 7 ('*Diff Cps*') (ObjecSim t(69) = 5 06 p = 006/SimRat t(69) = 4 27 p = 015) Categories 8 ('*Sing D/Multi E*') and 9 ('*Multi D/Sing E*') do not show significant differences in both kinds of similarity measures, only in word length

5 3 4 <u>The Identification Task</u>

One of the aims of the experiment was to compare recall data from the naming task to recognition data from a forced-choice identification task to determine the extent of non-recall and the factors that had influenced uncertainty in the subjects during recall The use of a recognition task allowed assessment of the intuitive knowledge used during the access of the Dutch words (§ 3 2 4) The following points were considered

First, subjects were not given any *a priori* indication that, after the naming task, they would be asked to identify the names of the same pictures Only pictures for which an emigrant had *not* provided the target Dutch name during recall were presented for identification For practical reasons not all the items were presented for both recall and recognition On the one hand, previous research had found that non-recognition of previously re called information was extremely rare (Puff, 1982, Summers *et al*, 1989) On the other hand, restricting the number of identification items reduces the length of the experiment and hence the degree of imposition on the emigrants in their homes This test format implied that a recognition error in the identification task could not occur unless a naming error had been made The data on recall and recognition processes can still be compared by investigating the relative differences between the two tasks for each word category

Second, the recognition data were collected using a *forced-choice* format unsuccessfully named pictures were accompanied by their Dutch name and a set of *distracters*, from which subjects had to choose the correct name (*cf* § 3 1)

Third, *no feedback* was given on the correctness of their responses, in order to prevent a learning effect from occurring A pilot run (N = 9) showed that feedback on accuracy was used by some of the subjects to guide their guessing strategies and caused frustration in other subjects about the items they had missed The experimenter's assessment of the response was therefore keyed in *without* informing the subject of the outcome

Fourth, the chance of guessing and deduction (*cf* Nelson, Gardner & Narens, 1984) was further reduced by using five distracter types rather than the usual four (see below)

Fifth, concurrent reports were collected in the identification task *after* presentation of the pictures and the naming attempts These followed guidelines set out in Anders-Ericsson & Simon (1984)

Sixth, for practical reasons the experimenter opted for *visual* rather than auditory[12] presentation of the recognition options (in addition to the picture) By adding the picture it was hoped that the recognition results would be affected least by the characteristics of the task (oral recall *versus* visual recognition) Visual presentation of the Dutch distracter words was not considered too difficult for the dormant emigrants since Dutch and English orthography are relatively similar and Dutch spelling closely resembles the pronunciation of the words

<u>Constructing the distracters</u>

The construction of distracters for the identification task aimed at having equally dis similar alternatives over all the items (§ 3 2 4) This permits inferences to be made about the selection of distracters (*cf* Nelson *et al*, 1984) and hence the type of lexical information the emigrants used during reactivation of the Dutch target. For the construction of distracters, verbal reports and responses from interviews and experiments on dormant bilinguals were used. The principal source was the types of incorrect responses given by 24 dormant Dutch emigrants in a pilot picture-naming experiment (*cf.* Ammerlaan, 1987c). Five categories were included because, for instance, the "approximations/circumlocutions" type was too long for the test format, and the "phonological approximations" type proved to be easily misread by emigrants (*e.g.* /oel/ for 'uil') (see Appendix 5.5 for a list of the excluded types). The response types used for the options are listed below (Table 5.6), using the Dutch word for 'asparagus' as example.

Table 5.6. Types of options used in the identification task of the picture-naming experiment.

(a) Correct Dutch name (**asperge**).
(b) English name (**asparagus**): the English name for that picture.
(c) Dutchified name (**asparagoes**): a Dutch pseudo-word that was a literal translation of the English name into Dutch in the case of multi-stem words, or the English name pronounced and written in Dutch phonemes and orthography, using Dutch clusters.
(d) Orthographic Alternative (**uspersje**): the correct Dutch name but spelled in a novel way using Dutch orthography.
(e) Semantic class member (**witlof**). member of that semantic class, based on the experimenter's judgement.
(f) Superordinate name (**groente**) the name of the class to which the item belongs *i.e.* vegetables

The *English* option (b) was included to give the subjects the opportunity to indicate that they had at least recognised the object depicted. The *Orthographic Alternative* (d) was the incorrect option resembling the Dutch target most closely, since it only differed in spelling. The *English* name and *Dutchified* name (c) are semantically related to the target but belong to the other language, with the *Dutchified* option being morphologically and phonologically modified in the direction of the Dutch target. Frequent selection of *English* or *Dutchified* options would suggest that English had affected Dutch access processes, especially if effects of similarity were found during recall and recognition. Since English was the fluent language these options may appear most familiar to the subjects as names for the picture (though they were not the target names). The two semantic options (e, f) were phonologically, orthographically, and morphologically distinct from the target. Selection of type (e) helps determine whether the appropriate semantic area but a related item had been inadvertently accessed. These options were also added to determine whether subjects with lower proficiency in Dutch tended to select these options, rather as was found in a study by Goggin *et al.* (1994) for Spanish.

In most instances, suitable words for the types of "incorrect" options were found for each target word In the cases of the cognates 'ladder", "bus", and "ring", difficulties occurred because distracter type (a) and (b) were spelled the same Therefore the English names were replaced with a semantically and orthographically unrelated Dutch word English "ring" was replaced by "paal" (pole), "ladder" by "snoer" (power cord), and "bus" by "huis" (house) These options belonged to words in the *identical* Category which was expected to be least problematic for the emigrants

5.4 Presentation

All the selected pictures representing the target items were converted into digital images in order to be presented on a *computer* screen (see Appendix 5 6 for technical details) A computer (portable IBM-PC) was used rather than using cards or slides because a computer was easier to handle, was less obtrusive than slide-presentation which required darkened rooms (while visiting the subjects' homes), was less noisy (which improved the quality of the recording of the response efforts and verbal reports), and finally, because this ensured all the items were presented under comparable conditions (which was difficult when using cards)

Conversion of the pictures to computer images was done with great care in order to ensure that nothing but the medium of presentation was different from the pre-test series[13] As in Snodgrass and Vanderwart (1980) and the pilot study, the images were displayed as black lines on a light background[14]

The images were presented in one of five different random orders Each naming task was preceded by 11 practice items[15] All the pictures were preceded by a blank screen for 0 5 seconds, the time needed to load each picture image Each presentation lasted up to 8 seconds to allow ample opportunity for picture recognition and name recall This may appear a very long time, but pilot-testing (N = 9) had revealed that dormant emigrants became irritated if given less time to respond After 8 seconds it was assumed that there was a retrieval problem and the item was marked for re-presentation in the identification task The experimenter also controlled the presentation rate to reduce the effect of disruptions and lapses in concentration

The instructions were to "name the picture as quickly and as accurately as possible" If there were problems, subjects had to indicate what information they had managed to retrieve about the Dutch word The instructions for the identification task were given to the subjects only *after* completion of the naming task All the instructions (see Appendix 5 7a) were read in both languages Responses to any queries were answered in the language used by the subject in making the query

In the identification task, unsuccessfully named pictures were presented again (accompanied by 6 options) in the same order and manner as in the naming task, in order to ensure equal time lag between the tasks over the items Only the order of the options for each word was different in each presentation In this task subjects were asked to say aloud the letter indicating the selected option (*e g* "A") and the option itself (*e g* "asperge") (see Appendix 5 7b) This reduced the influence of mistakes on the preferences expressed The corresponding letter was then keyed in and the next picture presented The computer then matched the letter to the distracter category for that word, and this was stored on magnetic disk

The entire experiment was *recorded on audiotape*, so as to have a verbatim record of the responses (*i e* the types of attempts and any strategies used) Each image on the computer screen was therefore accompanied by an audible beep that ended as soon as the entire picture was flashed onto the screen Responses were recorded on tape using a micro phone attached to a headset, so as to eliminate interference from background noises This facilitated subsequent transcription of the responses

5 5 Monolingual Pretest

The digitalised pictures and the format were pretested on 31 monolingual native speakers of Australian English This made it possible to assess the efficiency of using pictures as recall cues after digitalisation for computer presentation, and to determine whether similarity, length and frequency had been successfully controlled for Information in a "problem-shooting session' after the identification session (see Appendix 5 8 for the instructions) was used to further adjust the digital images so as to ensure these were easily interpretable and had only one name Other comments during and after the session revealed how the subjects selected the options

The Australian subjects (15 male, 16 female) were on average 24 7 years old and had corrected-to-normal or normal vision Most were staff or students at the University of Melbourne They constituted a fairly homogeneous group of well-educated, young adults with a similar socio-economic background

5.5.1 Results

In a few instances the subjects gave an incorrect name, or no name at all, or a non-target name initially. Cases where this non-target name was followed by the target were disregarded. Verbal reports on these instances suggested that the monolinguals provided the target name as a synonymous option, or gave it as a correction after the first response. This information was used in § 5.5.2.

Monolingual "similarity effects"

The monolingual results were used to determine if there were no inherent differences between the bilingual single-stem and multi-stem categories as far as the errors were concerned. The mean percentages of naming errors per category in Table 5.7 suggest that naming difficulties were particularly frequent in Categories 4 (*Phon. sim./diff. Syll.*), 7 (*Diff. Cps*) and 9 (*Mult.D./Singl.E.*).

Table 5.7. Error percentages in the single-stem (n = 62) and multi-stem (n = 16) categories by the monolingual subjects (N = 31).

SINGLE-STEM	CATEGORY	Mean %	Std.dev.
	1. Identical	0.64	1.28
	2. Phonologically similar/ Same num. Syll.	1.63	2.80
	3. Phonologically dissimilar/ Same num. Syll	1.38	2.90
	4. Phonologically similar/ Diff num. Syll.	8 78	16 05
	5. Phonologically dissimilar/ Diff. num. Syll	1 94	4 02
	TOTAL	2.50	7.33
MULTI-STEM	6 Same-meaning components	3.00	6.00
	7 Different-meaning components	9.82	10.91
	8 Single-stem Dutch/ Multi-stem English	2.25	4.50
	9 Multi-stem Dutch / Single-stem English	7.55	8.72
	TOTAL	5.65	7.80

Correlations between the naming errors and 'ObjecSim' and 'SimRat' were not significant ($r = .03$ ns, $r = -.02$ ns respectively). Word-category differences in the occurrence of errors were investigated in SPSSx-Manova using the 'special contrast' option (SPSSx Inc., 1986). Analysis of variance, with naming errors as the dependent variable, shows there were no significant differences between the 9 categories ($F(8,69)$ 0.89, p = ns). Over all the pictures, the multi-stem pictures were not more difficult to name than the single-stem ($F(1,76)$ 0.84, p = ns). Neither the differences within the single-stem group nor the greater length-in-letters and lower frequency of the multi-stem items (as listed in the corpuses) significantly affected recall success for monolinguals

Other analysis of variance conducted separately for single-stem and for multi-stem categories to investigate 'similarity' effects within each showed no significant differences (Appendix 5 9) Over 5 levels the difference between the single-stem categories was not significant ($F(4,57)$ 2 39 p = ns) The difference between the errors made in the four multi-stem categories was not significant either ($F(3,12)$ 0 84, p = ns) This suggests that the nature of the images and their English name did not affect recall differentially between the similarity categories (Appendix 5 9)

Word frequency and word length effects

The results of correlations between frequency and length variables are given in Appendix 5 10a Neither Dutch word length and frequency (r = 07 ns, r = 07 ns), nor 'EnLeng (r = 16 ns) or 'EnFreq' (r = - 15 ns) were related to the error percentages across all 78 items There also was no significant correlation between naming-error percentages in the single-stem categories and the word characteristics Within the multi-stem categories no significant correlations emerged between any of the word characteristics and the errors made (Appendix 5 10b) For each picture in the experiment the error percentages of the monolingual test of the picture images were stored using the variable name 'Cimage'

5 5 2 Picture Ambiguity

Further analysis of the monolingual pretest aimed at ensuring that the now digitalised computer images in the monolingual pretest were as perceptually and lexically unambiguous as in the pencil-and-paper pretest (see variable 'pretest' § 5 2 above) Comparison of the results of both tests (see Appendix 5 11) showed that performance is correlated (r = 34 **), though the amount of variance explained is rather small On the whole, presentation involving the digitalised pictures increased name-agreement

A few retrospective comments on individual pictures made by the monolinguals during the 'identification" session were used to further improve the distinctness of these picture cues for the picture-naming experiment involving the bilingual subjects, although they had not had any significant influence on the monolingual results The picture names and the changes made are given in Appendix 5 12 The new versions were pretested again on staff and students at the University of Melbourne (N = 20), and only if 90 % of these subjects agreed on the adjusted image and its name was the new picture included in the stimuli lists

<u>Brief summary</u>

To sum up, cultural bias, visual complexity and ambiguity in the pictures were controlled for as well as variables related to the picture names, such as frequency of occurrence and length in letters This will allow investigation of recall and recognition as a function of *word type* (single-stem *vs* multi-stem categories), morphological and phonological *similarity*, *semantic transparency* and *stem agreement* The single-stem categories 1-5 were cross-linguistically more similar than the multi-stem categories 6-9 Cross-linguistic phonological similarity was investigated by contrasting categories 2 and 4, and categories 3 and 5 Similarity in syllable numbers was investigated by comparing categories 3 to 5 and 2 to 4 Semantic transparency was investigated by comparing categories 6 to 7, and stem-agreement by comparing categories 8 to 9

No effects of 'form similarity' or effects of word length and word frequency were found in the monolingual pretest, suggesting that the variables had been successfully controlled for For monolinguals, naming errors were not due to frequency or length or to the cross-linguistic similarity" of the English target words

The rating tasks by fluent bilinguals supported the similarity distinctions between the words categories, particularly in terms of phonological features These emigrants also rated the categories of commonplace concrete picture names as equal in frequency of occurrence

The use of 5 distracters in an identification session allowed investigation of possible bias affecting the recognition of the Dutch picture names

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[1] These ambiguously named and identified items had what Snodgrass and Vanderwart called a "H-value" > 0 20 and image agreement less than 4 00 (Snodgrass & Vanderwart, 1980)

[2] Not all *sociolinguistic* variables (*e g* mentioned in Lambert *et al* , 1986) could be controlled Words belonging to gender-specific or home-specific domains in which a picture-name was used could affect the success of recall in L1

To limit the influence of domain-specificity, pictures of objects considered specific to specialised domains were avoided where possible Pretests showed that it was difficult to determine the semantic domain to which each particular word belonged Five mature monolingual speakers of Australian-English were presented with a random list of the English picture names from Snodgrass *et al* (1980), and asked to provide the semantic category label to which every word belonged and to order the words in categories The words were individually presented on cards, and category labels for each word were recorded on a sheet in front of the subject by the experimenter During the task all subjects were observed to frequently change category labels when 'new evidence' (*i e* another word) was shown The results showed large variation in the number of members of each domain and the semantic categories Because (a) the number of items per semantic class were not equal in Snodgrass *et al* (1980) and (b) disagreement occurred about which pictures belonged to which semantic classes, a systematic investigation of the role of domain on L1 attrition could not be conducted Even though the pictures were prototypical of the objects related to that name (*e g* all tables look like the picture of the table) this did not automatically mean they could be assigned to a group (*e g* does "table' belong to 'furniture' or 'utensil'?) The alternative of selecting individual examples of each domain which were matched for frequency and length to examples from other domains was considered to yield unreliable results

The same results were found when cultural specificity was tested for Avoided were words specific to the L1 only because they are unique to Dutch (*e g* 'gezelligheid' = type of coziness, 'botje' = type of skate) or which are restricted to early childhood (*e g* 'slabbetje'-'bib') Words for typical Australian concepts (*e g* 'ute', 'esky') with no direct equivalent in Dutch (type of 'bestelauto', type of 'koeltas') may not be known in Dutch Most affected may be Dutch words representing concepts common to both cultures (*e g* 'tafel' and 'table')

[3] No information was gathered on the age at which the picture names had been acquired, in view of the findings in Berman, Friedman, Hamberger & Snodgrass (1989) In this study, little variation in name agreement and frequency was found in the results of 2nd to 4th grade monolinguals and the adult subjects, suggesting that by age 7 the information processing needed to name pictures is completed

[4] Features were phonological similarity in the first letter, in the first stressed syllable, in the stressed syllable, in the vowel quality in the stressed syllable, in the number of syllables in each word, in stress placement, in the final syllable, in the final letter cluster, and in the final letter

[5] Note that since 'ij' is considered one letter in Dutch it was counted as one letter

[6] The variable frequency of occurrence is related to many other variables For instance, De Groot (1992a) reports significant correlation between 'frequency' and 'imagineability'

[7] No data was available on the vocabulary which the Dutch emigrants had known before emigrating to Australia A plausible approximation of pre-emigration knowledge of Dutch was considered the assumption that the experimental words needed to be commonplace Dutch words for objects

[8] The section on written Dutch only contained 600,000 words whereas the English corpus contained 1,000,000 words Although this somewhat increases the risk of reduced corpus accuracy in the low-frequency range, the scores in the two corpuses were now comparable without the differences in size being too distinct

[9] Several studies have investigated the frequency of occurrence of Dutch words (Beijk & Aan de Wiel, 1978, De Jong, 1979, De La Court, 1937, De Vriendt-De Man, 1971,

Eeckhout, 1968, Linschoten, 1963, Rolf & van Rijnsoever, 1984, Van Berckel, Brandt-Corstius, Mokken & van Wijngaarden, 1965, Van der Geest & Swuste, 1978) Of the ones consulted few were suitable

[10] Such extensive pretesting of new images could not be conducted for financial and pragmatic reasons As a result of increasing awareness of multiculturalism in various emigrant groups throughout the 1980s, more and more emigrants began to be interested in their L1 "as this was now okay". This resulting increase in use of Dutch meant that the potential subject population of 'dormant' Dutch emigrants in the Melbourne region became gradually smaller Since there was not enough time and funding to seek potential subjects in more remote areas, the project had to proceed at great speed

[11] The correlations between the frequency rating and the listed frequency of occurrence were not significant for the multi-stem words This is due to the many missing cases in these categories

[12] A pilot test of an oral/aural version of the naming and identification experiment on dormant bilinguals (N = 10) revealed insurmountable problems in the paradigm Subjects were not able to remember the options in the identification session as "they all sound unfamiliar" All the subjects often "got lost", asking "now what were the other ones again?"

[13] Transformation of the Snodgrass and Vanderwart (1980) drawings into digital images was accomplished with Imaging-software written by the late Rod Dickenson (see Appendix 5 6a)

[14] This had the effect that all images were preceded by a 'flash' when the screen went blank, which could annoy or startle the subjects The alternative of having positive pictures would eliminate flashes, but failed to result in ready recognition of the picture of a 'skunk' in a pretest on 5 monolingual Australians This version was therefore discarded, moreover because this could complicate comparison of the results with Snodgrass and Vanderwart (1980) and the pilot study, in which the pictures had been presented as negatives By ensuring all presentations were in (near-) daylight conditions we were able to reduce the flashing effect

[15] The practice items were a whale, a pyramid, a ball, a skeleton, a shirt, a trumpet, a bear, a windmill, a bicycle, a belt, and a pram

CHAPTER SIX
THE BILINGUAL PICTURE-NAMING AND IDENTIFICATION EXPERIMENT

(giraffe/giraf) " *'n erm hoe heet zo'n beest erm heet zo'n lang beest? ermm Ja, weet ik niet* " [a erm, what do you call such a long animal again?, erm Yes, I don't know] (Pilot N)

6 1 Introduction

The method of presentation for the dormant bilinguals was exactly the same as for the monolingual pretest except that no verbal reports were specifically elicited during the identification session (Appendix 5 8 lists the monolingual instructions)

The experiment was analysed in respect of three sources of data spontaneous verbalisations during the naming and identification sessions, errors made during both sessions, and the type of distracter selected in the identification session

Analyses of the results concentrate on the distribution of errors (*cf* § 3 4) The 'naming errors' in the recall session were studied to determine the types of words for which recall processes in Dutch resulted in non-target responses The 'identification errors' in the recognition session allow insight into recognition processes that led to one of the distracters being chosen Both results were compared to investigate whether recall failure was due, for instance, to access difficulty (in which case identification was faulty as well), or to 'derailments' (processing slips) during attempts to speak Dutch, in which case only naming was unsuccessful Slips were expected to be the result of being 'rusty' in accessing and retrieving Dutch rather than, say, illustrating incomplete acquisition of Dutch Spontaneously given responses, reports, and strategies by the 64 dormant Dutch-English bilinguals were employed to help interpret the results of the analyses of the errors Responses were very slow (often several seconds) so that reaction time analysis would not reveal much about the processes involved (as it had done in monolingual experiments) As evident from the pilot data, many activities other than picture-naming processes occurred before the emigrants provided the name, making interpretation of reaction times and comparison with previous experimental picture-naming research difficult

Outline

This chapter is organised as follows Spontaneous verbal reports and types of strategies which were spontaneously given were analysed first (§ 6 2) In § 6 3 the analyses of the error percentages in the two tasks are presented, including an investigation of the extent to which the emigrants' linguistic background influenced the distribution of errors (§ 6 3 2) After this, the data for recalling and recognising the Dutch picture names in each category are compared Comparison of the disproportionalities between the two sessions together with the verbal reports (§ 6 3 3) are used to examine the cause(s) of the problems during retrieval of the Dutch words From § 6 4 onwards the number of errors in each word category are investigated, starting with possible effects of lexical characteristics (§ 6 4 1) and the results for the single-stem and multi-stem categories (§ 6 4 2) Investigated next are the effects of the type of similarity of form in the naming errors and the identification errors, first for the single-stem (§ 6 4 3), then for the multi-stem (§ 6 4 4) categories Specific effects (*e g* similarity in the number of syllables, semantic transparency, stem agreement, and phonology) on the number of errors were studied by means of similar analysis of variance 'over subjects' as used in the monolingual experiment (§ 5 5 1) and, when several word characteristics are at issue, by means of analysis 'over items' Where relevant, analysis involved the 64 dormant Dutch emigrant subjects divided over three levels of residual Dutch proficiency (*cf* § 6 3 2)

Types of identification errors (*i e* the number of the distracters selected during the identification task) are analysed in § 6 5 The aim is to examine whether the type of word and level of ResProf affects the selection of distracters This could show the extent to which subjects were misled by the options, which points to the type of information on the Dutch lexicon most frequently affected by 'being rusty" Combined, the results of the three types of analyses (reports, errors, and distracters) help to determine whether inability to provide the target name during the naming task was caused by confusion about the appropriate Dutch name, not knowing the name, or problems in accessing or in retrieving the target

6 2 Verbal Reports and Strategies

The responses and spontaneous verbalizations by the bilingual subjects were transcribed orthographically (the conventions are reiterated in Appendix 6 1) This data shows that in many cases long pauses preceded the response When subjects "thought aloud", the verbalizations suggest that recall and recognition attempts were 'reconstructive/analytical' rather than 'holistic' *i e* several types of attempts were made during the recovery of a particular word from memory (*cf* Ammerlaan, 1984, Kellerman *et al*, 1990) A selection of the variety of transcribed response types is given in Appendix 6 2 and 6 3 (*nb* as in earlier chapters, the target and its translation are given in brackets, ' ' indicates English and / / a comment by the experimenter, the subject is indicated by PICT, retrospective comments are underlined, and the words which are particularly illustrative are printed in bold)

Subjects were rarely very certain, as is evident from the following transcript:

- (fence/hek) " 'n hek 'or a fence' erm /Which one?/ Palings paling, Oh, 'n hEk **'I don't think that is right, but.'** ' (PICT 78)

Various linguistic or communication strategies were used in the *naming* task, as illustrated and discussed in Appendix 6 3 Since the subjects used these strategies to tackle linguistic problems, the nature of these 'recall' and 'recognition' strategies is similar to problem-solving activities (PSAs) in general contexts and PSAs in language-learning contexts (*cf* Ammerlaan, 1984, 1987c) The two examples below clearly illustrate the parallels with what in other studies are called "retrieval strategies" (Olshtain & Barzilay, 1991, Ritter *et al.*, 1973), "recall strategies" (Glahn, 1978, Read & Bruce, 1982, Williams & Hollan, 1981, Zimmermann & Schneider, 1987), or "compensatory strategies" (Altenberg & Turian, 1991, Poulisse, 1990)

Approximation:

- (strawberry/aardbei) Dat 's 'n **uidebaa**, erm erm erm 'n aardbei " (PICT 15)

Paraphrase:

- (elbow/elboog) " Armbocht **arrembocht** " [=arm bend] (PICT 13)
- (watering can/gieter) " Oh! SIGH 'What is it in English? erm erm Erm, **The thing you fill- put water in if the plants with.'** That will do' LAUGH 'Watering can'" (PICT 47)

Both the strategies and the reports illustrate that during the accessing of relevant (lemma and lexeme) information, problems were perceived which resulted in abandonment, avoidance, or in attempts to achieve the original communicative goal by alternative means (*e g.* a semantic neighbour from Dutch or English, morphological adjustment of an English lemma or a description/paraphrase of the features of the target concept).

In addition, as in TOT states, the reports show a systematic use of information such as the meaning and form of the target word, its length, its similarity to other languages (*i e* English or German), its context of learning and use, and other metalinguistic knowledge The appropriateness of these features suggests partial recall of the target information. Examples are

Semantically related neighbour:

(spoon/lepel) " 'Spoon' erm LAUGH **'n vork, ...'n mes,** LAUGH 'What is it?' /I'll tell you later on / [a fork, a knife] (PICT 42)

- (rabbit/konijn) " **'n paard** 'No, I don't know No' erm, 'n paard 'is a horse No ' (PICT 3)

Form-related neighbour:

- (ruler/lineaal) " TZK Erm da's 'n erm 'n 'ruler', erm **'n lijn** TZK 'Can't think of it SIGH No'" [a line] (PICT 78)

Semantic feature:

- (chain/ketting) ' erm 'Chain Chain' **metaal**, 'No I don't know what the word for chain is ' [metal] (PICT 29)
- (onion/ui) ' Oh erm erm uien ui I had to think of **what makes you cry**, and erm' uien (PICT 13)

Episodic feature:

- (peacock/pauw) " erm It is a peacock, erm'.....TZK SIGH. TZK..'Go on' . **'My daughter used to have them on the farm.'"** (PICT 78)
- (grasshopper/sprinkhaan) "...een . een.. erm..**'Hang on, let me sing a Dutch song a minute': Daar hum hum ..en zwaaide met z'n hoed.. hum hum hum hum.. hum.. hum... 'There's a sONg about him'... Een kleut- erm ern..Klik- kikker..kikker..**'No' .Da dum hum hum hum .hum . 'Oh, I don't know.'" (PICT 58)

Form feature:

- (axe/bijl) " . erm...**'starts with' ij.** ij ...... 'No'.." (PICT 85)

Subjects had an idea of the target word, but often could no longer (correctly) recall the Dutch entry in full. Other examples (listed in Appendix 6.2) also illustrate how the emigrants used this information to reconstruct the words and to monitor the response:

- (lemon/citroen) " .'erm .... Now, ... HAHA It was there a minute ago!'....erm. Citroen!. Yeah .**'I knew it was something with' OE. 'I couldn't get tha- LAUGH where the word came from.'"** (PICT 13)

The systematic use of lexical information sometimes resulted in a cross-linguistic mix. For instance, the use of Dutch "strui" in the attempt below indicates some knowledge about the target ("<u>strui</u>svogel") which is confused with the English "<u>ostr</u>ich":

- (ostrich/struisvogel) "**...... ostruik 'tha- that is Austria'...erm...Struik...'Emu'....os....ostruik.**" (PICT 29)

The dissection of the intended meaning and form into its features apparent in the verbalizations is a common feature of linguistic PSAs (Newell & Simon, 1972; Underwood, 1978). The systematic use of specific form and meaning characteristics of the target words (*cf.* phonemes, syllables, associations) may to some extent reflect characteristics of the nature of bilingual retrieval processes, or at least the information considered during these processes[1].

As already stated, the strategies and reports often involved the use of *English* features such as English translation equivalents, English words related in form and/or meaning to the target word, morphological/phonological adjustment of the English picture names (Dutchification), and transpositions of English semantic elements into Dutch (literal translation). English either came in at the outset or was part of a PSA to reconstruct the target word. Very clear examples below involve 'to sweep' in PICT 15, which was Dutchified, and 'butterfly', which was translated literally:

- (broom/bezem) " .erm ..**zweepertje**....erm. 'n bezem." (PICT 15)
- (butterfly/vlinder) "..'Butterfly' . **'butter', boter...'fly', vlieg... 'Butterfly',..botervlieg?...**" (PICT 53)
- (ironing board/strijkplank) " ...erm .'n strijk tafel..... **'I translated this'** (PICT 85)
- (spider/spin) " Spin. **'It is like being retarded, having to think for words, it is so simple.'**/xxxxxx/ 'I don't know with these ones ' 'Because that is, some of them I can directly translate, I mean...look- think about in English, and over they-... But' spin 'Ni-, I don't erm.. I don't know how I got that one ' .. . 'Trying to think of a nursery rhyme I think. Visualize a nursery rhyme ' (PICT 25)
- (leg/been) " erm **'Leg,..leg, leg, leg, leg, leg,**...No .. No idea in Dutch'" (PICT 47)
- (toothbrush/tandenborstel) " **te- toes..toest... bussel**..'No, not a' bussel **'I don't know, something like that anyway!'** LAUGH" (PICT 79)

English morphemes emerged in the Dutch attempts, which were sometimes given English phonological features ("leg") as well as Dutch phonological ones ("zweepertje"). It appears that the pictures "triggered English words before the Dutch", and the English information was used to access or reconstruct the Dutch target name:

- (banana/banaan) " 'banana' banaan, sorry " (PICT 8)
- (violin/viool) "'Violin'.. TZK 'Don't know how to say violin in Dutch ..Sorry ' LAUGH " (PICT 17)
- (elbow/elboog) " 'elbow' erm .'I said elbow, but it is n-'. ./It is not/ 'It is the English word, isn't it?'. 'Can't think of the Dutch one .' /hmn/" (PICT 62)
- (retrospectively) " [What I found was that the **English was..trying to dominate** with selecting a name And. I'd go to say the English, and then all of a sudden realized NO I was forcing, I was forcing an ENGlish version of the word whereas there was a different version .Yeah, You sort of recognize the English. /yeah/ you know, in in a word sometimes]" (PICT 23)
- (rollerskates/rolschaats) " Ah, da's 'n erm... 'I think I had those too.'..Erm ff- erm Ja. Zijn niet "schaatsen", maar 't zijn r- rOl roler. Rolschaatsen /Rolschaatsen/ yeah /How did you get that?/ 'Well, that erm rOllerskates, and erm. then I had to say LAUGH' ja, schaats, 'and erm roll', 'Yeah, sort of **had to..go from English to Dutch a bit**, I think.' /ahum/ " [. Ah those that is a erm I think I had those too Erm Ja They aren't "skates", but they are rOll roller...Rollerskates /Rollerskates/ yeah /How did you get that?/ 'Well, that erm rOllerskates, and erm then I had to say LAUGH' ja, skate, and erm roll, Yeah, sort of had to. go from English to Dutch **a bit**, I think ' /ahum/ "] (PICT 5)

Judgements of *phonological/orthographic* similarity of the target to English often featured in the recall attempts:

- (giraffe/giraf) "...'n sje giet ge ..**'Don't know how to say it in Dutch, but it'd be the same!** It is a' gi.. raf? . /ahum/" (PICT 82)
- (violin/viool) "'Violin, I imagine that would be **mUch the same in pronunciation**' erm.. er Vioolin? (PICT 26)
- (retrospectively) " ['There were a lot of words there that were very similar to the English words And they are fairly easy And it is when you have a drastic change that it gets a bit hard']... " (PICT 4)

As in the fluent bilinguals in the rating task (§ 5.3.3.1), dormant bilinguals apparently based their intuitions on similarity in "**sound**" between the Dutch and English words. Subjects did not distinguish further as to the type of similarity, or as to whether similarity was based on the activated English word or was part of the partially recalled Dutch target.

A few reports illustrate that the use of this perceived similarity to English not only assisted, but sometimes also inhibited recall attempts, particularly when subjects considered Dutch and English names "too close" to be plausible:

- (crown/kroon) "...'Crown.. I know the word for King.. but I don't know ...' Kroon! . 'It is **too close** to English!'" (PICT 7)

Apart from close similarity, other verbal reports suggest that emigrants sometimes blamed the quality of the computer images for not being able to remember the Dutch words:

- (needle/naald) " .Nee 'n erm 'sideview' of 'n mEs LAUGHS 'I didn't know what that was in English, either, mind you.'" (PICT 34)

- (balloon/ballon) " huh? /You- you don't know it?/ 'I I don't know what it looks like, not even in English!' /OK/" (PICT 87)

This could, however, also be merely an expression of frustration since extensive pretesting had not shown up any difficulties in respect of the pictures.

Voluntary verbalizations during the *identification* task indicated that motivations for selecting a non-target option were twofold: either the selection was due to satisficing or it was considered (closest to) the target Dutch word (*cf.* Appendix 6.2).

- (pram/kinderwagen)" ...erm...'it could be *A*' 'n kinderwagen... 'or *C*' 'n poppenwagen ./Which one?/ ... 'Oh, **I'd say** *A*' kinderwagen (PICT 82)
- (elbow/elboog) "..'elbow', elboo..elbo.. KniE, 't is nie knie'.. Elboo, 'yeah, which one?' ..'Oh, ***B* will do.** LAUGH '" (PICT 79)
- (pineapple/ananas)" .SIGH...'See', sinaasappel 'is an Indonesian word. .or is' ananas 'the Indonesian word. See this is where I get very- mixed up ' .. Sinaasappel, of .erm .ananas...tzk...annenas... 'Oh, **I'll take a punt on this one,**' *F*, ananas." (PICT 82)

Whereas pronouncing the words was occasionally a problem in the naming session, spelling sometimes caused problems in the written identification task:

- (nose/neus) "'Nose...oh shit ..It is'.... neus? Neus? /Yeah/ 'Yeah'.... /A guess or?/ 'No, I I knew it but was trying to think of the right way of pre- pronouncing it.' /Hmn/, 'And that is the case with some of those words, I think.' 'Well, I'm pronouncing it wrong, right or wrong.' /Well, it doesn't matter./ 'Yeah .. afraid of getting it wrong, I don't want to be embarrassed by it.'" (PICT 50)

Just like pronunciation was used to occasionally guide recall attempts, spelling was also used to assess how plausible an option was in the recognition session:

- (pig/varken) " .... 'No . I think it starts with' aard 'but I'm not sure '" (PICT 64)
- (star/ster) "'n staar ..... aaa .. 'Maybe with' a . .../What are you looking for?/ 'It might be a long, odd name .. ..No it is an odd name '. /No?/.......... Staar . ..'being such an odd word, that I, You know, it is shining, isn't it?' /Yeah/ ...." (PICT 16)

- (umbrella/paraplu) "'I know it is a' paraplu 'but how do you spell it?' .Ja..*D*, paraplu..../Ja/ .'I didn't know what is the spelling.' (PICT 87)
- (guitar/gitaar) "... .. 'Ah, don't know which one. guitar guit'aar...snaarinstrument...snaa instrument. .. hmn.. 'No, I don't know that one. /Guess?/ . *D*, sounds Dutch.'" (PICT 86)

In addition, intuitions on similarity were frequently used in the identification session as well.

In short, the features above illustrate the attempts by the subjects to fully access and retrieve all the lexical information, as well as monitor the output of their attempts. It is assumed that, irrespective of whether reconstruction or recognition or guessing was given as the reason, choices were made on the basis of some residual knowledge about the word or general "intuition" about Dutch and English during the instances of partial recall and recognition. The next sections describe whether the type of word and/or the biolinguistic background provided a basis for this information.

6.2.1 Distribution of Types of Strategies and Reports

Mostly the Dutch picture names were provided without much additional information, "popping up" after some hesitation:

- (asparagus/asperge) " erm..as-...asperge 'yeah!'" (PICT 2)
- (rabbit/konijn) "'Erm I think I know it but I can't erm' ke-, . konijn /How did you get it?/ 'No, it just came, I knew that I, is it right?' 'I knew that I knew though I, though I knew it but I couldn't find it' /hmn/ 'No It suddenly came.'" (PICT 9)

Success in naming reduced the number of instances in which reports and strategies became apparent in the data: analyses of the verbalizations therefore concentrated on the instances of incomplete access and retrieval. An added difficulty in computing distributional properties was that the subjects used many types of strategies, as well as set strings of several strategies (*i.e.* clusters) that seemed related to one another, rather than one-off holistic attempts. Often the combination of 'Dutchification'-'literal translation'-'approximation'/ 'paraphrase' was given. There appeared to be some sequential order in which types of strategies occurred: some features typically appeared initially, others typically in final position. This is illustrated in Figure 6.1.

Figure 6.1. Possible preferential relations between the types of strategies that occurred during attempts to recall Dutch picture names by dormant Dutch emigrants.

	initial features	--------------------------------------		final features	
	Eng formal Neighbour	Dutchified		Episodic feature	
ENGLISH --	Eng semantic Neighbour --	lit.translation --	DUTCH --	specification	-- Don't know
	Dut semantic Neighbour			semantic feature	

Attempts involving English tended to occur first, and only as a final resort did subjects claim ignorance or inability. Usually, features of the English words were reported before Dutchification occurred, and specification of the word, also by adding episodic information, usually came finally in the verbalizations (Ammerlaan, 1995c). The verbalizations appear to reflect a tendency to tackle the problem globally before concentrating on features.

To facilitate analysis and interpretation, combinations were made of the most frequently co-occurring strings (details in Appendix 6.4a, 6.4b). Combinations included *English-based* (TCLI: English only, English used, Dutchified responses), L1 or *Dutch-based* (TDUTCH: phonological/semantic neighbours, paraphrases, approximations), *form-related elements* (TFORM-

AL. phonological neighbours, features and incorrect pronunciation), *meaning-related elements* (TSEMAN: semantic neighbours and features, subordinate, superordinate), avoidance/abandonment TNODK ("no idea"/ "don't know"), and achievement *communication strategies* (approximations and paraphrases).

Background characteristics

Correlations between the distributions of the various response types and the variates based on the questionnaire data are given in Appendix 6.4c. The data suggests that the more years a subject had spent in the Netherlands (BIO1) and the higher the self-estimates (SE4) were, the fewer strategies such as NODK '*no idea/don't know*' were used. Higher original level of Dutch (BIO1) was also correlated to a greater tendency to report problems in interpreting the computer images. Frustration with their own memory performance appears to be a possible reason why high-proficiency subjects blamed the pictures (§ 6.2). Less proficient subjects with many years in Australia (BIO5) and limited use of written Dutch (SE2) more often resorted to English-based CLI strategies.

Word category

In respect of the word categories, more strategies were used during the recall of *morphologically* dissimilar word categories (*i.e.* differing in stems and in number of syllables) than during the recall of cognate categories (Figures 6.2 and 6.3).

Figure 6.2. Distribution of various strategies during the recall of single-stem words.

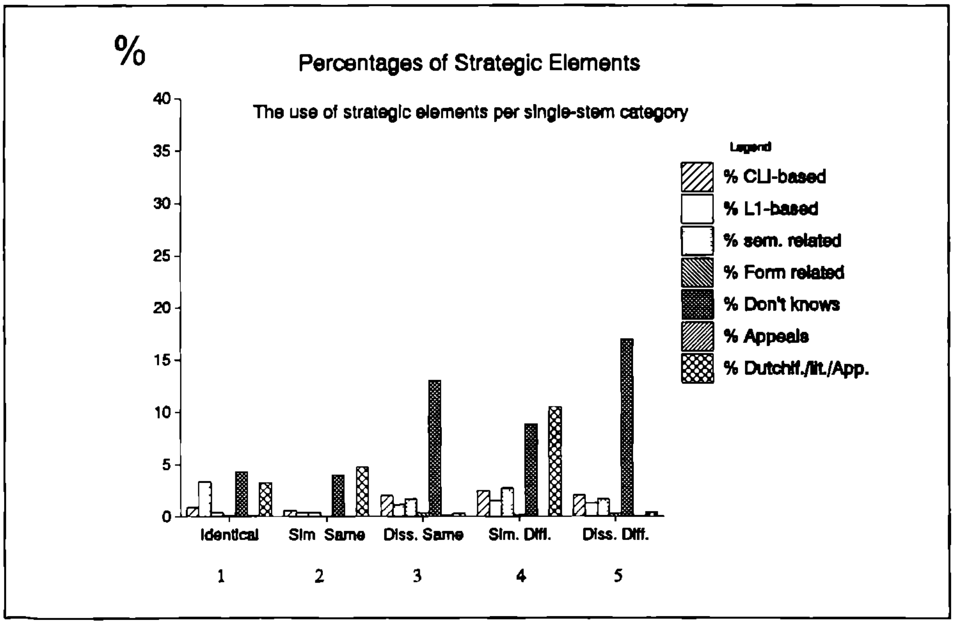
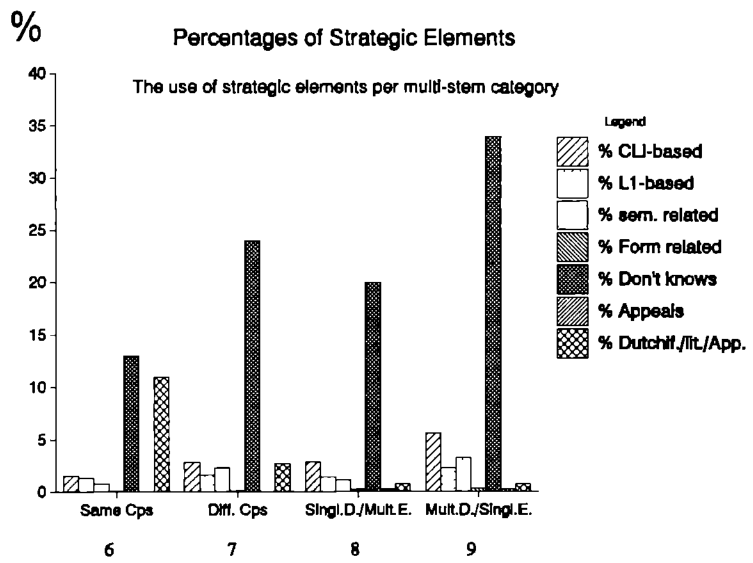


Figure 6.3. Distribution of various strategies used during the recall of multi-stem Dutch picture names.



There also appears to be a marked increase of NODK responses with the less cognate categories (see Appendix 6.4d for the complete set of means). Anovas involving category contrasts showed that English-based elements (CLI) often occurred in the multi-stem categories and in categories 4 and 5 with different numbers of syllables in English (t(69) = -3.60 p = .006). There were also more Dutch-based elements (L1) and more avoidance/abandonment indicators (NODK) in the multi-stem categories (t(69) = -3.53 p = .003/ t(69) = -6.17 p = .000). Category 9 '*Single-stem in English/multi-stem in Dutch*' more frequently resulted in the use of NODK (t(69) = -3.33 p = .018), Semantically-based (t(69) = -3.97 p = .010) and Dutch-based elements (t(69) = -3.03 p = .046) than the reverse (Cat. 8). It appears that similarity in the number of syllables and stems was used to help search for/reconstruct the Dutch target words.

Phonological dissimilarity only had a significant influence on the distribution of Paraphrasing and NODK. Indications of NODK occurred more frequently in the phonologically dissimilar categories, particularly more often in Category 5 than in 4 (t(69) = -2.46 (69) p = .023), and in Category 3 than in 2 (t(69) = -3.26 p = .004). Only between Categories 2 and 3 did phonological dissimilarity significantly increase the occurrence of elements such as CLI-based (t(69) = -3.42 p = .004), Dutch-based (t(69) = -3.93 p = .001), Semantically-based (t(69) = -3.04 p = .007) and NODK (t(69) = -3.26 p = .004). Recall of phonologically dissimilar word categories less often involved the use of '*Dutchification/literal translation/approximation*' as compared with similar categories (t(69) = -2.25 p = .035). These patterns suggest that recall difficulty appears to vary with cross-linguistic similarity, and in particular that the subjects used estimates of similarity to determine if pursuing the search for the full target word would be fruitfull or not. Subjects appeared to have used intuitions on similarity in stem and syllable structure to guide their reconstruction and search efforts, more than phonological similarity only. In the dissimilar categories, CLI- (*i.e.* English-based) elements occurred more frequently in the verbalizations than Dutch-based elements, and Semantically-related more often than Form-related elements. The latter trend is probably due to the fact that, with form-dissimilar words, subjects tended to use the conceptual information.

To sum up, the analyses of the reports suggest that the extent of Dutchification of the responses is influenced by various types of morphological similarity of the word, the level of proficiency of the subject, and the extent of contact with fellow expatriates. Phonological similarity appears to have been used to gauge how feasible the attempts were, as *Dutchifications* were more common in the phonologically similar words than the dissimilar ones. This suggests, therefore, that subjects used knowledge of similarity in attempts to find the Dutch words. Whether this knowledge was residual (*e.g.* remnant of Dutch) or part of the English name (*e.g.* stored when the L2 English words were first learned) was not clear in the verbalizations. The absence of any significant differences between categories 6 and 7 in reports and strategies suggests that reconstruction is a general strategy in cases of difficult retrieval.

The analyses of the distributional properties are limited, however, as relatively few reports of the same type emerged in the data. Another restriction is that the categorization of the nature of the elements and strategies in the response was sometimes ambiguous[2]. Distributional properties therefore cannot be the main thrust of an analysis of the naming attempts in the experiment. As in bilingual speech slips (§ 2.2), the responses must be regarded as being illustrative of the (either deliberate or subconscious) mixing of information accessed in the two lexicons. The sections below examine whether the influence of English that appeared in the spontaneous verbalizations during the recall of the Dutch words was reflected in a pattern of cross-linguistic similarity in the error analyses.

6 3 Error Analyses

Assessing the responses

The decisions about the correctness of each reply during each recall attempt were made according to guidelines ensuring standardization of the responses by the experimenter over subjects and categories The guidelines were the following if the word could be easily interpreted as the Dutch target, the response given during the naming task was 'correct', even though something "sounded unusual about it to the non-Strutch-using experimenter Considered 'incorrect' or naming 'errors' were blatantly Dutchified words, words pronounced with a distinct English accent, dialect names, English names, responses that had not been given by the native speakers in the Netherlands, guesses, and responses followed by dismissing comments, for instance (violin/viool) "vioolin 'No, that is not right' " (PICT 9) and (giraffe/giraf) " 'No' 'Unless it is something simple as "giraffe"' LAUGH 'No ' (PICT 58) The 'incorrect' cases were subsequently re-presented during the identification task

Ensuing post-experimental rating of the emigrants' replies by an independent Dutch-Australian bilingual showed considerable agreement between the assessments by the author and this bilingual The few cases of disagreement on the assessment of correctness (18 out of 5,000-odd replies) were not specific to a category or subject In all instances the experimenter had dismissed a reply as 'incorrect' where the rater would have accepted the response

Data treatment

The raw error scores (*i e* the number of errors per word category) were converted into percentages of errors per category in order to be able to compare between categories Percentages 'identification errors' were calculated over the number of items in each category, not over the number of the 'naming errors' made Even though (as a result of the experimental format) errors made in the identification of the target word were necessarily a subset of the errors made during the naming task, comparison of the two tasks is not trivial as it is highly improbable that subjects failed to recognise a word that they had recalled in the same task format (§ 1 4) Comparison of the tasks concentrated on the degree of proportionality of both error types (over word category), with recognition scores being regarded as a result of a multiplicative transformation of naming errors The residuals per category allowed investigation of whether the reduction in errors in the identification task was significantly different in one or more categories from the other categories and whether one level significantly varied from other levels of ResProf Differences in the ratio between the number of recall errors and the number of identification errors indicate in which categories retrieval processes in Dutch are interfered with most, and in which ones inaccessibility might rather be held responsible for errors Identification errors in this context were taken to indicate the instances where non-recall of the target was the result of absent, incorrect, or inhibited knowledge of the L1 word

After analysis of this task effect (§ 6 3 3), the effects of word categories and proficiency level are examined (§ 6 4) by means of an analysis of variance 'over subjects' (as given in Table 6 7 and referred to in each section)

6 3 1 <u>Overall Error Percentages</u>

The mean percentages of naming and identification errors in each category are listed in Table 6 1 For convenience, the names of the 9 word categories involved are repeated along with examples

Table 6 1 The types of single-stem and multi-stem word categories used in the picture-naming experiment (n = 78), and the percentages of naming and identification errors by dormant bilinguals in each category (N = 64)

CATEGORY	Dutch example	English example
1 Phonologically and morphologically identical	glas	glass
2 Phonologically similar - Same num of Syll + +	zon	sun
3 Phonologically dissimilar Same num of Syll - +	paard	horse
4 Phonologically similar - Different num of Syll + -	asperge	asparagus
5 Phonologically dissimilar Different num of Syll - -	bureau	desk
6 Same meaning components	tandenborstel	toothbrush
7 Different meaning components	sprinkhaan	grasshopper
8 Single stem in Dutch Multi stem in English	vlinder	butterfly
9 Single stem in English Multi stem in Dutch	vingerhoedje	thimble

CATEGORY	NAMING ERRORS	Std dev	IDENTIFICATION ERRORS	Std dev
1 Identical	8 70	(11 56)	3 35	(6 85)
2 Phon sim /Same Syll + +	9 94	(11 42)	4 40	(7 77)
3 Phon diss /Same Syll - +	29 21	(25 28)	7 10	(10 47)
4 Phon sim /Diff Syll + -	45 47	(27 99)	17 34	(20 01)
5 Phon diss /Diff Syll -	37 83	(27 55)	12 28	(12 43)
6 Same Cps	42 58	(36 91)	12 89	(20 41)
7 Diff Cps	61 72	(27 08)	12 11	(17 81)
8 Sing Dut / Mult Eng	48 05	(34 88)	26 17	(27 25)
9 Mult Dut / Sing Eng	74 61	(25 78)	19 92	(24 47)

Examination of the error scores in each session suggests that the bilinguals were able to correctly name the pictures with their Dutch name in an average 41% of the cases, despite their claims during the screening stage that they "had lost Dutch as a result of non-use". Only in about one in three of the unnamed items (13%) did identification of the target Dutch words fail as well, suggesting that most of the unrecalled Dutch target words in the naming task were accessible for the emigrants. Most perceived "loss" therefore appears temporary in nature, as was also evident from the reasonable results in the Dutch assessments. On the whole, recall of some L1 words was temporarily problematic. This 'temporarity' would also be evident from dependence of the errors on proficiency level and on word category.

A cursory glance at the means in Table 6.1 suggests that 'Category' is an important source of variance in the error distribution: single-stem categories appear to be remembered more successfully than the longer, morphologically more complex, and less similar multi-stem categories. The most cognate categories 1 and 2 appear to be remembered best. The various category differences in Table 6.1 are also in stark contrast to the results of the monolingual experiment (*cf.* Table 5.7), in which no category differences were found.

The various category differences are examined fully in separate sections, starting with the effect of background characteristics on the error percentages (§ 6.3.2). Next, computations are presented of the size of difference in error percentages between the two sessions (possible "task effects"), in order to help identify the source of difficulty (§ 6.3.3). This involves investigation of the disproportionalities between the two tasks. After this, the results are presented of analyses on how category differences were affected by different levels of residual proficiency in Dutch (§ 6.4). Finally, patterns in the selection of distracters are looked into, again in terms of their relationship to proficiency level and word-type.

6.3.2 <u>Adjusting for Levels of Residual Proficiency in Dutch</u>

Before studying the main aspects of the picture-naming and identification experiment (*viz.* task differences and the effects of word categories) it was investigated *whether* and, if so, *how* the relevant dependent variables (naming and identification error percentages) co-vary with the variates summarizing the questionnaire and assessment data (*cf.* § 4.5.3). On the one hand this investigation is empirically interesting in itself, and on the other hand it may help detect blocking factors which may be relevant for the partitioning of subjects into subgroups on the basis of their biolinguistic background and current performance in Dutch. This refers to factors that may help answer questions as to either the generalizability or the interactive nature of the experimental findings

The relevant correlations between the biolinguistic and assessment variables in the sample have already been presented in § 4 5 4 Identification of specific background variable(s) that co-vary with the various dependent variables to such an extent that these may affect the experimental outcome can only now be established as the dependent variables (the error percentages) were not available earlier As a first step in this identification, correlation coefficients were calculated between the variates from § 4 5 4 and the error percentages (see Table 6 2)

Table 6 2 Results of correlations between the variates based on the biolinguistic background of the subjects and the error percentages (N = 64).

	Nam Errors	Iden Errors		Nam Errors	Iden Errors
SE1	-0 156	-0 159	BIO1	-0 433 **	-0 386 **
SE2	-0 321 **	-0 370 **	BIO2	-0 130	-0 101
SE3	0 004	0 048	BIO3	-0 174	-0 161
SE4	-0 547 **	-0 537 **	BIO4	-0 256 *	-0 341 *
SE5	-0 209	-0 283 *	BIO5	-0 418 **	-0 359 **
ATT1	-0 196	-0 252 *	TASK1	-0 781 **	-0 803 **
ATT2	-0 141	-0 106	TASK2	-0 038	-0 083

Limiting the discussion to the coefficients that are significant at the 0 01 level (to keep the overall α at reasonable level) there are two similar patterns of correlations for naming and identification errors In both patterns TASK1 convincingly outweighs the other variates, indicating that '*residual proficiency in Dutch*' must be considered the main subject factor responsible for variation in the error scores Confirmation of this is found in the strong correlation with SE4 (*self-estimate of proficiency in Dutch*) which can be considered an alternative measure of the same trait Next in magnitude are the variates BIO1 (*original level of Dutch*) and BIO5 (*contact with fellow expatriates in Australia*) The former represents the degree of pre-emigration experience in Dutch, the latter the extent of contact with Dutch in everyday situations through, for example, spouse or expatriates The last variate to satisfy the established criterion is SE2 (*written use of Dutch*).

This preliminary correlation analysis can, of course, only be the first step in the search for possibly fruitful blocking variables to be used in the error analysis To this end, the interrelations between the predictors of the errors have to be analysed as well Therefore, as a second step, two stepwise multiple regression analyses were performed, one of the naming errors on the various variates, and one of the identification errors

The first stepwise regression, again using an alpha of 0 01 for the adoption of predictors following the same reason as that given above, resulted in a one-predictor solution

Nam Errors' = 25 72 -11 96 * TASK1

The associated "multiple correlation" (of course equal to the simple correlation of -0 78 given above) accounts for 61% of the variation in naming errors The remaining partial correlations of the above-mentioned variates, not adopted in the equation, are -0 143 (SE4), -0 056 (BIO1), -0 159 (BIO5), and -0 254 (SE2) Comparison of these partials with the original correlations indicated that (at least for SE4, BIO1, and BIO5) their impact on naming errors seems to be mediated by TASK1

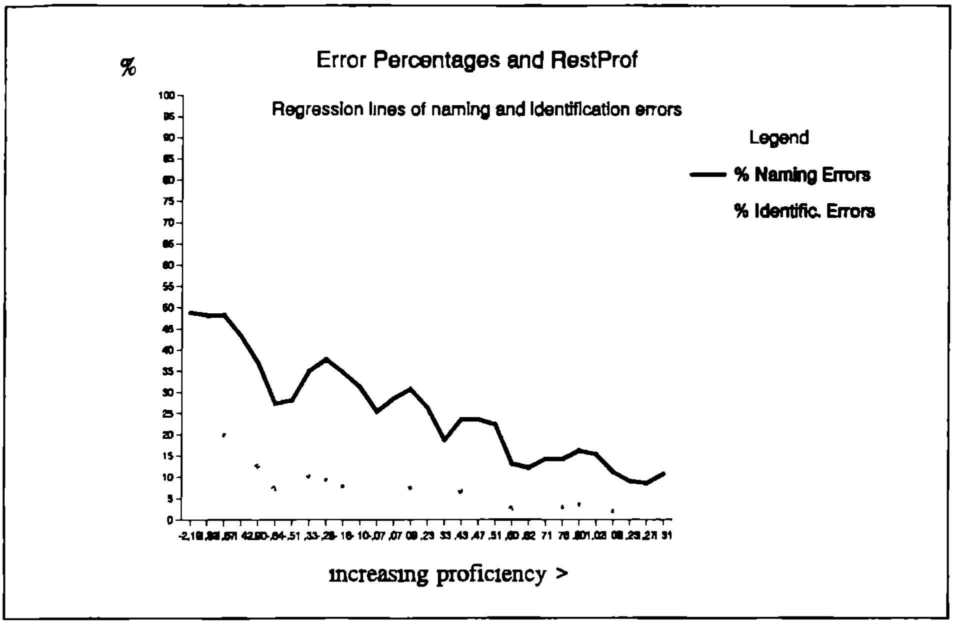
The second stepwise regression for identification errors resulted in two predictor solutions

Iden Errors' = 7 86 -5 78 * TASK1 -1 59 * SE2

The associated multiple correlation coefficient is 0 82 and the variation accounted for is 69% Again, TASK1 was the predominant predictor After its adoption, in the first step, the partials of the 'variables not in the equation' were of the same size as in the regression of the naming errors -0 098 (SE4), 0 056 (BIO1), and -0 042 (BIO5) Only the partial of SE2 '*written use of Dutch*' (-0 343) was large enough to warrant the adoption of this predictor in step 2, as it accounted for a significant extra percentage of variation in identification errors of 4 2% (over and above the 64% explained by TASK1 alone) Experience in writing Dutch seemed to help subjects significantly in identifying the target words in the identification session with its 'written' format, but to such a limited degree that introduction of SE2 as an additional blocking factor in the experiment was not considered To improve transparency, the variate TASK1 was called 'ResProf' (residual proficiency in Dutch)

The relationship of this between-subjects factor to the error scores is illustrated in Figure 6 2 This shows an increase in naming and identification error percentages with lower ResProf The plot not only shows decreasing error levels with increasing ResProf, but also indicates that the graphs converge There is a general visual suggestion that identification errors and naming errors co-vary proportionally, although, upon closer inspection of the graphs, the ratio of identification errors to naming errors seems larger at the lower ResProf levels than at the higher ones The percentage of errors made varied with the level of ResProf, suggesting that with lower ResProf levels relatively more identification errors were made

Figure 6 2 Regression of naming and identification errors with decreasing level of ResProf (N = 64)



This suggests that, if the subjects with low scores on ResProf (*i e* low age of departure, little contact with fellow Dutch emigrants and the Netherlands) were not able to retrieve the name they also had relatively more difficulty in accessing the target name in the identification session This issue will be addressed in detail in § 6 3 3

Correlations between the constituent variables of ResProf and the percentages of errors showed higher significant p-values between the written assessments and the number of identification errors than with the naming errors (*e g* $RDUC_{iden}$ $r = -68$ $p < 0001$, $RDUC_{nam}$ $r = -58$ $p < 0001$, $REDD_{iden}$ $r = -66$, $p < 0001$, $REDD_{nam}$ $r = -53$ $p < 0001$) The scores of the fluency tests and the error percentages were more closely related for the naming errors tha the identification errors (FLD_{iden} $r = -61$ $p < 0001$, FLD_{nam} $r = -68$ $p < 0001$)

Subject groups

To facilitate the study of potential interactions of the experimental findings with ResProf it was decided to divide the subject sample into 3 groups with respect to ResProf 20 subjects who performed very poorly on ResProf (labelled poor'), 20 subjects who performed well on ResProf (high), and 24 subjects who were in between these two (' middle") This decision was strongly suggested by visual inspection of the frequency distribution of the errors

6 3 3 Differential Task Effects Naming and Identification Performance

Central to the experiment is the question whether Dutch words corresponding to the images were no longer accessible (*i e* were neither named nor identified) or were difficult to retrieve (*i e* were not named but were correctly identified) for certain types of words and certain emigrant types To address this question, comparison of the error percentages in both tasks is highly relevant

Regression of the subjects' overall identification error percentages (Y) on the naming error percentages (X) yielded a regression line (Y' = -0 167 +0 322 * X), the intercept of which hardly differs from zero and justifies the conception of identification errors as a multiplicative transformation of the naming errors On the basis of the total numbers of identification (511) and naming (1603) errors, this transformation can be calculated as Y' = 0 318 * X It will prove useful to take the Ratios of 'Identification errors to Naming errors' (INR) under the various ResProf/Category combinations and relate them to this overall INR value of 0 318 Investigation of possible variation in the proportion of unrecognised items with the categories would help determine whether the strategy adopted by some emigrants had been the same regardless of the extent of similarity ("assume similarity - Dutchify the lot, irrespective of the Dutch target"), or whether specific residual knowledge on each word guided the use of English lexical information Analysis of the variation in the proportional differences between identification errors and naming errors in the categories provides information about the size and nature of the retrieval difficulties in each category

Table 6 3a is presented in order to facilitate these comparisons The first two figures in each of the cells give the frequencies of the naming and identification errors in the corresponding ResProf level/word Category combinations The third figure in each cell provides the corresponding 'Identification Naming Ratio'-value, expressed as a percentage

Table 6 3a Frequencies of naming and identification errors and INR values per category and ResProf level (N = 64)

NAM IDEN INR	1	2	3	4	5	6	7	8	9	Σ
poor	48 15 31	38 16 42	129 37 29	133 64 48	182 65 36	62 22 35	67 19 28	63 38 60	77 27 35	799 303 38
middle	23 7 30	26 9 35	85 17 49	105 37 35	109 31 28	41 9 22	53 8 15	41 19 46	68 16 24	551 153 28

high	7 5 71	7 2 29	29 5 17	53 10 19	48 9 19	6 2 33	38 4 11	19 10 53	46 8 17	253 55 22
Σ	78 27 35	71 27 38	243 59 24	291 111 38	339 105 31	109 33 30	158 31 20	123 57 46	191 51 27	1603 511 32

The marginal INR values ('poor' 38%, 'middle' 28%, and 'high': 22%) confirmed the impression given in Figure 6 2 that the ratio of naming to identification errors decreases as ResProf increases At lower ResProf levels relatively more identification errors were made, indicating relatively more accessibility problems, at higher ResProf levels retrieval problems seem to predominate The significance of these differences is discussed below

Likewise, the marginal INR values in the bottom row of Table 6 3a suggest that categories differed in the extent to which retrieval or accessibility problems occur At the one end of the scale is Category 8 '*Sing Dut /Multi Eng* ', where an INR value of 46% suggests relative great difficulty in accessing its lexical entries, at the other end there is Category 7 '*Same Cps*' with an INR value of 20%, suggesting the relative prevalence of retrieval problems One should, however, be careful not to overgeneralise the deviation of these marginal INR values in terms of main effects, because ResProf and Category seem to interact The relatively high INR value in Category 4 '*phon Sim /Diff syll* ' (38%), for instance, suggests global accessibility/"knowledge" problems which, however, are experienced only by the 'poor' ResProf group In testing the INR values against the overall value of 0 318%, therefore, I concentrated on the separate cells of the table and interpreted them in generalising terms where possible

<u>Testing the INR values</u>

Because the error frequencies in Table 6 3a result from additions of both dependent and independent errors (in these frequencies errors by the same subject and errors by several subjects are lumped together), current cross-tabular analyses were not used (*e g* simple 'Chi-square' or 'loglinear' analysis) Instead, a bootstrap procedure (Efron, 1979, Schils, Van der Poel & Weltens, 1993) was used to estimate, for each discrepancy between the observed and the expected ratio of identification errors to naming errors (INR), the standard error of this discrepancy (the bootstrap standard error, neatly accounting for the fact that the subject is the sampling unit on which Table 6 3a is based) This standard error was then used to calculate and test the normal deviate, corresponding to the above mentioned discrepancy The details of this procedure are as follows

From the original sample of 64 subjects a re-sample involving replacement with the same size was taken 1,000 times, maintaining the original tripartition of the sample (*i e* each sample was actually a triple of the subsamples, formed by the 20 'poor', the 24 'middle', and the 20 'high' ResProf levels) Each (perhaps repeatedly) selected sample subject with his/her scores on 9 categories forms one or more rows of two 64 x 9 matrices (one for each error type) which were subsequently compressed to two 3 x 9 matrices per subject level and category (*i e* these are 'bootstrap replications' of Table 6 3a) For each re-sample the corresponding INR values were computed in the same way as in Table 6 3a For each ResProf level-Category combination this yields 1,000 bootstrap replications of the INR statistic, the standard deviation of which is known as its bootstrap standard error (BSE_{INR}) Dividing the empirical INR from Table 6 3a by this BSE_{INR} yields its normal deviate For testing purposes this can be interpreted by resorting to a normal distribution table

The BSE_{INR} values obtained varied in range from 2 9% for the most numerous ResProf/Category combinations (*e g* 'poor'/Category 5) to 20 5% for the least numerous (*e g* 'high'/Category 1) and yielded the normal deviates (Z-scores) given in Table 6 3b The significant scores are starred in the usual way, the positive Z-values indicate the relative predominance of accessibility problems, the negative Z-values indicate the relative prevalence of retrieval problems

Table 6 3b Normal deviates indicating the relative over- or under-representation of identification errors (*i e* the relative prevalence of accessibility problems *versus* retrieval problems) (N = 64)

Level	1 Iden	2 Si/Same	3 Di/Same	4 Si/Diff	5 Di/Diff	6 SameCp	7 DiffCp	8 Sing D	9 Mult D
poor	0 06	1 36	-0 68	3 12**	1 31	0 60	0 56	4 98**	0 48
middle	0 18	0 27	-2 59**	0 57	0 83	1 36	3 90**	1 60	1 45
high	1 92	0 17	-2 16 *	2 20 *	2 15 *	0 08	4 46**	2 41 *	-2 46 *

Limiting the discussion to the significant differences between the sessions, it can be seen that, on the whole, the more proficient 'middle' group and especially the 'high' ResProf group more often than average tend to experience *retrieval* problems during picture-naming, as most significant Z-scores are negative '*Accessing*' deficiencies (underlying both recall and recognition) appeared more prevalent in the 'poor' ResProf group, where the significant Z-scores are positive The subjects in the 'high' group experienced relatively more retrieval problems than those in the 'middle' group Not all the categories were affected equally for instance, Category 8 was relatively inaccessible even for the 'high' ResProf group

In the similar categories 1, 2 (cognates) and 6 (*Same Cps*) the task differences within the groups were small, suggesting that in the cognate categories Dutch access and retrieval processes were least interfered with Processing problems primarily occurred in the partially similar categories 3 and 4, and in the very distinct categories 5, 7, 8, and 9

The identification errors outweighed their expectation on the basis of the naming errors ('positive' Z scores) in Category 4 '*phon Sim /Diff syll*' in the 'poor' group and Category 8 '*Sing Dut /Multi Eng*' in the 'poor' and 'high' groups It appears that accessibility of the knowledge of Dutch target words was relatively deficient in the categories which are cross-linguistically different only in morphological aspects (syllables/stems) for subjects with little L1 proficiency and exposure Category 8 appears to contain words that are difficult to access for most subjects

Significant 'negative' Z-scores (*i e* predominantly retrieval problems) were found for the 'middle' and 'high' groups in categories 3 '*phon Diss /Same syll*' and 7 '*Diff Cps*', and for the 'high' group also in the morphologically different 4 '*phon Sim /Diff syll*', 5 '*phon Diss /Diff syll*' and 9 '*Multi D / Sing E* The normal deviates suggest that, for the groups with greater ResProf ('middle/high'), partial semantic similarity and phonological dissimilarity between Dutch and English and discrepancy in the semantic components particularly inhibited the retrieval processes in Dutch (*cf* comments such as "too similar", § 6 2) Evidence of this CLI on retrieval is also apparent in the 'high' ResProf group in the dissimilar categories, as also in respect of Category 4 and the most dissimilar categories 5 and 9 relative retrieval problems occurred Unlike the 'poor' ResProf group, the subjects in the 'high' group were able to access information but had difficulty in retrieving all the information of morphologically partially similar '*Diss /Same*' and '*Diss /Diff*' words (Cat 4 and 5) and words with more stems in Dutch than in English (Cat 9) In the more cognate categories 1, 2 and 6 these subjects did not have as many retrieval difficulties Similarity affects processing, although further analysis is needed to determine which type of form dissimilarity was most influential on remembering the partially similar and dissimilar L1 words

In the multi stem categories, retrieval processes appeared to be interfered with in the 'middle' and 'high' ResProf groups for items that had '*different meaning components*' (Cat 7), the semantically more similar Category 6 did not exhibit this pattern It also emerged that Dutch words with a multi-stem base in English (Cat 9) were difficult to retrieve, whereas words in Category 8 were relatively difficult to access Performance in Category 9 may have been affected to a lesser extent than Category 8 because the use of analytical PSAs on the English single-stem words results in recognition of each stem of the Dutch target (*e g* skunk

= animal that stinks, stinkdier). Specific analyses of these and other category differences will be discussed in § 6.4 below.

To sum up, the data on the relative differences between the tasks suggest that 'poor' ResProf subjects not only made most errors, but that these errors were also often due to relative inaccessibility of the Dutch entries. Some attrition of L1 competence, or (less likely) insufficient acquisition, may have occurred in these subjects. In the 'high' group errors were more likely to be the result of English affecting the retrieval processes of Dutch words, particularly dissimilar and partially similar words. These were the emigrants who had most often indicated that they used both English and Dutch languages, whereas the 'poor' emigrants rarely if ever used Dutch. Partial phonological and morphological dissimilarity, different meaning components and a greater number of stems in Dutch than in English inhibited retrieval processes in Dutch of the more proficient dormant emigrants. Accessing Dutch information was least successful when words only differed morphologically (in the number of stems and syllables), but the effect on retrieval processes was less clear. Specific effects are investigated below.

6.4 Category Differences in Error Percentages

So far I have shown that in general more errors were made by lower ResProf subjects and in categories with Dutch picture names that were dissimilar to English. Similar patterns in the naming errors and identification errors are depicted in Figures 6.3 and 6.4 below. Results of the omnibus analysis of variance, using ResProf as 'between' and Category as 'within subjects' factors and the error percentages as dependent variables, are listed in Table 6.4. This shows that the differences between both the ResProf groups and the word categories are significant.

Table 6.4. Results of Anovas on naming errors and identification errors (N = 64).

NAMING			IDENTIFICATION		
ResProf	F (2,61)	31.13 p.000	ResProf	F (2,61)	20.85 p.000
Category	F (8,488)	120 57 p 000	Category	F (8,488)	21.55 p 000
ResProf by Category	F (16,488)	6 10 p.000	ResProf by Category	F (16,488)	3 11 p 000

Although there is a significant interaction between ResProf and Category, visual inspection of Figures 6.3 and 6.4 indicates that the conclusion of there being a main effect of ResProf is justified, since in all the categories the same hierarchy in error scores from 'poor' to 'high' is found.

Figure 6.3. Naming error percentages in three groups of dormant Dutch bilinguals (N = 64).

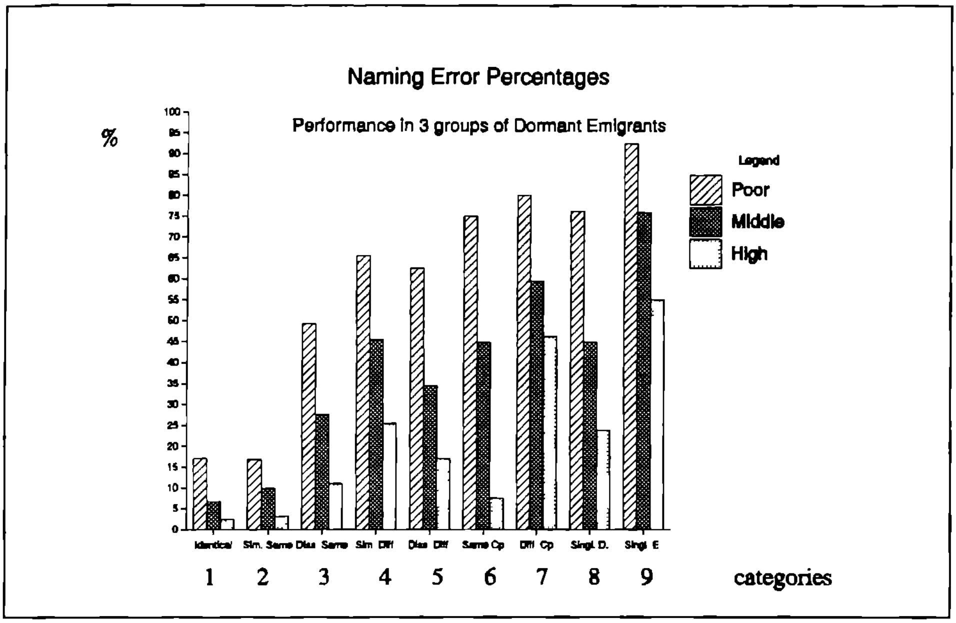
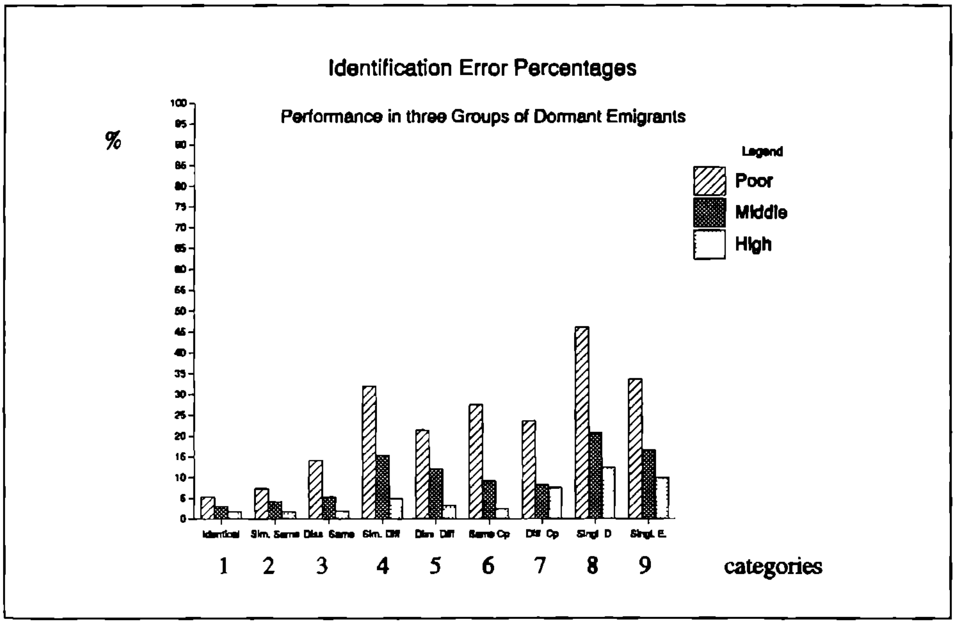


Figure 6.4. Identification error percentages in three groups of dormant Dutch bilinguals (N = 64).



Detailed analysis of the 'Category' factor, however, will be made in terms of simple main effects (*i.e.* ResProf-wise) because the order of categories -- at least partially -- seems to depend on proficiency level (for instance, see the distinct relative position of Category 6 for the 'high' ResProf level in Figures 6 3 and 6 4) Both figures show that, on the whole, the interactions between word category and proficiency are of the ordinal kind across the levels of residual competence in Dutch (ResProf) Following the global Anova, specific category differences were calculated in various simple contrasts (SPSSx Inc , 1986) and the results will be shown in Table 6 7 The specific results (*i e* phonological and/or morphological and/or stem-number) will be handled in separate sections, starting with the single stem items (§ 6 4 3) First, the justifications are discussed which led to the conclusion that the category differences in the error percentages are not merely caused by category differences in word length and word frequency

6 4 1 <u>Internal Validity of the Design</u>

Figures 6 3 and 6 4 illustrate that the percentage of naming and identification errors co-vary with the category differences This section investigates the important question whether the category differences in error percentages disappear when other lexical characteristics of the items, such as unintended differences in word length and word frequency between the categories, are taken into account The averages for various lexical characteristics for all the categories (disregarding, of course, the items for which no frequency information was listed) are summarised in Table 6 5, based on Appendices 5 3 and 5 4

Table 6 5 The means of the item-characteristics of the picture names in 9 word categories, "*miss* " indicates that no information was listed[3]

FEATURE	Ident	Sim / Same	Diss / Same	Sim / Diff	Diss / Diff	Same Cps	Diff Cps	Sing D/ Mult E	Mult D/ Sing E	ALL
DuFreq	28 92	37 22	25 50	12 86	23 20	3 33	miss	12 00	3 00	24 35
EnFreq	27 15	31 10	29 92	18 20	19 42	3 50	miss	4 33	1 00	23 15
FreqRat	4 77	4 54	4 00	4 45	3 89	4 07	3 52	3 17	2 68	4 12
DuLeng	4 5	5 4	4 8	5 7	5 3	11 0	9 2	5 7	11 0	5 9
EnLeng	4 9	5 6	5 1	6 2	4 8	10 0	10 7	9 0	6 5	6 0
ObjecSim	1 79	1 60	0 46	1 24	0 28	1 04	0 32	0 32	0 43	0 94
SimRat	6 09	5 50	1 71	5 23	1 58	4 04	1 94	2 15	1 70	3 61
Krom	4 23	4 09	4 00	4 33	4 28	4 00	5 00	4 50	5 50	4 25
Staphor	9 23	17 00	11 08	3 60	3 84	2 00	1 50	6 00	miss	8 64

In § 5 3 3 2 preliminary investigation had shown that the differences between the categories varying in number of syllables were not paralleled in 'SimRat' for Cat 4 5 *versus* 2-3 (although they did for Cat 8 and Cat 9), and that differences in phonological similarity between Cat 3-5 and Cat 2-4 could be confounded by lower 'FreqRat' values for Cat 3-5 In the light of this, analysis is needed to examine if, for instance, similarity-of-form effects within single-stem categories are weaker with frequent words because these would be recognised and recalled more successfully anyway (*cf* Table 3 1, § 3 3) Similar analysis is needed to examine whether cross-linguistic dissimilarity to English was primarily responsible for the less successful recall and recognition of Dutch words in Categories 6 to 9 compared with 1 to 5 There are many variables, some of which are intrinsically related to cross-linguistic similarity, the principal variable in which words in the single-stem categories differ For instance, longer words scored lower on 'objective similarity' (based on each word feature) than shorter single-stem words because of the method used in assessing similarity Similarly, the multi stem items are by definition longer (in the number of letters), contain more meaning-related morphemes (stems), and are less 'frequent' in Dutch (based on Uit den Boogaart, 1975)[4]

As a first step towards controlling for this "sea of co-variates" it was decided to correlate the co-variates over the items and to factor-analyse the correlation matrix (Table 6 6)

Table 6 6 Results of a PC analysis on the other lexical characteristics of the items in the picture-naming experiment (n = 78)

	Factor 1	Factor 2	Factor 3	Factor 4
Dufreq	76125	- 28019	32983	10698
Enfreq	73492	- 34295	41971	18557
Freqrat	71509	27432	18462	- 36358
<u>Staphor</u>	65727	- 34449	19940	07636
Simrat	61858	72206	- 21586	13192
<u>Objecsim</u>	62360	70236	- 28309	04081
Duleng	- 34433	41064	70659	- 30777
<u>Enleng</u>	- 42261	51110	57887	12937
Krom	- 18372	17228	13400	90553

	communality		Eigenvalue	% of var	cum pct
Dufreq	77824	1	3 16540	35 2	35 2
Enfreq	86831	2	1 86424	20 7	55 9
Freqrat	75289	3	1 33784	14 9	70 7
Objecsim	96398	4	1 13441	12 6	83 4
Simrat	96801				
Duleng	88117				
Enleng	79165				
Krom	90137				
Staphor	59627				

The resulting unrotated principal components in Table 6 6 already showed a clearly interpretable structure among the variables Four factors emerged, which together account for 84% of variance These are *Frequency* (DuFreq, EnFreq, FreqRat, and Staphor), *similarity* (SimRat, ObjecSim), *word Length* (DuLeng, EnLeng) and *Krom*

The next step was to investigate whether the distinctions representing the design structure had any surplus value in accounting for the dependent variables (the naming and identification errors) over and above these variables, with the exception, of course of *similarity* The focus was on the extent to which the word category differences were able to account for a significant amount of variation *after* adjustment of these categories for the non-similarity variates that had emerged from the principal component analysis (*Frequency*, *Length*, and *Krom*) To test the surplus value of the category structure, two multiple regressions were compared First, a restricted model was used in which naming errors (and subsequently identification errors) were regressed on *Frequency*, *Length* and *Krom* Second, an extended model was used in which an orthogonal coding of the category structure was added to the aforementioned predictors The coding followed suggestions about "orthogonal coding with unequal n's" (Pedhazur, 1982 324 ff) In addition the coding was conducted in such a way that it reflects the most important category contrasts, as far as this is possible within a single system of orthogonal contrasts The contrasts chosen were 'word-type' (single-stem Categories 1-5 *versus* multi-stem Categories 6-9), the 'dummy' contrast C1_2345, the cognate contrast C1_2, the morphological contrast C23_45 (*i e* same Syll /diff Syll) and within each morphological pair the phonological contrasts C2_3 and C4_5, the phonological contrast C24_35 (*i e* similar/dissimilar), the phonological contrast C24_35 (*i e* similar/dissimilar) and the morphological contrasts C2_4 and C3_5 within each pair, the 'dummy' contrast C67_89 (Cat 6-7 *versus* Cat 8-9), and finally the multi-stem contrasts C6_7 and C8_91 The test focusses on the question whether, after this extension, the increase in variance explained (R^2_{change}) is significant The various separate contrasts, comprising the design structure as far as they are relevant, will not be discussed here but later on (§ 6 4 2 onwards), along with other relevant contrasts (*e g* C24_35, C2_4, C3_5, defined in a different orthogonal system)

<u>Results</u>

Naming errors (restricted model) Multiple regression of the percentage of naming errors on the factor scores of *Frequency*, *Length* and *Krom* resulted in the following equation

Nam Errors' = 21 16 -11 37 * *Frequency* +1 86 * *Length* +4 68 * *Krom*

The regression weights can be compared immediately as the predictors are factor scores resulting from a principal components analysis and, therefore, both standardised and orthogonal As far as the naming errors are concerned, *Frequency* has most impact (the associated t was -5 55 (df = 42, p = 000), followed by *Krom* with a weight of 4 68 (t = 2 285, df = 42, p = 027)) *Word length* remains (at first surprisingly, but see below) far behind with a non-significant weight of 1 86 (t = 0 91, df = 42, p = 370) The multiple correlation coefficient is 0 684, and so, together, the variates account for 0 467 of the variation in naming errors (F(3,42) 12 289, p < 001)

Naming errors (extended model) After introduction of the orthogonal vectors which code the category structure in the experiment, the multiple correlation coefficient is 0 825 The proportion of variance explained is 0 680 (F(9,36) 8 507, p < 001)

The numerator of the F-ratio of the model comparison test is now formed by the quotient of the increase in proportion of variance explained (0 213 = 0 680 - 0 467) and the associated degrees of freedom (6, see below) The denominator is formed by the quotient of the proportion of unexplained variance of the extended model (1 - 0 680) and the residual number of degrees of freedom (namely 36) The result is

$$F = \frac{(R^2_{extended} - R^2_{restricted}) \,/\, (df_{extended} - df_{restricted})}{(1 - R^2_{extended}) \,/\, (df_{residue\ after\ extension})} \quad \frac{(0\ 680 - 0\ 467) \,/\, (9 - 3)}{(1 - 0\ 680) \,/\, (36)} = \frac{0\ 0355}{0\ 0089} = 3\ 99$$ [5]

The associated p-value is smaller than 0 01, in other words, the 21 3% additional variance accounted for by the experimental design is significant This implies that the category differences in the design account for a large and significant part of the variance in the naming error percentages over and above *Length*, *Frequency* and *Krom*

Identification errors (restricted model) Multiple regression using the identification errors per item involving *Frequency*, *Length*, and *Krom* resulted in the following equation

Iden Errors' = 6 16 -3,73 * *Frequency* -0 13 * *Length* +3 20 * *Krom*

Only the weights of *Frequency* (t = -3 08, p = 003) and *Krom* (t = 3 20, p = 011) proved to be significant The associated multiple correlation coefficient is 0 531 and R^2 = 0 282

Identification errors (extended model) Extension with the design vectors increased the R^2 with 0 122 to 0 404, but this extension is only marginally significant (F(6,36) 1 224, p < 051) However, the reported R^2_{change} is now much larger than in the analysis of the naming errors, suggesting a reduction in power rather than a non-significant influence of the design

The conclusions should, however, be considered with caution From the discussion of the F-test it appears that the numbers of degrees of freedom are 6 *versus* 36 rather than 8 *versus* 62 which the reader might have expected (the df(numerator) being the number of design vectors, the df(denominator) being the number of items (74) minus the total number of predictors (3 co-variates and 8 design vectors) - 1) As a result of missing data in several variables which constitute the variates (*e g* DuFreq, Staphor), the number of items included in the calculation has been reduced to 46 as a result of listwise deletion As a consequence, Categories 7 and 9 are not represented, and Categories 6 and 8 contain one item only One can therefore argue that the analysis above mainly applies to the single-stem items in the design, and even there incompletely, because there are missing cases as well, for instance, Category 4 is only represented by 3 items This small number may partly account for the surprisingly insignificant influence of *Length* on the variation in errors Categories with the longest items, the multi-stems, do not enter into the calculations In order to counter this drawback, the test procedure was adjusted

<u>Revised testing procedure</u>

As a result of the incomplete data on DuFreq, EnFreq, and Staphor the item set concerned had been almost halved and furthermore distorted to the detriment of particularly the multi-stem categories As a result of listwise deletion many cases are missing for the factor scores of *Frequency*, *Length*, and *Krom* The model comparison test was therefore repeated but this time involving FreqRat to represent 'frequency' (as this is complete and highly correlated to DuFreq and EnFreq), DuLeng to represent 'word length' (as this is the variable with the highest loading on *Length*) and the original score of Krom (rather than the standardised version) as the other variables are also unstandardised The naming error results will be discussed first

Naming errors The restricted model resulted in the following equation

Nam Errors' = 50 02 -11 54 * FreqRat +2 83 * DuLeng +2 65 * Krom

The weights for FreqRat (t = -5 429, p = 000) and DuLeng ([1]) (t = 3 575, p = 001) were significant, whereas they were not for Krom (t = 0 687, p = 495) The associated R was 0 688 and the R^2 = 0 473 (F(3,68) = 20 36, p = 000) After the orthogonal design vectors were added to the model, the R^2 increased by 0 255 to 0 729 This increase is "highly significant" (F_{change}(8,60) = 7 061, p < 0 01)

Identification errors (restricted model) Analysis of the identification errors resulted in the following equation

Iden Errors' = 16 63 -4 45 * FreqRat +0 13 * DuLeng +2 49 * Krom

in which only FreqRat had a significant loading (t = -3 686, p = 0 0005) The associated R was 0 502 and the R^2 = 0 252 (F(3,68) = 7 632, p = 000)

Identification errors (extended model) After the design vectors were added to the model, the R^2 increased by 0 209 to 0 460 This increase is significant ($F_{change}(8,60) = 2\ 901$, $p < 0\ 01$)

Returning to the question at the beginning of this section, it can be stated that although the variation in the errors in naming and identifying the experimental images was partly caused by lexical characteristics of frequency and length, the differences between the categories on the basis of cross-linguistic similarity are essential for an explanation of this variation

A useful by-product of this type of analysis, which can be labelled as a co-variance analysis of naming errors between the word categories while controlling for other lexical characteristics, was that the manner of coding (orthogonal) allows the testing of b-weights on the print-out to be interpreted as testing of the contrasts concerned while adjusting for various relevant item characteristics such as frequency and DuLeng Since Krom was incomplete and did not make any significant contribution, the reports on the individual contrasts in each paragraph are based on corrections for length and frequency, based on repeated procedures Details of the t-values of these analyses 'over items' are discussed in subsequent paragraphs (*cf* Appendix 6 5)[6]

6 4 2 Word-type Effects Single-stem and Multi-stem Categories

On the basis of the omnibus analysis it was concluded that, first, ResProf kan be employed as main effect, both for naming and for identification errors and second, that category differences should be examined per level given the interaction between Category and ResProf Third, the preceding paragraph showed that category differences can only partially be attributed to variations in length and frequency In view of this, the logical next step is an analysis in terms of ResProf levels of the theoretically important contrasts between the categories The F-ratios are listed in Table 6 7

Figure 6 5 below illustrates that across all three levels of ResProf the single-stem picture names were retrieved more successfully than the longer, morphologically more complex and phonologically less similar multi-stem categories The simple (*i e* ResProf level wise) contrasts between the single and multi-stem categories (Table 6 7-1) are all highly significant Irrespective of the level of residual proficiency in Dutch, fewer errors were made in the single-stem categories than the multi-stem

Figure 6.5. The mean naming and identification error percentages in the 9 word categories for three levels of proficiency (N = 64).

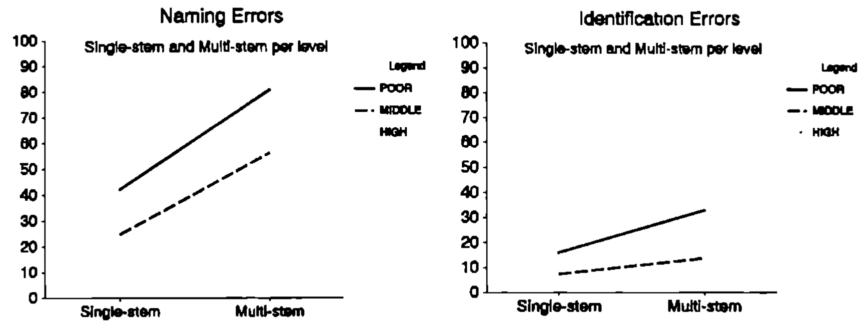


Table 6.7. Results of several 'special contrasts' on the naming and identification error percentages over three levels of ResProf (N = 64).

TYPE OF CONTRAST	Task	'Poor' ResProf	'Middle' ResProf	'High' ResProf
1 single-stem - multi-stem C12345_6789	Naming Identification	F(1,61) 184.61 ** F(1,61) 64 98 **	F(1,61) 145.24 ** F(1,61) 11.33 **	F(1,61) 55.56 ** F(1,61) 5.63 **
2 identical - highly similar' C1_2	Naming Identification	F(1,61) 0 02 ns F(1,61) 1 38 ns	F(1,61) 2.13 ns F(1,61) 0 79 ns	F(1,61) 0 07 ns F(1,61) 0.29 ns
3. morphological. C2_4 phono. similar	Naming Identification	F(1,61) 101.38 ** F(1,61) 56 07 **	F(1,61) 63 57 ** F(1,61) 15 87 **	F(1,61) 21.31 ** F(1,61) 1 53 ns
4. morphological: C3_5 phono dissimilar	Naming Identification	F(1,61) 16 31 ** F(1,61) 8.57 **	F(1,61) 5 83 ** F(1,61) 5.51 **	F(1,61) 3 32 ns F(1,61) 0 28 ns
5. phonological. C2_3 same num. of syll.	Naming Identification	F(1,61) 56 61 ** F(1,61) 10 02 **	F(1,61) 19 43 ** F(1,61) 1 03 ns	F(1,61) 3 42 ns F(1,61) 0.21 ns
6 phonological C4_5 diff. num. of syll.	Naming Identification	F(1,61) 0.43 ns F(1,61) 9 85 **	F(1,61) 6 83 ** F(1,61) 2.34 ns	F(1,61) 3.85 ns F(1,61) 0.28 ns
7 morph. x phono C25_34	Naming Identification	F(1,61) 34.88 ** F(1,61) 17 44 **	F(1,61) 26.69 ** F(1,61) 3 10 ns	F(1,61) 7 41 ** F(1,61) 0 45 ns
8 seman. transp.: C6_7	Naming Identification	F(1,61) 0 74 ns F(1,61) 0 51 ns	F(1,61) 7 55 ** F(1,61) 0.05 ns	F(1,61) 44 42 ** F(1,61) 0 23 ns
9 stem agreement C8_9	Naming Identification	F(1,61) 9 07 ** F(1,61) 4 61 *	F(1,61) 40.27 ** F(1,61) 0.61 ns	F(1,61) 33.56 ** F(1,61) 0 18 ns

The distinct F-values in the three ResProf groups in Table 6 7-1 indicate that the effects of word-type were strongest at the lower proficiency levels

The word-types varied in similarity, length (*i e* in syllables/letters/phonemes/stems), and frequency (*cf* 5 3 3 2)[7] but it is unlikely that the contrast merely is the result of item characteristics like frequency and length, when the differences in item characteristics between the single-stem and multi-stem word types was taken into account (§ 6 4 1) the contrasts remained significant even when the error percentages are adjusted for FreqRat and DuLeng (naming $t_{adjusted}$ = -2 844 p = 006 t = -7 358 p = 000, identification $t_{adjusted}$ = -2 305 p = 024 t = -3 792 p = 002) This confirmed that accessing and retrieval processes were affected by greater dissimilarity to English and more lexical information (in the number of syllables/letters /phonemes/stems) The multi-stem words had more meaning-carrying morphemes than the single-stem words Dissimilarity in stems and in semantic components in the multi-stem categories interfered with naming, as opposed to greater similarity and fewer meaning-carrying morphemes in the single-stem categories Next we will examine whether there were differential effects as to the type of similarity involved in these categories

6 4 3 <u>Single-stem Categories Degrees of Cross-linguistic Similarity of Form</u>

On the basis of the proportional differences between the tasks it had already been shown that relatively more retrieval problems occurred in the partially dissimilar categories than in the similar ones This section examines in detail which type of (dis)similarity was most influential on performance by investigating category differences in the actual numbers of errors made across the three levels of ResProf The effects of the types of cross-linguistic similarity of form within the five single-stem categories are investigated separately from the possible effects of stem agreement and meaning transparency within the multi-stem categories (see § 6 4 4)

The mean error percentages of these five categories across the ResProf levels (Table 6 8) suggest that facilitatory effects of cross-linguistic similarity in 'syllable number' and/or phonemes on the recall and recognition of 'dormant' Dutch words in the single-stem categories varied with the level of proficiency and fluency in Dutch

Table 6.8. The mean percentages of naming errors made during the recall task (top) and identification errors made during the recognition task (bottom) by the 64 bilinguals in 5 single-stem categories.

CATEGORY	mean (std dev.)	poor	middle	high
1. Identical	8.70 (11.56)	17.1	6 8	2.5
2. Phon.sim. /Same syll + +	9.94 (11.42)	16.8	9 8	3.2
3 Phon.diss./Same syll - +	29.21 (25.28)	49.2	27.6	11 1
4 Phon sim. /Diff. syll. + -	45.47 (27.99)	65 5	45.4	25 5
5 Phon diss./Diff syll - -	37.83 (27.55)	62.5	34.5	17 1

CATEGORY	mean (std.dev.)	poor	middle	high
1. Identical	3.35 (6.85)	5.4	2.1	1.8
2. Phon.sim. /Same syll + +	4.40 (7.77)	7.3	4.2	1 8
3. Phon.diss./Same syll. - +	7.10 (10.47)	14.2	5.4	1.9
4. Phon.sim. /Diff. syll. + -	17.34 (20.01)	32.0	15.4	5.0
5. Phon.diss /Diff. syll. - -	12.28 (12.43)	21.4	12.2	3.2

The percentages of errors varied depending on the level of ResProf and the dissimilarity in form. These category differences appear to be less important for successful identification with better ResProf scores.

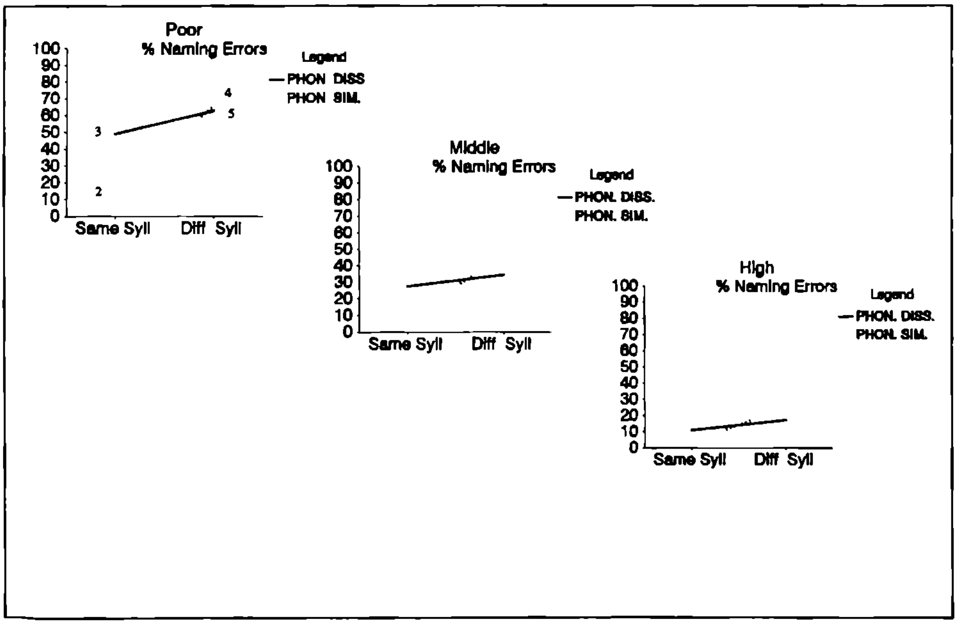
What is most apparent is that the most cognate Categories 1 ('*identical*' glass/glas) and 2 ('*phon. Sim./Same syll.* screw/schroef') were remembered best. These two categories varied in the definition of cognateness used (§ 2.3.2). The contrasts (Table 6.7-2) show that, across the ResProf levels, the two most cognate Categories 1 and 2 did not differ significantly in respect of either the naming errors or the identification errors on either of the ResProf levels. The conclusion remains the same upon adjustment for item characteristics (§ 6.4.1): naming: $t_{adjusted}$ = 0.494 p = .623/ t = -0.191 p = .849; identification: $t_{adjusted}$ = -0.091 p = .928/ t = -0.212 p = .834 (see again note 5).

The single-stem categories 2 to 5, in particular, were analysed for the potentially different effects of similarity in phonemes and syllables across the three subject groups. To assess the effects, simple contrasts (Table 6.7, 3-7) were calculated between the categories which differed in 'morphological' (syllabic) similarity separately for each ResProf level as well as for categories which were differentiated across phonological similarity. The reason for this simple (*i.e.* level-wise) analysis for phonological and morphological effects was the significance of the interactions of morphological (syllabic) and phonological similarity (Table 6.7-7). In the analyses of the naming errors this interaction, represented by contrast C34_25, was significant in all the groups, but in the identification error analyses only for the 'poor' ResProf group, whereas there was a trend of this similarity effect for the 'middle' group The results of the contrasts are discussed below for each type of similarity

<u>Effects of similarity in the number of syllables</u>

The results of the contrast analyses in Table 6 7, 3-4 show that naming performance across all three levels of proficiency was better for words with a similar *number of syllables* in the Dutch target word and its English translation equivalent Particularly when words were phonologically similar as well (*cf* Categories 2 and 4), the facilitatory effect of similarity in the number of syllables on naming was significant The effect of similarity in the number of syllables on naming was also significant in the comparison of Category 3 '*Diss /Same*' and Category 5 '*Diss /Diff*', except for the 'high' ResProf group This implies that, in partially similar words, similarity in syllables assisted naming processes in Dutch mainly for subjects with limited levels of ResProf Within the phonologically dissimilar categories 3-5, additional difference in the number of syllables did not make recall more difficult for the 'high' ResProf subjects

Figure 6 6 Naming error percentages in the 4 single-stem categories which differ in phonological and morphological similarity (N = 64)



The varying influence of ResProf on naming is illustrated in plots of the naming error percentages for the categories 2 to 5 for each level of ResProf (Figure 6 6) This figure shows that, as ResProf increases, the difference in the number of errors between Categories 2 '*Sim /Same*' and 4 '*Sim /Diff*' appears to be larger than the difference between Categories 3 and 5 (varying in syllabic similarity only) The angle of the profile for Cat 2-4 in Figure 6 6 changes somewhat over levels of ResProf, illustrating that on particularly the 'poor' ResProf level the effect of similarity in syllables was strongest This impression is confirmed by analysis of variance on the relevant contrasts (Cat 2-4) with the ResProf levels For this analysis, the interaction was tested between the contrasts and combinations of subject groups (Table 6 9) The non-significant results for contrasts between the 'middle' versus 'poor/high' group show that the pattern in the 'middle' group is a transition between the other groups The 'poor' group, however, significantly differs from the 'high' group, particularly in respect of the morphological contrast C2_4 (naming F(1,61) 14 87 p = 000, identification F(1,61) 19 53 p = 000)

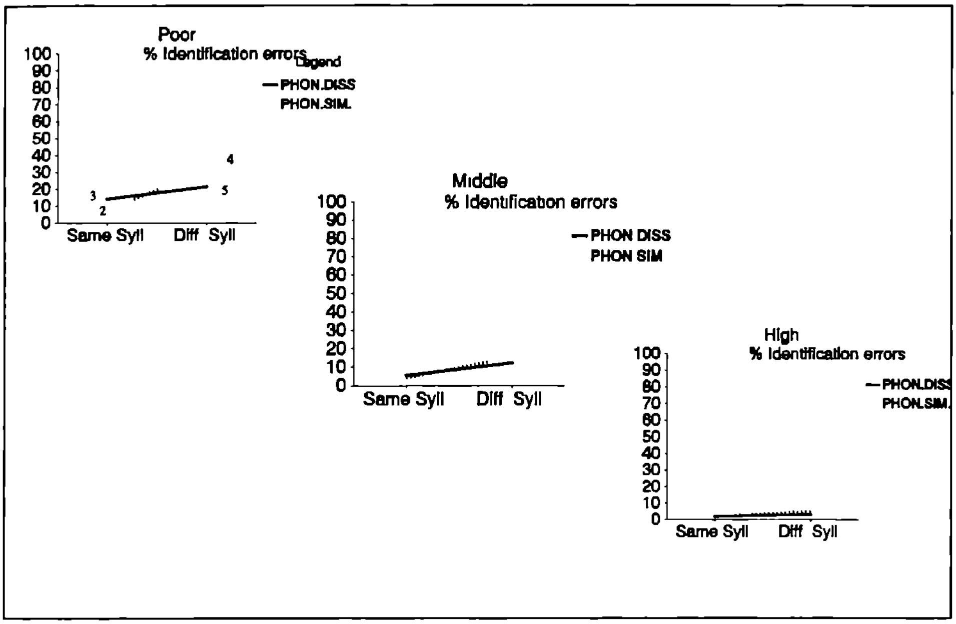
Table 6.9 Results of analyses of variance involving special contrasts between the single-stem categories and for two combinations of subject groups (N = 64)

Contrast		ResProf x Contrast	poor vs high	middle vs poor/high
C34_25	nam	F (2,61) 2 59 083	F (1,61) 5 06 028	F (1,61) 0 12 735
	iden	F (2,61) 3 33 047	F (1,61) 6 16 016	F (1,61) 0 50 484
C23_45	nam	F (2,61) 8 84 000	F (1,61) 17 47 000	F (1,61) 0 21 652
	iden	F (2,61) 10 86 000	F (1 61) 21 63 000	F (1,61) 0 09 768
C2_4	nam	F (2,61) 7 43 001	F (1,61) 14 87 000	F (1,61) 0 00 956
	iden	F (2,61) 9 96 000	F (1,61) 19 53 000	F (1,61) 0 40 531
C3_5	nam	F (2,61) 1 47 237	F (1,61) 2 45 122	F (1,61) 0 49 484
	iden	F (2,61) 1 51 230	F (1,61) 2 89 094	F (1 61) 0 13 720
C24_35	nam	F (2 61) 5 75 000	F (1,61) 10 36 002	F (1,61) 1 14 290
	iden	F (2,61) 0 14 867	F (1,61) 0 27 603	F (1,61) 0 01 916
C2_3	nam	F (2,61) 8 21 001	F (1,61) 16 09 000	F (1,61) 0 33 568
	iden	F (2,61) 2 12 129	F (1,61) 3 66 061	F (1 61) 0 59 446
C4_5	nam	F (2,61) 0 83 439	F (1,61) 0 69 410	F (1,61) 0 98 327
	iden	F (2,61) 1 77 178	F (1,61) 3 40 070	F (1,61) 0 14 706

The results for the less L1-proficient subjects could be interpreted as having more often assumed phonological similarity between the items than the more proficient emigrants, and therefore more often came to grief when the words were morphologically dissimilar The more proficient emigrants attempted to recall phonologically dissimilar Dutch words in 3 and 5 without resorting more to the English equivalent in Category 3 than in 5

In the *identification* error percentages, similar results are found as with the naming errors, except, within the 'high' ResProf group, the F-ratios found in the contrast of both Categories 2 '*Sim /Same*' and 4 '*Sim /Diff*' (F(1,61) 1 53, p = 356) and Categories 3 and 5 (F(1,61) 0 28, p = 744) were not significant (Table 6 7-3) Similarity in the number of syllables had no significant effect on access of these Dutch words for these subjects Only in the less proficient emigrants did identification improve when the Dutch and English words had a similar number of syllables (Figure 6 7)

Figure 6 7 Identification error percentages for the four single-stem categories which vary in phonological and morphological similarity (N = 64)



Comparison of the groups (involving analysis of variance between combinations of groups for each contrast) showed that the 'high' group, in particular, differs significantly from the 'poor' group (Table 6 9) Both plots of the naming and identification error percentages (Figures 6 6 & 6 7) suggest that identification of the Dutch target words was worst if these differed from their English translation equivalent in the number of syllables

Adjusting the various relevant contrasts (C2_4 and C3_5) for item characteristics (see again § 6 4 1) confirmed that the effect of similarity in the number of syllables was strongest when words were phonologically similar (C2_4 naming $t_{adjusted}$ = -6 344 p = 000, t = -5 469 p = 000, identification $t_{adjusted}$ = -3 638 p = 001, t = -3 374 p = 001) If the words were phonologically dissimilar (Cat 3 & 5) these analyses showed that difference in the number of syllables did not result in poorer recall (C3_5 naming $t_{adjusted}$ = -1 211 p = 230, t = -1 338 p = 188, identification $t_{adjusted}$ = -1 451 p = 152, t = -1 385 p = 171) In the analyses of the identification errors similarity in the number of syllables still improved performance only when the words were phonologically similar to English (C2_4) if the words differed cross-linguistically in the number of syllables the subjects were less successful The power of this type of analysis is limited, however, and therefore the findings on the recall session were not reconsidered

To sum up, the type of morphological similarity affects performance, primarily for subjects with lower residual proficiency in Dutch (poor/middle) and primarily in the naming session This facilitatory effect of syllabic similarity appears stronger within the set of phonologically similar categories than the phonologically dissimilar ones, the F-ratios in the contrast 2-4 are much larger than the contrast of Categories 3-5 (Table 6 7, 3-4)

<u>Effects of phonological similarity</u>

The phonological effect varied more with the level of ResProf and the type of Category than the morphological effect The effect of phonological similarity was not significant for the 'high' ResProf group in either tasks for C2_3 and C4_5 (Table 6 7, 5-6) Differences in phonological similarity to English between the categories influenced access and retrieval of the Dutch picture names primarily for the subjects with lower ResProf scores The fewer significant results in Table 6 7 suggest that phonological similarity affected the retrieval of partially similar words for these subjects less than similarity in the number of syllables Tables 6 7, 5-6 suggest that in the 'middle' and 'poor' groups, phonological similarity improved naming performance primarily when the word pairs were also similar in the number of syllables (C2_3) If the word-pairs differed in the number of syllables (C4_5), additional phonological similarity in words like 'asparagus /asperge' *inhibited naming* in the 'middle' group, whereas naming in the 'poor' group was not affected by phonological similarity once the target words differ in the number of syllables Perceived phonological similarity for words in Category 4 confused these 'middle' proficient subjects more than total dissimilarity (Category 5) in the naming session

Only in the 'poor' group, *identification* performance was significantly assisted by phonological similarity in the categories that were similar in the number of syllables (C2_3) The opposite phonological effect was found for C4_5 phonological similarity inhibited identification performance if the Dutch words differed in the number of syllables from their English translation equivalents Words in the partly similar Category 4 were accessed significantly less well by the 'poor' group than totally dissimilar words, with similar trends in the other groups. Target words in Category 4 were appeared more difficult to recognise than in Category 5 for the 'poor' group. Partial similarity in a word category inhibits more than twofold dissimilarity of form, contrary to our expectations.

Adjusting the contrasts C2_3 and C4_5 (see § 6.4.1) largely confirms these results. Phonological similarity facilitated naming performance when words were similar in the number of syllables (C2_3: naming: $t_{adjusted} = -2.929$ $p = .005$, $t = -3.087$ $p = .003$; identification: $t_{adjusted} = -0.171$ $p = .864$, $t = -0.869$ $p = .388$). The facilitatory effect appeared restricted to word categories which were morphologically similar. The inhibitory effect of phonological similarity proved significant in the '*Diff. syll.*' categories after adjustment as well (C4_5: naming: $t_{adjusted} = -2.564$ $p = .013$, $t = -1.472$ $p = .146$; identification: $t_{adjusted} = -2.262$ $p = .027$, $t = -1.412$ $p = .162$). Given the reduced power of this analysis I can conclude that, depending on ResProf, phonological similarity improved naming performance (*cf.* also the word-type effect), primarily when the words were also similar in the number of syllables, and inhibited it when words differed in the number of syllables. Some verbalizations illustrate that similarity "in sound" to the English equivalent can cause confusion or block access:

- (violin/viool) " . viejolin, 'I think' ..Viejolin." (PICT 45)
- (anchor/anker) "....'n angkoor .eng- erm ankoor, ja....Ja, ENgker. 'n enker, 'isn't it? 'Did my dad used to call it that?' enker...'Can't remember.'" (PICT 45)
- (anchor/anker) " 'n ...anker.....'it is an' anker /Sure?/ Ja.. 'It is too close to the English ' LAUGHS" (PICT 13)
- (elbow/elboog) " 'elbow' erm.. 'I said elbow, but it is-'. /It is not/ 'It is the English word, isn't it?' 'Can't think of the Dutch one..' /hmn/" {I felt elbow coming very fast, and just had to say it . I knew it was wrong. But then I could go to the Dutch word.} (PICT 62)

To release the blockage subject 62 felt she had to say the English word before trying to "get at the Dutch".

Facilitation in accessing the Dutch words when these sounded similar thus mainly occurred during naming (*i.e.* in the written identification task, facilitation by phonological similarity was least often statistically significant) and mainly when words had the same number of syllables, and was primarily used by subjects with limited proficiency in Dutch ('poor/middle'). Interaction of the contrast '*Sim./Same*' (2) versus '*Diss./Same*' (3) with ResProf level (Table 6.9) shows that phonological dissimilarity influenced the 'poor' more than the other groups. The difference was most marked in the naming session (C2_3: naming: $F(1,61)$ 16.09 $p = .000$, identification: $F(1,61)$ 3.66 $p = .061$).

In the identification session, phonological similarity was less influential than in the naming session, as there was no longer a significant difference between Categories 2 and 3 A possible explanation for the phonological effect in the written task for 'poor' subjects is that when words differed from English in the number of syllables, 'poor' subjects felt they had to "say the words aloud" in order to distinguish the target word from the less familiar distracters

The phonological effect varied depending on the levels of ResProf Comparison of Table 6 7 3-7 to Figures 6 6 and 6 7 shows that, in the partially ('phonologically) similar Category 4, more naming errors were made by the 'middle' ResProf group, and more identification errors by the 'poor' ResProf group than in the phonologically and morphologically more dissimilar Category 5 ('desk/bureau') The fluent bilinguals (§ 5 3 3 2) rated the words in Category 4 'asparagus/asperge' as being more similar to English than the words in Cat 5 and more similar than those in Cat 3 ('horse/paard'), suggesting they used phonological similarity as a criterion The dormant bilinguals, however, made *more* naming and identification errors in Category 4 than in 5 Phonological similarity together with different number of syllables confused 'poor' ResProf subjects when they tried to identify the target word, and misled 'middle' subjects more than the words in Category 5 which differed in both types of similarity Table 6 3b had shown that words in Category 4 were relatively difficult to access for the 'poor' group, and relatively difficult to retrieve for the 'high' group This puzzling effect is discussed in more detail in chapter 7

6 4 4 The Multi-Stem Categories

Central to the analyses of the multi-stem categories is calculation of whether, within these categories of longer, less frequent, and less cognate words, there are effects on the errors of similarity in semantic transparency between the Dutch target and its English translation (Cat 6-7) and of morphological similarity in stem-structure between the English and the Dutch target (Cat 8-9) The category means for each level of ResProf are listed in Table 6 10

Table 6 10 The percentages of naming and identification errors by dormant bilinguals in the multi-stem categories (N = 64)

Naming errors	poor	middle	high
6 Same Cps	75 0	44 8	7 5
7 Diff Cps	80 0	59 4	46 2
8 Sing Dut / Mult Eng	76 2	44 8	23 7
9 Mult Dut / Sing Eng	92 5	76 0	55 0

Iden errors	poor	middle	high
6 Same Cps	27 5	9 4	2 5
7 Diff Cps	23 7	8 3	7 5
8 Sing Dut / Mult Eng	46 2	20 8	12 5
9 Mult Dut / Sing Eng	33 7	16 7	10 0

The means suggest that naming and identification of the multi-stem words depended on the type of similarity and the level of proficiency First the effect of Task is reiterated, then findings are presented on the effect of ResProf, and finally the results of analyses of possible differential effects of stem agreement and semantic transparency in each group

Effects of task type

Comparison of recall and recognition performance in § 6 3 3 had suggested that, particularly in Category 8 (*'Sing Dut /Mult Eng* '), many Dutch words were difficult to access by the 'poor' and 'high' ResProf emigrants When the semantic components of the English words were distinct from the Dutch target (Cat 7 'grasshopper/sprinkhaan') the 'middle' and 'high' ResProf groups appeared to find words relatively difficult to retrieve (*cf* Table 6 3b, Table 6 7) In Categories 6 and 9 the relative difference between errors in the naming and identification session did not deviate much from the overall 32 ratio

Effects of proficiency level

Figure 6 8 below illustrates that, also for the multi-stem categories, naming performance was better for subjects with higher ResProf levels The number of naming errors was smaller for subjects with higher residual proficiency Similar patterns were found in the identification errors (Figure 6 9 below) This graph also suggests that category differences were much smaller than in the single-stem categories

The means in the two figures suggest that there is an interaction between higher residual proficiency in Dutch and transparency of the target word that depends on the task Naming appears to be more difficult for Cat 7 and Cat 9 for all the levels of ResProf, whereas in the identification session errors appear more common for Cat 6 than 7 and for Cat 8 than for 9 at the 'middle' and 'poor' levels The significance of these category differences for each ResProf level were investigated by means of simple contrasts These are given in Table 6 7, 8-9 and discussed separately for each effect

Figure 6.8. Mean percentage naming errors in four multi-stem categories (N = 64).

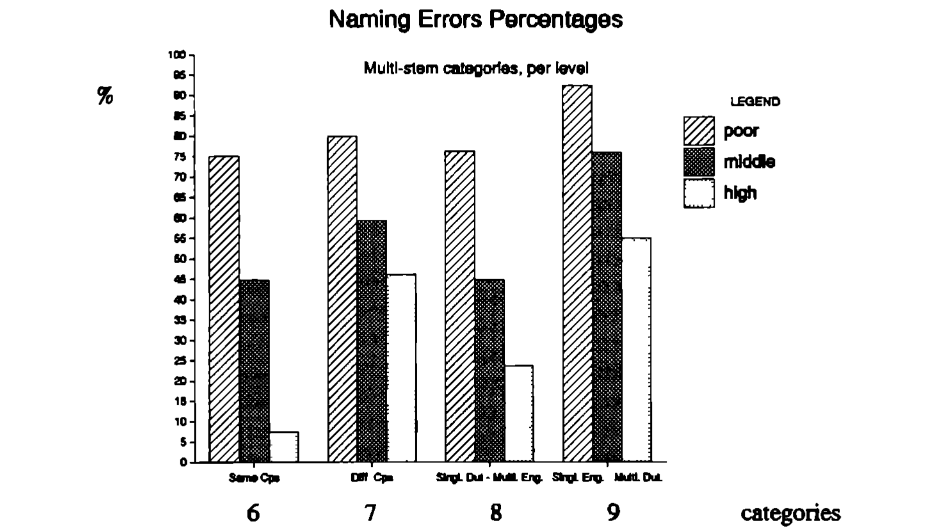
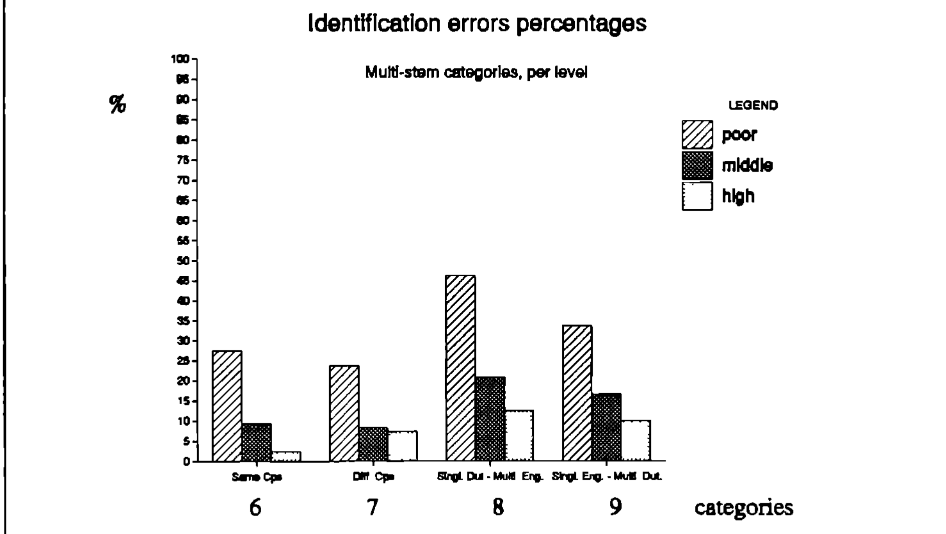


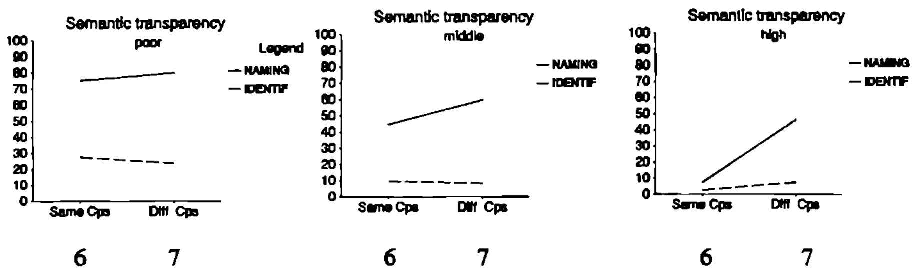
Figure 6.9. Mean percentage identification errors in four multi-stem categories (N = 64).



Semantic transparency effects

The contrasts in Table 6 7-8 show that for the 'middle' and 'high' groups, recall was significantly better for the multi-stem Dutch words that were semantically more transparent (Cat 6, 'toothbrush/tandenborstel') than for words that did not share meaning elements in Dutch and English (Cat 7, 'grasshopper/sprinkhaan') Transparency, however, did not significantly assist performance in the identification task, in which very few errors were made These findings suggest that English was used during the naming attempts, and that some level of proficiency in Dutch was required to use this information successfully This dependence on ResProf is more clearly illustrated in Figure 6 10 This shows that the differences in error percentages in the naming and identification tasks were larger in the 'high' and 'middle' ResProf groups for categories 6 and 7

Figure 6 10 Mean percentages of naming and identification errors in the multi-stem categories which differ in semantic transparency (N = 64)



Contrasts involving the interaction between the contrast C6_7 and ResProf group (Table 6 11) show that the difference between the 'poor' and the 'high' groups was significant for naming only (C6_7 naming F(1,61) 16 85, p = 000) The pattern in the 'middle' group formed a transition between the 'poor' and 'high' groups (C6_7 naming F(1,61) 1 18, p = 282)

Table 6 11 Results of analyses of variance involving special contrasts between the multi-stem categories and for two combinations of subject groups (N = 64)

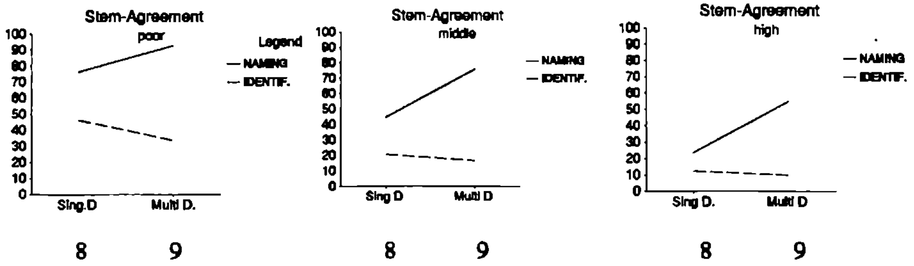
Contrast		ResProf x Contrast	poor vs high	middle vs poor/high
C6_7	nam.	F (2,61) 9 01 000	F (1,61) 16.85 .000	F (1,61) 1 18 .282
	iden.	F (2,61) 0 36 .699	F (1,61) 0.72 .401	F (1,61) 0 00 .945
C8_9	nam	F (2,61) 2 66 078	F (1,61) 3.87 .054	F (1,61) 1 45 233
	iden.	F (2,61) 0 86 .428	F (1,61) 1.48 .229	F (1,61) 0 25 .622

In view of the low number of cases per category, the contrasts over categories with the items as cases are not reported on.

Stem-agreement effects

Words in Category 8 (butterfly/vlinder) had one meaning-carrying element in Dutch, whereas Category 9 had two (thimble/vingerhoed). The simple contrasts (Table 6.7-9) show that significantly more naming errors were made when the Dutch words were much longer/had more stems than the English words in Category 9 '*Mult.D./Sing.E.*' than when English multi-stem words were longer than their Dutch translation equivalents in Category 8 ($F(1,61)$ 4.61, $p < .05$). Like the word-type effect, the effect of stem agreement on naming was comparable for all levels of ResProf (Figure 6.11).

Figure 6.11. Mean percentages of naming and identification errors in the multi-stem categories differing in agreement in the number of stems (N = 64).



The effect of morphological similarity found in these word types was the opposite in the recognition session (Table 6.7-9). In the identification errors, significant results were only found for the 'poor' ResProf subjects, who now made more errors in the '*Sing D /Mult E*' category (F(1,61) = 4 61 p < 05), presumably because words in Category 8 were inaccessible for them The error percentages between categories 8 and 9 did not differ significantly over the ResProf levels (Table 6 11) In the light of the reduced power of this type of analysis 'over items', I concentrated on the results of the analyses over levels of ResProf These contrasts showed that more stems in the Dutch target than in the English equivalent (Cat 9, skunk/stinkdier) now *assisted* the 'poor' ResProf subjects in identifying the target Dutch word, resulting in fewer errors When identifying the Dutch target word in a set of distracters, *more* errors were made when the Dutch target word had fewer stems than the English equivalents (Cat 8, butterfly/vlinder) whereas the reverse was the case in a naming context Possibly, the Dutch words in Category 9 provided more access cues because more meaning-carrying elements were available

To sum up, naming was particularly sensitive to 'semantic transparency' (Category 6) and 'fewer stems' in Dutch than in English (Cat 8), particularly at higher ResProf levels In the identification task the higher ResProf subjects were not helped or hindered by whether the Dutch word was transparent or whether words with distinct number of stems in Dutch or English had a single-stem in Dutch or in English[8] It should be noted, however, that these findings were based on very few words

The restricted influence of semantic transparency on multi-stem words could have a number of causes For instance, it is possible that 'semantic' similarity did not significantly improve naming performance for the 'poor' subjects because they could not access the words for the pictures The level of ResProf was minimal More likely is the related possibility is that the presence of a transparency effect during recall could only be the result of frequent use of English-based communication strategies (§ 6 2) at the 'middle' and 'high' ResProf levels during speaking, which in the case of Category 6 could have fortuitously resulted in the target Dutch word (*e g* tooth + brush = tanden+borstel) but not led to success in Category 7 (*e g* grass + hopper ≠ sprink-haan) 'Poor' subjects would not have had this experience as they would have resorted to English-based strategies or avoidance This is suggested to some extent by § 6 2 1 in which more *Dutchified/literal translation/approximation* strategies were found in Category 6 than the other multi-stem categories It appears that subjects were more motivated to attempt to remember these words

- (pram/kinderwagen) TZK Oh 'Yeah I know Can t even think of the Dutch equivalent' 'Pram Erm 'I should know it no (PICT 17)

\- (thimble/vingerhoed) 'A thimble 'I don t know Simbel 'I don t know what you call them (PICT 14)

The Dutch lemma information that is co-activated with the English name may appear more familiar to the subjects, stimulating their attempts to remember more of the Dutch words in Category 6

6 5 <u>Preferential Selection of Distracters</u>

A final analysis of the data from the identification task assessed which types of incorrect options were particularly selected These patterns in preferences could support the interpretation of the error analyses in respect to the sensitivity of access and decision processes to sim ilarity and proficiency It was investigated by which subjects and in which categories certain distracters tended to be selected

First, one aim was to investigate whether ResProf levels affect choice one could expect that 'poor' ResProf subjects would be more likely to base their selection on the fluent English language than the 'more informed' 'middle' and 'high' ResProf emigrants, but also that they randomly selected an option irrespective of Category Goggin *et al* (1994) had found that more semantic neighbours and superordinate names were selected by subjects with lower self-rated proficiencies

Second, the fact that similarity may affect the selection of distracters, suggesting that similarity to English may affect the access and decision processes in Dutch In addition, analysis of the distracters per category could assist in interpreting the puzzling number of errors in category 4 '*Sim / Diff*' Investigation of the type of distracter could be interpreted as follows if subjects had considered Dutchification of the naming responses to be more appropriate for Cat 4 items than for Cat 5 ('*Diss /Diff*') on the basis of perceived phonological similarity in Cat 4, one could expect that the *Dutchified* option was selected more often in Category 4 than in 5 If Dutchification during naming had been a mere performance strategy aimed at achieving a near-target response irrespective of category differences, then the option would not have been selected more readily in Category 4 than in other categories

<u>Restriction</u>

It was decided not to conduct an analysis of variance into possible dependence on the type of word or subject characteristics given the number of subjects and word categories, rela tively few selection errors were made, and furthermore these were not equally spread over all the categories To adjust for variation in size of the categories and subject groups, percentages were used (see § 5 3 1/5 3.2) Since only a third of the total number of errors made in the naming session involved incorrect selection (N = 64, n = 78), the distribution is only described[9]

6 5 1 Distribution per ResProf Level

The distribution of the incorrect distracters per level of ResProf (Table 6.12) shows that in all the groups the *Dutchified* and *Orthographic Alternative* distracter types were selected most frequently. Least frequently selected was the *English* option

Table 6 12. Number and percentage of occasions when an incorrect distracter option was selected in the identification session, together with the expected percentages (bottom row), expected under independency of ResProf-level and response category (N = 64)

	English	Dutchif	Orth Alt	Sem Neigh	Sem Sup	Σ
poor	16 5 4%	128 43 1%	93 31 3%	31 10 4%	29 9 8%	297 59 0%
middle	9 6 2%	46 31 5%	50 34 2%	20 13 7%	21 14 4%	146 29 0%
high	13 21 7%	16 26 7%	12 20 0%	7 11 7%	12 20 0%	60 11 9%
Σ	38 7 6%	190 37 8%	155 30 8%	58 11 5%	62 12 3%	503 100 0%

The *Dutchified* option and the *Orthographic Alternative* option appear to be options that the emigrants felt to be most familiar and that were considered most similar to the target words Both options resemble the Dutch target the *Dutchified* option sounds like Dutch but has an incorrect base, whereas the *Orthographic Alternative* sounds like the target Dutch word, but has inappropriate spelling Other patterns are listed below

First, Table 6 12 illustrates that the *Dutchified* option was selected relatively frequently, particularly by the 'poor' ResProf subjects these subjects preferred to select English-based options, apparently using the more fluent language as a guideline for their choice, but without using the overt English option. Awareness that the *English* option was incorrect apparently overruled the urge to use this option to indicate that the picture had at least been identified Difficulty in accessing the required Dutch information/faster priming by the picture of English lexical information as shown in the analyses of errors affected the type of distracter which the 'poor' subjects tended to select

Second, Table 6 12 also shows that the *English* option was selected sporadically Surprisingly, emigrants with 'high' ResProf selected this option more often than expected In the 'high' group, there is a relative 'underrepresentation' in the choice for *Dutchified* and *Orthographic Alternative* options, together with an 'overrepresentation' of the *English* option. As in the results of the analyses of errors, 'high' ResProf subjects made relatively more English-influenced errors which interfered with retrieval than the other groups. The transcriptions of the verbalizations (§ 6.2) suggest the possibility that these subjects could not access sufficient knowledge of Dutch to recall the target, but sufficient to decide that the other, Dutch-based or semantically inappropriate options were incorrect. This could have led to two strategies. One is that uncertainty about the precise nature of the Dutch target word may have prompted the subjects to indicate that they at least knew a name for the image (*i.e.* to save face) by selecting the *English* picture name:

- (orchestra/orkest) "...oorkestra .'*E*..I'll take the English version '" (PICT 66)

It is also possible that these subjects, who must more often have used Dutch in conjunction with English, may have been more confused about language membership than the 'poor' and 'middle' ResProf levels, as observed in Hoeks (1988). The latter groups barely used their Dutch. Some verbalizations support this argument that the subjects satisficed:

- (watering can/gieter) "...waterkan, *D*? .'Oh, yeah, you see, I would say' wateringkan, wateringkan, water kan, . . erm. ..waterkan....'N Gieter, 'erm, it is too, it is also a' gieter... /Which one?/ 'I don't know!' Waterkan! . Watering kan, waterkan ***'B* will do**!...Can be any of those three, can't it? I mean, I've answered- I answered .*B*, right?'/ahum/ erm..." (PICT 79)
- (duck/eend) "..gans..watervogel . duk duk, watervogel, 'they're both the same.' 'n eend 'is also right', eend ...EEnd 'is also a duck', EEnd, **'*C* will do'**." (PICT 79)

Third, selection of the *Orthographic Alternative* option, which resembled the target Dutch word most "in sound", suggested successful access of at least residual knowledge about the aural/oral form of the target. This option was relatively unpopular in the 'high' ResProf group, supporting the interpretation that these subjects were able to identify this option as an incorrect distracter on the basis of their better literacy skills.

Fourth, the *Semantic neighbour* and *Semantic superordinate* options were selected relatively infrequently. In the cases it was selected this could also have been the result of a face-saving strategy to indicate partial access of the target word.

- (peacock/pauw) "... .'No, sorry, **I know it is a' vogel, 'but** /xx/ I know it is a peacock, naturally'...'*A*, try, it is *A*'..it is a bit of a guess, yeah...." (PICT 10)

As discussed below, Category 5 was mainly responsible for this pattern, as shown in Table 6.13 which provides the distribution per word category.

6 5 2 <u>Distribution per Category</u>

A less regular pattern appears from the distribution within each Category (Table 6 13) This is the result of the very small numbers in each cell, which open up the possibility that single items may influence these findings, *e g* reported difficulties with the items 'apple', 'button', 'balloon' and 'asparagus'

Table 6 13 Distribution of incorrect distracters in 9 word categories (N = 64)

	English	Dutchif	Orth Alt	Sem Neigh	Sem Sup	Σ
1 Identical	5 18 5%	9 33 3%	6 22 2%	1 3 7%	6 22 2%	27 5 4%
2 Phon sim / same syll	2 8 7%	19 82 6%	2 8 7%	0 0 0%	0 0 0%	23 4 6%
3 Phon dis / same syll	2 3 2%	12 19 4%	31 50 0%	12 19 4%	5 8 1%	62 12 3%
4 Phon sim / diff syll	18 17 1%	35 33 3%	43 41 0%	3 2 9%	6 5 7%	105 20 9%
5 Phon dis / diff syll	2 1 9%	19 17 8%	30 28 0%	21 19 6%	35 32 7%	107 21 3%
6 Same Cps	1 2 9%	21 61 8%	10 29 4%	1 2 9%	1 2 9%	34 6 8%
7 Diff Cps	2 6 3%	16 50 0%	7 21 9%	6 18 8%	1 3 1%	32 6 4%
8 Sing Dut Multi Eng	0 0 0%	41 63 1%	14 21 5%	4 6 2%	6 9 2%	65 12 9%
9 Multi Dut Sing Eng	6 12 5%	18 37 5%	12 25 0%	10 20 8%	2 4 2%	48 9 5%
Σ	38 7 6%	190 37 8%	155 30 8%	58 11 5%	62 12 3%	503 100 0%

The frequencies of incorrect distracters in Category 1 '*identical*' are too low to allow much to be made of the relative preference for the *English* option Furthermore, one reason could be that in the most cognate Categories 1 and 2 the distracters resembled the target word more than in the less cognate categories The resulting confusion could account for the relative popularity of the *Semantic Superordinate* option in Category 1 as a clearly distinct alternative

In the '*Sim /Same*' Category (2) the *Dutchification* option was selected in 82 6% of cases, whereas 37 8% was expected on the basis of the mean This option was also relatively often selected in Category 6, suggesting that in morphologically similar categories, the emigrants tended to select the phonologically related *Dutchified* option In the phonologically and morphologically distinct single-stem category 5, there was a relative reluctance to select the

Dutchified option Also in Category 3 the phonological dissimilarity meant a reluctance to chose the *Dutchified* option This suggests that especially phonological similarity made the similar-sounding *Dutchified* option more appealing If the distracter and the target words were phonologically similar (Cat 2), and hence the options closer to the target, then the *Dutchified* option was relatively more attractive

In Category 3 '*Diss /Same*' the emigrants most often selected the *Orthographic Alternative* option, followed by the *Semantic Neighbour* Partial similarity of form (syllabic) led the subjects to select the *Orthographic Alternative* options This is also illustrated by the popularity of the *Orthographic Alternative* in Category 4

The '*Sim /Diff*' words in Category 4 revealed a relative preference for the *English* option Items like 'tomaat /tomato' which, if 'incorrectly' named, could in this session have confused the emigrants so much that they chose the only option they were sure of, the *English* option, or the familiar-sounding *Orthographic Alternative* Some verbalizations illustrate this

(violin/viool) " 'n vijoolin 'Wrong? Wasn't it a violin?' (PICT 79)
(tomato/tomaat) " '*B*' Oh sorry', it was *F*! Oh well, it was the spelling, it was wrong ' (PICT 23)
(tomato/tomaat) " tomato '*C* 'wrong?' ' (PICT 79)
(banana/banaan) ' ermm ba naane be naane, banaane banana benaa erm ban be naan '*A* wrong?' (PICT 79)

The *Semantic Neighbour* option was selected relatively infrequently in Category 4, suggesting that phonological similarity made this option less appealing (*cf* Categories 3 and 5)

In the most dissimilar single-stem Category 5, the *Dutchified* and *English* options were selected relatively rare, suggesting that perceived phonological dissimilarity provided a clear hint not to select English-based options The preference for the semantic distracters in Category 3, and particularly Category 5 supports the interpretation of the error analysis that accessing the Dutch name was difficult in the case of these dissimilar single-stem words

In the multi-stem categories, in which the options were most distinct from one another, few significant differences occurred from the main trend The relative preference in Category 8 for the *Dutchified* option could have been the result of single items, like 'butterfly'

- (butterfly/vlinder) " erm 'it is a' botervlieg, 'yeah yeah, butterfly *F*' /'*F* botervlieg, yeah/ (PICT 47)
- (butterfly/vlinder) ' Botervlieg *F* /ahum/' (PICT 86)

In Category 6 also rather many *Dutchification* options were selected, and in Category 9 relatively many *Semantic Neighbours*

To sum up, the distribution of the types of distracters suggested that, among the dormant bilinguals tested, those with extensive experience in both languages ('high' ResProf) tended to make more transfer-based errors than the less fluent subjects Infrequent selection of the semantically related options suggests that the subjects still tended to know the target words and could access the relevant semantic fields, although least well in Category 5 The more proficient emigrants ('high') appeared more 'informed' in their selection of distracters, as fewer patterns emerged in the 'poor' group Presumably the latter had difficulty in accessing information on the Dutch lexical entries to influence their choice

Similarity in form between the options also affected which distracter type was selected morphological similarity tended to attract the emigrants towards the Dutch-based option that only sounded correct, whereas phonological similarity made English-based options like *Dutchification* more appealing The emigrants did not blatantly Dutchify all the words, but based their choice on similarity in form Although more identification errors were made in Category 4 than in 5, the deviation from the target meaning and form appeared more serious in the distinct Category 5 than in Category 4

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[1] Verbal protocols were used to assist in identifying strategies in conjunction with performance data and metalinguistic comments By using these three sources of information it was expected that a penetrating (although not direct) assessment could be given of the processes operating during the task under investigation, related to **how** words are retrieved and **where** problems occur, thus guiding research on strategic behaviour away from studying epiphenomena to issues more directly related to speech production processes used during an oral recall task
One cannot be certain that the systematic use of specific lexical information in the experiment here is not also the result of general PSAs rather than a reflection of the usually very automatic lexical access and retrieval processes This is because not all of the requirements set by Anders-Ericsson and Simon (1980) for improving accuracy of verbal reports could be met The fact, however, that similar approaches using similar types of information were shared among the subjects should not be dismissed off hand

[2] The taped naming and identification sessions were transcribed several times, and the identification of the introspective reports and responses was first conducted in 1987, followed by an independent scoring session in 1991 Both times scoring was based on the aural data There was considerable overlap between the types of strategies and lexical features identified

[3] 'Cimage' is the variable name that indicates the picture ambiguity based on monolingual pre-tests This variable was not used as the images had been altered after the presentation to monolinguals Inclusion in any of the analyses did not alter the results

[4] Generally, longer words tend to occur less frequently (Zipf, 1949)

[5] Note that the F-values in these analyses are much lower than those reported in § 6 4 as this adjustment procedure necessarily analyses 'over items', whereas the analysis in § 6 4

is 'over subjects'

[6] Two reasons can be identified why the values of F and t used in showing these similarity effects are quite distinct from those in the analyses 'over subjects' First, these analyses involved a much smaller number of items per category (sometimes only 4) than the analyses over subjects In view of the resulting limited power, analyses over subjects were primarily relied upon Second, the manner of testing was rather strict only after *Frequency*, *Length*, and *Krom* had been allowed to display their explanatory power were the design vectors (similarity) introduced in the multiple regression

[7] The effect of each type of item characteristic on the error percentages, however, cannot always be computed The information on the listed Dutch and English word frequencies and on Staphorius is, for instance, incomplete and other variables are intrinsically related to one another

[8] The same results were found when the three levels of proficiency were not employed in the analysis of variance In this analysis, however, the difference between the first two multi-stem categories and categories 8 and 9 was significant (F 6-8 17 26 **/ F 7-9 6 79 *)

[9] The various comments on the distribution of the options were guided by a Loglinear analysis although not quite appropriate owing to the mix in the data of repeated results from the same subjects and other subjects, some statistical validation of the distribution patterns was felt necessary These analyses were restricted to the distracters by ResProf and to the cross-tabulations by item category, as the scarcety of cases in the cells impeded analysis of higher order interactions A Hiloglinear analysis was conducted to guide the discussion The results are only discussed if the Z-score was 2 or more

CHAPTER SEVEN
CONCLUSIONS

- *"I really- well, A lot of these words I was trying to push myself back to when I was erm small boy, and try to erm remember the lAnguage from my parents, coming back to me /yeah/ And sometimes it didn't come "* (Subject 3)

7 1 Introduction

<u>Strutch</u>

The version of Dutch spoken by Dutch emigrants in Australia is often speckled with English phonemes, morphemes, words, expressions, and sentence structures as well as other non-native Dutch elements This variety of broken Dutch is called 'Strutch' The motivation for my investigation was the claim by some emigrants that their Strutch was the result of "having lost their Dutch" Other emigrants, however, claimed that Strutch was the result of English "obstructing their attempts to speak in Dutch" and that Dutch was "difficult to get to" as a result of the language shift from Dutch to English They were simply "rusty in Dutch"

This study, which is limited to the area of the lexicon, investigated the claims whether, as a result of disuse, first language (L1) Dutch words had been 'irretrievably lost' or whether the emigrants were primarily 'rusty' in processing their L1 words In other words, it examined whether the English intrusions in Strutch occurred as a result of general changes in the access of knowledge of Dutch due to, for instance, frequent code-mixing and converging of the L1 norm as a result of disuse, or whether these occur as a result of temporary, tip-of-the-tongue (TOT)-like problems in retrieving all the L1 information needed to produce a specific utterance in Dutch In both cases 'forgetting' is the result of interference, but the cause varies In the former case, a process called associative unlearning has resulted in the deletion of prior associations by subsequent practice of interfering items, in the latter, process-related response competition has resulted in blocking of the desired information and temporary inaccessibility of the target information In the former meaning information can no longer be traced and is deemed lost, in the latter it is still in memory but process attrition has occurred

<u>Types of 'forgetting'</u>

One theory on 'forgetting' is the depth-of-processing theory This accounts for the dependence of results on variables such as the subjects' motivation, the subjects' experience, the amount of practice, the type of information, and the task format The variables explain why what is shown in a memory test does not always reveal what is 'known' or what is 'forgotten' Generally, information that was analysed well during the encoding stage, that was subsequently not altered by similar new information, and that was practised well is stored permanently This information is readily available in memory tests, unless the processing of the information is interfered with Research on forgetting suggests that practice can alter the stored information if this practice involves slightly different information (retroactive interference)

On the basis of psychological studies on 'forgetting' I hypothesised in Chapter 3 that Dutch, which was acquired and used as a native language prior to emigration, is unlikely to have been forgotten in the sense of 'being erased' what is more likely is that certain Dutch structures and words had not been acquired and practised sufficiently prior to the period of disuse to escape the influence of predominant use of English on lexical processing

In the light of the effect of similarity, I hypothesised that cross linguistic influence (CLI) of English may have both an inhibiting and an assisting effect on lexical processing in Dutch If information is identical, activation in one language can spread to its related counterpart in the other language, thus assisting retrieval of the other-language information If the information is not identical, the new information may overwrite the old, as a result of which new information can be retrieved more easily Partial similarity can result in partial over-writing by the new material, thus hindering retrieval of the original information

<u>Retrieval processes</u>

Assuming that Dutch is stored permanently, the *processes* involved in retrieving Dutch lexical information during speaking play a key role in the use of Strutch by Dutch-Australian emigrants Speech production processes in monolinguals have been outlined in detail by Levelt (1989) Basically, speech production has been described in terms of component processes that operate in two stages At the first stage, lemma information is activated that is part of the words needed to produce the utterance Once this semantic and syntactic information is available, this activates the lexeme information on the morphological and phonological form of the utterance Together this forms the input of the processes which actually physically produce the utterance A distinction is made between access and retrieval of lexical information If the mental lexicon is likened to a library, access is like looking up the index card to verify that the book is present, whereas retrieval is like also locating the book and reading its contents Access of information predominantly influences the results of recognition tasks, whereas retrieval processes mainly determine the results of recall tasks in which response production occurs The process of mental search is generally conceived of as activation spreading along the links between lexical representations

Bilingual research on speech processes has shown that access of cognate words is cross-linguistically linked, because activation of one affects processing of the other These processing links depend on the degree of similarity, the type of task, the context of learning either language, and the level of proficiency in each language In respect of proficiency it was found that, with increasing proficiency in the second language (L2), processing information in one language becomes increasingly independent of the other In respect of tasks type it was found that in tasks involving more superficial lexical processing (*e g* recognition), cross-linguistic similarity of form is less important than in tasks involving extensive processing, for instance, in the recall of words for speech production The nature of lexical processing in the context of a 'dormant' L1 was tested in an experiment

Recall versus recognition

The hypothesis of predominant process attrition in an L1 context was tested by comparing the results of a recall task with a recognition task within the same experiment, in this case, naming a picture in Dutch versus identifying the Dutch name of a picture The picture names varied in similarity of form so as to study the manner in which lexical information was processed by the dormant Dutch emigrants It was expected that process attrition was the main source of interference in emigrant Dutch, as a result of which performance in the recognition session would be dramatically better than in the recall session, particularly with similar words that share accessing processes in the L2 and the L1 Longer L1 words would furthermore be more difficult to retrieve

Lexical variables cross-linguistic similarity of form

The scope of the experiment was restricted to the lexicon, and within that, to the recall and recognition of single 'concrete' L1 words Formulaic expressions were not investigated[1] Two groups of word categories were used The five single-stem word categories mainly varied in phonological and morphological similarity (*e g* 1 glass/glas, 2 sun/zon, 3 horse/paard, 4 lips/lippen, 5 desk/bureau) The 4 multi-stem categories varied in semantic transparency (*e g* 6 toothbrush/tandenborstel, 7 grasshopper/ sprinkhaan) and stem agreement (*e g* 8 butterfly/ vlinder, 9 skunk/stinkdier) Potential domain-related and perceptual differences between the word categories were controlled for The pictures during the recognition session were accompanied by 5 types of distracters *English*, *Dutchification*, *Orthographic Alternative*, *Semantic Neighbour*, and *Semantic Superordinate* In order to examine the processes in detail, the responses and spontaneous verbalizations were recorded in addition to scoring the errors in each session. The word categories allowed investigation of the susceptibility of particular words to CLI during processing, and of component processes in the L1. Processing difficulties would depend not only on 'lexicon-internal' variables such as types and degrees of similarity in form and the number of stems, but also on 'lexicon-external' variables such as the level of proficiency and fluency in Dutch as well the context of language-learning.

Proficiency, fluency and the contexts of learning and practice

Since the nature and degree of learning and practice has an effect on how information is stored and/or processed, these data were collected in a questionnaire and in language assessments. The questionnaire determined when, where, how, why, and how often Dutch was used and elicited self-estimates of the frequency, proficiency, and estimated change in Dutch and the emigrants' attitudes to Dutch. The assessments consisted of two Dutch Clozes, and English Cloze, two verbal Fluency tasks in either language and one Dutch Editing task. Both types of background data were used to interpret the experimental results.

Subjects and their linguistic background

The subjects (N = 76) were Netherlands-born emigrants to Australia with a minimum of 6 years of native speaker experience and a current age below 50. The subjects reported having little or no contact with the Netherlands and with the Dutch in Australia.

Outline

The findings of the language assessments and questionnaire in conjunction with the results from the picture-naming and identification experiment are discussed in § 7.2 in the light of what they imply for language processing of a set of picture names by dormant Dutch-Australian emigrants. Section 7.3 describes the relevance of the findings in respect of the type of lexical attrition, and the type of processes which appear to be affected by non-use of the L1. The types of data considered were the error percentages in each session and each word category, the selection of the distracter types and the types of strategies used. This section is followed by recommendations and suggestions for further research in § 7.4.

7.2 Results

Profile of the 'dormant' Dutch-Australian emigrants

About half of the subjects considered their Dutch to have deteriorated since their arrival, particularly in respect of speaking (55%). Correlations showed a relationship between the length of time subjects had lived in the Netherlands, high self-estimates of proficiency and usage of Dutch, and the subjects' self-estimate that their Dutch had become worse. Results show that contact with Dutch, which was mainly oral, did not have as powerful an influence on Dutch as the number of pre-emigration years in the Netherlands The subjects' *age of departure* turned out to be a good predictor of their performance in the Dutch assessments

The assessment data showed that subjects were more fluent in English than in Dutch Reading Dutch texts was slow and painstaking Subjects provided more syntactically aberrant responses in the Dutch Clozes than in the English Cloze The self-estimates of L1 proficiency and frequency of use were highly correlated to the scores in the Dutch assessments Self-estimates appear to be a fairly reliable way of quickly assessing the global level of language proficiency and fluency

Computations relating the assessment scores, the questionnaire data, and the experimental scores showed that the subjects' score in the Dutch language assessments best predicted how well the subjects performed in the experiments Other variates of past and present language-learning and language use generated by the questionnaire were less directly influential This computed index of residual L1 proficiency was called 'ResProf' ('residual proficiency in Dutch) The data were not clear as to whether the scores on ResProf represented fluency and/or proficiency in Dutch, and whether this was the result of pre-emigration usage and/or post-migration contact ResProf was primarily adopted to simplify the interpretation of the dependence of the experimental effects on the subjects' language background, its use by no means implies that the questionnaire variables and each individual assessment did not to some extent reflect language competence, but rather that statistically these variables operated via ResProf The '*number of pre-emigration years in the Netherlands*' proved to be an important influence on ResProf, as did the rated extent of current L1 use and the level of literacy skills in Dutch On the basis of a strong suggestion from the frequency distribution of ResProf the subject sample was divided into subjects with 'high', 'middle' and 'poor' scores on ResProf

The length of residence in Australia only slightly influenced the extent of deterioration of Dutch The questionnaire data showed that the perception of 'negative change' was more likely to be related to *the number of years in the Netherlands* than to the *number of years in Australia* Similarly, no support was found for the emigrants' claim that all elderly Dutch emigrants regress to their L1 with increasing age Although initially some correlation was found between aging and the level of L1 proficiency, it is more plausible that this is the result of older subjects having left the Netherlands at a more advanced age, and hence being more exposed to the Dutch language and culture than younger subjects Older arrivals had also acquired English less well

7 2 1 'Process attrition' or L1 lexical 'loss'

The assessment results indicated that Dutch words had not disappeared from memory the subjects were still able to read the Dutch texts, fill out the Cloze gaps, and provide appropriate Dutch words in the free association task, although in all tasks they relied heavily on strategies and expended considerable effort in providing the responses Since three-quarters of the experimental words could be recalled and since two-thirds of the unnamed items were subsequently correctly identified, one can state that years of non-use had not resulted in complete erasure of the Dutch picture names for common objects from memory Instead, recall was above all *temporarily problematic* Comparison of the task differences in each subject group showed that it was primarily the emigrants who had performed poorly on the Dutch assessment tasks (*i e* 'poor' ResProf) who recognised few words in the identification task, whereas subjects with higher ResProf scores identified most unnamed words Disfluency in Dutch as a result of years of non-use appears the main cause for the perceived "loss of Dutch"

A further indication that mainly Dutch lexical *processes* rather than Dutch knowledge itself was affected by non use came from the comparison of errors in the word categories In comparison to the naming sessions, performance particularly improved for the dissimilar categories in the identification sessions This showed that dissimilar Dutch words were more vulnerable to language disuse than similar ones as a result of the manner of processing More information on the category differences will be given below

At the same time though, recognition failed in one third of the cases presented in the identification session Relatively many identification errors were made particularly in the dissimilar categories than in the similar ones, and the mistakes in '*phonologically dissimilar/ morphologically different*' Category 5 tended to be semantically distinct from the target words It appears therefore that retroactive interference as a result of English had affected the access of dissimilar Dutch words This suggests that, apart from the main effect of 'process attrition', Strutch also appears to be the result of changes to the access of knowledge of Dutch This change in accessing L1 knowledge could be the result of insufficient initial encoding, predominant use of related English words, and task-specific constraints

In sum, support was found for the hypothesis that non-use of L1 Dutch words in Australia is more likely to result in *process attrition* than in 'loss' or 'attrition of L1 lexical knowledge' Many years of encoding and practice in L1 environment and close integration of an L1 user's cognitive and linguistic development seemed to have lifted most Dutch words in the experiment beyond the critical retention threshold level Disfluency in producing Dutch, rather than indiscriminate deterioration of lexical knowledge of Dutch itself, seems to underlie the emigrants' claims of "loss' Further support comes from task specific considerations

Recall and recognition performance

In the context of this investigation, non-identification was not equated with 'lack of knowledge' but rather with processing difficulties since the subjects were former fluent native speakers of Dutch and since the experimental words were common Failure to recognise a Dutch target word in the identification session can also not be equated with 'complete loss' The verbalizations by the emigrants showed some influence of guessing, deduction, and response strategies on the results

In addition, the fact that recognition results were better than recall results may be due to a number of context-specific influences One is that, because the emigrants more often used the L1 listening skills than the L1 speaking skills, they had least practice in retrieving lexical information Since the effect of practice on memory performance is selective (*i e* restricted to the items and skills involved), this could be a reason why recognition of Dutch words was superior to production A related argument is that the formulation of a response in recognition tasks involves less knowledge-based processing than in recall tasks Since in recall more processing is required to reconstruct the response than in recognition, bias based on previous experience may be more likely to interfere with processing in the recall context For instance, if the subjects thought that Dutch and English were similar, this bias would affect name recall more than recognition A third argument for the session difference comes from linguistic studies on language loss These studies argue that it is primarily linguistic core properties which are maintained, whereas specific details and the exceptions tend to disappear from use (Dorian 1981, 1982, Dressler & Wodak-Leodolter, 1977) This partial information may be sufficient for recognition but insufficient for producing the target words The prevalence of TOT states and the accuracy of information reported in the verbalizations suggests that problems due to partial access were common Less accessible information hindered the complete formulation of access cues and activation of all the information required by speech component processes to recall the target This impedes recall more than recognition A fourth argument for the fact that recognition performance was better than recall performance is that, in the identification session, both the picture and distracters provided more cues for the target word than the picture in the recall session

The initial claims by the emigrants of 'having lost Dutch' (in the sense of 'lost from memory') therefore appear to be overstatements, particularly when it comes to recalling the concrete object names used in the experiment. Non-performance is not therefore an index of knowledge deficit, although it does suggest an increased likelihood of a knowledge gap. Failure to identify the target L1 word can be interpreted as attrition having affected that un-recognised item **more** than an item that was recognised. I argued that combined recall and recognition failure points to access problems, and recall failure only to retrieval problems. Supporting this are various psycholinguistic justifications for stating that "Dutch had been forgotten". These were centred around the influence of English and the inordinate amount of effort in using the L1. Phrases like "being rusty in Dutch", "competition", and "being distracted by English" suggest that, during the attempts to use Dutch, English appears to be difficult for the emigrants to deactivate (*cf.* Green, 1986; Shannon, 1991). A sample comment is:

- "Dus .'when' je 'don't speak' de de 'language' /ahum/. hè, 'you find the English words much **easier to use** /ahum/ And, for instance, when I ss.. when I actually speak Dutch, /yeah/..It is a- basically sprinkling of Dutch with English words .thrown in /ahum/ because at the time of speaking **you can't think of the Dutch word qUIck enough** /right/ or it is a much more **difficult word to SAY** .So. You know, you. you struggle in the Engl- what I, for instance you talk, about deff erm no..the "fence" /ahum/ which in Dutch is a' "schUtting" /yeah/ 'It is very difficult to..actually say this, /yeah/ so you say "fEnce" /coz it is easy to work out-much **easier to say** /ahum/.. And and and that is where I think..people or....The NOT so intelligent cannot remember those, beco- it it is it is solely a memory function /ahum-/ and- and an NOT. erm communication function../and then of course there are the people who can't be bothered, and-/ That is right, yeah / **Just throwing in anything** Ok. well' " (Comment on picture-naming in Dutch, PICT 38)

Despite the focus of attention in the experiment being on Dutch, the imbalance in fluency between Dutch and English results in virtually automatic processing in English. English cannot be deactivated: retrieval of Dutch words was experienced as slower and less accurate than lexical processing in English. This was also evident in the greater number of responses in the English than in the Dutch Fluency task. The comments below illustrate that retrieval of Dutch was sometimes seen as being in competition with processing in English:

- " .'I'm now switching off erm from from from ENglish, erm, but I'm only talking in ENglish **becoz that is more EASier for me** If I would- have to say all this in DUtch /ahum/ I wouldn't be Able to sort of sAy it.. Erm'. Dan zou ik moete zegge 'erm'. "Je haalt je je haalt 'n hEleboel HOllandse. wOOrdereeks voor mekaar." Dat 'Of course that is what I want to rEAlly say. erm /yeah/ You know, it is it is It gets dIFFicult for me. to sort of erm .tAlk in DUtch. erm about something that I found a little bit difficult /ahum? .Ok But that is .no surprise after all these years' /ahum/" (PILOT D) [I would have to say then erm, you confuse many Dutch words .]

- " 'I can't do them in Dutch. I was trying to please you by doing them in Dutch I would by choice do all of them in English because that comes That is **natural** *the first thing that comes to my mind* The- the I was trying to please you before when you said I could do them in Dutch, and I- Thought I was trying to think what tha- the the word could get any words in Dutch but it is **easier to translate the word** and then to associate, you know, think of another word in English, English That was the test /Well, as long as you were honest / Well, I was honest It was easier, I went faster .." (PILOT T)

- " .'Funny' hè, ik had er geen erg in . dat **sluipt erin** .met die Engelse woorden..ben ik eerder geneigd om ze m'n Nederlands d'rin te sluipen omdat ik me geen erm niet concentreerde, Als je nu bijvoorbeeld over zou doen /ja/ dan zou ik wellicht als ik erm 'txx 'do it in English' /Good/ Ik had er geen erg in omdat ik net op 't randje stond van de 'bilingual situation'. /Hmn moeilijk/" [Funny, I did not notice that they sneak in, with those English words I am more used to have them sneak into Dutch because I did not concentrate If you for instance let me do it again, I'd probably do it in English I had no idea because I was just on the verge of a bilingual situation] (PILOT F)

Despite the remarks made during the initial screening of the volunteer subjects that "Dutch had been lost", knowledge and skills in Dutch were still present. Some emigrants thought that their former proficiency in Dutch would return given enough practice:

- "' You know, Tom, I must- **sure I can get most of it back in a few months** Well, if I went back to Holland .. MOst people that I have talked to have When they went back to Holland Oh, **it took them about two days or so** / yeah?/ **to get going** . I mean it all, it was always here the odd phrase that they just didn't know .. Yeah strange I I it just sounds clumsy, you know /ahum/ It sounds clumsy.. It will **breed conflict. English is much more..natural** and also more a convenient way. Dutch is zxxxx while you're reading it xxxxx, especially with the word order /yeah/ '" (PICT 72)

<u>Reasons for the perception of "loss"</u>

Apart from remarks about feeling 'rusty' and being distracted by English the emigrants' view that "Dutch had been lost" came from a variety of sources (see Ammerlaan, 1990b, 1990c). One is that the emigrants felt insecure about the present standard of their Australian-Dutch after decades of separation from the Netherlands ("Strutch is really inferior Dutch") and also disassociated themselves from present-day Dutch in the Netherlands that, according to some, is "polluted with English". It was argued that

"speaking a crummy language gives the impression of being a crummy person... I therefore stick to English, which I am better at. .... I also know more specific and accurate words in English than I would know in Dutch, because I never learned fancy expressions and impressive words in Dutch"

Acceptability of Strutch appeared slightly lower in the Netherlands than in Australia where "everybody switches regularly and it often does not matter as we all speak Dutch and English, ..or Dinglish, or whatever" (Pilot A).

Other socio-psychological reasons also emerged, such as the comments that non-fluent L1 production may result in "loss of face" and "poor communication", and that the L1 was associated with a past life they wished to leave behind. Some excerpts illustrate this.

- "**My Dutch is simply not good enough any more**, so why should I bother using it? .My relatives giggle at my attempts to speak Dutch, think it is antique . And when I'm in Holland they speak English to me Cannot blame them, it is only a small country with a small language, and erm, well, most science and business is conducted in English' " (PICT 47)

- "..'Shit. ..No /What do you do when you normally don't know a Dutch word?/ In normal...lang-? When I'm using the language? /When you're using the language/ Then I use English. I combine Dutch and English I guess, and I obviously do.. **cannot really bloody stand it** No'.." (PILOT H)

- " ...'See, the trouble is I talk half Dutch half English to mum /I see/ If I say "have you pulled the plug out?"' dan' "hedde de de plud d'rOet getrokke " /ahum/ 'But I mean the .pluch, But I don't think that is Dutch, is it? /No/ No, that is the trouble! see? /But you knOw it is not actually Dutch/ I know it is not Dutch. SHE knows what I mean too ' "hedde de plug oet getrokke?" . I would then refer to' ploeg. /ahum/ 'Half English, half Dutch' LAUGHS" (PILOT R)

- (bus/bus) "... 'I don't give a bUGGer about what YOU say' I still think it is an' AUTObus' **'That is what they called them when we left Holland!** /hm/ It is an' autobus bus' .A!" (PICT 8)

- " **It would do** . I would get by. **They use a lot of English anyway.** My Dutch cousins always talk about "cOOl" and "okay", and what about the use of "shit" and F-words in everyday language?"

Other socio-psychological influences such as the context of use thus seem an important influence on the emigrants' perception of L1 "loss". Some emigrants commented that they had avoided Dutch so that their speech could no longer reveal the socio-geographical origin of the emigrant and thus prevent "a truly new start in Australia". At the same time, statements like "my Dutch is gone" were used by some emigrants to avoid having to "dig up these old memories" and this "past identity", as well as to circumvent the "taboo topic" of "having lost something" which could suggest that the emigrants' identity was "no longer complete". Using these arguments the dormant emigrants could have justified the situation of not using their mother tongue[2] and at the same time avoided being drawn into the study. The questionnaire data supported the argument that the perception of "loss of the Dutch mother tongue" was primarily attitudinal in nature. Correlations showed that particularly emigrants with many years of education in the Netherlands were likely to perceive a negative change in their Dutch. Particularly the 'high' ResProf subjects commented that "a mixture of Dutch and English" was considered "less acceptable", both in the Netherlands and in Australia.

The various arguments may also reflect the monistic policies towards LOTEs pursued by the Australian authorities at the time of arrival. It is also likely that these negative views towards the L1 are typically Dutch, as in German, a closely related language, these views were not shared (Waas, 1993).

To sum up, the perception that information has been "lost" therefore need not imply that this has actually taken place. Changes in the norm of what is Dutch, influence from English, and the relative effort involved in using Dutch in comparison with English led some emigrants to state they had "lost their Dutch". Instead, processing difficulties during the retrieval of Dutch seemed the most prominent source of code-mixing and switching in Strutch. Subjects blamed inaccessibility and interference from English. What the processing difficulties were due to, and where they particularly occurred in the bilingual language production system, was investigated experimentally by a number of analyses using various lexical variables in two contexts.

7.2.2 Reconstruction, TOT reports, and strategies

In the two sessions, efforts to access and retrieve the target L1 words involved both information stored in memory and information reconstructed on the basis of deduction. Reconstruction efforts in the naming session were particularly resorted to when some information was known about the word or about its relationship to the L2 word.

- (retrospectively) "'You got to really **dig** back And erm .think of what- what it might be In fact sometimes you almost have to **reconstruct the word** You know, like the "ostrich" /yeah?/ erm, you know you ss something to do with "strich".../yeah/ and then you sort of get ss slowly comes back, and the "screw" the same thing Erm And then you try to do the same thing with "screwdriver" and d- it doesn't come You know, there is no word..that is there. /ahum/ There is no relation So you really do re- reconstruct it back .It is interesting, . you try to sort of **create the parts back to where** .. hopefully **it is stored**, so going through retrieval exercises, sometimes it doesn't work, yeah, yeah /Well, obviously/ Yeah, but you know, these are ALL words that I would have known and used when I was speaking Dutch /yeah?/ Yep, so you're not- That is erm . **It is really just a question of digging there- really of a very dusty corner.** /LAUGH/ LAUGH /But you got most of them, I mean erm-/ Yeah, the words are still there, it is clear, **MOst of them are still there, but it takes erm..a bit of retrieving to get them back.**" (PICT 31)

The "reconstruction" efforts were influenced not only by the extent of similarity and the related amount of partial information but also by the level of proficiency. Particularly for 'poor' ResProf subjects, remembering the Dutch picture names after decades of disuse was a matter of laborious, painstaking "reconstruction", involving the systematic use of various types of information. The 'poor' emigrants used avoidance/abandonment behaviour during the experiment more often than 'high' proficiency emigrants. The strategies resemble compensatory strategies as found in language-learners' L2 speech, as well as recall strategies found in studies on forgetting (*e.g.* Glahn, 1978).

TOT reports

Research on 'forgetting' has shown that recall failure can result from a defect in activating all or some of the required lexical information. If only parts of the lexical entry were accessable (TOT state), these parts could be reported, they could be evident in the attempts to recall the words, they could or be evident in the types of distracters that tend to be selected In other words, the presence and nature of residual information can be revealed indirectly by analysis of the recall attempts as well as success.

In the case of the Dutch emigrants, TOT reports and remembering attempts exhibited the use of *episodic* and *semantic* features, semantic neighbours, translation equivalents (English), form characteristics (rhyming or alliterating words, syllables, stress pattern, associations), paraphrasing and approximation, in short, form and meaning features also encountered in monolingual TOT reports and during various stages of problem-solving activities (PSAs) in other communication contexts.

Many of the features reported are similar to those employed in learning vocabulary (Cohen, 1986, Nation, 1990) For instance, Cohen (1986) points to strategies like rote learning as well as learning through associations (structural association, semantic association, and mnemonic association) to acquire the L2 word The type of word appears to influence which type of strategy is used (*cf* Cohen & Aphek, 1980) The use of similar types of strategies during the retrieval of L1 words suggests that the manner of learning was stored with the lexical entry of the L2 words Verbalizations support this. the emigrants reported using the context of encoding to activate the disused L1 word. Both semantic and episodic information from the moment of learning and use and information on the English translation equivalent of the Dutch target word were used during the naming attempts

- (broom/bezem) ermm 'I cAn't imagine nOt knowing this word' vEger? off erm 'I know 'veger 'is is is to to swoop' /yeah?/ Vegerstuk? 'Is that a sweeping stick?' LAUGH 'I'm thinking of the **how my mother used to say: "go and get the broom"'** Ga de de iets hAle LAUGH Veger 'is the only word I can use' 'And duspail and broom, I'm trying to think of that what those is' Nee! 'I can t think of it but I can't possibly imagine I don't know the word' /ahum/ 'Thats all I can say' HAHA" (PILOT X)

- (scissors/schaar) ' SIGHS /ahum/ schier? 'I was thinking of shiers!' Erm 'I think I was be- try- I was trying to say' schaar 'in in English!' HAHA 'Because I think of 'scissors' and all I say is' ss ss ssier /Then the vowel change/ sss ss 'So I missed the' schaar 'I know its' schaar 'because **I imagined in my mind mu mother..trying to cut material with sss** /yeah/ saying, "'Ja, haal de schAAr'' ' (PILOT X)

The recall efforts were similar to strategies used during the learning of L2 vocabulary (Nation, 1990)

7 2 3 Cross-linguistic similarity

Particularly prominent in the comments was cross-linguistic similarity Access and retrieval attempts often illustrated the use of intuitions on cross-linguistic similarity in "sound" and "form"

- (spoon/lepel) ' lEEpel Lepel? lepul? 'Sort of sounds right But you don't spell it that way Hang-on *F*' (PICT 19)
- (glass/glas) gl- glas /Glas/ ahum 'I'm remembering the ones that sound similar to the English words, aren't I? Mainly'' (PICT 28)

The intuitions reported were rarely more specific than "sounds similar" Only occasionally was the perceived similarity spelled out in terms of phonological features, syllables, or word stems The prominence of notions on similarity of "form" presumably is the result of the more prevalent practice in listening/reading by the emigrants, if practice in Dutch had occurred at all

Intuitions about cross-linguistic similarity between the English picture name and the

Dutch equivalent were used both in searching for the target word and in monitoring the search result. Most comments illustrated that similarity to English was used to *assist* recall of the Dutch word, either by translating the English name or by saying the English version aloud. This had "worked in the past" and was therefore assumed to "work now as well". A few reports, however, indicated that the use of similarity sometimes *hindered* remembering:

- (giraffe/giraf) " 'n giraaf 'it is a giraffe, yeah, but . 'It is **too close** to English'" (PICT 23)
- (chair/stoel) " . .hmn..stoel ..Stoel en tafel? Zetel.. Zetel 'is more formal, I think it is *A*, after all ' /Why did you think that in the first place?/ Stoel 'seemed **too close** to another English word' " (PICT 13)

These verbalizations illustrate the fact that similarity to the English equivalent can cause confusion or block access. To release the blockage, some subjects felt they had to say the English word before trying to "get at the Dutch".

- (elbow/elboog) " .'elbow' erm.. 'I said elbow, but it is-'.../It is not/ 'It is the English word, isn't it?' .'Can't think of the Dutch one ' /hmn/" {I felt elbow coming very fast, and just had to say it I knew it was wrong But then I could go to the Dutch word } (PICT 62)

Cross-linguistic similarity sometimes lured the emigrants into thinking they had remembered the appropriate Dutch word, whereas in fact their feeling of successful activation of the picture name was based on the English name:

- ". 'erm A couple of them was the spelling /yeah/ that the spelling of two names was very similar, and I wasn't sure about the spelling of them /hmn/ .Erm A couple- erm, yeah **What I found was that the English was.. trying to dominate...with selecting a name. ...And..I'd go to say the English, and then all of a sudden realised: NO** I was forcing, I was forcing an ENGlish version of the word whereas there was a different version . Yeah, You sort of recognise the English../yeah/ you know, in in a word sometimes ' " (PICT 23)

Apart from false success, successful reactivations could also be falsely rejected on the basis of perceived similarity. A few times the Dutch word was interpreted as an English response rather than the Dutch picture name when the similarity to English was considered "too close". These comments suggest that CLI affected both the accessing processes as well as the monitoring processes in which the decision was taken that the activated lexical entry matched with the cue.

The verbalizations had already suggested that cross-linguistic similarity of form was found to influence retrieval and access processes in the dormant language. In the error analyses, *similarity* of the Dutch target word to its English counterpart resulted in fewer errors. The differences in ratio between the sessions, however, suggested several interactions between similarity and proficiency. For instance, the words in Category 8 (*single-stem in Dut./Multi-stem in Eng.*) proved relatively inaccessible, both for 'poor' and 'high' ResProf subjects. The 'poor' group had particular accessing problems in morphologically partially similar categories such as Category 4 (*phon. similar/ diff. num. of syllables*) and Category 8. On the whole it emerged that processing difficulties during the retrieval of the Dutch words in the 'high' group were more likely with the Dutch categories that were morphologically different from English (Categories 5, 7 *different semantic components* & 9 *Multi-stem in Dut./Single-stem in Eng.*). In general, partial and total dissimilarity inhibited successful retrieval, whereas total similarity facilitated L1 processing. Other effects are discussed below in § 7.2.4.

In sum, CLI was stronger on L1 performance than on L1 competence, and the influence of automatisation or 'old habits' shown to be strong. In addition, findings did not support a cumulative effect of dissimilarity: instead there were differences in the types and degrees of similarity. The 'strong' Contrastive Analysis hypothesis (*cf.* Odlin, 1989) was not supported. The effect of similarity appeared to have a 'U' shape with varying 'age of departure'/ proficiency, which is similar to the one observed in CLI research on L2 learners with different proficiency levels (Kellerman, 1987).

<u>Origins of intuitions on similarity</u>

Following the arguments on the influence of the encoding context in the literature on forgetting, the intuitions about the cross-linguistic similarity could be derived from the time English had first been acquired by the emigrants. Grammar-translation methods in which similarity and contrasts between the L1 and L2 were stressed were very common in the 1950s (Van Els *et al.* 1984) and the individual learners could have adopted a strategy of "looking for cognates". According to some emigrants' reports, similarity in form and use was used during the learning of L2 and in early attempts to communicate in English:

- (ruler/lineaal) " 'a a a' lineAAl Lineaal. . . 'Similar words in English· lineal, lineaal, in English I just remembered that, in.. **When I first came to Australia,..that is how I learned English so rapidly, the words-..There's words that was similar**. and erm. and you know, you're able to sort of just transfer a lot of your knowledge, and just sometimes transfer pronunciation and things like that I made a lot of mistakes too " (PILOT S)

Frequent allusions to the use of similarity during early attempts to communicate with Australians are also made in emigrant literature (*cf.* Daan, 1987; DACA, 1993a; Lodewijckx, 1956; Nijenhuis, 1967; Schuur, 1953; Watt, 1980). Nevertheless, the possibility should not be discounted that the remarks during the experiment were merely formulated *a posteriori* to provide an excuse for the subjects' errors.

Theoretically, it also is possible that effects of similarity are due to a task strategy of using English during the remembering attempts regardless of the type of target word. This is, however, unlikely because in the naming session not all the words were Dutchified irrespective of their similarity, and because in the identification session not only Dutchified options were selected (see below)

Apart from the use of similarity based on notions about language distance, the origin of the intuitions on similarity could also be related to the cross-linguistic links in processing similar words Similar sounding Dutch words may have "rung a bell' when accessed as they sound familiar as a result of co-activation of their more frequent English forms Because of the resulting feeling of familiarity, the pre-search stage may been considered more likely to result in full activation of the target L1 entry than would have been the case for less similar words This familiarity is the result of activation spreading It could be the reason why more effort was put into recalling the Dutch target words in the similar categories than in the dis-similar ones Perception of similarity, Zwitserlood (1994a) argues, is a pre-requisite for common processing

The presence of processing links between cognates could have had the effect that subjects managed to access the English name before the Dutch The links between the lexical representations can result in information becoming available on similarity stored with the English word This may subsequently have influenced the attempts to access the Dutch word if considered 'similar', subjects may have tried to access the L1 words via English

In addition it is possible that the intuitions on similarity were among the bits of lexical information that subjects were able to access from the disused Dutch lexicon[3] In both cases the finding that set sequences of strategies were used in the responses can be accounted for The sets of strategies were more often started with English-based than Dutch-based, and more often involved attempts to recall the word after a comment on its similarity than the other way around

Analyses of the reported features showed that they varied with the level of proficiency in Dutch and the lexical characteristics of the target words The distribution of these features is discussed in combination with the results of the analyses of the error percentages and the types of distracters

7 2 4 Experimental Findings Error Analyses

Proficiency effects

In respect of the error percentages, the following proficiency-related results were found First, emigrants who, on the basis of the Dutch-language proficiency and fluency tests (ResProf), had scored better than average tended to make fewer errors These 'high' ResProf subjects also used fewer communication strategies in their naming attempts The 'poor' subjects more often tended to use English based PSAs in their responses

Second, comparison of the error percentages to the questionnaire data showed that the smaller number of errors by the 'high' ResProf group is related to having spent more 'pre-emigration years in the Netherlands' (and *ipso facto* having had more practice in using Dutch, having more training in Dutch literacy skills and, in Australia, making more use of opportunities to converse in Dutch) and partly due to greater contact with the Netherlands In other words, not only a solid base of L1 proficiency prior to emigration, but also later contact with Dutch through other emigrants affected the success of L1 processing in the naming session

Contact with fellow expatriates, however, did not just improve L1 proficiency it also increased CLI Subjects with more contact with fellow expatriates in similar sociolinguistic domains were found to use CLI-based strategies more often, appropriately or less appropriately In the identification session, the 'high' ResProf subjects also tended to select the *English* distracter type more often than other subject groups Although this could have been a strategy to save face, it is possible that greater exposure to code-switching and mixing for the 'high' ResProf subjects could have made English-based responses more appealing to them as being communicatively appropriate It is possible that these subjects, who regularly used both languages, were more confused about language membership than the subjects who almost always only employed English

Third, the type of processing varied with the level of L1 proficiency Comparison of the discrepancy between the observed and expected ratio of errors in the naming and identification sessions in relation to ResProf showed that, if problems were perceived, the subjects who had performed poorly in the Dutch assessments tended to have difficulties in *accessing* Dutch words in the experiment rather than only in retrieving them When 'high' proficiency emigrants did experience difficulties, these were more likely to be due to *retrieval* problems than to access problems For instance, in the identification session, 'high' ResProf subjects had sufficient literacy skills in Dutch to identify the *Orthographic Alternative* as a distracter

Fourth, on the whole, the 'high' ResProf emigrants named and identified more words, and were less affected by similarity of the target words to English 'Poor' ResProf subjects tended to have relatively more difficulties in even accessing the words, particularly non-cognates Less L1 experience in the Netherlands is related to difficulties in accessing L1 words now Subjects in the 'poor' ResProf group also selected semantically aberrant options in the identification session more often than more proficient emigrants This also suggests that the 'poor' subjects experienced difficulties in accessing the appropriate semantic fields in the Dutch lexicon It appears that attrition manifests itself in access problems below a certain threshold level.

Word frequency effects

Not only were there processing differences between subjects who varied in the frequency of L1 use, but differences in the frequency among the target words also influenced the success of naming. If emigrants perceived the frequency of occurrence of a word to be high, this motivated the emigrant to search longer than if it were low.

- (skunk/stinkdier) " 'Nah Wouldn't have a clue **Never see those here** either, so forget about the Dutch word then I probably did know it once, but not now ' ' (PICT 72)
- (rollerskates/rolschaats) ' 'Bloody hell, that is **not very common** here, mate! I know "roller" but the "skates" bit Not something you see here often Nope (PICT 12)

The error analyses showed that the Dutch-Australian emigrants recalled and recognised less frequent non-cognate words least successfully. The effect of frequency depended on similarity: frequency in Dutch was more important when the target Dutch words were less similar to English. In other words, English was used in the bilingual recall processes of less common words.

In the error analyses no evidence was found that the frequency of the English name affected performance in Dutch more than frequency of the Dutch target. The data did not show that the Dutch lexicon had been 'overwritten' by the English equivalent as a result of disuse of Dutch.

A similar relationship between word frequency and similarity had been found in the rating task performed by fluent bilinguals. words that were cross-linguistically similar had been rated as being more frequent. Both findings suggest that frequency of occurrence in bilingual contexts is different from that in monolingual contexts. Verbalizations by the emigrants supported the notion that in the emigrant contexts different notions of frequency were used than in the monolingual contexts:

- (switch/schakelaar) " deur- er swi- erm 'n erm . erm elektriciteit HA Hoe noem je zo'n ding?' 'Schakelaar' /ja/ 'n 'switch' . Weet je wat ik dus vaak heb?' 'WAt je vaak, en dat heb ik zelfs, D'r zijn woorde in het Engels Nee, d'r zijn Nederlandse woorde die in 't Nederlands gebruikt je heel sterk maar waar je hier in het algemeen, ook al spreek je erm ik spreek toch 'n vrij behoorlijk hoog Nederlands, die je nOOIt gebruikt EEn van die woorde is "aanrecht" /ja/ **Je zult nOOIt 'n Hollandse vrouw hier ze- hier hore zegge "'t ligt op 't aanrecht." Al spreke ze vloeiend Nederlands op het moment, ze zegge: "het ligt op de 'sink'".** /ja/ Maar 't woord "'sink'" dat gebruik ik al jaren, en ik betrap me d'rzelf op /ahum/ Omdat, afijn, omdat "'sink'" is 'n enige lettergrepig woord, en "aanrecht" is 'n tweelettergrepig, en je hebt het zelfde met xxxxxxx 'voo- voo- vocalising, more difficult ' "Aanrecht" en "sink" " [door erm swi An erm electricity switch Dyou know what I often find? What you often find and what even I often experience,..There are words in English No, there are Dutch words that you use in Dutch very often but where you generally here, even

> though you still speak a fairly high standard of Dutch, which you NEver use One of these is sink You will nEver hear a Dutch woman here s hear her say it is on the sink Even if they speak fluent Dutch at that moment, they say it is on the sink /ja/ But the word sink I have used for years and I noticed that /ahum/ Because well, because sink is a monosyllabic word and aanrecht is a dissyllabic, and you have the same with xxxxxxx 'voo voo vocalising more difficult ' Aanrecht en 'sink] (PILOT C)

Traditional monolingual measures of frequency of occurrence (*i e* the use of frequency counts based on written texts) therefore appear of limited use in a bilingual context, particularly in the case of the heterogenous set of non-balanced bilinguals investigated in this study Using the average score of the listed Dutch and English frequency to equate the word categories in the experiment was only a provisional solution

Word length effects

Whereas a frequency effect tends to be regarded as an index of retrieval processes, a length effect tends to relate to access processes Several types of length effects were found on the errors in both naming and identification sessions, suggesting that access processes in Dutch were slow or rusty On the whole, it was found that more letters, syllables, and stems, was related to more recall errors Subjects also stated that they felt less motivated to recall long words because they felt they could only partially activate the target information It seemed that the longer the word, the higher the risk that a particular component was missing or incompletely accessed during the reconstruction process from memory Short words, on the other hand, were articulated more quickly and completely

7 2 4 1 Word type

The effects of proficiency were related to the type of word category (*i e* dependent on number of syllables, stems, and phonological similarity) In this section the various findings concerning the relationship between background and the multi stem word categories are discussed

Problems in accessing the longer more dissimilar multi-stem word categories occurred more often than in the more similar and shorter single-stem categories All three subject groups experienced more difficulties in both naming as well as identifying the multi-stem Dutch words than in the single-stem categories The difficulties in the multi stem categories could be a result of greater dissimilarity to English, combined with greater length-in-letters, more meaning-carrying morphemes (stems), and possibly a lower frequency of occurrence than in the single-stem categories (although a number of multi-stem words were not listed in the corpus) On the basis of Goggin, Estrada and Villareal (1994) one could argue that this word type effect may be due to a decrease in name agreement for the morphologically more complex and less frequent words in the Snodgrass and Vanderwart picture set. However, given the extensive pretesting and calibration of the pictures prior to testing, this argument seems less plausible than the argument that morphologically more complex words are recovered with more difficulty from the dormant L1 lexicon.

Dissimilarity affected performance. The verbalizations showed that remembering Dutch words via their English picture name was also a strategy used in the multi-stem categories when the Dutch names were not recalled immediately. Particularly in the 'high' group, retrieval problems occurred in the '*different-meaning components*' Category 7 and the '*multi-stem in Dutch/single-stem in English*' Category 9. Comparison of the sessions revealed that, when problems occurred, particularly words in Category 8 were relatively difficult to access, whereas in Category 7 (grasshopper/sprinkhaan) and 9 (skunk/stinkdier) there were relatively more retrieval problems.

<u>Semantic transparency effects</u>

Category 6 '*Same-meaning components*' (toothbrush/tandenborstel) had been rated more similar to English by the fluent bilinguals than Category 7. This difference also affected naming by the dormant bilinguals. Semantic transparency significantly improved recall performance for the 'middle' and 'high' subjects. Absence of this transparency effect in the identification session suggests that this type of similarity was primarily used during the retrieval stages in word production. There was some support for Kellerman's claim (1987) that semantic transparency increases transferability, though mainly in the recall context.

The semantic transparency effect could be the result of a combination of processes. Activation of the English equivalent makes the words in Category 6 feel more familiar as a result of spreading activation. The use of PSAs in the naming session involving semantic similarity may to some extent account for the success in Category 6 compared with Category 7.

- (toothbrush/tandenborstel) ". 'n . tanden 'brush' 'No, that is not right' Tanden.. 'What is a brush?' Borg, brug, broos 'I don't know Forget it!'" (PICT 13)
- (peacock/pauw) ".. erm ... TZK Pluimvogel 'I'm not sure..what it is '" (PICT 11)

PSAs which analysed the intended meaning into semantic components (which in turn are used to reconstruct the Dutch target) are perhaps more likely to be closer to the actual target in Category 6 than in Category 7. In the last example, the meaning of 'peacock' was dissected into the Dutch words for 'plume' and 'bird' as part of a PSA aimed at 'pauw'.

No effect of semantic transparency on naming was found in the 'poor' group. It is possible that the 'poor' ResProf subjects may not have been able to access sufficient lexical information or that they may have felt too uncertain to use analytical PSAs or trust their intuitions on this type of similarity Semantic similarity may have been noticed at the lemma level for words in Category 6, and used to motivate searching for the remaining L1 lexeme information This co-activation between languages appears more prevalent in the 'middle/high' groups The emigrants with experience in using both languages interchangeably may be more likely to perceive a relationship between the compounds, and hence to consider these word pairs more 'cognate' than the 'poor' emigrants who exclusively used the L2 Zwitserlood (1994a) argues that co-activation of the lemma information depends on the subjects' perception of similarity between the words

<u>Stem agreement</u>

Recall errors occurred more often with Category 9 words (*'multi-stem in Dutch/single-stem in English'*) than with words in Category 8 (*'single-stem in Dutch/multi stem in English'*) Comparison of the sessions showed that words in Category 8 were relatively difficult to access In this category relatively more identification errors were made than had been expected on the basis of the number of naming errors Since no significant differences were found in the distribution of CLI-based strategies between Categories 8 and 9, the emigrants may, in the case of the long multi-stem words, have adopted the approach of assuming similarity in order to reach the Dutch target name The success of this assumption varied in each category and in each session The double stems in the English words in Category 8 may have misled the emigrant into looking for a multi stem word in Dutch, whereas the application of the same naming strategy to the single-stem English word in Category 9 may have resulted in a compound that resembled the Dutch multi-stem target For instance, dissecting the meaning of 'thimble' into 'a hat for one's finger' is more likely to lead to the Dutch target name 'vingerhoedje' than dissecting 'butterfly' into 'butter' and 'fly' when 'vlinder' is the target It is conceivable that the combination of a blanket approach to Dutchify multi stem words and the use of analytical naming strategies increased the chance of uttering non-target names in Category 9 Some support for this argument was found in the distribution of strategies In Category 9 more abandonment of naming attempts occurred than in Category 8

In the identification session the reverse error pattern was found access of the Dutch entries was particularly poor in Category 8 in all the groups, more so than in Category 9 It is possible that Category 8 contained very uncommon words, since the 'middle' and 'high' residual proficiency groups also experienced remembering problems in this category

It should be noted, however, that the number of items in the multi-stem categories was very small and that information on additional lexical characteristics was not always complete Although speculations were made, this situation prevents conclusions being drawn about Dutch multi-stem words in general

7 2 4 2 Degrees of similarity of form single stem categories

Within the single-stem categories, effects of degrees of similarity between the Dutch and English lexemes were investigated The difference between the single-stem and multi-stem categories had shown a morphological effect (*i e* an effect on the number of stems) The single-stem words were used to examine whether varying degrees phonological and morphological similarity in single-stem words affected performance in the dormant L1

The results of the error analyses show a generally facilitatory effect of similarity of form on performance, particularly in the naming session On the whole, similarity of form was less influential on processes involved in the identification session, only similarity in the number of syllables (morphological similarity) had a facilitatory effect on the identification errors in the single-stem categories Another overall pattern was a tendency for the Dutch-based options to be selected often with morphologically similar Dutch words, whereas phonological similarity tended to lure the subject towards *Dutchified* options

The effect of similarity of form varied with the level of ResProf In general, similarity of form also was less influential for 'high' ResProf emigrants in respect of the number of naming and identification errors made, suggesting that, on the whole, the 'high' group very easily accessed and retrieved the picture names As far as the number of errors are concerned, retrieval processing in Dutch was affected by English (*i e* less independent processing) in the 'middle/poor' ResProf groups, who had less success in immediately naming dissimilar names Both morphological and phonological similarity affected successful identification in the 'poor' group, whereas in the 'middle' group only morphological similarity was needed to help identification The 'high' ResProf emigrants made relatively fewer errors than the less proficient emigrants, particularly in the cognate categories (Cat 1 & 2), in Category 4 (*phono dissimilar/same number of syllables*), and in 8 (*single-stem in Dut /multi-stem in Eng*) Other significant interactions between Category and ResProf will be reiterated below, starting with the cognate effect

Cognate effects

Dutch-English *cognates* were accessed and retrieved with least difficulty Under both definitions of cognateness (Categories 1 & 2), cognate names were recalled and recognised better than non-cognates, irrespective of the proficiency level (ResProf) Verbalizations like the one below illustrate that the subjects were aware of this

> (glass/glas) gl- glas /Glas/ ahum 'I m remembering the ones that sound similar to the English words aren t I? Mainly ' (PICT 28)

The very small differences in similarity between Categories 1 and 2 made no difference to the results of the error analyses Reports in previous literature suggest that the cognate effect is due to a lower activation threshold for cognates than for non-cognates in all three groups This is considered the result of frequent activation of the translation equivalents and the spreading of activation along links between the entries for cognates towards the other language Evidence of this partial activation when the English equivalents are accessed and retrieved was weaker in the more frequent cognate items (*cf* similar results in Verkaik & Van der Wijst, 1986), presumably because the frequent Dutch words were remembered immediately As discussed earlier, it is not clear whether the sharing of accessed information is a remnant of the way the L2 names had been encoded in the past or of the way they were used during the daily access of English cognates

<u>Effects of partial and total similarity of form</u>

- Partial similarity of form and differences between the sessions were the possible determinants used to investigate which component processes in Dutch show signs of CLI On the whole, very dissimilar words were remembered less well than partially similar single-stem words, and involved more CLI-based strategies and more elements of semantically-based search The results of the error analyses in the two sessions suggest that if Dutch words in the more similar categories were not recalled this tended to be due more to *accessing* problems than to retrieval problems, whereas if Dutch words in the more dissimilar categories were not named this tended to be more the result of *retrieval* difficulties (*i e* not activating all the relevant information)

Similarity of form was less influential in the identification session than in the naming session, particularly the effect of phonological similarity in the single-stem words It was mainly *morphological* cross-linguistic dissimilarity that inhibited access and retrieval processes in Dutch, particularly in the less proficient subjects In the identification session, the phonologically similar categories tended to attract the *Dutchified* distracter, suggesting some inhibition as a result of similarity

Depending on the level of ResProf, partial similarity resulted in *facilitation* when English was used to reconstruct the target word and *inhibition* by competition from more rapidly activated English information Similarity in the number of syllables assists naming in Dutch, both in the multi-stem as in the single-stem categories Especially when the words are phonologically similar (Categories 2 & 4), being equal in the number of syllables results in better naming and identification in all the ResProf groups as compared with the dissimilar categories If the names differ phonologically (Categories 3 & 5), the same number of syllables significantly assists naming and identification in the 'middle/poor' groups only For the subjects with lower ResProf, differences in the number of syllables in the Dutch and English word pairs make the Dutch words harder to remember

In the 'high' ResProf group there was no significant effect of phonological similarity on the errors, either in the naming or identification session These subjects managed to process Dutch more 'independently' than the lower ResProf groups, and mainly experienced retrieval rather than access difficulties In the light of this it appears that dissimilarity in the number of syllables was a more disrupting element for lexical processing than phonological dissimilarity For the lower groups, phonological similarity assisted naming performance primarily if the words were similar in the number of syllables (Categories 2 & 3) If the number of syllables was different, phonological similarity did not affect naming in the 'poor' group, and could not compensate for an inhibitory effect on identification

Phonological similarity had no measurable facilitatory effect on the identification of the single-stem words except when words were similar in number of syllables This suggests that, if the word-pairs only differed in the way they 'sound', the 'poor' ResProf subjects were led astray in their attempts to name and identify the target The effect on identification could be the result of the written nature of this session, in which orthographic rather than phonological lexical information was the target of identification The verbal reports, however, show that uncertainty about spelling only occasionally resulted in phonological activation in this task, as subjects often said the words aloud to see what each [option] sounds like

(orchestra/orkest) ORkester orkESt Orkest 'Oh that sounds near enough to the Dutch to me '*A* (PICT 19)

(button/knoop) knoop 'Yeah knoop erm 'Which spelling though 'I ll go for *E* (PICT 15)

- (grasshopper/sprinkhaan) sprinkhaan '*F* A bit tricky some of the spelling is so similar (PICT 28)
- (cannon/kanon) Kanon 'Yeah I thought it was kanon 'But I don t know the spelling Whether it is *F* or *A* ermmm Kanon hmn 'I ll say *A* (PICT 28)

This uncertainty about Dutch spelling found in the data could originate from the 'poor' ResProf emigrants' more limited experience with Dutch spelling rules[4]

The fact that the effect of phonological dissimilarity was smaller than that of morphological dissimilarity in the identification session suggests that, particularly in the access stage of speech production, morphological information from English affects Dutch processing. CLI from the more often-used English language affects the access of the Dutch lemma during production, rather than merely the access of the lexeme prior to production, particularly in the 'poor' and 'middle' groups. Recognition processes were affected by morphological dissimilarity. This implies that these groups were least able to deactivate English while accessing Dutch lemmas. More proficient emigrants were apparently able to process Dutch information more independently of English, because effects of cross-linguistic similarity of form were much smaller for this group. Nevertheless, some evidence in the distracter analyses suggests that English occasionally influenced the judgements of the 'high' ResProf subjects.

Analysis of the distribution of the types of distracters had suggested that English influenced the remembering of Dutch words. The subjects were not always sure of the correct spelling of the target words and used English intuitions to eliminate the options. The most popular incorrect options were those that resembled Dutch (orthographically, phonologically, morphologically): one subject's comments suggested that the *Dutchified* and *Orthographic Alternative* options "felt familiar because of their resemblance to English names and their association to the picture cues":

- (umbrella/paraplu) "'I know it is a' paraplu 'but how do you spell it?'..Ja..D, paraplu..../Ja/...'I didn't know what is the spelling.'" (PICT 87)
- (spoon/lepel)"...lEEpel..Lepel? lepul?..'Sort of sounds right ...But you don't spell it that way..Hang on..*F*.'" (PICT 16)
- (giraffe/giraf) "..Aha!..'It is not a zebra, and it is not a' dier....'I just have to get the spelling right.... *B*...'ger' af...geraf...LAUGH." (PICT 85)

These two options resembled the Dutch target word most. The emigrants rarely selected pure English options, suggesting they knew what was English but were less certain about what constituted the appropriate Dutch form. The frequent selection of the '*Dutchified*' and '*Orthographic Alternative*' options supported the interpretation that the type of CLI was form-based: the subjects' judgement of what sounded Dutch had been affected by English. When a word could not be immediately recalled or the correct name could not be given, the subjects selected the option that resembled Dutch orthography and phonology and felt familiar (because it would otherwise have been English).

The '*Dutchified*' and '*Orthographic Alternative*' options were frequently selected in the phonologically similar categories, again suggesting that the subjects used their intuitive or residual knowledge about the similarity of the Dutch target to the more familiar English name.

Access of knowledge about the Dutch target word was more affected by English in the less proficient subject group than in the other two groups 'Poor' ResProf subjects tended to select the *Dutchified* and *Orthographic Alternative* options when they could not identify the target It appears that access of knowledge about the Dutch target words in the Dutch lexicon had been affected by the predominant use of English and the relatively limited practice in Dutch The reluctance to select the *English* option suggests that subjects had recognised this more frequently used label as being inappropriate English had not simply replaced Dutch

7 2 5 Partial similarity Category 4

The results showed an effect of morphological similarity on remembering Dutch words single-stem words were recalled and recognised better than multi-stem words Among the single stem words, morphologically similar words are remembered best However, the single-stem category which differed in both phonological similarity and similarity in the number of syllables (Cat 5 desk/bureau) was *not* recalled less well than the words in the category that only differed in number of syllable (Cat 4 asparagus/asperge)

Analyses of the various lexical characteristics had shown that the differences between Category 4 and neighbouring Categories 3 and 5 lay primarily in the feature similarity ('objective similarity' and 'similarity rating'), as had been intended in the design Even when 'frequency ratings' and the 'length of the Dutch word in letters' were accounted for (*cf* Table 6 6), it appeared that particularly partial similarity in the single-stem items in Category 4 (*phono similar/diff number of syllables*) obstructed recall of these short words, more so than dissimilarity in the twofold distinct Category 5 Partially similar words in the multi-stem categories (*different-meaning components*) also revealed these retrieval problems (Table 6 4b) In other words, partial similarity appeared more disruptive than total dissimilarity in form

Since adjusting for the various lexical characteristics did not contradict this finding, we seem to have to conclude that morphological and phonological dissimilarity do not inhibit access and retrieval processes in Dutch in an additive fashion Replication of this facet in a new experiment will determine whether this finding is generalisable or whether it is confined to the idiosyncrasies of the item set selected in this study Analyses of the frequency of comments expressing difficulties with certain images did not result in a pattern that could explain the problems in Category 4 in terms of greater picture ambiguity These comments turned out to originate from a variety of motivations, only one of which was difficulty in recognizing the picture

7.3 Implications for Lexical Processing in Bilingual Picture-naming and Word Identification

Recall problems resulted in "broken Dutch", which to an observer created the impression that the Dutch emigrants had lost their disfluent language· in fact, however, emigrants turned out to be simply unable to retrieve the required information, or retrieve it as rapidly as equivalent words in the L2

In the light of the bilingual version of Levelt's framework of speech production and the type of picture-naming processes outlined in, among others, Glaser (1992), the experimental findings suggest that various processing paths could be used in picture-naming by dormant Dutch bilinguals.

Generally, processing in picture-naming commences with the interpretation of the visual cues by accessing conceptual memory. Once recognised, the pictures activate syllable structure information in the linguistic system. Recent findings in monolingual research on picture-naming suggest that activation of lemma information occurs first, and once the target lemma is accessed, the lexeme information is accessed in order to retrieve the name. Research shows that related units of words at each stage can block access of the target unit, though only within their processing level. The separation in the two levels of speech production is evident in the finding that phonologically-related words only interfere with the target word at the form level (*cf.* Levelt *et al.*, 1991). Activation-spreading stops at each level after the target node has been activated.

In a bilingual context, the information in a lexical representation is presumed to be language-specific (Albert & Obler, 1978a; Green, 1986, Shannon, 1991), with within-language links being stronger than between-language ones. This specificity normally regulates processing like a shunt: normally, when the intention is to produce utterances in one language only, the activation of the appropriate language-specific unit lowers the activation threshold for representations in that language, so that representations in the other language(s) are in comparison relatively inhibited. This specificity may be part of the pre-verbal system in case of culturally-marked concepts or a one-language-only context (see De Bot & Schreuder 1993 for an opposing view), but more commonly influences grammatical encoding at the lemma level.

The importance of the language-specificity depends on both contextual cues and competitive interaction: certain tasks may be more appropriate for switching than others, and practice in common contexts can provide feedback indicating that the words are communicatively interchangeable, *i.e.* similar (De Bot & Schreuder, 1993).

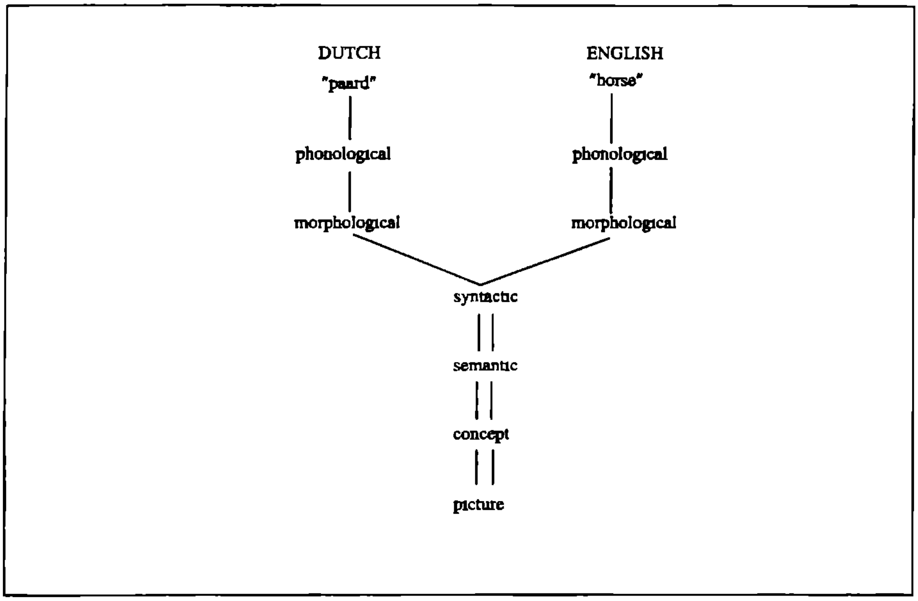
Apart from being based on shared use in both languages, specificity can also be based on explicit comparison during learning of the other language Beginning L2 learners tend to assume that cross linguistic similarity of form is identical to similarity in meaning, and not to adjust these tags if the L2 proficiency is not developed beyond beginner level (Walsh, 1983) Others who continue to expand to their L2 knowledge are more skilled at distinguishing cognates from pseudo cognates, and base notions of similarity on fact rather than on assump tion Learning context, level of proficiency, usage and similarity of form thus interact

In the light of this it is no surprise that the cognate effect in language learners was found to depend on the level of proficiency and the context of language-learning (*cf* Kerkman, 1984, Lanza, 1988, Mildred, 1986) In the present study on language attrition, proficiency had a dual effect First, the more proficient the bilinguals are now in Dutch, the more successful access and recall had been as a result of recent practice (*i e* greater frequency) The more proficient the subjects were in the past (which was related to more years in the Netherlands), the better analysed the Dutch information and the more practice in recall prior to emigration and therefore the better performance Second, by analogy to proficiency related behaviour in language-learners (*cf* Kellerman, 1987), least proficient emigrants may have more likely accessed and retrieved L1 words via analogies to their translation equivalents in L2, based on assumptions that the L1 is similar to the L2, while more experienced bilinguals did so only when appropriate, and less often based their linguistic behaviour on assumptions that identical 'labels' refer to the same concept with the same distribution restrictions This showed up in the differences between naming and recognition sessions for less proficient subjects the effect of similarity in the naming and identification sessions was more constant than for the more proficient emigrants The latter 'knew' in the identification session which option was the target (despite initially getting it wrong in the naming session), resulting in greater differences between the two sessions

In the light of the above there are various pathways along which concrete open-class words can be retrieved by the emigrants (*cf* Figure 2 6) that account for the influence of English (L2) on picture-naming in the dormant L1, direct search in the fluent language (L2) and/or search in the disfluent language (L1) followed by translation The experiment shows a 'priming effect' English is accessed faster than Dutch by the picture stimuli, and the activation spreads faster for similar words, presumably because more links are activated

The bilingual version of Levelt's framework of speech production processes allows more detail to be added to this picture Since the majority of pictures were language neutral and had a noun as their name, it can be assumed that at the lemma level there was considerable over lap between the representations in each language in the form of links (Figure 7 1)

Figure 7 1 Flow chart of possible speech processes in the Dutch of emigrants during the naming of the picture for horse/paard



The morphological effect in the data suggests that, once the picture has activated the associated semantic concept, the morphological information of the English-language picture-name is activated rapidly before the more task-appropriate Dutch information Information on the number of stems in the English name, its morphological structure, and the perceived cross-linguistic similarity that are part of the lemma can subsequently influence access and retrieval of the Dutch lexical entry Apparently, on presentation, the associated English information is accessed almost automatically[5] and used during the processing of the target word (*cf* Lukatella & Turvey, 1994 on letter-reading) The activated phonological information activates entries similar to it, with each entry providing information about, for instance, how the word is spelled and its episodic trace Suppression of incorrect entries occurs once a sufficient match is perceived between the picture and the information activated

Fast processing in English as a result of the greater frequency of occurrence of these words in comparison with slower processing of disused Dutch words in turn triggers the English phonological information before the Dutch phonological information Monitoring activity prior to articulation can either "block" the articulation of the task-inappropriate English response, resulting in only the target Dutch picture name being pronounced, or else pass the English information as communicatively feasible. The term "block" is used in the sense that formulation of the response does not result in actual articulation. If the English form is similar to the Dutch form, phonological similarity facilitates processing of the Dutch words. Superficially 'correct' responses are given to the cognate words, and foreignisation occurs in the less similar words when the influence of English cannot be pushed aside. In other words, as a result of the predominant use of English and rare use of Dutch, the constrain to 'provide a Dutch name' can be overridden by the higher activation of English (as a result of greater frequency).

At the lemma level English can also interfere with the Dutch lemma. If the English lemma is activated faster, further activation of the lexeme occupies the production processes, resulting in an English response first, or a response with English lemma features and Dutch lexeme characteristics (Dutchification). Disagreement in syllable structure does not provide morphological cross-linguistic links and therefore reduces the chance that activation of the English lexical entries will spread to the Dutch, but the greater frequency of English can still override the task-appropriate Dutch-specific feature(s) of the target lexical entry.

The presence of English influences in the verbalisations and the error patterns could also have been the result of post-access links, when the English picture name may be used as a cue to access the Dutch translation. Post-lexical checking process may also be a locus where the similarity is identified (*cf.* Tzelgov & Eben-Ezra, 1992) as well as during access of lemma information. On the basis of the present experiment it is difficult to distinguish between the influence of English due to spreading activation or due to reconstruction of Dutch using the English word as the cue rather than the picture.

To sum up, as a result of 'rusty' lexical processing in Dutch, English can come in at the lemma level, at phonological level, or after articulation of the entire English word when the word is translated (*i.e.*, used as cue, rather than the picture). The experiment was not specific enough to tease out any of these causes[6]. What appears to occur commonly in Strutch is that the often-used language is difficult to deactivate when the less frequently used language is employed. As De Bot and Schreuder state, "elements of the active but not selected language [English] cannot always be suppressed, or will not be suppressed because the L2 may be felt to be communicatively appropriate" (1993;199). In some cases, the English lexeme is accessed before the Dutch even though a Dutch lemma (syllable structure) was specified in the task. This appears to be very common with cognate picture names, as the corresponding lemma in other language was co-activated regularly The English lemma facilitates the Dutch lemma The emigrants considered Dutch and English to be closely related, and this perception may have promoted co-activation

Learning context

In addition to between-language links on the basis of similarity of form, links may also exist on the basis of the contexts of learning and use Reconstruction of the Dutch words involved both semantic and form features Comments by the emigrants suggest that processing appears to have been affected by the simultaneous or consecutive acquisition and use of the languages involved Some support comes from De Groot (1993) She suggested that L2 teaching via translation methods may have influenced her students to process L2 words via translation Chen (1990) shows how lexical processing by low-proficiency bilinguals is affected by learning strategies in picture-naming Learning via pictures increases processing involving conceptual memory rather than processing via translation Paivio and Desrocher (1980) argue that the conceptual information can contain the acquisition and usage history (connotations) of the entry as well as amodal, common semantic elements An L2 word learned consecutively via the L1 is likely to be retrieved via L1 if access is most successful in the conditions under which the item was acquired As a result of this link, the reverse scenario is also possible dormant L1 words are re-activated by the L2 Some ('meta-linguistic') residual knowledge could be accessed concerning the outline of the L1 word (comparable with the result of a pre-search in TOTs) and its similarity to the L2 equivalent This need not be a remnant of the Dutch entry but may also be stored with the English equivalent as a result of learning strategies of L2 English which now guide access

Other factors are similarity of the word to the contact language in form, word frequency, and similarity in length The findings also showed an effect of proficiency Whether regression had taken place is not clear, however although comparison of the levels of ResProf suggests that 'high' ResProf subjects processed the words more independently than those with lower levels of ResProf, caution is needed The groups were relatively small, and showed considerable variation, thus rendering the study vulnerable to potential cohort effects in the groups In addition, I do not know whether the individuals had already processed the words more independently before being tested Some emigrants may have switched from processing subordinate language English to subordinate Dutch without ever reaching independent level English-Dutch A follow-up on the present subject groups could resolve this (see below)

7 4 Suggestions for Further Research

As in every study, many compromises had to be made Given these restrictions it is difficult to generalise the findings from this study to all bilinguals At most, the study is valid for 'dormant' Dutch-Australian emigrants

The present study can be characterized as investigating within-generational, natural L1 attrition of the lexicon in an L2 context from a primarily psycholinguistic perspective that takes sociolinguistic data into account In this section an outline is given of further types of investigation, concentrating on methodological issues (§ 7 4 1) The extensive data collected in the course of this study, of which only a part was discussed here, was very 'rich' On the basis of the data, some suggestions are made in sections 7 4 2 and 7 4 3 for possible further investigations of dormant Dutch, divided into linguistic and sociolinguistic topics

7 4 1 Methodology

A similar study needs to be carried out on a larger scale, in terms of population and lexicon The present study was restricted in a number of ways

Subjects

The sample of subjects was restricted to residents of Victoria, middle-class emigrants, and subjects with some connection to other emigrants This was a result of the way dormant Dutch subjects were contacted and the fact that the subjects were unpaid and had to give up their spare time Another restriction was that only 76 were tested of a total of 96,000 first generation Dutch-Australian emigrants in Australia, half of whom might be "dormant in Dutch"[7] Within the group of 76 there was furthermore a great deal of variation Testing involving a larger, more randomly gathered group could address more questions[8] A larger number of subjects in the sample would permit detailed investigation of, for instance, the impact of proficiency and fluency in Dutch on the experiment, which in the present context was compressed into 'ResProf' In addition, the nature of lexical processing in aging Dutch emigrants could be investigated to assess claims that first-generation Dutch emigrants use more Dutch once they retire or lose their partner

Items

In addition, only a small part of the Dutch language was investigated in the naming experiment The items were purposely selected, fairly common words for objects shared by both Dutch and Australian cultures This restricted the power to generalize to the Dutch lexicon Future analysis of the other experimental data collected from the subjects (like the lexical decision experiment) may shed more light on selective attrition in word classes other than concrete words Investigation of the corpus resulting from the unreported story-retell tasks and the interviews may provide information about the role of formulaic phrases in L1 attrition These well-practised Dutch phrases may be less vulnerable to attrition

Analyses

The use in subsequent studies of more items in each category and equal numbers in each can allow better insight into the processing of the words, and hence reveal more about the interaction between various lexical characteristics on processing This will require extensive pretesting of more picture stimuli than in the Snodgrass and Vanderwart (1980) set Analyses in such studies may involve LISREL (Ginsberg, 1986) A large-scale study may also assess the impact of proficiency or purely fluency related effects on picture-naming

Paradigm variables

In a large scale investigation, more lexical variables can be taken into account, such as 'context availability' (De Groot, 1992a), 'age of acquisition' (Carroll & White, 1973a), 'codability' (number of different names, Lachman, 1973), and 'image agreement' (Snodgrass, 1993) Some of these had been taken into account but were incomplete ('DuFreq', 'Krom', 'Staphorius') or could only be inferred (*e g* the age at which subjects had acquired the Dutch picture names in the 1940s and 1950s) In future studies, recent findings in respect of these variables should be considered Also, the relationship between 'FreqRat' and 'SimRat' deserves further examination De Groot (personal communication) also found a relationship between frequency judgements and estimated similarity Furthermore, the effect of syllabic information may be distinguished more clearly from the effect of phonological information In the analyses, some indications were found that several types of syllable information (*e g* similarity between Dutch and English syllables, how many syllables in the target word) affected the responses The importance of the impact of syllables as units is in bilingual speech production needs to be investigated In addition, only a few types of similarity were investigated structural relatedness across languages, however, covers more types of similarity and combinations of similarity at various linguistic levels It should be investigated which types of similarity influence processing most

In addition, the use of more reliable data (like CELEX) for lexical information on word frequency should be considered, as larger corpuses provide better indications of actual frequency of occurrence in Dutch and English In addition, better information should be collected on the frequency of occurrence in bilingual contexts and what this is based on (*e g* form and/or meaning of the word) In addition, various indexes of phonological and morphological similarity should be separately defined in future research Extensive pretesting on a larger set of pictures in combination with more and better information on the picture names may then allow detailed investigation of interactions between lexical variables

Paradigm method

In combination with the above, recent developments on priming methods in picture naming should be applied to bilingual research, such as the use of semantic and phonological primes before and after access of the picture name (*cf* La Heij, Dirkx & Kramer, 1990) These methods could more precisely locate the source of interference in the processing of Dutch by the emigrants, particularly in comparison with current psycholinguistic research on fluent Dutch-English bilinguals in the Netherlands In the current format it was not possible to determine whether the effect of similarity of form was pre access or post-access

Paradigm introspection and retrospection

The combination of experimental data and introspective data proved illuminating in respect of the type of information considered by the subjects during the recall of Dutch words Even when conducted following the guidelines proposed by Anders-Ericsson and Simon (1984) these data, however, remain complementary in respect of the very automatized access and retrieval processes The wording in some reports suggested that occasionally reports were construed as opposed to reflecting what actually happened

> (spider/spin) Spin 'It is like being retarded having to think for words it is so simple /xxxxxx/ I don t know with these ones Because that is some of them I can directly translate I mean look **think about in English** and over they But spin Ni 'I don t erm I don t know how I got that one Trying to think of a nursery rhyme I think Visualize a nursery rhyme (PICT 25)

The data mainly provide information about the considerations used by the subjects during the experiment, and about the types of variables that should be considered

Paradigm baseline

The study also provided more experience regarding the use of norms in studies on attrition As in most research on L1 attrition, this project was started on a group which had not been tested prior to the onset of the first symptoms of attrition An alternative pre-attrition norm (*i e* using the same experiments and tasks on a comparable group of fluent Dutch native speakers in the Netherlands) was inappropriate for our research since I was not interested in bilingual *versus* monolingual lexical processing The use of assessment of the sociolinguistic background of the emigrants in combination with psycholinguistic testing of lexical processing as carried out in this project proved to be better than mere cross sectional comparison of subject groups in terms of interpretation Comparison of groups (within the emigrant community as well as to outside groups of native speakers) should be avoided, given the heterogeneity observed in the emigrant groups To sum up, the definition and operationalization of points of reference (Jaspaert *et al*, 1986) in research on language attrition needs further attention One possibility is to conduct a follow-on study with the 76 subjects, using the present results as baseline data

Continuation of research into language attrition on the same subject sample should be considered, in order to determine if changes in proficiency and fluency in Dutch have occurred, and whether as a result similarity effects have changed This is because detailed information is available on the subject group, as well as a fairly detailed assessment of their L1 and L2 proficiency in 1988 Recent contact with a number of subjects has shown that some had "picked up their Dutch" as a result of taking part in the experiment, whereas others had not or had done so only temporarily

<u>Questionnaire</u>

In future psycholinguistic studies, a simpler questionnaire involving fewer variables would be sufficient Important variables proved to be *age of departure*, *self-estimates* of proficiency, *contact* with L1 in host language contexts, and the use of external *global* assessment of proficiency and fluency in either language This information proved to be sufficient for research on language attrition, as well as essential for improving the exchange of research data across psycholinguistic studies of bilingualism[9]

If the purpose of future studies is, however, not merely psycholinguistic but more anthropological in nature, questions can be added on motivation and attitudes, dialect knowledge, attitudes to Strutch, re-emigration, emigration to a third country, former marriages, contact with elderly emigrants, the nature of the subjects' own identity, the nature of their stay in Australia, and their behaviour at school in Australia, remarks on these issues frequently recurred in discussions on language attrition and maintenance

The self-reports were highly correlated to the 'objective' assessments of global proficiency and fluency, but still included the distortion of information when people were asked to report on their own behaviour (Clark, 1982) In future studies rephrasing may reduce this potential influence, for instance if the wording used is replaced by "is your performance on test X better/ same/worse than at any earlier point in time?", as such provides a more specific point of reference (*cf* Grendel, 1993)

7 4 2 Linguistic Approaches

The transcriptions of the interview and story-retell tasks that are not reported on in this dissertation (together with the data from the retrospective sessions) can be analysed in more detail for a variety of linguistic phenomena of Strutch, some of which have been investigated in the context of language acquisition Below is a list of potential research topics

Non-verbal

- Paralinguistic messages (*e g* hand movements and facial expressions) used by the emi grants could be investigated These were often English-Australian rather than Dutch For instance, rather than use the Dutch one-finger gesture of disapproval the emigrants resorted to the Australian-English two-fingered version Emigrants reported that gestures like 'that went over the top of my head" came automatically Some emigrants had even adopted Australian parameters for physical communication, stating that they felt 'constrained in the Netherlands as far as personal space was concerned"

> The Dutch stand right on top of me They get too close Much closer than erm I would find comfortable in Australia Hmn The Greek and the Dutch differ a lot in that respect (Pilot D)

It was even noticed that mixed forms occurred These non-verbal aspects, however, could not be referred to in the current study since they were not recorded 'live' on camera nor were the focus of attention

Communication strategies

The types and use of communication strategies (*cf* Appendix 6 2) could be investigated in more detail It has already been pointed out that the nature of the strategies used by the emigrants was very similar to that in language acquisition contexts In addition, it could be examined whether certain combinations of strategies occurred more frequently than others, and whether variables influenced the implicational order of strategies which the emigrants used to recall the words (Ammerlaan, 1995a) This order suggests that language users routinely follow certain patterns in their attempts to solve problems (*cf* Ammerlaan, 1984)

Textual

- Various topics could be examined Reduction in stylistic variation in the exchange of questions and replies In answering the questions, emigrants often used exactly the same words and grammatical constructions contained in the questions

- /Waar heeft U gewoond in Nederland?/ Waar heb ik gewoond in Nederland Ik heb gewoond in Nederland in Den Haag (PICT 18)"

Formulaic language was used disproportionately frequently in the data, which may be common in language attrition contexts (*cf* Berman & Olshtain, 1983 233) This type of language may be less permeable to cross-linguistic influence than more 'original' language The reduced expressiveness in the rusty L1 manifested itself in a lack of *ad hoc* responses, idiomatic phrases, proverbs, humour, repartee, quips, and onomatopoeia in the story-retell sessions and interviews As a result, the emigrants' L1 often sounded flat and textbook-like, as well as somewhat fragmented because of halting speech and deviations from the Dutch sentence structure The use of hesitation markers to win time was most common Further, emigrants doubled fillers, sometimes replacing Dutch ones by English ones As with the monosyllabic onomatopoeia, reflex responses are brief, but usually dissyllabic in English, for example 'sorry', 'bless you', 'pardon', 'gotcha', 'oh dear'

Lexical/syntactic

- Patterns in neologisms could be investigated When the intended word could not be accessed, emigrants invented words, such as "voorvinger", "puntvinger", "aanwijzer" for 'wijsvinger/indexfinger', "ambocht ammenbocht" for "elbow" (PICT 11), "katolOgies" (PICT 18) for 'catalogue', and "fantaliseren" for 'fantaseren' (to imagine)

We gingen in die tijd om erf- om iets te fantalisEren, /ahum/ erm hoe noemen ze dat? Nee (PICT 19)

- The distribution of switches and code-mixing could be another topic of research Strutch is widely used, and therefore provides many occasions for investigating theories on constraints on the occurrence of switches and mixing The prevalent use of, for instance, English 'erm' in filled pauses in Strutch could be investigated to determine which hedges are most frequently transferred and where they occur (*i e* in typically Dutch or English locations)

Given the aging of the emigrant population, the size of the possible corpus appears to increase even further Clyne (1981) found that in elderly emigrants fluency in the L2 decreases, and the number of transfers and code-switching into the L1 increases

The emigrants' attitude to mixing and switching could be investigated in more detail The dormant speakers interviewed did not always approve of code-switching, avoiding it as much as possible and abandoning sentences This was at variance with Poplack's (1979) study on Puerto Ricans in East Harlem, where code-switching occurred frequently and was even considered as an "integral part of community speech norms (Poplack, 1979) in their environment Further, in Poplack's study the emigrants switched from L2 to L1, whereas in the current study the switch was almost exclusively from L1 to L2

- The use of English onomatopoeic expressions when describing noises in Dutch could be examined (*cf.* Waas & Ryan, 1994). Onomatopoeia (Bloomfield, 1933) are acquired early, through baby talk, nursery rhymes, fairy tales, games, comic strips, cartoons, TV shows, music, poetry, and commercials. It is therefore likely that onomatopoeia, like nursery rhymes and counting to 10, becomes fixed in the vocabulary The emigrants' speech, when speaking in their L1, was almost devoid of L1 onomatopoeic sounds, idioms, and expressions. If used, L2 forms were used:

> Well what I noticed is that people [the Dutch] have told me that I umm .. speak slowly [in Dutch] and the reason for that is that I often have to think first, yes, that I umm not like in English simply go on "**chatter-chatter-chatter**".' (PICT 57)

The subjects translated the English onomatopoeic model structure into L1.

- L1 acronyms and abbreviations could be examined. These were rarely used throughout the corpus data. Most frequently used was "HBS", which is a type of Dutch secondary school.
- Also kinesics could be examined. Strutch showed a tendency to use single nouns and little compounding. If a word of six or more syllables was attempted at all, emigrants became entangled in the process, showed signs of effort and/or backed it up by L2 onomatopoeia and fillers, or production was very slow. At other times the attempt was abandoned altogether, like this attempt to describe a council house:

> "../Wat voor hUIs?/ Erm . was do eek weer verhUUr! /ahum?/ Erm in erm **BANGS THE TABLE**.. 'T was vlak bij de mIJnn, /yeah?/ bij de EMMa /ahum?/ Erm 'It was like the housing commission here ' enn erm 'that is where we lived '" (PICT 19)

To compensate for not accessing the correct form quickly enough, exaggerated kinesics and body language were used (especially hand gestures). Emigrants became impatient with themselves and the transcripts show a large number of annotations attesting to this effect, *e.g.* SNAPS FINGERS, SIGHS, TZK (CLICKING SOUND), BANGS TABLE, THROWS UP HANDS

- The linguistic features of lexical entries could be investigated in detail. Emigrants also had substantial difficulties in accessing all the relevant L1 information. Some features from the current study illustrate this.

Morpho-syntactically, the emigrants showed difficulties in producing correct singular and plural constructions. For instance, instead of 'Australiërs' sometimes '*Australianen' was used, from 'Australian' but pronounced in Dutch and with the plural suffix '-en'. Also the plural was avoided, or the word concerned was kept in the L2.

Unlike L1 Dutch speakers in an L1 environment, these emigrants no longer seemed able to produce gender agreements 'automatically', confusing 'de' and 'het' as well as 'hij' en 'zij'.

Word order and reflexive verbs in L1 caused an additional problem, particularly when the corresponding L2 verb was non-reflexive and was therefore not made reflexive in L1 (*e g* ("'oh yes, ik ben bewust [= , I am aware]" and " ik was _ elke morgen, en dan ik ga naar mijn office om 8 uur ")

Future studies of Strutch should include other aspects of lexicon (*e g* mass nouns, abstract concepts, verbs) as well as other linguistic levels like phonology (English phonemes in Strutch) and the impact of dialects (certain Strutch features coincide with L1 dialects "doe" (do) in "doe mij dit maar open maken" and in the dialect use of "them" for "they")

- The distribution of formal "U" *versus* "jij" (you) could be investigated given the absence of this distinction in English Similarly, the reasons involved for preferring one to the other could have changed as a result of the years in Australia, from using "U" to express respect to using "U" towards strangers
- Onomastic research can be conducted into Anglicisation of names This ranged from elimination of end syllables (*e g* "Durenkant" to "Duren") to having the name altered legally by deed poll (*e g* 'Van der Berg' became 'Vanderberg, 'Jansen' became "Johnson')

Phonological

- Phonological changes in Dutch could be studied These appeared prevalent Consonant quality for both alveolar liquids was at times strongly anglicised, *e g* lateral liquid /l/, as in 'wild', and retroflex liquid /r/, which also resulted in a rolled /r/ The same occurred with the labiovelar glide /w/, particularly at the beginning of words
- A marked feature of Australian English is rising intonation, particularly in colloquial speech This high rising tone pattern prevalent in marking the end of a sentence (Horvath, 1985 17) was sometimes incorrectly used in Dutch, where a rising terminal indicates a question marker expressing a query or doubt However, when speaking in their L1, emigrants who were interviewed had the same rising end inflection as the Australians, whereas the Dutch monolinguals finished their sentences with a falling end sentence indicator

To sum up, a variety of features of spoken Strutch could be investigated The size of this corpus and the detailed information available on its speakers allows computation of the influence of variables affecting the quality of Dutch in Dutch emigrants in Australia

7 4 3 Sociolinguistic Approaches

Further research can be undertaken into why Dutch emigrants in Australia avoided fellow countrymen and the Dutch language (Ammerlaan, 1990b, 1990c, Van Leeuwen, 1995)

Language shift in New Zealand, Canada and the United States seems to illustrate the same reluctance to identify oneself as Dutch and to use the Dutch language, although the low level of participation in ethnic-based communities and in mainstream political organizations seems unique to Australia Possible influences are the role of the media in the Netherlands in the 1950s, the assimilation policies pursued in Australia at the time, and the education level and attitudes of the Dutch emigrants selected for emigration to Australia (*cf* Van Leeuwen, 1995)

<u>Aging</u>

Sociolinguistic research could be continued on the same subject sample concerning the reported shift back to Dutch in elderly Dutch emigrants and the patterns in which Dutch words and morphemes re-emerge and their English counterparts become disused Reported continuing regression to the L1 with increasing age of the Dutch community (*cf* Clyne, 1981) could be tested in this group, and hypotheses can be formulated as to lexical and biolinguistic variables affecting this. Clyne suggested retirement, absence of children, decreased value of L2 as means of communication or even neuro-psychological factors One can add that the limited register with which the elderly are addressed by their younger compatriots and siblings (rather like baby- or foreigner-talk) reduces the quality of input and practice (Ashburn & Gordon, 1981)

<u>Recovery and relearning</u>

The data from the present study could also be used for longitudinal research on L1 attrition Research into re-learning should be conducted (*cf* Allendorff, 1980, Hansen, 1980 on re-learning an L2), both on the L2 and on the L1 Since the experiments were conducted many of the subjects have begun to use Dutch as well as teach Dutch to their off-spring

Various subjects commented on the recovery of their skills in Dutch during the task, and during follow-up visits Subjects reported that during return visits to the Netherlands they had needed an incubation period for their Dutch, not only to recover from jet lag and in order to acclimatize to the weather, the money ("It's like toy money, so colourful") and right hand traffic, but particularly to adjust to the prevalence of Dutch (*cf* Elich & Blauw, 1981, Van Leeuwen, 1995) Some of the 76 emigrants had been asked to keep a diary of their first impressions and during return visits they reported that during the first days they "soaked up Dutch" After a while their Dutch became more active and they "felt more at ease using Dutch actively", and were "no longer concerned with the stumbling and blockages" Only then did the influence of English on their Dutch start to wane, and did the "intimidating and frustrating" comments by their hosts about their Dutch lessen The subjects reported being very sensitive to these corrective comments, and also to the frequent occasions when Australian concepts could not be communicated easily to their hosts Emigrants reported that they were regarded as snobbish because they spoke Dutch with an English accent Others were even complimented by strangers

- 'They said that I sound like an Englishwoman who has learnt Dutch well LAUGH Mhm Well, I, my mother tongue doesn't come through, in other words'' (PICT 80)

A number of variables seemed to affect this incubation period, such as the extent of initial exposure to and use of Dutch and the extent of support from the L1 context. Using the L1 in the L1 environment again often resulted in direct translations from English into Dutch and use of English words with Dutch pronunciation, *e g* "petrol station" for 'benzinestation'

The language of dreams

In addition to closer investigation of the generated corpus of Strutch, comments by the emigrants on their Dutch could be studied A recurrent comment concerned the language of dreams Emigrants reported that "once they had been in Australia a few months" they had "started to dream in English", which usually coincided with greater fluency in that language During return visits they had noticed that after a few weeks they started to dream in Dutch again, which to them indicated an inherent level of fluency in a language

In sum, this dissertation describes a number of aspects of the Melbourne project on L1 attrition in dormant Dutch bilinguals The data showed that the Dutch language is 'dormant' rather than 'dead' in first-generation emigrants Both similarity in form and the level of residual proficiency influence which words can be remembered easily and which cannot

The description of the data and the suggestions for future research illustrate that this community is a rich source of intriguing facts. Future psycholinguistic research as well as studies like those reported in Gruter and Stracke (1995) could provide an interesting testing ground for a number of theories on forgetting, language processing and language maintenance

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[1] Formulaic expressions were used extensively the pilot experiment (Ammerlaan, 1987c) and in the unreported story-retell and interviews A range of expressions appeared to be "untouchable" for the greater freqency of English as a result of their automaticity Examples range from "of zoiets" [or something like that] to nursery rhymes "Naar bed naar bed, zei Duimelot"

[2] During phone-ins after presentation of some of the findings on Dutch and Australian radio, several callers from other 'ethnic communities' could not believe that the Dutch would not even use Dutch at home Comments ranged from being outright "appalled" to suggestions

that this "denial of their roots must cause huge psychological problems, if not now, then in the future when they [the Dutch emigrants] retire"

[3] It is unclear whether the information that was systematically used was information stored with the English lexical entries, residual information stored with the Dutch entries, or whether it was information generally generated from resources by problem-solving activities or strategies

[4] The dormant Dutch emigrants commented that disruption during the second world war and the limited number of opportunities to read Dutch made the identification session a challenge Relative unfamiliarity with Dutch spelling conventions even occurred with regular readers of Dutch When the experimenter introduced new spelling conventions during his time as editor of a Dutch newspaper in Australia, this met with a spate of criticism Readers complained that they had difficulty in reading the "unusually spelled words in the articles which "no longer rang a familiar bell'

[5] Subjects reported that occasionally they 'could not help activating the English words , as if "they just came first", whereas other subjects consciously decided to employ English to obtain the target picture name

[6] Since the pictures were L1/L2-neutral, the decision to access one language did not occur at the meaning level, but at the subsequent access level of grammatical encoding In earlier studies this has already been shown to be language-specific

[7]According to self-estimates in the Census more than 50% of the Netherlands-born emigrants do not use Dutch

[8] However, note that comparison of the results of this study to the Census data (Chapter 4) revealed that patterns found in the subjects' background did not conflict with those investigated in the population

[9] In respect of the latter, it is argued here that research findings should no longer be generalized to answering questions about language processing as such, but should be related to comparable studies only To ensure this, scholars should report in more detail about the actual test items used, the subjects' background (their proficiency and fluency in the language), and select the research paradigms with care, ensuring that enough is known about the type of processing involved and the variables affecting the results in both monolingual and bilingual studies

ABBREVIATIONS AND REFERENCES

" *Do you reckon you can get enough to write a book about us?*" (Pilot C)

In this final section the various references are listed that were used in the description of this part of the project To facilitate further research on the Dutch emigrants in the Pacific, references on Dutch emigrants are added that were consulted but were not explicitly referred to in the texts This section starts with a list of the abbreviations used in both the text and the references

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACE	Australian College of Education
AE	Australian English
AGPS	Australian Government Publishing Service
AILA	Association Internationale de Linguistique Appliquée
ALAA	Applied Linguistics Association of Australia
ALS	Australian Linguistics Society
ANU	Australian National University
ANOVA	Analysis of variance
Ancova	Analysis of co variance
ARAL	Australian Review of Applied Linguistics
CHOMI	Clearing House on Migration Issues, Melbourne
CLI	Cross-linguistic influence
CUNY	City University of New York
CUP	Cambridge University Press
Cito	Centraal Instituut voor Toetsontwikkeling (Arnhem, Netherlands)
ERIC	Educational Resources Information Centre/Clearing House on Languages and Linguistics
ESL	English as a Second Language
IJAL	International Journal of American Linguistics
IJSL	International Journal of the Sociology of Language
IL	Inter-language
IRAL	International Review of Applied Linguistics in Language Teaching
ITL	Instituut voor Toegepaste Linguistiek
ITT	Instituut voor Toegepaste Taalkunde
JEP	Journal of Experimental Psychology
JML	Journal of Memory and Language
JVLVB	Journal of Verbal Learning and Verbal Behavior
JPR	Journal of Psycholinguistic Research
KUN	Katholieke Universiteit Nijmegen (Nijmegen University)
L1	First language or mother tongue
L2	Second or foreign language
LOTE	Language Other Than English
MIT	Massachusetts Institute of Technology
MLJ	Modern Languages Journal
OUP	Oxford University Press
QJEP	Quarterly Journal of Experimental Psychology

SLANT	Second Language Acquisition Notes and Topics
SPSSx	Statistical Package for the Social Sciences (SPSSx Inc , 1986)
SSLA	Studies in Second Language Acquisition
TOT	Tip-of the-Tongue state

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LIST OF APPENDICES

Appendix 3.1

Transcription conventions for data from the pilot picture-naming study.

Dutch and English words were transcribed using the appropriate orthographic traditions of these languages. When it appeared clear to the transcriber that a English words was pronounced as a Dutch word (= Dutchified) these words were written in Dutch orthographics (*e.g.* engenier) where ever possible. The following symbols were used in this orthographic transcription:

- PILOT stands for a particular subject during the pilot experiment.
- When 'weak forms' of words were produced this is indicated in the transcription (*e g* 't.. = het). Similarly, suffixes or other elements of words that were not pronounced are not represented in the transcription either (*e g.* "..helpe. " [-n])
- English words and phrases are marked by ' (*e.g* "Ik zag 'the man' ")
- - indicates a broken off segment of a word followed by a glottal stop (*e g* " 'end' toen kwa- ging de ")
- Intonation units resembling a sentence are marked by a capital letter after a full stop at the start, and a full stop at the end (*e.g.* "..Een konijn kwam in. Hij vroeg...") Where ever possible sentences are furthermore written on new lines
- ' after words indicates a clause boundary marked by a change in intonation.
- When capitals are used within words this indicates that the word, or that syllable (in polysyllabic words) is stressed (*e g* ". De fIEtsemaker zei ").
- Erm indicates a filled pauze.
- . ... indicate a silent pause. It has been attempted to distinguish by means of the number of dots between slight hesitations (marked ..) and longer interruptions of speech (.........).
- When extraordinary lengthening of consonants and vowels occurred these are indicated by doubling their respective alphabet equivalent (*e g* "..De mann... erm..zei..").
- TZK indicates a tongue click.
- HAHA or LAUGH indicates derision
- COUGH , SIGH or any other comments on the delivery of speech is given in capital letters
- / is used to separate the comments by the interviewer from those of the interviewee (*e.g.* "../Hoe heeft U leren fietsen?/.. Erm, ik heb 't..").
- ___ underlining of words and sentences indicates that these were uttered during the retrospective session
- [ ] indicates that the underlined remark in between these form a remark by the subject during the retrospective session.
- [/ /] indicates that the underlined remark in between these form a remark by the interviewer during the retrospective session in the Pilot.
- { } indicates remarks by others than the interviewer and interviewee
- . xxxxx.. marks a segment that was not intelligible.

- ahum marks a grunt, intended affirmatory without a question mark, or interrogative with a question mark (*e.g.* /ahum?/).

- ! marks exclamatory intonation.

- ? marks interrogative intonation.

- " " indicate that the intonation indicated the quotation of a segment This symbol is most often used during the transcription of the retrospective session. (*e g.* [/He said "that is sheer bribary " How would you say that in Dutch?/])

Appendix 3.2

Some examples of the strategies, TOT states and verbal reports in the attempts to recall and recognize Dutch words in the pilot experiment (N = 26).

(1) Some comments indicate that pronunciation difficulties with the longer words (containing more clusters of letters and potential infrequent letter/phoneme cluster) could have affected the results.

> (PILOT X) sneeuwpop/ snowman "'Snowman'......Sneeuw-,..Sneeuw-.. Oeh, 'that is a hard word!' Sneeuwman. 'How do you actually say it?'/Sneeuwman/Sneeuwman. /See/ 'Its a hard word.' /Is it?/ 'Oh, it is a hard word to pronounce.'Sneeu ./Something like' "misschien?"/ "Misschien" 'is easy.' "Snee-, snee-" 'Say it again?' /What is "lion" in Dutch?/ 'I don't know.' /Leeuw/ Leeuw, 'sounds like "leo"'.'l', 'e', 'o', 'double u'"

(2) An example of how useful reports can be is the response to the picture for "potlood/ pencil" was "pensEEl" by PILOT S. This appeared to be an occasion where the subject had adjusted the English equivalent name to Dutch, but the subject's verbal comments afterwards (underlined) indicated otherwise:

> (PILOT S) ". pensEEl 'I don't think that is perfectly right /No?/ 'I don't think it is' 'n penseel, 'its' tekene, 'that is the word I associate with that' Tekenene, 'drawing' . /Yeah?/ 'And .ermm. 'Tekenen... 'I don't think it is' penseel, 'but that is the one I chose, you know'. /Potlood?/..'n pot lood 'yeah' Potlood '"pencil", yeah it is' ..'n potlood."

This case clearly illustrates how verbal reports can serve to disambiguate responses.

(3) An example of partial recall is:

> (PILOT S) (kers/cherry) ".....SIGH.... 'I know that word too'...'Cherry', erm .. ... KErst /Ahum?/ kErst KerstbOOm, kerst kerst..kErsten, kerst /Yeah/ 'Something like that' "

(4) Another observation is that dialect names, and even more personal names, could be given as the target response rather than the response given in standard Dutch (A.N.):

> PILOT O (stinkdier/skunk) " .Da's nne vOss of ja?../'n vos?/ ..Ja, dat erm Ja ermm Ja, niet drek 'n vos, wat is 't? Eigelijk 'n **EIketske?** 'n /Ja? Ja? 'n ingketske?/ HAHA **Eiketske** LAUGH /Eekhoorntje/"

This subject could not immediately recognize the picture, or not recall the appropriate Dutch name, first responding with 'vos' (fox), followed by the response 'eiketske'. This is a dialect version of A.N. 'eekhoorn' (squirrel) restricted to Baarlo (Limburg).

(5) It was not always clear whether the response is sometimes fabricated on the spot, or whether the response was an accepted form of Strutch An example is the following

> (PILOT O) (schakelaar/switch) Schakelair van de erm van de elECtrische Voor IN te steke, of niet? /Ja maar hoe heet dat nou?/ Ja, dat het Ik ik kAn ook weer niet denke, maar ik wEEt 't, 'T moete inPLUnge ep- IN te plunge in 'n electrische dinge /Ahum/ van de elECtrische integreexx /Ja, ja 'T is van electrisch Maar U weet de naam niet?/ erm chakelair? /Nee?/ Nee, ook niet Schakelair is 't voor in te steke /Is dat t dat dIng werkt/ Erm Is dat niet verschrikkelijk dat ik niet opkome ka- ik erm 'N plUCh Pluch zegge ze hier INplukke, inPLUKke /Yep, inpluche/

The subject offers a number of options for 'switch', even a description of what its function is, but finally settles on 'plUch', which more closely resembles English "plug" rather than the standard Dutch "stekker"

TOT features

(6) Despite the failure to formally elicit information about the elements of the unsuccessfully recalled words, subjects occasionally reported similar elements as in monolingual TOT studies, although in reduced number For instance·

> (PILOT K) ananas/pineapple ' 'n 'pineapple', maar hoe noemen ze dat in het Hollands? 'Pineapple, erm' 'Pineapple' 'Pineapple' Kun je die in het Hollands kopen? /Erm/ 'Pineapple' 'Pineapple **Het-het woord zit er Het zit ergens** "

> (PILOT X) ster/star "'N staar aaa **'Maybe with "a"'** /What are you looking for?/ **'It might be a long, odd name.' 'No it is an odd name'** /No?/ staar 'Being such an odd word, that I, You know It is shining, isn't it?' /Yeah/'

> (PILOT W) potlood/pencil 'Pencil, didn't you have that before, that word?' /No, you were looking for it / 'Yeah, I know erm' erm 'Pencil, oh my goodness, I should know that one ' /What are you-/ **Poot, poot-** erm **poot- 'something'**, 'Hang on, erm' 'Oh I can only think of' poot' (GIGGLES) /Poot 'something then?'/ 'Yeah', poot'something, yeah, you know, it could be something like, that you erm, a' poot 'No', pootstukje, 'no erm' punt', 'No, Oh, I can't think of it, isn't it terrible!' /Pretty close / 'Yeah, eh, it must be close, yeah ' Poot erm pot 'is it?' 'No' 'Pencil, no that is back to English nearly, erm' Pootje 'I don't know' 'You have to tell me '"

The presence of the same elements as recorded in TOTs suggests that the bilingual subjects were systematically trying to recall the Dutch name for the picture, and that they were doing it in a similar way as monolinguals would try to The fact that bilinguals know an L2 may influence their attempts, and this was investigated in more detail in the next section

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STRATEGIC EFFORTS DURING PICTURE NAMING

(7) Various types of efforts were apparent in the data. These can be divided into attempts aimed at achieving the meaning intended and those that abandoned or avoided it (Ammerlaan, 1995c) Various distinctions have been made (Table 1)

Table 1 Some of the distinctions made in the literature on strategic behaviour All nodes represent end-points of a gradual difference.

```
                PLANS
communicative /
behaviour      \            /                reduction - total avoidance
               STRATEGIES --           /            adjustment
                            \ Linguistic strat
                                       \
                                         achievement  -
                                                      -
                                                      -
                                                      -
                                                      - oral CpS on lexical
                                                        problems by L2 earners
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(8) Avoidance can be overt such as in this example where the subjects uses English and reports not to know the appropriate Dutch word

(PILOT N) meloen/pumpkin 'Its a pumpkin 'No idea

Avoidance behaviour could also occur in the form of **reduction** of the goal the subject decided that a related name was "good enough as is clear in some of the reports This word could be a name from the same semantic class in Dutch, as illustrated below

(PILOT T) krukje/stool Kleine stoel 'That will do /hmn/ Klein stoeltje 'what was the proper word for it stoel 'What is the word? /Kruk/ Kruk aah'

Avoidance of the recall attempt could also follow a Dutchified name when such was considered a mere stop-gap solution

(PILOT F) sigaret/cigarette LAUGH 'Erm yeah again same thing' sigaret **passes** ' 'I know that passes but whether that is strictly correct I wouldn t know /Hmn/ 'As long as I can get a native speaker of Dutch to understand it

(PILOT X) knoop/button Aah 'button n button **'Probably not right, but that will do**

(9) Strategic behaviour resulting from achievement motivation in the context of the picture-naming task was determined by, for instance, imagining a possible context of earlier use, as can be observed in the following examples

(PILOT X) bezem/broom 'I cannot imagine not knowing this word , veger of erm broeme Nee' 'I can t think of it but I can t possibly imagine I don t know the word /Hmn/ 'I m sure that I ve seen it before 'That s all I can say 'I know veger 'Yeah veger'stick 'I mean a sweeping a sweepingstick /Is there an other may can you think of the word?/ 'Erm **I'm thinking of how my mother would say'** go and get the broom ga de iets halen Veger 'and dustpail and broom 'I m trying to think of that 'Tell me what dustpail is in Dutch /Blik/ 'No does not help me 'What is it? /Bezem/ 'No never heard of it

(10) Within achievement strategies, a number of other strategy types were identified similar to compensatory strategies used by language learners Apart from 'appeals for help' these were grouped into those strategies that operated within Dutch (intra-lingual), and those results that are more other language-based (inter lingual) Examples of such inter-lingual strategies are listed below

(PILOT N) Schommelstoel/rockingchair "..'n st-..st- stoel nee, nee, 'swing swinging'. Sweegstoel? /Swee-sweegstoel?/ Weet niet. .'That is all I can think of for rockingchair.'"
(PILOT R) paddestoel/toadstool "-..toodstOEL?../Yeah?/ "
(PILOT S) sneeuwman/snowman ".. Sneeuwman. .'I translated it, I am not sure ' 'We used to make them when we were children ' . Sneeuwbal... Winterman 'perhaps'.

(11) Foreignisation, or in this case **'Dutchifisation'**, occurred frequently. It involves making the English name sound more like Dutch. Examples are:

(PILOT X) viool/violin "'Violin', vieoo vieoolin, Nee....**'I'm trying to make it sound Dutch'** . LAUGH .. /Viool?/ 'No, I wouldn't have guessed that. I imagine it is more like' "viola", 'is it' viola?"
(PILOT X) kangaroe/kangaroo "Kangaru.../yeah?/... **'I think it is a word you can change '"**
(PILOT T) slang/snake " .. . ./How are you trying to think of the word?/ 'Erm, it is "snake", d'you know come to me' Snuik GIGGLE 'but that is not right, that is more like "snork", isn't it' /hmn/ 'Something erm snake'...Slang!!... it just came back to me, it popped up.'"

Note that this is often difficult to keep apart from phonological search in this example.

(PILOT X) slang/snake "'Snake'..'snake'.. Paling 'is an eel, not a snake', 'snake- snake!' 'Oh, come on'. I must know snake!' 'Not' snaak....'Brother!' Sneek, snaak /hmn/ 'No' . 'What is a snake?' 'Snake, snake' ...'not' paling...'Snake, similar to English or?'. .'I can't think of a snake ' .. 'If you tell me I know ' /Starts with 's'/ 'Does it?' /One syllable/ .Slang!! /See!/ 'Yeah, but I couldn't think of it though, wouldn't have thought of it'..."

(12) Other traditional compensatory strategies in the data were intra-lingual strategies like approximation and circumlocution/paraphrase. Both are types of descriptions, but approximations are descriptions of the word (form, spelling, sound), whereas descriptions are related to the concept: descriptions of its function, description of elements (colour). An example of approximation is:

(PILOT S) zaag/saw " Zeer...Zeer .. Nee! Zagen, iets met zagen, erm ... **'t hoort te zagen maar ik weet niet wat het is** . .."

Examples of association are:

(PILOT X) citroen/lemon "..'a lemon' /ahum/ **'Something to do with citrus'..** 'Something'.. Citron?.. 'There you go!'..'Wow, that is..that is pretty good!' 'I never though that word.'"
(PILOT W) schaar/scissors "Oh, 'scissors' ..'Isn't that funny, all these erm....words that are common and I should know them, but because I haven't used it for so long'.......**'I can only think of' "scherp" 'or of some reason, but that is "sharp", isn't it?'** /Yeah/ 'That is all I can think of.' /oh/.....'What is it?' /Schaar/ 'Oh yeah!'"

An example of word-coinage is:

(PILOT M) lamp/globe "...'n **glOOb** . .'n 'light'....'I donno'/Ja?/ Dat is.. 'n **lichtbolb** LAUGHS"

Some examples of paraphrasing are:

(PILOT I) schakelaar/switch "...'n erm. **.kNOp voor 't licht.** /hmn/ LAUGHS"
(PILOT O) tang/pliers " .een erm..Is 'n tANGetje veur-. erm wie- erm wat- Hoe noeme ze dat al weer? Joa, ik gebruik dat nooit, maar ik weet 't wel-..TZK..Ik weet 't wel **'T is 'n tANgetje.. voor wat vASs erm te zette of wat los te make.** /Ahum/ **Die gebruike ze voor erm... schrOEfjes vast te draaie.** Joa, ik weet 't niet.. Ik wEEt 't niet. "

(PILOT I) pijl/arrow "'n er .. ja.. Hoe heet dat nu in het Hollands, **iets wat je directie mee er er** ...er/No idea? How you try to?/ 'How I come to it?' /Yeah/ 'n er .. 'n .'n directiewijzer /hmn/ ok

An example of a mime is:

(PILOT R) stekker/plug " ..'a plug. and a plug and a plug in the English' 'And in Dutch it is'..../**Looking at it?/. 'plug, plug, plug'....** "

Mixed examples occurred as well:

(PILOT X) klerenhanger/coathanger "....Jas .. Jashanger... Nee. .. /That is an translation/ ..'It is ' 'Is it right?' . ...'What is it?' /Kleren/ 'What?' /Kleren/ Klerenhanger /Yeah/ 'That is it?'.. /Klerenhanger, 'coathanger'/ "Hang je kleren op" /Op de klerenhanger/ "op de klerenhanger", yeah!'"

(PILOT W) stekker/plug "Er ..**'something electric'...'Plug'...pleug'. 'No, that is the only thing I can think of..'"**

Note that the majority of these examples are in Dutch rather than in English. Perhaps this indicates that some command in Dutch is necessary in order to employ these strategies.

(13) The types of cues used determine the direction of the search through the mental stores. Cues could be based on the English name, or be associatively or phonologically related to the target. Associatively generated cues for instance involved generating members from the same meaning category as the target (13a). Phonologically related cues for instance involved rhyming and alliteration (13b). An example is this:

(PILOT T) (potlood/ pencil) "'Pencil, didn't you have that before, that word?' /No, you were looking for it / 'Yeah, I know erm erm... Pencil, Oh my goodness! I should know that one' /What are you-?/ **Poot, poot-** erm Poot- 'something', 'Hang on, erm Oh, I can only think of' poot' GIGGLES /Poot 'something, then?/ 'Yeah', Poot 'something, yeah, you know, it could be something like, that you, erm a' poot. 'No', poot-stukje, 'no, erm '"

It is difficult to distinguish these cues from the strategy of 'foreignization' (see below).

(13a) Associative cues refer to the use of related concepts. One can distinguish between word-related, semantic associations and episodic associations. An example of the use of **conceptual** cues is the following, where a subject recalls the Dutch word for 'spoon' via the words for 'fork' and 'knife'.

(PILOT S) (lepel/spoon) ". 'Its' vork, mes, 'and'...lEpel' lepel!"

(PILOT T) lineaal/ruler "Erm....'ruler'...oh. ...**'A pencil'**. erm **'ink, I've got back to the inkwell'** GIGGLE, 'the ink erm ruler'.. ......'No, it is not coming back to me that way'...'I'll bet I know all these things afterwards, you know, erm. if you tell me.'. /How did you get hold of ink'?/ 'Well, **I'm going back to school, you know, I think I was trying to think of pen and pencil and the ink, you know, remember the inkwell and everything'** /aha/ erm........ 'Ruler-ruler'.. 'No, what is it?' ..."

Why this approach was used becomes particularly clear in the following examples:

(PILOT Q) wortel/carrot "'. 'n er er 'carrot', ui erm 'carrot, good grief! I have a mental block for these things'' 'Erm . Carrot', appel, peren, . 'carrot'. .'Don't know'... .erm .. **'I'm just trying to go around some of these other fruits again, and erm see whether I can, or vegetables, I should say, see whether I can remember that thing, but erm'** 'Turnip erm.... probably had a hiding for them quite often, and I have eaten the darn things since I left camp ' ..'No, give up.'

Examples of episodic associations are the following:

(PILOT T) kaars/candle "Kandel erm ..kadeltje? GIGGLE 'I don't know', kandel. 'Pray it is not right'... hm. ..**'I'm thinking about my childhood again'**. 'You know, **you think about Xmas, and stuff like that, you know'**../Ok/. ... 'Dgee, I should know that easy!' kandeltje, 'no'.. 'Still not a bit closer?' /A bit closer/..'Go on, tell me what it is ' /Kaars/ kaars!, 'of course! Yeah, yeah, yeah.'"

(PILOT S) pinda/peanut "... er. peanut' er noten erm er 'are nuts', 'but' .. peanoten, 'no, I don't know.' . ..**'We used to buy them at the market'**, de markt, op de markt. Paling **'we used to buy'**, gerookte paling, **'and we used to buy those peanuts, but I can't think, and take them home.'** 'One of the things I remember as a child and we used to crack them at home, a little treat we had ' 'What is it?' /Pinda/ 'what?' /Pinda/ 'No, never heard of it.'"

(PILOT S) waterput/well "'Its a "well" in English, but a similar word comes in Dutch ' **'I have to think back to the fairy stories my father used to read to me** . the' kikker, 'you know, the princes, and the er the well, and I forgot the word for well'" LAUGH

(PILOT G) stekker/plug " ... . .stekker ./How did you get that word?/ ...'Is it right? Is it' stekker? 'Once again, going back to my fam-, to my parents erm,' ..'My dad is a bit of a handyman and he loved to put a new' stekker 'on the' snoer /hmn/ 'of the electric jug recently, /Yeah/ but erm' /That is how you know?/ 'Yeah, plus moving around from country to country all our appliances needed a new' stekker, 'is that the right word?' /yeah/ 'Well, that is my association '"

Both types also occur together in the following extracts.

(PILOT H) zaag/saw "'N eh. .... zaag! ja ./Hoe komt U daarop?/ **Ja, ik denk wel aan hamer, denk ik .moet ik denken naar thuis, eh , naar m'n vader, met gereedschap aan het timmeren xxxxxx Passeer me even de zaag** (laughs) zo kom je daaraan...als je lang denkt "

(PILOT S) ui/onion "....... erm...'I know that too'.. Ei, eireren, 'that is eggs, erm, something with' ei, ... 'is It?'....."**Spek and Eieren**", en ei, spek 'and .."Fry the onions", **'my mother used to say,** that's how I remember, would remember that one ' 'Something' eu 'in it, eu- 'sound, but I don't know what goes with it ' ...."

Associative sources were predominantly related to Dutch related concepts. Within the latter one can distinguish between word-related, semantic associations, and episodic associations of childhood (fairy tales, nursery rhymes).

(PILOT X) kroon/crown "'A crown' 'a **queen,**crown' Konigin ze...../Hmn/ 'Not' kruin! 'I don't know ' ..'A crown, yes, a crown' **Koning** ...'a crown' ...'See, that is not a word I would use, I would never- ever use probably, so that is a bit different, you see, a' "slang" 'I would use when I'm talking to mum but erm now that the-'.. kroo-,.Kroon!./Kroon/ Kroon!.../But you were saying something about the queen's-/ 'Yeah, the' kroning, kroon, 'yeah, the Queen's' kroon, 'I said.' /Aah!/ 'But I couldn't think of the' koning z'n erm kroon..../What. Why did you do that?/ **'I thought maybe if I use another Dutch word I might catch on.'**"

(PILOT T) lepel/spoon "'Spoon', ermmm . **vork** .... lepel!"

(PILOT U) boom/tree ". 'Tree' er .... Bomen... /How did you do that?/ 'Beg your pardon?' /How did you get that word?/....'Erm..**I was thinking of different types of trees, and then I thought, no, that is not right', 'I mean, collective names,** and then all of a sudden it just came to me ' /Aha/.. 'I was just thinking in English about different names like "ash", and that sort of thing, and I realized that I didn't know the names for.'...,'I don't think I knew the names in Dutch, and then I realized that I didn't know them, and then... '"

(PILOT Q) kers/cherry "'That is a cherry erm' Kers! Kers /Again, how did you do it?/ 'Well, we used to have a lot of them in Holland, and I thought gee wiz,I must have remembered that /hmn/ I ate the bloody things **and er yeah, it just sort of popped up, eventually.'**"

Examples of episodic associations are the following:

(PILOT S) wijsvinger/indexfinger " Erm ving- vinger, maar dat is erm ... er ...'Do you call them first or second finger or pointing finger?' 'Index finger?'...Vinger, 'what, I don't know the first finger, the first just' "'n vinger". Eerste vinger, 'that's what I would say' 'I stick to that first for some reason or another', eerste vinger, ja, 'because I cannot think of er'...'This is erm' dom dum dum dum dom, 'No, when I think of "thumb", we had the fairy tale' **"kleine" er "kleine Tom", 'or' "kleine" er, 'not little thumb, you know, coming back to the thumb'...... Dummer, 'I seem to think of something like' dummer 'or something like that.' /But you can't get anything else but that?/ 'I can't get anything else than that.' /Duim/ Duim, duim ... /Wijsvinger/ wijs? Wijsvinger? Wijs, 'that is pointing the way, yes, but I would not have used that.' 'If somebody had used it and said' "wijsvinger" 'I would recognize it straight away but I wouldn't have known it.'"**

(PILOT X) bezem/broom "'I cannot imagine not knowing this word', "veger", of erm ..."broeme", nee! 'I can't think of it but I can't possibly imagine I don't know the word.' /Hmn/ 'I'm sure that I've seen it before' ..'That's all I can say' ...'I know' "veger".....'Yeah', veger'stick, I mean a sweeping a sweepingstick ' /Is there an other, may, can you think of the word?/ Erm, I'm thinking of how my mother would say. "go and get the broom"', "Ga de iets halen". ."Veger, 'and dustpail and broom' 'I'm trying to think of that' . 'Tell me what "dustpail" is in Dutch ' /Blik/ 'No does not help me ' 'What is it?' /Bezem/ 'No, never heard of it.'"

(PILOT T) stekker/plug "'Plug'... (GIGGLES) 'The Dutch word though' ...'No, I wouldn't know that one.'..'I should because I've been warned not to touch it the that, by my dad, as a child.'(GIGGLES) 'But I can't think of it ' /Hmn/...../Stekker/ Stekker, 'pity, I wouldn't have known that.' /No?/ 'No'.. 'Oh, I have heard of the word' "stekker" 'but I would have associated it with something else ' /Like what?/ 'Probably more to do with "iron"'....'I don't know why' ...'What's "iron" in Dutch?' /An iron?/ '"Iron", yeah' /'N strijkijzer/ 'See, yeah, that is what' "stekker" 'say', strijk 'yeah '..'No, I wouldn't have associated that one.'"

(PILOT U) potlood/pencil " Er potlood /How come you got that?/ 'Because dad used to-''Oh, we got a **cousin named "Peter", and Dad called him' "Pietje Potlood."**(LAUGHS)"

Both types also occur together in the following extracts.

(PILOT H) zaag/saw "'N eh .. Zaag! ja../Hoe komt U daarop?/Ja, ik denk wel aan "hamer", denk ik...Moet ik denken naar thuis, eh , naar m'n vader, met gereedschap aan het timmeren xxxxxx "passeer me even de zaag." **(LAUGHS) Zo kom je daaraan...als je lang denkt."**

(13b) Phonological searching also occurred, as illustrated in the example below.

(PILOT N) kers/cherry "'n kers, .kerst?, kerst?, 'or something or other.'"

(PILOT X) uil/owl "'I was going to say' koe. LAUGH... /'n koe!/ .. 'n 'owl', uil 'Yes '"

(PILOT W) tandenborstel/toothbrush "'Toothbrush er' ...'Well', erm 'n, 'something like er' tante, tanden-' block or something like that ' /Tandenborstel?/ 'Beg pardon?' /Tandenborstel?/ 'Oh, right!, yeah!' .. 'Still sounded all right.'"

The difference between phonological search and Dutchifisation is hard to tell in this example:

(PILOT X) slang/snake "'Snake'..'snake'.. Paling 'is an eel, not a snake, snake- snake!' 'Oh, come on! ' 'I must know snake!'...'Not' snaak ...'Brother!' Sneek, snaak /hmn/ 'No'......'What is a snake?' 'snake, snake' . 'Not' paling ..'Snake, similar to English or?' ..'I can't think of a snake' .'If you tell me I know' /Starts with 's'/ 'Does it?' /One syllable/ . Slang!! /See!/ 'Yeah, but I couldn't think of it though, wouldn't have thought of it '. "

(13c) Mixed varieties of associative and phonological searches are the following:

(PILOT S) kanon/cannon " kano- erm kannoon?..kanon?...kanoon?...'**I was thinking of' schieten, 'and' eh vuur, vuur ....'I don't think' kanon 'was the right word, it might have been because "cannon" and' kanoon 'is very similar words, but er if I had to choose another word, then I'd say something with' erm schie- er schieter- 'something with' schiet maschien 'or' schiet... vuur 'and' schieten, 'are two words that I associate with them, but I cannot think of the proper word**, kanoon is the only one I would choose '"

(14) More purely linguistic searching can involve the use of expressions or phrases to retrieve the target Dutch word. Examples are listed below where subjects activate parts of phrases in which the target word is considered to occur frequently.

(PILOT U) bezem/broom "..'A broom'.. TZK....brum ......erm "Stoffer 'and' blik" 'is "shuffle and thing", and the broom is' ..... bezem! 'Oh god!', bezem!, 'I think ' . 'I put, I try and imagine I hear my mother say "get...get the ."' 'We always had the erm...you know...the erm' "stoffer en blik", er, 'kids even get the' "stoffer en blik", erm .."

(PILOT X) wortel/carrot "'Carrot' 'carrot'.."worteltjes en erwtjes", "erwtjes 'and' worteltjes", wOrteltjes' - ...'Mum used to have that, you see' /Aha/..."erwtjes 'and' worteltjes" together '

Which cues are ultimately used (*i.e.* in our context, become visible in the search stage where the various component processes in retrieval become reflected in the reports) probably depends on the subjects' experience in the language and culture, the context in which the target word was learned and used, as well as the perceptual dominance of certain elements. The data suggests that these cues later on serve as criteria to compare the retrieved information with, in order to ensure that the intended information has been found. Generally, retrieval moves from general outlines, retrieving more related information, to particular specificity, depending on the cues at the onset. Usually a semantic field is activated after which units are searched within a lexical subset in this field. Whatever may be the nature of the description, it must provide two types of information: the target description needed for the search in memory, and the verification criteria.

Some reports indicate that the **context of learning** of the target word could be invoked as well.

(PILOT I) molen/ windmill " een erm. ha . /How are you trying to think of the word?/. 'I'm trying to think what they said in Holland when they first showed me '. .'Oh' erm' molen, ja, erm molendijk, ja."

The use of the word 'molendijk' can here be interpreted as indicating some sort of monitoring or evaluation (see below).
The reports appear also to indicate that search activities involve various networks simultaneously, a phenomenon also observed in TOT studies. The following example illustrates how an apparantly associative search in Dutch becomes an English search for the Dutch word 'lepel'.

PILOT X) lepel/spoon "'A' me-, 'a' le- erm Lepel? /yep?/ 'I was going to say' mes 'and' vork 'but I didn't get that... 'I was thinking of **ladle**, and I got confused, I knew it was' la-, le- 'and then I went to ladles.'"

(15) The search operations can involve other languages that are considered relevant, and to operate simultaneously in various lexical networks, as illustrated in the following examples

(PILOT U) lineaal/ruler "'Erm . Hoe noem je dat? erm ..erm... erm . 'I don't know' 'I don't know but I lost it.' /Can you describe it?/ Erm. erm...'Ruler!..in Dutch' ERm . 'I cant even think of it' . **'The French word is actually' "regle"**, 'and I'm thinking of "ruler", thinking of the the one, can't think of the Dutch word at all.. '"

(PILOT X) potlood/pencil "**'Bleistift** LAUGHS /Sprechen Sie Deutsch?/ 'Ja!' LAUGH 'einen kleinen bis-' /Bischen/ bisschen', yeah.... .'Pencil, ah' .. ah, 'German word not good enough, half, do I get half?' /You got half all right'/. ... /Why did you come up with 'bleistift' all of a sudden?/ 'Because I remember reading it in German, such a stupid word '.....bew .... /pot/ 'What?' /Potlood/ 'Yeah!.' 'Blei' is lood, 'Bleistift'-potlood.. 'It doesn't help, I can't speak German that well '"

From these examples it appears that all relevant areas of the lexicon, even if they belong to their languages, are activated to recall the word.

(16) **Simultaneity** of activation of more than one memory store becomes apparent in this example:

(PILOT S) kanon/cannon ". .kano- erm kannoon?. kanon? kanoon? ...'I was thinking of' schieten, 'and' eh vuur, vuur 'I don't think' kanon 'was the right word, it might have been because "cannon" and' kanoon 'is very similar words, but er if I had to choose another word, then I'd say something with erm' schie- er schieter-, 'something with' schiet maschien 'or' schiet...Vuur 'and' schieten, 'are two words that I associate with them, but I cannot think of the proper word', kanoon 'is the only one I can think of."

(17) Illustrations of monitoring are the following:

(PILOT I) konijn/ rabbit "'n erm. ... 'n Ja, 'T is geen haas, 'because that would be hare.' **.....'n erm konIJn!"**

(PILOT X) ui/onion "... Ui LAUGH 'is it?' {hmn} 'I don't know. I don't remember whether that was an 'egg' or not.'"

It could appear that the form of the word was misinterpreted, due to overgeneralization of a morphemic rule (e.g. plural):

(PILOT W) molen/windmill "'A windmill' erm erm... 'I only know the plural'....Meulen. **'But I don't know the "wind"'.... Molen, moo?......'I'm just wondering, is it' molen 'or' meulen...'Coz I even think of the way it is written' m-o-l-e-n, 'but then, where have I learned, where have I picked up' meulen 'from?'...'I don't know.'...'I kept on repeating "windmill", you know, thought of an xxxxx, and'...'I sort of pictured it in a sort of er, in a, in a... /landscape/ Yeah, where they belong.'"**

(PILOT F) molen/windmill "'Erm, I can only remember the **plural** for that', molen, /Hmn/ but erm, I cannot remember what the singular is.'.. 'no' . ... /You're are convinced that' molen 'is plural?/ Ja, m-o-l-e-n, 'and I can just see erm' grachten erm 'canal with a whole row of mill erm windmills ' /Hmn/"

It is possible that this is the result of attrition of the Dutch competence by English, assuming that these former native speakers once had a 'perfect' knowledge of Dutch. Such influence could also have been the cause of the change in meaning in the following example. The Dutch word 'pijl' for 'arrow' is regarded to be a different word when direction is implied:

(PILOT J) pijl/arrow "ERm pijl, of erm..'n 'arrow' Dat is 'n pijl, maar waar je mee schiet eigenlijk. Dat is misschien geen pijl . 'n aanwijzer? /hmn/"

(PILOT T) waterput/ well "'Erm, well'. 'Is that Dutch?' GIGGLE 'Its English in well...'I say well.'. ./put/ Put?..'I know' put' 'I know' put' 'I know that but I would have thought they had a different name.' 'Because being a well, you know, I thought' put 'was more outside the door, so you just had to run the tap' /Yeah, that too'/ Yeah, yeah 'So I thought they would have a different word.' ...."

In the first example it seems that the subject prefers a 'one word-one meaning' relationship.

(18) Motivation was a key factor in deciding whether a search effort could be successful, or whether avoidance should be resorted to. Basis of this motivation was a sense of familiarity of the target word, or (as in the next example) the contexts in which it could have occurred.

(PILOT X) asbak/ashtray "'No, they (= parents) didn't smoke so I'd never hear that word.'"

Appendix 4.1

The instructions and questionnaire used in the Melbourne project on dormant Dutch-Australian bilinguals.

INSTRUCTIONS

Before we start I will give you a questionnaire It contains questions relating to the particular linguistic background you have. I need to know what type of bilingual person you are in order to interpret the results of the other tasks

All information I obtain through this test is strictly confidential. Your name will be changed into a number, and only that will be your identification from then onwards The only reason why I need your name, address and telephone number (which will be stored safely) is to contact you lateron in order to send you a brief abstract of the results.

If you feel that certain questions are not clear, or that you have additional information to offer, please do not hesitate to ask me while I am setting up the other tasks.

Do you have any questions?

Turn the page

T Ammerlaan
tel. 344-6359/-4185 | 380-9277 (h)

ALL THE INFORMATION PROVIDED WILL BE TREATED AS STRICTLY CONFIDENTIAL, TO ENSURE THAT THE PRIVACY OF YOU AND YOURS IS PROTECTED.

1 Name ....
2 address ....
telephone ....

Please tick the appropriate answer, or add your own in the space provided.

3 What is your age?
20-25 [ ]
26-31 [ ]
32-37 [ ]
38-43 [ ]
44-49 [ ]
50-55 [ ]
56-plus [ ]

4 What is your sex?
male [ ]
female [ ]

5 What is your 'marital' status?
never married [ ]
widowed [ ]
divorced [ ]
married [ ]

A If ever married, is/was your spouse a native speaker of Dutch?
yes [ ]
no [ ]

B If ever married, does/did your partner speak Dutch fluently?
yes [ ]
no [ ]

6 Where were you born? Australia [ ]
Netherlands [ ]
Please specify .... Other [ ]

7 In which place in the Netherlands were you born?

8 What place do your parents come from? mother = ... father=...

9 When did you leave the Netherlands? date... 19 ..

10 When did you emigrate to Australia? date 19 .

11 How long did you live in the Netherlands in your youth? years

12 Did you live in other countries in between migrating here? yes [ ]
no [ ]

A If YES, which country/ countries? ... .

13 How many years in total have you lived in the Netherlands? years

14 What was your occupation in the Netherlands, if any?

15 What is your present occupation?

16 Why did you come to Australia? unemployed in Netherlands [ ]
job in Australia [ ]
war threat [ ]
parents moved [ ]
to escape nuclear weapons [ ]
Please specify .... other reasons [ ]

17 Have you ever re-visited the Netherlands? yes [ ]
no [ ]

A If YES when? .... For how long? ....
when? .... For how long?
when? . ... . . For how long?

18 Are you in regular contact with the Netherlands? yes [ ]
no [ ]

A If YES, how do you keep in contact? Is this through: relatives [ ]
friends [ ]
business [ ]
Please specify . ... other [ ]

B If YES, how frequent is this contact? Is this every day [ ]
every week [ ]
every month [ ]
every 3 months [ ]
every 6 months [ ]
yearly [ ]
Please specify .... other [ ]

19 Do you have contact with other Dutch immigrants in your area? yes [ ]
no [ ]

A If YES, how often is this contact?	daily [ ] weekly [ ] monthly [ ] sporadically [ ]
Please specify .. .	[ ]
20 Do you have contact with <u>recently</u> arrived Dutch immigrants?	yes [ ] no [ ]
A If YES, how frequent is this contact?	daily [ ] weekly [ ] monthly [ ] sporadically [ ]
Please specify	[ ]
21 Are you an active member of a Dutch club?	yes [ ] no [ ]
A If YES, which?	
B If YES, how often do you meet a year?	daily [ ] weekly [ ] monthly [ ] sporadically [ ]
Please specify	[ ]
C If YES, in which language are the meetings held?	Dutch [ ] English [ ] Both [ ]
23 A In which language do you count?	Dutch [ ] English [ ] Both [ ]
B In which language do you swear when you are emotional?	Dutch [ ] English [ ] Both [ ]
24 Do you regularly go to church?	yes [ ] no [ ]
A If YES, do you go to a Dutch-speaking or English-speaking church?	Dutch [ ] English [ ] Both [ ]
B If you pray, do you pray in Dutch or English?	Dutch [ ] English [ ] Both [ ]
25A In what language did you receive primary education?	Dutch [ ] English [ ] Both [ ]
B In what language did you receive your secondary education?	none [ ] Dutch [ ] English [ ] Both [ ]

C In what language did you receive your tertiary education?

none [ ]
Dutch [ ]
English [ ]
Both [ ]

26 Do you know any other languages apart from Dutch and English?

yes [ ]
no [ ]

A If YES, how well do you know each of them? Language ... . ..

poor [ ]
fair [ ]
good [ ]
native [ ]

Language ....

poor [ ]
fair [ ]
good [ ]
native [ ]

B If you know any other languages, where did you <u>primarily</u> learn them?

Language: ..... learnt

at home [ ]
school [ ]
relatives [ ]
friends [ ]
abroad [ ]
other [ ]

Please specify ....

Language ....

learnt at home [ ]
school [ ]
relatives [ ]
friends [ ]
abroad [ ]
other [ ]

Please specify . ...

27 Did you have any school-training in the Dutch language here?

yes [ ]
no [ ]

A If YES, where? ....

B If YES, for how long? ....

28 Did you know any English before you came to Australia?

yes [ ]
no [ ]

A If YES, how would you rate your knowledge of English <u>then</u>?

poor [ ]
fair [ ]
good [ ]
native [ ]

29 Where did you learn your English?

learnt at home [ ]
school [ ]
relatives [ ]
friends [ ]
abroad [ ]
other [ ]

Please specify

30 Can you <u>understand</u> Dutch?

yes [ ]
no [ ]

A If YES, how is your understanding of Dutch compared to how it was 10 years ago? better [ ]
same [ ]
worse [ ]

B If YES, how well can you understand Dutch? poor [ ]
fair [ ]
good [ ]
native [ ]

C If NO, why? ....
....

D How often do you hear Dutch? never [ ]
every day [ ]
every week [ ]
every month [ ]
sporadically [ ]
Please specify .... other [ ]

E Who addresses you in Dutch? TICK ALL THE APPROPRIATE ANSWERS

mother	[ ]	father	[ ]
brother(s)	[ ]	sister(s)	[ ]
uncle(s)	[ ]	aunt(s)	[ ]
grandparent(s)	[ ]	parental friends	[ ]
friends	[ ]	other	[ ] (specify)

F Where do you most often hear Dutch? at home [ ]
school [ ]
work [ ]
other immigrants' homes [ ]
radio (3EA) [ ]
TV (SBS) [ ]
Please specify .... other [ ]

G What topics do you particularly hear about in Dutch? relatives [ ]
immediate family [ ]
Dutch customs [ ]
cooking [ ]
sports [ ]
politics [ ]
religion [ ]
school [ ]
work [ ]
Please specify ... ... other [ ]

31 Can you <u>speak</u> Dutch? yes [ ]
no [ ]

A If NO, why did you stop speaking Dutch? .. ..

B If YES, how is your speaking skill in Dutch compared to how it was 10 years ago? better [ ]
same [ ]
worse [ ]

C If YES, how would you rate your speaking skill in Dutch? poor [ ]
fair [ ]
good [ ]
native [ ]

D If YES, how often do you speak Dutch?

never [ ]
every day [ ]
every week [ ]
every month [ ]
sporadically [ ]
other [ ]

Please specify ....

E Who do you talk in <u>Dutch</u> to? TICK ALL THE APPROPRIATE ANSWERS

mother	[ ]	father	[ ]
brother(s)	[ ]	sister(s)	[ ]
uncle(s)	[ ]	aunt(s)	[ ]
grandparent(s)	[ ]	parental friends	[ ]
friends	[ ]	other	[ ] (specify)

F Who do you speak to in <u>English</u>? TICK ALL THE APPROPRIATE ANSWERS

mother	[ ]	father	[ ]
brother(s)	[ ]	sister(s)	[ ]
uncle(s)	[ ]	aunt(s)	[ ]
grandparent(s)	[ ]	parental friends	[ ]
friends	[ ]	children	[ ]
spouse	[ ]	other	[ ] (specify)

G Where do you speak Dutch?

at home [ ]
school [ ]
work [ ]
other immigrants' homes [ ]
radio 3EA [ ]
TV - SBS [ ]
other [ ]

Please specify .. . .

H What topics do you specifically talk about in Dutch?

relatives [ ]
immediate family [ ]
Dutch customs [ ]
cooking [ ]
sports [ ]
politics [ ]
religion [ ]
school [ ]
work [ ]
other [ ]

Please specify

32 Can you <u>read</u> Dutch?

yes [ ]
no [ ]

A If NOT, why? ....

B If YES, how would you rate your reading skill in Dutch now compared to 10 years ago?

better [ ]
same [ ]
worse [ ]

C If YES, how well can you read Dutch?

poor [ ]
fair [ ]
good [ ]
native [ ]

D If YES, how often do you read Dutch?

never [ ]
every day [ ]
every week [ ]
every month [ ]
sporadically [ ]
Please specify .... other [ ]

E What do you read in Dutch?

newspapers [ ]
magazines [ ]
Dutch literature [ ]
letters [ ]
translated books [ ]
Please specify .... other [ ]

F Where do you read Dutch?

at home [ ]
school [ ]
work [ ]
other immigrants' homes [ ]
radio [ ]
TV [ ]
Please specify .... other [ ]

G What topics do you specifically read about in Dutch?

relatives [ ]
immediate family [ ]
Dutch customs [ ]
cooking [ ]
sports [ ]
politics [ ]
religion [ ]
school [ ]
work [ ]
Please specify .... other [ ]

33 Can you <u>write</u> in Dutch?

yes [ ]
no [ ]

A If NOT, why? ....

B If YES, how would you rate your writing skill now compared to what it was 10 years ago?

better [ ]
same [ ]
worse [ ]

C If YES, how well can you write in Dutch?

poor [ ]
fair [ ]
good [ ]
native [ ]

D If YES, how often do you write in Dutch?

never [ ]
every day [ ]
every week [ ]
every month [ ]
sporadically [ ]
Please specify . . . . other [ ]

E Who do you write to in Dutch? TICK ALL THE APPROPRIATE ANSWERS

mother	[ ]	father	[ ]
brother(s)	[ ]	sister(s)	[ ]
uncle(s)	[ ]	aunt(s)	[ ]
grandparent(s)	[ ]	parental friends	[ ]
friends	[ ]	other	[ ](specify)

F Where do you write in Dutch?

at home [ ]
school [ ]
work [ ]
other immigrants' homes [ ]
radio - 3EA [ ]
TV - SBS [ ]
Please specify other [ ]

G What topics do you specifically write about in Dutch?

relatives [ ]
immediate family [ ]
Dutch customs [ ]
cooking [ ]
sports [ ]
politics [ ]
religion [ ]
school [ ]
work [ ]
Please specify other [ ]

34 Do you like using the Dutch language?

yes [ ]
no [ ]
don't know [ ]

A Why?

35 Would you encourage others to use and learn Dutch?

yes [ ]
no [ ]
don't know [ ]

A Why?

36 Do you think that being bilingual has an effect on your

A work? positive/ negative/ no effect

B family life? positive/ negative/ no effect

C social life? positive/ negative/ no effect

D religious life? positive/ negative/ no effect

E cultural life? positive/ negative/ no effect

F intelligence? positive/ negative/ no effect

G other ? positive/ negative/ no effect
Why?

Appendix 4 2

Instructions, target responses and the text of the English Cloze

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INSTRUCTION

The text on the other page is an English story However a number of words have been left out of the story and replaced by a blank ( )
The length of this blank does not give an indication of the length of the English word left out
I would like you to fill out the gaps in the text by writing in each blank a single English word which you think originally occupied that place The result must be a sentence which you think is both appropriate and grammatically correct

An example is the following

> The man walked across the street and went the shop There he bought a big sandwich he was hungry

Words that you could have used are 'into' and 'because'

Remember, you can only fill in ONE word in each gap

DO YOU HAVE ANY QUESTIONS?

IF NOT TURN OVER THE PAGE AND START READING THE TEXT

TIME | AUSTRALIAN SUBURBS | NAME

Australian suburbs have always come in for a caning phrases like red brick 'veneereal' disease , entombed in the suburbs', 'deserts of boredom clearly illustrate the negative feelings there seem to exist against suburban life The consequences for the Australian way of (life) are enormous if one considers that almost (all) of the entire population of this country (live) in suburbs Does this mean that we do (not) live a happy life in the 'lucky (country)'?

Recent research at Sydney University however has (shown) that such views are not shared (by) the population at large It may be that (the) streetlife in an Australian suburb never matches (that) of Paris or London but neighbours still (have) an under-rated strong sense of street community This (is) especially the case in the inner city suburbs (which) have not yet become 'trendy to live (or) invest in Here the attitude towards suburban life is (more) positive This is reflected in the increasing number of (street) fairs, and in the growing number of Neighbourhood Watch zones, especially (in) the less affluent suburbs Some sub-urbanites appear (to) care a great deal about their environment, and (what) is more, are actively involved in (maintaining) and increasing its attraction Could it then (be) that suburban isolation is class related?

In (order) to investigate the question whether dissatisfaction with (suburban) life is related to social class one (must) look at the make-up of its population In the 1980s (increasing) material wealth has led to people slowly (becoming) isolated from each other, bricked-in used (to) having strangers next door As a result of (these) deteriorating relations within the community crime has risen (dramatically) Suburban dwellers further increasingly lose interhuman skills (as) interaction with television rather than people takes (a) leading part in their social life Crime is (no) longer rife in the poorer areas but (has) spread to more affluent suburbs Only recently the number of Neighbourhood Watch zones (has) increased, reflecting a growing awareness among (residents) of the seriousness of the problem One main factor that has often been quoted (for) the increase in isolation appears to be emancipation The (former) pillar of the neighbourhood, the housewife, is (no) longer in the home, keeping an eye (on) the streets She now is to be found in the (workplace)
Such a situation is typically found in (middleclass) families In lower-class families more traditional male-dominated values still reign

Another (factor) promoting the growing isolation is materialism In the (past) people tended to share whatever they had

. (If) your family had a bike everybody could borrow it, and .... (what) is more, they looked after it These . (days) people strive to be trendy they .. (do) not want to know you, only impress you with what they have They are all wrapped up in themselves (and) their career The only people that appear to make an effort are working class people, "unlike middle-class bullshit artists" one person commented

Appendix 4.3a

Instruction, target items and the 'long' Dutch Cloze text presented to dormant bilinguals (English and Dutch) and native speakers in the Netherlands (Dutch only)

INSTRUCTION

The text on the other page is a Dutch story. However, a number of words have been left out of the story and have been replaced by a blank ( )
The length of the blank does not give an indication of the length of the Dutch word left out
I would like you to fill out the gaps in the text by writing in each blank a SINGLE Dutch word which you think originally occupied that place. The result must be a sentence which you think is appropriate in the context as well as grammatical.

An example is the following.

> The man walked across the street and went .... the shop There he bought a big sandwich .. he was hungry.

Words that you could use to fill the gap are 'into' and 'because'.

Remember, you can only fill in ONE word in each gap

DO YOU HAVE ANY QUESTIONS?

IF NOT, TURN OVER THE PAGE AND START READING THE TEXT

TIME ..... NAME .

EEN MISDAAD

De gelegenheid maakt de dief: als ik 's nachts om vijf over zes naar huis wandel, staat de deur van de vis- en broodjeswinkel nog open. Ik doe een stap naar binnen en vraag aan de baas, die achter de toonbank aan het opruimen is. "Kan ik nog even een haring krijgen?"
Hij kijkt als een struikrover.
"Gauw dan maar", antwoord hij en dan heb ik het beest al bij de staart en til het boven mijn hoofd. Terwijl .(ik) kauw, zegt de winkelier "Ze zijn lekker, he" ....(en) drentelt naar de deur, waar aangekomen hij (plotseling) angstig schreeuwt: "Een politieagent! Vooruit, gooi weg dat ....(ding) !"
Ik geraak in paniek en doe, met (de) haring tussen de vingers, een paar loze passen (weggooien) ? Da's zonde, fluistert mijn gierigheid en, terwijl (het) gevaar op zware laarzen nadert, prop ik het (hele) beest, met staart en al, in mijn .(mond)
De agent, groot-zwart, staat op de drempel en (zegt) · "Goeienavond heren " want het begin is (meestal) vriendelijk, al ligt er iets dreigends in.
"Goeienavond ....(agent) ", antwoordt de winkelier op de vals- brave toon . . (van) het bekende jongetje, dat, met een sneeuwbal achter ...(zijn) rug, vriendelijk doet tegen een heer met (een) hoge hoed
Ik voor mij, knik alleen maar . ..(een) beetje, want als je een halve haring, . . (met) staart en graat in al doodstil op je tong .... (hebt) liggen, valt de conversatie moeilijk
"Meneer is .. (nog) laat in de zaak", meent de agent met (een) gevaarlijke kalmte, "Ik heb het tien over zes .. . (op) m'n klokkie."
"O, dat is in orde", zegt de (winkelier) "Hij eet niks, begrijpt U, maar hij (is) een kameraad van me. We staan effe (over) zijn vrouw te praten, die heeft er (weer) een kleintje bij, niet waar Kees?"
Dat is (tegen) mij Ik knik maar eens en lach gelukkig, ... (maar) toch niet te hevig, anders zou die . (haring) wel eens uit mijn mond kunnen gaan hangen

"O, ... (op) die manier", zegt de agent. "Maar ik . (denk) toch dat het beter is op de stoep (het) gesprek voort te zetten, want meneer mag . (zich) op dit uur niet meer in de lokaliteit . .. (ophouden)."

Hij is heel gemoedelijk en meegaand Langzaam (zet) hij zijn pet een beetje rechter en loopt . . (naar) de deur, waarheen ik hem, op een wenk (van) de winkelier, schielijk volg, met mijn volle (mond) Op de stoep moet hij nog even praten

"Zozo", zegt .... (hij) beminnelijk "Meneer heeft er dus een schreeuwertje .... (bij) . Een jongetje of een meisje, als ik . . (vragen) mag?"

Hij mag natuurlijk niet, want als (ik) nu knik, denkt hij dat ik gek .... (ben) en laat mij in een gesticht opnemen Antwoord ik .... (hem) daarentegen, dan merkt hij dat ik mijn mond .... (vol) heb en arresteert de winkelier. Er bestaat . (geen) enkel duidelijk gebaar waarmee men, zwijgend, kan aanduiden .... (of) het een jongetje of een meisje is Ik .... (zou) natuurlijk mijn schouders kunnen ophalen, maar dan zou .... (hij) me wegens onverschillig vaderschap laten opsluiten. Het .. (enige) middel is doofheid. Ik doe net of (ik) niets gehoord heb en grijns maar tegen .. . (hem), maar hij herhaalt: "Een jongetje of een .... (meisje)?" en ziet mij met twee oprecht ... (geinteresseerde) agenten ogen aan.

Er is niets meer aan . .. (te) doen: hier kan ik niet omheen. Ik schep diep adem en dan slik ik alles door de vis, de graat en de staart

"Een jongetje" zeg ik, met mijn laatste krachten.

Appendix 4.3b

Target items of the long Dutch Cloze ('Misdaad' text) which were based on the responses provided by monolingual native speakers of Dutch

TARGET	WORDCLASS	TARGET	WORDCL	TARGET	WORDCLASS
ik	Pron.	en	Conj.	plotseling	Adj.
ding	Noun	de	Art.	weggooien	Verb
het	Art	hele	Adj.	mond	Noun
zegt	Verb	meestal	Adverb	agent	Noun
van	Prep.	zijn	Pron.	een	Art.
een	Art.	met	Prep.	hebt	Verb
nog	Adverb	een	Art.	op	Prep.
winkelier	Noun	is	Verb	over	Prep.
weer	Adverb	tegen	Prep.	maar	Conj
haring	Noun	op	Prep.	denk	Verb
het	Art.	zich	Pron	ophouden	Verb
zet	Verb	naar	Prep	van	Prep.
mond	Noun	hij	Pron.	bij	Prep.
vragen	Verb	ik	Pron	ben	Aux.
hem	Pron.	vol	Adv.	geen	Pron
of	Conj	zou	Aux.	hij	Pron.
enige	Adj.	ik	Pron.	hem	Pron.
meisje	Noun	geinteresseerde			
			Adj.	te	Part

TOTAL:

Nouns	7	Pronouns	10	Articles	6
Verbs	8	Auxiliaries	2	Particles	1
Adjectives	4	Adverbs	4	Conjunction	3
				Prepositions	9

Open class: 19 Closed class: 35

Appendix 4.4a

Instruction and the "short" Dutch Cloze text presented to dormant bilinguals

INSTRUCTION

The text on the other page is a Dutch story However, a number of words have been left out of the story and have been replaced by a blank (.)
The length of the blank does not give an indication of the length of the Dutch word left out
I would like you to fill out the gaps in the text by writing in each blank a SINGLE Dutch word which you think originally occupied that place. The result must be a sentence which you think is appropriate in the context as well as grammatical

An example is the following:

The man walked across the street and went .. the shop. There he bought a big sandwich .he was hungry

Words that you could use to fill the gap are 'into' and 'because'.

Remember, you can only fill in ONE word in each gap

DO YOU HAVE ANY QUESTIONS?

IF NOT, TURN OVER THE PAGE AND START READING THE TEXT

Time Name .

PLEASE INSERT THE APPROPRIATE DUTCH WORDS IN THE FOLLOWING TEXT.

Een duiker, die voor de politie werkte, kreeg op een nacht de schrik van zijn leven Hij had al een half uur tevergeefs gezocht naar een man die in het ....(water) van de gracht was gevallen, toen hij plotseling door een hand . (werd) beetgepakt.
De hand bleek toe te behoren aan . .(de) gezochte jongeman, de 20-jarige Leo de Hoog.
Hij zat . (met) zijn hoofd in de opening van ....(het) riool Doordat daar een luchtbel aanwezig was, had hij .. (het) al die tijd onder water kunnen uithouden
Toen de (duiker) met de man boven water was gekomen, vertelde hij:
"Het .. (kostte) me nog de grootste moeite om het slachtoffer . .. (boven) te krijgen Hij vond het kennelijk prima onderwater Volgens .(mij) was hij stomdronken, en daarom bood ik hem een (biertje) aan. Hij wilde toen wel meewerken.
Met mijn hand ....(om) zijn mond geklemd zwom ik met hem naar de .... (kant) en daar konden we hem met een lijn omhoog .. .. (hijsen)."
Tenslotte kreeg de politie ook nog een probleempje met de ... (dronken) klant. Hij was nog maar net op de (droge) grond of hij wilde met de agent een borrel (gaan) drinken in de stad
Hij bleek zo dronken te .... (zijn) dat hij niet besefte waar hij was en dat (hij) door een wonder aan de verdrinkingsdood was ontsnapt.
Het .... (was) helemaal niet makkelijk voor de agent om de . (man) mee te nemen naar het politiebureau Daar kon hij schone kleren .... (aantrekken) en zijn roes uitslapen

Appendix 4.4b

The original text of the short Dutch Cloze and the instructions given to the subjects to read it out aloud

INSTRUCTION

I will now give you the text which you have just filled out, but this time with all the gaps filled I would like you to read this Dutch text aloud so that I can see what your reading is like
Please tell me when you are ready, so that I can start the recorder
Any questions?

Een duiker, die voor de politie werkte, kreeg op een nacht de schrik van zijn leven
Hij had al een half uur tevergeefs gezocht naar een man die in het water van de gracht was gevallen, toen hij plotseling door een hand werd beetgepakt
De hand bleek toe te behoren aan de gezochte jongeman, de 20-jarige Leo de Hoog Hij zat met zijn hoofd in de opening van een riool
Doordat daar een luchtbel aanwezig was, had hij het al die tijd onder water kunnen uithouden
Toen de duiker met de man boven water was gekomen, vertelde hij "Het kostte me nog de grootste moeite om het slachtoffer mee te krijgen Hij vond het kennelijk prima onderwater
Volgens mij was hij stomdronken, en daarom bood ik hem een biertje aan Hij wilde toen wel meewerken Met mijn hand om zijn mond geklemd zwom ik met hem naar de kant en daar konden we hem met een lijn omhoog hijsen "
Tenslotte kreeg de politie ook nog een probleempje met de moeilijke klant Hij was nog maar net op de droge grond of hij wilde met de agent een borrel gaan drinken in de stad
Hij bleek zo dronken te zijn dat hij niet besefte waar hij was en dat hij door een wonder aan de verdrinkingsdood was ontsnapt
Het was helemaal niet makkelijk voor de agent om de man mee te nemen naar het politiebureau Daar kon hij schone kleren aantrekken en zijn roes uitslapen

Appendix 4.5

Text, target responses and instructions of the Dutch Editing test

INSTRUCTION

Below you will find a Dutch story In this story there are a number of words added that should not be there (The mark # was not visible to the subjects). Read the text carefully, and while doing so cross out those words that are incorrect or superflous, as is done in the first line

Time CARLOS NAME

Dit is een koud verhaal over een jongen Die jongen #been heet Carlos Carlos is dertien #stoel jaar
Carlos woont in een dorp Het #staat is een klein dorp. Het #schreeuwt ligt hoog in de bergen Carlos is #gezond een herdersjongen Iedere morgen gaat hij naar de bergen
Zijn schapen #van en zijn hond gaan mee worden Carlos is altijd alleen De gewoon hele dag moet hij op #ligt de schapen passen Hij kan niet #kleedjes met zijn vriendjes spelen Carlos verveelt zich
"Gebeurde #geknoopte er maar eens iets leuks", denkt hij
Op een dag #voelen wandelt hij met zijn schapen in #een de bergen
Beneden ziet hij vier of vijf boeren #niet die op hun land werken. Opeens #bruine begint Carlos heel hard te roepen
"Help, de wolf Kom #duur me gauw helpen, hij eet mijn #goedkoop schapen op " De boeren rennen naar Carlos toe Als #bij Carlos ziet hoe hard ze rennen, begint hij vrolijk te lachen
Hij lacht en #meneer hij lacht tot hij niet meer kan Eindelijk #een zijn de boeren bij Carlos en zijn schapen #Er maar ze zien geen wolf
"#Een Carlos heeft ons allemaal voor #fronst niets laten rennen', zeggen ze tegen elkaar En #meneer boos lopen ze naar beneden om verder te werken #Aarzelend Carlos heeft nu een spelletje gevonden, waardoor hij zich niet meer hoeft te vervelen

"Had je die boeren #hij moeten zien rennen", denkt hij , 'wat #niet zijn ze stom en wat #kleedjes heb ik een lol gehad"
Het is weer #waarmee een paar dagen later Carlos #had wandelt met zijn kudde in de bergen En #geen dan gebeurt het
Plotseling komen van achter #tot de bomen vijf grote gevaarlijke wolven tevoorschijn Ze rennen naar #gebeurt de kudde toe om de #het schapen te verscheuren met hun scherpe tanden
Carlos schrikt vreselijk #over en begint te roepen zo hard #beneden hij kan· "help, help, de wolven zijn #remt gekomen Ze eten mijn schapen op Vlug, kom #een vlug!"
De boeren horen het wel, maar ze blijven rustig doorwerken
"#Cirkeltjes o, daar heb je Carlos weer", zeggen #U ze tegen elkaar
"Hij wil ons #ben zeker weer voor de gek #me houden. Nou, wij geloven hem #knikt niet meer"
Huilend roept Carlos nog een keer
'De wolven zijn hier, #het ze zijn echt gekomen Ze eten mijn schapen op Kom toch #lacht alsjeblieft'
Maar de boeren werken gewoon door #Kleedje de wolven eten al zijn schapen op tot er #moeten geen meer over is

Appendix 4 6a

Criteria for the Fluency tests

Solso and colleagues used Kuçera & Francis (1967) as their source From this they excluded hyphenated words, words with apostrophies and numbers Their method was as follows the word 'note' in Kuçera *et al* has a frequency of 127 and so 'n' is given the value of 127 for a four-letter word Scores from 4 and 5 letter words (1976) and 6 to 8 letter words (1979) were added together to yield the frequency with which a word-initial letter appeared in 4 to 8 letter words in English When the lists for the various word lengths were added up for all letters in the alphabet the following list resulted Lists like Solso's were not available for Dutch so that crosslinguistic comparison was difficult

Total frequency of word initial letters in 4 to 8 letter words, listed in Kuçera & Francis (1967), based on computations by Solso and associates (1976, 1979)

T 55675	A 27300	D 17276	V 5481
S 50534	F 26725	E 16081	J 4267
W 42434	B 25670	G 12356	K 4247
C 31582	H 20891	O 12171	Y 4036
M 27542	L 19963	N 9553	Q 1440
P 27424	R 19026	I 9024	Z 149
			X 13
total 476785			

Appendix 4.6b

Instructions for the Dutch and English Fluency task (only the English-language version is given)

INSTRUCTIONS

You will be given the name of a description of a category/a letter Then you will be given 2 minutes to say aloud as many items included in that category/ starting with that letter as you can, in any order
For example, if you see 'seafood' you may respond with such items as 'lobster, shrimp, clam, oyster, herring' and so on If you see 'A' you can respond with 'Apple, Arch, After' and so on If you get stuck I will present you with a new letter/ category after 20 seconds, after which you again have two minutes When you hear 'stop' you must stop saying the last item immediately
Any questions?

Appendix 4 7a

Comments on the recoding and combining of information in the questionnaire prior to statistical analyses of the questionnaire data (N= 76)

- **QUESTION 10** Based on the questions on the number of 'years in the Netherlands/Dutch speaking countries' and 'current age', the number of years in Australia were calculated The reference point was February 1988, the date when all interviews had been completed When subjects had lived in other countries in between emigrating to Australia (q 12), and this was a Dutch-speaking country (such as in the expatriate community in colonial Indonesia in the 1940s-1950s) the 'time of arrival in Australia' (q 10) was used as the departure point for this score If the country was not Dutch-speaking (for instance by emigrating first to Canada, New Zealand or America) the date from question 9 was used

- **QUESTION 11** the subject's age at time of departure was adjusted with the period that subjects had lived in other Dutch-speaking communities before emigrating to Australia, or when they had lived a number of years in isolated Dutch communities (language islands) like the bulb-farms near Melbourne or villages near Moe (Vic)

- **QUESTION 13** Total years in the Netherlands was based on 'age of departure' and adjusted for additional years spent in long-term L1 communities (see q 10 and 11 above)

- **QUESTION 17** Based on q 17/17A the following new scores were determined **A)** the number of return visits to the Netherlands, which would reflect the intensity of contact with the home country and its language **B)** the number of years since the most recent visit to the Netherlands of one week or more Recent visits could assist in maintaining or even expanding the vocabulary and fluency in Dutch, and the more recent this visit, the stronger the expected effect Shorter visits were expected to be be insignificant because subjects reported that during these tourist trips most time was spent with the tour group Subjects had also reported that they needed at least a week to get used to the Dutch language again, so that substantial improvements could not be expected within a shorter period **C)** the total number of weeks spent in the Netherlands was the third score calculated, as this would give an index of the duration of the contact

- **QUESTION 23A/24B** The extent to which subjects 'think' in Dutch (*i e* personal, non communicative language used in prayers and fast calculations) was reflected in a combination of q 23a and 24b called Dutch as a private language Reported 'use in calculations' was combined with 'use in prayers' since many subjects reported not to pray Remnants of rote learning in Dutch (*e g* nursery rhymes, alphabet listing, and multiplication tables) served as indications of the extent to which Dutch had been acquired for that individual

QUESTION 25 was split up into 2 values level of Dutch education, which reflected the quality and extent of prior knowledge of Dutch, and general level of education, which was taken to be an index reflecting such elements as general intelligence, testpertise and reading skills

- **QUESTION 26** Knowledge of German was separated here from other languages which the subject may know, since subjects had remarked during the interview procedures that using German helped them in interpreting and producing Dutch, since so many elements were similar

- **QUESTION 27** Some subjects who had arrived in Australia before the age of 18 had included Dutch in their VCE exam, and as a result had picked up and used more Dutch than those migrants who stopped using Dutch the moment they arrived in Australia Subjects who had learned Dutch in such formal conditions only were excluded altogether since their Dutch would be different in nature and fluency from the target group, and would therefore add another variable to the already impressive list of potential variables affecting lexical retrieval

Appendix 4.7b

Categories of replies to the open-ended question 34B on the subjects' reasons for their attitude to Dutch

- Category **1** 'inherent dislike' comprised arguments like "I don't like the sound of Dutch" and "Dutch sounds clumsy"
- Category **2** was called 'lack of use or no need to use Dutch', and consisted of "no interest in Dutch", "no need for Dutch", "no use for Dutch", "no opportunities for using Dutch", "no motivation to use Dutch" and "Dutch is not a world language" and "Dutch is not internationally used".
- Category **3** was called 'too much effort' Arguments in this category were· "I feel uncomfortable in Dutch due to a lack of fluency", "I have lost my Dutch", "I have forgotten most my Dutch", "It is too much effort to use Dutch", "Dutch is too difficult", "I don't have confidence in using Dutch"
- Category **4** comprised 'positive sentiments towards Dutch', such as "I want to maintain the link to my own Dutch background", "I feel my Dutch heritage", "Using Dutch provides a bond to my place of birth", "nostalgia", "pride in my native language" and "eager to maintain and retain Dutch"
- Category **5** was called "practice language skills' This covered arguments like "enjoyment in being able to use it", "I can practise my Dutch skills", and "maintain my knowledge of Dutch'
- Category **6** was called 'useful for communication' Arguments in this category were "Dutch enables me to communicate with elderly emigrants whose English is poor", "Dutch enables me to keep in contact with my relatives and family"
- Category **7** for responses to question 34 was 'inherent liking' Comments belonging to this seventh category were "knowing Dutch is useful for studies of other languages", "knowing an extra language is an asset", and "Dutch is a colourful, expressive language."

Appendix 4.7c

Categories of responses to question 35B on the subjects' reasons for their attitude to the teaching of Dutch to their offspring

- Category **1** 'Negative to Dutch' consisted of "Dutch has no value", "there are no advantages to Dutch", "There is no point in teaching Dutch", "No need nor use for Dutch", and "Dutch is not a world language".
- Category **2** 'Negative to bilingualism' consists of arguments like "Learning a language is a waste of time" and "A second language is soon forgotten".
- Category **3** received the label 'maintain Dutch', and covered the argument "We must teach Dutch in order to retain the existence of the Dutch language"
- Category **4** was labelled 'Dutch is useful as a communicative language'. It related to responses like "We must keep up Dutch in order for descendants of Dutch to understand their Dutch heritage", "Teaching Dutch is good as it helps reducing the generation gap to the elderly emigrants", "Dutch creates a common ground between generations", "Dutch is useful when visiting the Netherlands", "Its convenient for communication with relatives and visitors", "Dutch is a good back-up language" and " Dutch can be used as a secret language"
- Category **5** was labelled 'positive to bilingualism', and referred to comments like "teaching another language helps to understand and appreciate other cultures", "it is an asset to be bilingual", and "Its good to speak several languages".

Appendix 4.7d

Categories of responses to question 36 on the subjects' reasons for their attitudes to bilingualism in various contexts

- **1** 'negative' Comments in this category were "Bilinguals incur the jealousy of the Aussies", "there are negative prejudices against the Dutch in Australia", and "there is no use for Dutch".
- **2** 'negative indifference' Responses of this type were "Dutch plays no part in MY own life" and "Bilingualism has no effect on my life"
- **3** 'positive/indifference'. "It does not hurt to be bilingual", "Bilingualism has a positive effect on my own life" and "Bilingualism is part of own life"

- 4 'practical use' Comments in this category are: "Being bilingual helps to communicate with elderly emigrants and other non-Australians", "Being bilingual extends the range of business", "Bilingualism improves one's career prospects", "It enables me to read Dutch trade journals", "It is easier to learn other languages". "It is useful for solving spelling and language problems", "It boosts intelligence", "Being bilingual makes one more politically aware" , "bilingualism gives one a wider perspective of the world, a broader horizon", "bilingualism brings a better understanding of cultures" and "bilingualism gives one more scope".

Appendix 4.8

Summary of a selection of the questions from the survey on 76 Dutch-Australian bilinguals in Victoria (1988). Columns marked 'yes' indicate percentages given indicate the number of times the particular variable was present In these questions subjects could tick more than one answer.

Subjects' age:		**Gender:**		**Age of departure:**	
32 - 37	12%	Male	62.2%	0- 7	22 5%
38 - 43	39%	Female	37.8%	8-10	17.8%
44 - 49	28%			11-18	45 9%
50 - 55	10.5%			19-29	13 9%
55 - older	10 5%				

Marital status:		**Married to Dutch spouse:**		**Married to a fluent Dutch-speaking spouse:**	
single	3.9%				
widowed	0.0%	Yes	28.9%	Yes	17.1%
divorced	9.2%	No	71.1%	No	82.9%
married	86 8%				

Country of birth:		**Region of upbringing:**		**Other countries before migration to Australia:**	
Netherlands	94.7%	Holland	71.4%	none	90 7%
Indonesia	3 9%	North Neth.	10.5%	US/ NZ	1.3%
English-	1.3%	South Neth	11.8%	Europe	2.6%
Asia	0.0%	Other	6.3%	D.-Indon.	2.7%
other	0.0%			Other	2 6%

Total number of years spent in the Netherlands:		**Years spent in Australia:**	
1 - 10	40.8%	14 - 24	5.3%
11 - 20	42.1%	25 - 30	19.7%
21 - 29	17.1%	31 - 38	75.0%

Highest level of Education in the Netherlands:		**General level of Education: (in Australia)**	
none	9 2%	none	0 0%
primary	56.6%	primary	2.6%
secondary	30.3%	secondary	39.5%
tertiary	3.9%	tertiary	57.9%

Proficiency in English prior to emigration:

none	52.6%
poor	25 0%
fair	14.5%
good	7 9%
native	0.0%

Learning environment of English:

at home	1.3%
abroad	3.9%
school	35.5%
work	52 6%
other	6 7%

Formal training in Dutch: yes

no	88.2%
yes	11.8%

Present occupation in Austr.:

None/home	5.3%
Manual	26.3%
Clerical	42.1%
Profes.	26.3%

Main reason for emigration:

Job in Australia	2 6%
Threat of war	2.6%
Parents moved	75.0%
Nuclear threat	0 0%
Adventure	14 5%
Other	5.3%
None	0.0%

Number of return visits to the Netherlands:

0 = 44 7%	4 = 2.6%
1 = 26.3%	5 = 3.9%
2 = 14.5%	6 = 0.0%
3 = 5.3%	7 = 1.3%
	14 = 1.3%

Length of visits (in weeks):

1 - 5	67.1%
6 - 10	11 8%
11 - 15	1.4%
16 - more	19 7%

Years since last return visit:

1 - 5	69 7%
6 - 10	10 0%
11 - 15	14.3%
16 - more	6.0%

Occupation in the Netherlands:

None/home	75.0%
Manual	9.2%
Clerical	14.5%
Profes.	1.3%

Freq. of contact with the Netherlands:

none	51.3%
once	1.3%
sporadic	0 0%
annual	6.6%
half year	10.5%
3 monthly	13.2%
monthly	15.8%
weekly	1.3%
other	0.0%

Freq. of contact with other Dutch migrants:

none	61 3%
once	0.0%
sporadic	16 3%
annual	0 0%
half year	0.0%
3 monthly	0.0%
monthly	6.6%
weekly	13.2%
other	2.6%

Freq. of contact with recent emigrants:

none	96.1%
once	0.0%
sporadic	2.6%
annual	0.0%
half year	0.0%
3 monthly	0 0%
monthly	0 0%
weekly	1.3%
other	0.0%

Number of languages known (other than Dutch or English):

0 = 44.7%
1 = 17.1%
2 = 31 6%
3 = 6.6%

Contact to the Netherlands: (more than one answer) yes

through relatives	47.4%
through friends	9 2%
through business	1.3%
No contact	51 3%

Other languages known than Dutch or English: yes

German	42.1%
French	40 8%
Indonesian	6 6%
other	10.5%
none	44.7%

Est. proficiency in other language but German (average): yes

none	48 7%
poor	35 5%
fair	15 8%
good	0 0%
native	0 0%

Estimated proficiency in German only:

none	59 2%
poor	22 4%
fair	15 8%
good	1 3%
native	1 3%

Learning environment of German:

home	3 9%
abroad	5 3%
school	35 5%
friends	6 6%
other	48 7%

Frequency of visit to Dutch club or church:

none	94 7%
once	0 0%
sporadic	2 6%
annually	0 0%
half year	0 0%
3 monthly	0 0%
monthly	0 0%
weekly	2 6%
other	0 0%

Prefered private language:

Dutch only	14 5%
Dut and Eng	63 1%
English only	22 4%

Language of emotion:

Dutch only	6 6%
Dut and Eng	80 3%
English only	13 2%

Estimated change in UNDERSTANDING Dutch

worse	42 1%
same	46 1%
better	11 8%

Estimated frequency of UNDERSTANDING Dutch

never	7 9%
sporadic	56 6%
annual	3 9%
half year	1 3%
3 monthly	0 0%
monthly	5 3%
weekly	22 4%
other	2 6%

Estimated proficiency in UNDERSTANDING Dutch

none	0 0%
poor	9 2%
fair	32 9%
good	48 7%
native	9 2%

Who addresses you in Dutch? yes

family	48 7
relatives	22 4
D friends	32 9
colleagues	10 5
other	5 3
noone	17 1
everybody	1 3

Where is Dutch heard? yes

home	15 8
other migrants	46 1
school	5 3
work	5 3
media	40 8
other	1 3
nowhere	7 9
everywhere	0 0

What topics do you specifically hear about in Dutch? yes

family	55 3
Dut customs	13 2
cooking	13 2
religion	2 6
general topics	34 2
other	5 3
nothing	7 9

Estimated change in SPEAKING Dutch:

worse	55 3%
same	35 5%
better	9 2%

Estimated freq. of SPEAKING Dutch:

never	13 2%
sporadic	62 2%
annual	1 3%
half year	0 0%
3 monthly	1 3%
monthly	7 9%
weekly	13 2%
other	1 1%

Estimated proficiency in SPEAKING Dutch:

none	1 3%
poor	32 9%
fair	40 8%
good	23 7%
native	1 3%

Who does subject speak to in Dutch?

	yes
family	48.7
relatives	22.4
Dut. friends	43.4
at work	7.9
other	0.0
noone	17.1
everybody	0.0

Where is Dutch spoken?

	yes
at home	21.1
other migrants'	57.9
at school	0.0
at work	3.9
media	1.3
other	0.0
nowhere	22.4
everywhere	1.3

What topics are specifically spoken about in Dutch?

	yes
family	34.2
Dut. customs	21.1
cooking	5.3
religion	3.9
general topics	44.7
other	2.6
nothing	21.1

Estimated change in READING Dutch:

worse	40.8%
same	50.0%
better	9.2%

Estimated frequency of READING Dutch:

never	17.1%
sporadic	60.5%
annual	0.0%
half year	0.0%
3 monthly	0.0%
monthly	18.4%
weekly	1.3%
other	2.6%

Estimated prof. in READING Dutch:

none	5.3%
poor	27.6%
fair	30.3%
good	31.6%
native	5.3%

What is read in Dutch?

	yes
letters	59.2
paper	39.5
magazine	40.8
Dut. literat.	15.8
transl. books	2.6
other	1.3
nothing	13.2

Where is Dutch read?

	yes
at home	65.8
other migrants'	32.9
at school	0.0
at work	2.6
ethn. media	0.0
other	0.0
nowhere	17.1

What topics are specifically read about in Dutch?

	yes
family	46.1
Dut. customs	23.7
cooking	7.9
religion	0.0
general topics	46.1
other	0.0
nothing	13.2

Estimated change in WRITING Dutch:

worse	55.3%
same	39.5%
better	5.3%

Estimated freq. of WRITING Dutch:

never	32.9%
sporadic	47.4%
annual	1.3%
half year	2.6%
3 monthly	2.6%
monthly	10.5%
weekly	1.3%
other	1.3%

Estimated proficiency in WRITING Dutch:

none	6.6%
poor	51.3%
fair	23.7%
good	17.1%
native	1.3%

Who is written to in Dutch?

	yes
family	13.2
relatives	57.9
parents' friend	13.2
colleages	0.0
other	0.0
noone	32.9

Where is Dutch written?

	yes
at home	61.8
other migrants'	0.0
at school	1.3
at work	2.6
in media	0.0
other	0.0
nowhere	35.5
everywhere	0.0

What topics are specifically written about in Dutch?

	yes
family	53.9
Dut. customs	3.9
Dut. cooking	0.0
religion	0.0
general topics	31.6
nothing	30.3
other	0.0

Total number of persons addres-sing you in D.:	**Total number of persons you speak to in D.:**	**Total number of books you read in Dutch:**	**Total number of persons you write to in Dutch:**
0 17 1%	0 19 7%	0 25 4%	0 34 2%
1 52 6%	1 46 2%	1 39 5%	1 48 7%
2 22 4%	2 20 4%	2 21 9%	2 15 8%
3 7 9%	3 8 1%	3 13 2%	3 1 3%
	4 3 3%		
	5 1 3%		

Total number of domains where people address you in Dutch:	**Total number of domains where you speak in Dutch:**	**Total number of domains you read about in Dutch:**	**Total num ber of do-mains you write about in Dutch**
0 0 0%	0 0 0%	0 0 0%	0 0 0%
1 78 9%	1 92 1%	1 81 6%	1 98 7%
2 19 7%	2 7 9%	2 15 8%	2 1 3%
3 1 3%	3 0 0%	3 2 6%	3 0 0%

Total number of topics people who address you in Dutch:	**Total number of topics you speak about in Dutch: about in**	**Total number of topics you read about in Dutch:**	**Total num-ber of topics you write Dutch:**
0 9 2%	0 22 4%	0 13 2%	0 30 3%
1 64 5%	1 52 6%	1 59 2%	1 51 3%
2 19 7%	2 17 1%	2 18 4%	2 15 8%
3 6 6%	3 6 6%	3 9 2%	3 2 6%
	4 1 3%		

Total estimated change in using Dutch:	**Total estimated frequency in using Dutch:**	**Tot. estimated proficiency in Dutch:**
worse 65 8%	never 7 9%	none 1 3%
same 28 9%	sporadic 50 3%	poor 42 1%
better 5 3%	annual 13 1%	fair 39 5%
	half year 11 9%	good 17 1%
	3 monthly 0 0%	native 0 0%
	monthly 9 2%	
	weekly 0 0%	
	other 7 6%	

Attitude to the Dutch language:	**Attitude to teaching Dutch:**	**Av. Attitude to bilingualism:**
negative 32 9%	negative 35 5%	negative 25 0%
don't know 9 2%	don't know 11 8%	don't know 46 1%
positive 57 9%	positive 52 6%	positive 28 9%

Reasons:	**Reasons:**	**Reasons:**
inherent dislike 4 2	dislike of Dutch 31 6	bil is bad 5 3
no need for Dutch 8 5	dislike biling 1 3	indifferent 6 7
too strenuous 22 5	maintain Dutch 5 3	affects life 4 0
pos sentiments 17 1	to comm in Dutch 17 1	practical 18 7
practise skills 15 3	positive to bil 26 3	useful in ab 29 3
use for communi 11 3	don't know 18 4	don't know 36 0
don t know 21 1		

bil. at work:	bil. in family:	bil. social life:
negative 1.3	negative 6 6	negative 5.3
don't know 52.6	don't know 51 3	don't know 48.7
positive 46.1	positive 42.1	positive 46.1
bil. intelligence:	**bil. culturally:**	**bil. religious life:**
negative 1.3	negative 1 3	negative 1 3
don't know 52.6	don't know 40.8	don't know 82.9
positive 46.1	positive 57.9	positive 15 8

Appendix 4.9

Results of Pearson Product-Moment correlations amongst a selection of variables in the questionnaire data for emigrants who departed after the age of 6 (N = 67).

	SAGE	SEX	DSPOU	YROZ	DEPT	TOTDUT	EDDU	EDU	ENG	JOBD	JOBOZ
SAGE	--										
SEX	-.36**	--									
DSPOU	-.06	.24	--								
YROZ	.36**	-.19	-.09	--							
DEPT	.69**	-.30*	.11	-.28*	--						
TOTDUT	.70**	-.30*	.11	-.29*	.99**	--					
EDDU	.45**	-.21	-.02	-.24	.71**	.69**	--				
EDU	.25*	-.16	-.29*	.18	.07	.05	.36**	--			
ENG	.48**	-.22	-.00	-.17	.73**	.71**	.57**	.18	--		
JOBD	.54**	-.23	.16	-.16	.79**	.77**	.43**	-.08	.75**	--	
JOBOZ	.35**	-.25*	-.07	.32**	.21	.19	.18	.27*	.20	10	--
NOVIS	.19	.01	.03	-.11	.27*	.26*	.38**	.15	.34**	.13	.24
YERVIS	.05	-.14	.18	-.01	.05	.06	-.06	-.10	-.06	.01	-.12
WKVIS	.12	.04	-.00	-.29*	.30*	.30*	.24*	-.04	.31**	.28*	.13
TYPCO	.11	.20	.00	-.23	.18	.19	.08	.08	.21	.13	-.01
FRECO	.13	.24*	.07	-.22	.19	.20	.07	.04	.20	.13	-.02
OTHCO	-.11	.15	.36**	-.16	.05	.05	.08	-.05	- 03	.03	-.15
FLSPO	-.07	.09	.63**	-.07	.09	.09	-.03	-.28*	.01	.18	.12
LAPRIV	.27*	-.03	-.21	.04	.22	.22	.18	.14	.27*	.22	.04
LAEMOT	.19	.17	.09	-.03	.12	.12	-.03	.09	.04	.12	.11
COUN	.32**	-.04	-.10	-.17	.25*	.29*	.24	.11	.11	.03	-.00
NOLANG	.40**	-.13	-.07	-.07	.45**	.45**	.43**	.21	.48**	.41**	.21
UNFRE	-.16	.17	.12	-.29*	.03	.03	.04	-.04	.08	-.02	-.10
SPFRE	-.22	.33**	.29*	-.38**	.02	.03	-.00	-.09	.03	-.09	-.18
RFRE	-.02	.03	.22	-.08	.11	.11	-.08	.18	.17	.14	-.04
WRFRE	.16	.09	.31**	-.34**	.45**	.45**	.26*	.04	.42**	.39**	-.13
FRELIT	.09	.07	.32**	-.26*	.34**	.34**	.11	.13	.35**	.32**	-.11
FRECON	-.20	.26*	.21	-.35**	.03	.03	.02	-.07	.06	-.06	-.15
TOTALFRE	-.08	.21	.31**	-.37**	.21	.21	.08	.02	.23	.14	-.15
UNCH	-.01	.14	.16	.13	-.17	-.17	-.15	.13	-.09	-.15	.07
SPCH	-.25*	.19	.20	.09	-.25*	-.25*	-.17	-.08	-.06	-.07	.00
RCH	-.17	.32**	.23	-.07	-.13	-.13	-.10	.02	.00	-.11	-.10
WRCH	-.12	.19	.30*	.05	-.14	-.15	-.12	-.08	.00	-.07	-.06
TOTCH	-.16	.24*	.26*	.06	-.208	-.21	-.16	.00	-.04	-.12	-.02
UNPRO	.26*	-.13	.28*	-.09	.39**	.38**	.36**	.08	.27*	.27*	.20
SPPRO	.08	.14	.34**	-.25*	.33**	.32**	.22	-.00	.30*	.21	.08
RPRO	.26*	.09	.23	-.34**	.50**	.51**	.48**	.13	.44**	.32**	.04
WRPRO	.16	.07	.35**	-.34**	.51**	.49**	.41**	-.00	.43**	.35**	.05
TOTPRES	.23	.06	.35**	-.31**	.52**	.51**	.44**	.07	.44**	.34**	.11
UNWHO	.10	.32**	.14	-.09	.06	.06	.07	.07	.04	-.01	-.11
UNWHE	.03	.04	.12	-.19	.17	.16	.14	.06	.05	.12	-.08
UNTOP	-.13	.27*	.15	-.10	-.01	-.02	.01	-.02	-.10	-.02	-.09
SPWHO	-.08	.24*	.22	-.19	.09	.08	.22	.12	.06	-.09	.01
SPWHE	-.06	.15	.20	-.18	.13	.12	.05	-.03	.11	.07	.08
SPTOP	-.03	.22	.07	-.14	.04	.04	-.01	.02	.09	.03	.07
RWHA	-.02	.05	.18	-.05	.03	.04	-.02	.12	.03	-.06	-.04
RWHE	.03	-.03	.07	-.07	.05	.04	.12	.20	-.01	-.11	-.02
RTOP	.06	-.08	-.02	-.13	.16	.16	.17	.19	.16	.03	-.07
WRWHO	.20	-.02	.24*	-.27*	.41**	.41**	.29*	.17	.44**	.40**	-.01
WRWHE	.21	-.05	-.03	-.00	.19	.20	.24*	.26*	.21	.14	-.05

WRTOP	21	-06	02	-11	32**	32**	30*	14	38**	25*	01
ATTD	-22	-01	01	-18	-11	-12	-02	11	-03	-13	-01
REASD	-24	-06	14	-27*	-01	-01	04	11	04	-04	-03
ATTEA	-16	-02	-04	-11	-04	-03	-18	-10	09	02	-23
REAST	-12	15	-08	00	-17	-15	-19	08	-07	-17	-09
TOTATT	28*	-12	17	14	17	18	05	09	24	17	27*
REASON	16	-21	-18	-03	07	10	12	10	06	09	-07

	NOVIS	YERVIS	WKVIS	TYPCO	FRECO	OTHCO	FLSPO	LAPRIV	LAEMOT	COUN	NOLANG
NOVIS	--										
YERVIS	-11	--									
WKVIS	76**	-29*	--								
TYPCO	36**	-25	45**	--							
FRECO	43**	-17	48**	91**	--						
OTHCO	01	08	11	13	19	--					
FLSPO	18	-11	24	-11	-03	16	--				
LAPRIV	14	-18	16	16	18	-26*	-11	--			
LAEMOT	-13	02	-11	20	22	-00	-03	27*	--		
COUN	37**	02	34**	30*	32**	08	-13	23	-05	--	
NOLANG	22	-04	26*	13	13	07	-14	17	17	21	--
UNFRE	09	-08	15	39**	44**	57**	-04	-13	12	05	05
SPFRE	00	-08	10	31*	35**	61**	15	-13	12	10	-07
RFRE	-03	-05	06	28*	2910	38**	14	-17	14	-02	17
WRFRE	38**	13	43**	41**	49**	29*	07	-03	01	25*	44**
FRELIT	22	05	30*	41**	46**	40**	12	-11	09	14	36**
FRECON	05	-08	13	37**	42**	63**	06	-14	13	08	-01
TOTALFRE	16	-02	27*	47**	53**	62**	11	-15	13	13	20
UNCH	09	02	04	08	19	17	14	-10	-02	-02	05
SPCH	08	05	07	13	16	09	12	06	00	-16	01
RCH	19	-10	15	20	29*	20	22	-06	03	-01	-00
WRCH	26*	12	14	19	28*	11	15	06	06	-04	-01
TOTCH	18	02	11	17	26*	17	18	-01	02	-07	01
UNPRO	29*	-16	40**	24*	25*	29*	21	06	-08	13	35**
SPPRO	22	-24*	34**	19	22	23	33**	-05	-06	-04	13
RPRO	30*	-25*	34**	33**	35**	13	22	02	16	21	42**
WRPRO	31*	-12	36**	28*	33**	23	29*	13	15	05	25*
TOTPRES	34**	-23	43**	31**	35**	25*	31**	05	06	11	35**
UNWHO	-07	-23	-00	36**	33**	18	-10	10	25*	03	03
UNWHE	02	-14	11	08	13	34**	08	00	04	-01	07
UNTOP	-00	-03	04	18	24*	39**	-02	-13	09	00	03
SPWHO	03	06	-00	22	20	43**	14	-08	11	05	-04
SPWHE	07	16	16	33**	36**	38**	07	-05	09	-02	07
SPTOP	09	11	27*	34**	36**	24	-03	-17	10	00	-05
RWHA	09	-12	12	13	25*	09	19	-12	-01	04	08
RWHE	-02	01	-02	14	19	39**	-02	05	17	10	07
RTOP	02	02	08	25*	22	21	-14	02	18	-03	07
WRWHO	26*	16	28*	44**	45**	16	02	04	22	24*	35**
WRWHE	09	-09	17	35**	33**	05	-16	03	05	18	34**
WRTOP	26*	-08	40**	32**	30*	10	-03	00	08	15	36**
ATTD	19	07	20	13	17	17	-04	-04	-00	-05	06
REASD	19	21	13	02	05	34**	11	-11	01	-00	-01
ATTEA	-19	02	-10	07	06	11	-04	00	-05	09	-09
REAST	-23	12	-29*	-00	00	04	-02	-02	-18	08	-19
TOTATT	16	08	09	17	29*	07	16	-04	07	22	18
REASON	-01	-28	01	24	22	-04	-07	-05	-07	22	27

	UNFRE	SPFRE	RFRE	WRFRE	FRELIT	FRECON	TOTALFRE	UNCH	SPCH	RCH	WRCH
UNFRE	--										
SPFRE	77**	--									
RFRE	38**	38**	--								
WRFRE	29*	22	42**	--							
FRELIT	39**	35**	83**	85**	--						
FRECON	94**	94**	40**	27*	39**	--					
TOTALFRE	82**	80**	72**	65**	81**	86**	--				
UNCH	29*	17	16	07	13	24	22	--			
SPCH	18	09	19	-00	10	15	15	60**	--		
RCH	31*	24*	32**	13	26*	30*	34**	68**	60**	--	
WRCH	19	09	11	20	19	15	20	66**	68**	70**	--
TOTCH	29*	17	23	11	20	24*	27*	86**	84**	87**	88**
UNPRO	27*	25*	29*	36**	38**	28*	39**	24*	15	11	14

SPPRO	30*	34**	19	31*	30*	34**	39**	29*	25*	27*	29*
RPRO	23	21	38**	46**	50**	23	43**	18	06	38**	14
WRPRO	29*	29*	21	49**	42**	30*	43**	18	09	20	32**
TOTPRES	31**	32**	33**	49**	49**	34**	49**	26*	16	30*	26*
UNWHO	39**	41**	22	11	19	42**	38**	12	08	10	10
UNWHE	35**	29*	20	19	23	34**	35**	23	17	25*	24*
UNTOP	48**	36**	23	20	25*	45**	43**	02	05	-04	-08
SPWHO	50**	57**	32**	16	29*	57**	52**	13	15	15	17
SPWHE	46**	47**	44**	31*	44**	49**	56**	22	29*	17	25*
SPTOP	46**	39**	32**	25*	34**	46**	48**	21	26*	13	22
RWHA	24*	28*	55**	28*	49**	27*	44**	31*	24*	38**	29*
RWHE	54**	44**	41**	17	34**	52**	52**	24*	07	18	16
RTOP	38**	34**	38**	28*	39**	38**	46**	07	17	18	13
WRWHO	35**	21	35**	75**	66**	30*	56**	04	00	10	17
WRWHE	27*	11	32**	50**	49**	20	40**	05	-09	09	08
WRTOP	37**	18	31**	61**	55**	29*	49**	10	00	14	18
ATTD	19	23	09	17	16	22	23	17	28*	02	15
REASD	29*	31*	23	15	22	32*	33*	23	32*	17	17
ATTEA	23	27*	15	14	17	26*	26*	10	09	05	08
REAST	18	23	09	-07	01	21	15	26	08	13	05
TOTATT	08	03	21	26*	28*	06	19	23	05	21	21
REASON	01	-16	11	12	14	-08	03	39**	21	28	21

	TOTCH	UNPRO	SPPRO	RPRO	WRPRO	TOTPRES	UNWHO	UNWHE	UNTOP	SPWHO	SPWHE
TOTCH	--										
UNPRO	19	--									
SPPRO	32**	62**	--								
RPRO	22	55**	56**	--							
WRPRO	23	54**	68**	69**	--						
TOTPRES	28*	79**	84**	85**	87**	--					
UNWHO	12	36**	25*	25*	20	3142**	--				
UNWHE	27*	22	26*	24*	24*	2866*	3738**	--			
UNTOP	-01	16	10	08	04	1117	2828*	2348	--		
SPWHO	18	29*	28*	25*	29*	33**	51**	27*	35**	--	
SPWHE	27*	39**	24*	17	17	28*	48*	33**	41**	52**	--
SPTOP	24*	28*	28*	16	21	27*	26*	31**	40**	40**	61**
RWHA	35**	30*	27*	50**	28*	41**	21	29*	17	26*	31*
RWHE	19	32**	14	34**	32**	34**	47**	49**	42**	57**	45**
RTOP	16	22	20	39**	32**	34**	15	39**	29*	34**	35**
WRWHO	09	30*	29*	47**	44**	45**	14	16	22	28*	33**
WRWHE	04	23	12	37**	29*	31*	27*	34**	27*	20	24*
WRTOP	12	30*	30*	47**	43**	45**	06	35**	23	16	23
ATTD	18	25*	24*	04	19	20	02	02	11	14	23
REASD	26	28*	32*	13	25	29*	-01	12	27*	29*	32*
ATTEA	09	06	04	-00	02	03	06	01	09	25*	14
REAST	15	07	07	-02	-12	-00	21	10	06	30*	25
TOTATT	20	26*	10	19	14	21	11	20	04	19	29*
REASON	31*	19	-02	26	08	15	06	28	-22	00	-09

	SPTOP	RWHA	RWHE	RTOP	WRWHO	WRWHE	WRTOP	ATTD	REASD	ATTEA	REAST
SPTOP	--										
RWHA	35**	--									
RWHE	40**	48**	--								
RTOP	49**	41**	60**	--							
WRWHO	39**	29*	29*	41**	--						
WRWHE	27*	30*	35**	39**	63**	--					
WRTOP	43**	37**	37**	56**	71**	78**	--				
ATTD	30*	19	14	25*	04	04	07	--			
REASD	24	27*	27*	31*	10	-01	09	72**	--		
ATTEA	15	16	07	12	12	18	14	18	08	--	
REAST	16	20	07	-05	-03	12	-09	23	08	76**	--
TOTATT	19	24	16	12	36**	28*	23	-07	-05	24*	27
REASON	-08	24	08	14	13	28	19	08	08	18	12

	TOTATT	REASON
TOTATT	--	
REASON	45**	--

* - p LE 05 **- p LE 01 (2-tailed) (" " printed if a coefficient cannot be computed)

Abbreviations (*cf* Table 4 6)	
SAGE	The age of the subject
SEX	The gender of the subject
DSPOU	Married to a Dutch spouse
FLSPO	Does the spouse speak fluent Dutch?
BIRTH	Country of birth
YROZ	Number of years in Australia
TOTDUT	Total number of years in the Netherlands
NOVIS	Number of return visits to the Netherlands
YERVIS	Years since 1988 in which last return visit took place
WKVIS	Total number of weeks in the Netherlands during visits
FRECO	Frequency of contact with the Netherlands
OTHCO	Frequency of contact with other expatriates
NOLANG	Number of languages known other than Dutch and English.
RECCO	Frequency of contact with recently immigrated expatriates
CLUB	Membership of a Dutch club or church attended
LPRIV	Language used in private contexts
LEMOT	Language used in emotional contexts
EDDU	Level of education in the Netherlands
EDU	General level of education of the subject
DUT	Attendance of Dutch classes
ENG	Attendance of pre-immigration classes in English
UNCH	Estimated change in understanding Dutch
UNPRO	Estimated proficiency in understanding Dutch
UNFRE	Estimated frequency of understanding Dutch
SPCH	Estimated change in speaking Dutch
SPPRO	Estimated proficiency in speaking Dutch
SPFRE	Estimated frequency of speaking Dutch
RCH	Estimated change in reading Dutch
RPRO	Estimated proficiency in reading Dutch
RFRE	Estimated frequency of reading Dutch
WRCH	Estimated change in writing Dutch
WRPRO	Estimated proficiency in writing Dutch
WRFRE	Estimated frequency of writing Dutch
FRECON	Index of frequency of contact with Dutch
FRELIT	Frequency of using Dutch literacy skills
TOTALFRE	Total frequency of using Dutch
TOTCH	Total estimated change in using Dutch
TOTPRES	Total estimated proficiency in Dutch
TOTCONT	Total estimated contact with Dutch

Appendix 4.10

The scoring criteria used in analyzing the data from reading aloud the short Dutch Cloze

READING ALOUD. Mispronouncing a word resulted in deduction of 1 word from the pace of reading However, errors followed by an attempt to correct did not result in a deduction since the attempt to correct would already cost the "equivalent' time of at least 1 word

PARAPHRASING The categories in which the paraphrasing were scored were "not understood", "poorly comprehended", 'partially understood" and "understood", with the last one being the label for subjects who in their paraphrase conveyed the best knowledge

It was expected that faster reading than the subjects' natural pace would result in less accurate paraphrasing of the contents of the 'short' Dutch Cloze Therefore an additional score was added in which the pace-measure was adjusted, "not understood' meant a deduction of 10, "poorly comprehended' meant a deduction of 5, "partial" did not affect the score and 'understood" meant addition of 5 "words"

Appendix 4 11

Number of times a particularly category of response was given over 67 subjects in the 3 Cloze tasks

	Eng Cloze		Long D Cloze		Short D Cloze	
no reply	121	3 8%	528	14 6%	157	13 0%
target item	1924	61 1%	1880	52 0%	510	42 3%
Sem + Synt +	694	22 0%	557	15 4%	243	20 1%
Sem + Synt	119	3 8%	126	3 5%	34	2 8%
Sem Synt +	115	3 7%	253	7 0%	98	8 1%
Sem - Synt	176	5 6%	205	5 7%	109	9 0%
Eng Sem + Synt +			38	1 1%	39	3 2%
Eng Sem Synt +			19	0 5%	3	0 2%
Eng Sem - Synt +			8	0 2%	7	0 6%
Eng Sem Synt			4	0 1%	6	0 5%
Total	3149	100 0%	3618	100 0%	1206	100 0%

Appendix 4 12

Correlations between the various raw scores (number of correct responses) based on the Dutch and English assessments (N = 64)

	RENC	RDUC	RDUI	REDD	LFLE	WFLE	FLE	LFLD	WFLD	FLD	FLUE
RENC	1 00										
RDUC	28*	1 00									
RDUI	30*	69**	1 00								
REDD	10	58**	56**	1 00							
LFLE	44**	07	05	04	1 00						
WFLE	41**	15	12	07	51**	1 00					
FLE	49**	1	09	06	91**	82**	1 00				
LFLD	46**	53**	56**	41**	42**	38**	46**	1 00			
WFLD	13	60**	59**	37**	14	36**	26*	64**	1 00		
FLD	37**	61**	62**	44**	35**	41**	43**	96**	83**	1 00	
FLUE	52**	40**	39**	27*	78**	74**	87**	81**	62**	81**	1 00
TOTCLOZ	73**	84**	74**	49**	28*	32**	34**	65**	52**	66**	57**
RPACE	36**	62**	66**	58**	10	20	16	56**	47**	58**	41**
RERR	05	- 51**	- 47**	- 43**	- 07	02	- 03	- 43**	- 45**	- 48**	- 28*
CERR	12	- 15	- 10	01	- 09	- 10	- 11	- 10	- 21	- 15	- 15
CRPACE	35**	62**	68**	59**	10	20	16	57**	48**	58**	42**
NETPACE	35**	63**	68**	59**	11	20	16	57**	48**	59**	42**
RCOMP	06	24	34**	28*	11	13	14	13	21	17	18

	TOTCLOZ	RPACE	RERR	CERR	CRPACE	NETPACE	RCOMP
TOTCLOZ	1 00						
RPACE	66**	1 00					
RERR	- 35**	- 53**	1 00				
CERR	- 05	- 17	52**	1 00			
CRPACE	66**	99**	- 56**	- 17	1 00		
NETPACE	67**	99**	- 56**	- 17	99**	1 00	
RCOMP	23	16	- 03	- 01	16	20	1 00

Pearson correlations between the C/M scores (number of correct responses per minute needed to do the test) from the proficiency and Fluency tasks in Dutch and English (N = 64).

	ENGC	DUCL	DUIK	EDIT	LFLE	WFLE	FLE	LFLD	WFLD	FLD	FLUE
ENGC	1.00										
DUCL	.17	1.00									
DUIK	.36**	.65**	1.00								
EDIT	.24	.66**	75**	1.00							
LFLE	.36**	.09	.29*	.31*	1.00						
WFLE	.24	.19	.31*	.26*	.51**	1.00					
FLE	.36**	.15	.34**	.33**	.91**	.82**	1.00				
LFLD	.21	61**	.67**	.66**	.42**	.38**	.46**	1.00			
WFLD	-.02	.51**	.51**	.51**	.14	.36**	.26*	.64**	1.00		
FLD	.14	.63**	.67**	.67**	.35**	.41**	.43**	.96**	.83**	1.00	
FLUE	.31*	44**	.58**	.57**	.78**	.75**	.88**	.81**	.62**	.81**	1.00
TOTCLOZ	.37**	.65**	.66**	.64**	.28*	.32**	.34**	.65**	.52**	.66**	57**
RPACE	.26*	.71**	.65**	.70**	.10	.20	.17	.56**	.47**	.58**	.42**
RERR	.21	-.50**	-.43**	-.43**	-.07	.02	-.03	-.43**	-.45**	-.48**	-.28*
CERR	.16	-.20	-.13	-.11	-.09	-.10	-.11	-.10	-.21	-.15	- 15
CRPACE	.24	.72**	.65**	.70**	.10	.20	.16	.57**	.48**	.58**	.42**
NETPACE	.24	.72**	.66**	.70**	.11	.20	.16	.57**	.48**	.59**	.42**
RCOMP	.00	.18	.34**	.18	.11	.13	.14	.13	.21	.17	.18

	TOTCLOZ	RPACE	RERR	CERR	CRPACE	NETPACE	RCOMP
TOTCLOZ	1.00						
RPACE	.66**	1.00					
RERR	-.35**	-.53**	1.00				
CERR	-.05	-.17	.52**	1.00			
CRPACE	66*	.99**	-.56**	-.17	1.00		
NETPACE	.67**	.99**	-.56**	-.17	.99**	1.00	
RCOMP	.23	.16	-.03	-.01	.16	.20	1.00

* - Signif. LE .05 **- Signif. LE .01 (2-tailed)

Abbreviations

RENC	Number of correct responses in the English Cloze
ENGC	Number of correct responses per minute in the English Cloze
REDD	Number of correct responses in the Dutch Editing task
EDIT	Number of correct responses per minute in the Dutch Editing task
TDUC	Number of correct responses in both Dutch Clozes
RDUI	Number of correct responses in the "short" Dutch Cloze task.
DUIK	Number of correct responses per minute in the "short" Dutch Cloze task
RDUC	Number of correct responses in the "long" Dutch Cloze task.
DUCL	Number of correct responses per minute in the "long" Dutch Cloze task.
RPACE	Reading pace (per 2 minutes)
RERR	Reading errors made.
CERR	Corrected reading errors
CRPACE	Reading pace corrected for corrected errors.
NETPACE	Netto reading pace
RCOMP	Comprehension rating
FLE	Total number of responses in the English Fluency task
LFLE	Total number of responses in the English letter Fluency task
WFLE	Total number of responses in the English word Fluency task
FLD	Total number of responses in the Dutch Fluency task
LFLD	Total number of responses in the Dutch letter Fluency task
WFLD	Total number of responses in the Dutch word Fluency task
FLUE	Total number of responses in both Fluency tasks
TOTCLOZ	Total number of correct responses in all Cloze tasks

Appendix 5.1a

Instructions to the naming task by monolingual native speakers (only the English version is given here).

You will now see a set of cards, with in each a picture for a familiar object. I would like you to give me the appropriate name for each picture as quickly as possible. Do not provide a description, just the single name for the object that the picture stands for will do. I will record the responses in order to concentrate on turning the cards.

Any questions?

Here are some pictures to show you how the task works.

Appendix 5.1b

Results from two picture-naming experiments by 43 native speakers of Dutch (first section) and 30 native speakers of English (second section). The order in which the results are given is the same as used in Snodgrass & Vanderwart (1980).
Behind the names the following information is listed: the percentage with which the most freq-uently used name was given to the picture in Dutch and English. After both sessions their frequency per million in Dutch is given (*i.e.* when listed).
Also given are the number of times other names were given to the pictures. Question marks (?) indicate the number of times a person could not name the picture. 'nl' indicates that the frequency for the name of that picture was not given in the listing for that language.

DUTCH NAME (N = 43)

	name agreement	**listed freq.**	**alternative names**
-anker	100.0	7	
-appel	100.0	7	
-pijl	100.0	5	
-asbak	97.6	3	ring
-asperge	51.1	nl	tak 12, knop 2, 5 ? stengel, gras
-auto	100.0	277	
-bijl	97.6	5	hakbijl
-kinderwagen	95.3	nl	poppenwagen 2
-arm	97.6	70	elleboog
-ballon	95.3	8	luchtballon 2
-banaan	100.0	nl	
-ton	97.6	8	regenton
-beer	60.4	4	ijsbeer 17
-bed	97.6	204	ledikant 1
-bel	86.0	17	belletje 6
-riem	69.7	8	halsband 8, riempje broekriem, collar 2 hondenriem, hondeband, riembandje
-boek	100.0	312	
-brood	97.6	48	snee brood
-bezem	79.0	nl	kwast 5, veger 3, platte bezem
-bus	83.7	85	autobus 7
-vlinder	100.0	12	

-knoop	97.6	8	tennisbal
-dromedaris	67.4	nl	kameel 14
-kaars	100.0	5	
-kanon	95.3	3	kar 2
-kam	100.0	7	
-wortel	97.6	nl	peen
-poes	62.7	22	kat 16
-ketting	100.0	13	
-stoel	97.6	109	keukenstoel
-kers	95.3	nl	appel, ?
-sigaar	100.0	13	
-sigaret	100.0	40	
-klok	97.6	73	pendule
-koe	95.3	15	stier 2
-kroon	100.0	15	
-hond	100.0	70	
-ezel	100.0	10	
-eend	97.6	3	gans
-deur	86.0	284	raam 6
-jurk	90.6	13	japon 2, kleed, rok
-trommel	51.1	5	trom 21
-oor	97.6	27	oorschelp
-olifant	100.0	12	
-envelop	93.3	5	brief 3
-oog	100.0	133	
-hek	100.0	15	
-vinger	51.1	35	wijsvinger 21
-vis	100.0	61	
-vlag	95.3	25	vlaggetje, vaandel
-voet	100.0	46	
-rugbybal	90.6	nl	voetbal 2, bal 2
-vork	100.0	20	
-kikker	100.0	3	
-vuilnisemmer	69.7	nl	vuilnisbak 9, emmer 2 bak, vat
-giraf	100.0	nl	
-gitaar	100.0	nl	
-glas	95.3	91	beker, limonade glass
-sprinkhaan	96.6	nl	krekel 3
-hand	100.0	543	
-handschoen	90.6	3	hand 4
-hamer	100.0	7	
-klerenhanger	48.0	nl	kleerhanger 13, hanger 8, kledinghanger
-harp	97.6	3	luit
-hoed	100.0	53	
-hart	88.3	148	hartje 4
-helikopter	97.6	5	hefschroefvliegtuig 2
-paard	100.0	75	
-strijkijzer	100.0	nl	
-strijkplank	97.6	nl	strijktafel
-kangoeroe	93.0	nl	skippy 3
-sleutel	100.0	35	
-vlieger	97.6	nl	windvogel
-ladder	93.0	20	trapladder, ladder
-been	97.6	53	
-citroen	100.0	3	
-lamp	67.4	27	gloeilamp 8, peer 6
-mond	65.1	35	lippen 28
-muis	100.0	7	

-paddestoel	100.0	2	
-naald	86.0	5	streep, pin
-neus	100.0	85	
-ui	100.0	18	
-struisvogel	96.6	nl	emu
-uil	100 0	13	
-pauw	96 6	nl	fazant
-pinda	55.8	nl	pindanoot 7, olienoot, noot 6, apenoot 4, ?
-peer	100 0	nl	
-potlood	100 0	10	
-vleugel	55.8	7	piano 19
-varken	100.0	13	
-ananas	100 0	nl	
-pijp	100 0	25	
-tang	60.5	nl	nijptang 13, knijptang 3, bacoh
-stekker	100 0	nl	
-aardappel	86.0	10	spons, ? 5
-pompoen	55.8	nl	meloen 16, 2?, kalebas
-konijn	95 3	7	haas 2
-neushoorn	100.0	nl	
-ring	95.3	10	oorbel 2
-schommelstoel	74 4	nl	stoel 4, leunstoel 2, ligstoel, wipstoel,wiegstoel waggelstoel, wiebelstoel
-rolschaats	100.0	nl	
-deegroller	74 4	nl	deegrol, pijp 5, ? 6
-lineaal	90.6	nl	meetlat 2, thermometer 2
-sandwich	46 5	nl	boterham 17, tostie 3, brood vlaai, belegdbrood
-zaag	97.6	3	handzaag
-schaar	100.0	5	
-schroef	95.3	10	bout, houtschroef
-schroevendraaier	95 3	nl	schroefdraaier
-schoen	100.0	15	
-rok	100.0	25	
-stinkdier	93.0	nl	das 2, wezel
-slee	100.0	7	
-slang	100.0	18	
-sneeuwpop	67.4	nl	sneeuwman 14
-spin	97 6	3	insekt
-spinnewiel	97 6	nl	wolmachine
-lepel	97.6	18	lepeltje
-eekhoorntje	100.0	nl	
-ster	100.0	7	
-kruk	67.4	nl	krukje 8, stoel 5, tafeltje
-aardbei	100.0	nl	
-zon	100.0	91	
-schommel	100.0	nl	
-tafel	100.0	221	
-telefoon	100.0	35	
-vingerhoedje	100 0	nl	
-duim	95.2	8	vinger 2
-broodrooster	100.0	nl	
-tomaat	97.6	8	appel
-tandenborstel	100 0	5	
-boom	100.0	66	
-paraplu	95.7	8	
-viool	83.7	3	gitaar 7

-gieter	95 3	nl	plantengieter 2
-put	83 3	13	waterput 7
-molen	86.0	21	windmolen 6
-zebra	37 0	nl	zebrapaard 5, zeepaard 22

AUSTRALIAN NAME (N = 30)

	name agreement	**listed freq.**	**alternative names**
anchor	96.6	15	ship's anchor
apple	96 6	9	tomatoe
arrow	100 0	14	
ashtray	100 0	nl	
asparagus	70.0	1	9 ?
-car	100.0	274	
-axe	96 6	6	hatched
-pram	90 0	nl	perambulator 3
-arm	100 0	93	
-balloon	100 0	10	
-banana	100.0	4	
-barrel	93.3	23	drum, keg
-polar bear	60.0	nl	bear 12
-bed	96 6	127	single bed
-bell	100.0	18	
-belt	93.3	29	collar 2
-book	100.0	193	
-bread	63.3	41	loaf of bread 11
-broom	93.3	2	strawbroom 2
-bus	100 0	34	
-butterfly	100.0	2	
-button	100.0	10	
-camel	100 0	1	
-candle	100 0	18	
-cannon	100 0	7	
-comb	100 0	6	
-carrot	100.0	1	
-cat	100 0	23	
-chain	93 3	50	chainlink, links
-chair	96 6	66	table
-cherry	93.3	4	plum, apricot
-cigar	96 6	10	pipe
-cigarette	93 3	26	smoke 2
-clock	100.0	20	
-cow	100.0	29	
-crown	100.0	19	
-dog	100 0	76	
-donkey	100 0	1	
-duck	100 0	2	
-door	93 3	312	window 2
-dress	83.3	53	skirt 2, blouse 2, clothes
-drum	100.0	11	
-ear	96 6	29	right ear
-eliphant	100 0	7	
-envelope	90.0	21	letter 3
-eye	96 6	122	eye ball
-fence	100.0	30	
-finger	83 3	40	pointerfinger 3, forefinger, index finger

-fish	100.0	35
-flag	90.0	16 flagpole 3
-foot	100 0	70
-football	93.3	36 gridiron ball, footie
-fork	100.0	13
-frog	100 0	1
-rubbishbin	46 6	nl dustbin 7,garbagebin 3,bin6
-giraffe	93 3	nl zebra 2
-guitar	100 0	19
-glass	90.0	99 drinking glass, tumbler,cup
-grasshopper	90 0	nl cricket 2, cicadda
-hand	100.0	421
-glove	76.6	9 hand 7
-hammer	100.0	8
-coathanger	96 6	nl hanger
-harp	93.3	1 xylophone, ?
-hat	96 6	56 felt hat
-heart	93.3	173 Valentine 2
-helicopter	100.0	1
-horse	100 0	117
-iron	90.0	39 clothes iron 3
-ironingboard	96.6	nl
-kangaroo	86.6	nl kangaroo and joey 4
-key	100 0	58
-kite	100 0	1
-ladder	93 3	19 section of ladder, rungs of ladder
-leg	100.0	58
-lemon	100.0	18
-lightbulb	63.6	19 lightglobe 7, bulb 3, globe 5
-lips	80.0	69 mouth 6
-mouse	90.0	10 rat 3
-mushroom	86 6	2 toadstool 4
-needle	70.0	15 9 ?
-nose	100.0	59
-onion	93.3	15 turnip 2
-ostrich	90 0	nl emu 3
-owl	100 0	2
-peacock	90 0	2 lyrebird 3
-peanut	100.0	6
-pear	100 0	6
-pencil	100.0	34
-piano	70.0	38 grandpiano 8, harpsichord
-pig	100.0	8
-pineapple	100.0	9
-pipe	96.6	20 smoking pipe
-pliers	90.0	1 wirecutters 2, screwpliers, pair of tweezers
-plug	76 6	23 powerpoint 2, powerplug, American plug, powerpoint plug, electric plug, socket, electric point
-potato	80.0	15 stone, sponge, 4 ?
-pumpkin	100 0	2
-rabbit	100.0	11
-rhinoceros	100.0	nl
-ring	90.0	39 pearl ring, diamond ring 2
-rockingchair	83.3	nl chair 5
-rollerskate	90.0	nl skate 3
-rollingpin	100 0	nl
-ruler	100.0	3

-sandwich	100 0	10	
-saw	100 0	352	
-scissors	96 6	1	pair of scissors
-screw	100.0	20	
-screwdriver	100 0	nl	
-shoe	100.0	14	
-skirt	80.0	21	dress 5, icingcake
-skunk	96 6	nl	squirrel
-sled	70 0	nl	toboggan 6, sley 3
-snake	100 0	44	
-snowman	96.6	nl	iceman
-spider	100 0	2	
-spinningwheel	90.0	nl	loom 3
-spoon	96 6	6	teaspoon
-squirrel	90 0	1	rodent 2, chipmonk
-star	96 6	25	five-pointed star
-stool	93 3	8	chair, footstool
-strawberry	100.0	nl	
-sun	100 0	111	
-swing	90.0	13	rope swing 2, swinging chair
-table	96 6	197	small table
-telephone	100.0	73	
-thimble	100 0	1	
-thumb	83.3	10	finger 5
-toaster	100.0	nl	
-tomatoe	90.0	4	apple 2, peach
-toothbrush	100 0	6	
-tree	96.6	59	oaktree
-umbrella	100 0	8	
-violin	66.6	12	cello 5, guitar 4, base-cello
-wateringcan	100 0	nl	
-well	90.0	897	wishing well 3
-windmill	100.0	1	
-zebra	96.6	1	giraffe

Appendix 5.2a

Phonological cross-linguistic similarity (in points) of the name pairs eventually used in the picture-naming task (n = 76).

SINGLE-STEM

name	sirate	sifph	sifphcl	sifsyll	sivow	sisylln	sistres	silsyll	silphcl	silph	siletcl	sisylst
glass	22 00	2	2	2	2	2	2	2	2	2	2	2
bus	19 00	2	1	1	1	2	2	2	2	2	2	2
foot	20 00	2	2	2	2	2	2	2	2	2	0	2
clock	20 00	2	2	2	2	2	2	2	2	2	0	2
ring	22.00	2	2	2	2	2	2	2	2	2	2	2
ladder	22.00	2	2	2	2	2	2	2	2	2	2	2
star	19 00	2	1	1	1	2	2	2	2	2	2	2
anchor	21.00	2	2	2	1	2	2	2	2	2	2	2
apple	22.00	2	2	2	2	2	2	2	2	2	2	2
owl	15 00	1	1	1	1	2	2	2	2	2	0	1
hammer	22.00	2	2	2	2	2	2	2	2	2	2	2
comb	16.00	2	1	1	1	2	2	2	2	2	0	1
cannon	16.00	2	2	1	1	2	0	2	2	2	0	2
kangaroo	19.00	2	2	2	2	2	0	1	2	2	2	2

sun	17.00	2	1	1	1	2	2	2	2	2	0	2
nose	19.00	2	1	1	1	2	2	2	2	2	2	2
fish	16.00	2	1	2	2	2	2	2	1	0	0	2
cigar	18.00	2	2	2	2	1	1	2	2	2	0	2
screw	12.00	2	1	1	1	2	2	1	1	0	0	1
shoe	14.00	2	1	1	2	2	2	1	1	0	1	1
cigar	21.00	2	1	2	2	2	2	2	2	2	2	2
eliphant	16.00	0	1	1	1	2	2	2	2	2	1	2
guitar	20.00	2	2	1	2	2	2	2	2	2	1	2
ballon	20.00	2	2	2	1	2	2	2	1	2	2	2
girarph	21.00	2	1	2	2	2	2	2	2	2	2	2
horse	5.00	0	0	0	0	2	2	0	0	0	0	1
chair	6.00	0	0	0	0	2	2	0	0	0	0	2
leg	6.00	0	0	0	0	2	2	0	0	0	0	2
dress	5.00	0	0	0	0	2	2	0	0	0	0	1
fence	5.00	0	0	0	1	2	2	0	0	0	0	0
candle	8.00	2	2	1	1	0	1	0	0	0	0	1
lemon	7.00	0	0	0	0	2	0	1	1	2	0	1
rabbit	3.00	0	0	0	0	2	0	0	0	0	0	1
umbrella	2.00	0	0	0	0	2	0	0	0	0	0	0
donkey	4.00	0	0	0	0	2	2	0	0	0	0	0
axe	4.00	0	0	0	0	2	2	0	0	0	0	0
duck	5.00	0	0	0	0	2	2	0	0	0	0	1
carrot	6.00	0	0	0	0	2	2	0	0	0	0	2
lips	14.00	2	2	2	2	0	2	1	0	0	2	1
orchestra	12.00	2	2	2	2	0	0	1	0	0	2	1
needle	13.00	2	1	1	1	1	1	1	1	0	2	2
elbow	17.00	2	2	2	2	1	2	1	1	0	2	2
violin	11.00	2	2	1	2	0	0	0	0	0	2	2
tomato	16.00	2	2	2	2	0	2	1	1	0	2	2
tulip	16.00	2	1	2	1	0	2	1	1	2	2	2
spider	10.00	2	2	2	0	0	2	0	0	0	2	0
bananan	16.00	2	2	2	2	0	2	1	1	0	2	2
asparagus	13.00	2	2	2	2	0	2	0	0	0	2	1
desk	1.00	0	0	0	0	0	0	0	0	0	0	1
key	2.00	0	0	0	0	0	2	0	0	0	0	0
chain	4.00	0	0	0	0	0	2	1	0	1	0	0
onion	3.00	1	0	0	0	0	2	0	0	0	0	0
barrel	2.00	0	0	0	0	0	2	0	0	0	0	0
spoon	2.00	0	0	0	0	0	2	0	0	0	0	0
pig	2.00	0	0	0	0	0	2	0	0	0	0	0
arrow	2.00	0	0	0	0	0	2	0	0	0	0	0
button	2.00	0	0	0	0	0	2	0	0	0	0	0
swing	5.00	2	0	0	0	0	2	0	0	0	1	0
cherry	5.00	0	0	1	2	0	2	0	0	0	0	0
frog	2.00	0	0	0	0	0	2	0	0	0	0	0
ruler	0.00	0	0	0	0	0	0	0	0	0	0	0
broom	11.00	2	0	0	0	0	2	1	1	2	2	1

Number of cases: 62

MULTI-STEM

name	sirate	sifph	sifphcl	sifsyll	sivow	sisylln	sistres	silsyll	silphcl	silph	siletcl	sisylst
rollingpin	15.00	2	2	2	1	0	2	1	1	2	2	0
toothbrush	8.00	2	1	1	0	0	2	0	0	0	2	0
screwdriver	12.00	2	1	1	1	0	2	1	1	2	1	0
ashtray	11.00	2	1	1	1	2	2	0	0	0	2	0
strawberry	3.00	0	0	0	0	0	2	1	0	0	0	0

grasshopper	4 00	0	0	0	0	2	2	0	0	0	0	0
ironingboard	2 00	0	0	0	0	0	2	0	0	0	0	0
rollingpin	5 00	0	0	0	1	2	2	0	0	0	0	0
pineapple	4 00	0	0	0	0	2	2	0	0	0	0	0
butterfly	2 00	0	0	0	0	0	2	0	0	0	0	0
peacock	6 00	2	0	0	0	0	2	0	0	0	2	0
wateringcan	2 00	0	0	0	0	0	2	0	0	0	0	0
skunk	5 00	2	0	0	0	0	2	0	0	0	1	0
ostrich	4 00	0	1	1	0	0	2	0	0	0	0	0
thimble	2 00	0	0	0	0	0	2	0	0	0	0	0
toaster	8 00	0	0	0	0	1	2	2	1	2	0	0

Number of cases 16

Abbreviations

NAME = picture name
SIRATE = total similarity over all similarity-categories
SIFPH = similarity in first phoneme
SIFPHCL = similarity in first phoneme cluster
SIFSYLL = similarity in initial syllable
SIVOW = similarity in vowel quality
SISYLLN = similarity in the number of syllables
SISTRES = similarity in stress placement (includes monosyllables)
SILSYLL = similarity in the phoneme in the last syllable
SILPHCL = similarity in the last phoneme cluster
SILPH = similarity in the last phoneme
SILETCL = similarity in the initial orthographic cluster
SISYLST = similarity in the syllable structure

(0 = dissimilar, 1 = some similarity, 2 = very similar)

Appendix 5 2b

Pearson product moment correlations between the features of 'ObjecSim'

	simfph	simfphcl	simfsyll	simvow	simsylln	simstres	simlsyll	simlphcl	simlph	simletcl	simsylst
SIMFPH	1 00										
SIMFPHCL	80**	1 00									
SIMFSYLL	78**	92**	1 00								
SIMVOW	69**	83**	89**	1 00							
SIMSYLLN	10	17	19	26*	1 00						
SIMSTRES	02	- 08	03	- 02	01	1 00					
SIMLSYLL	59**	64**	69**	67**	47**	04	1 00				
SIMLPHCL	60**	65**	68**	66**	52**	05	95**	1 00			
SIMLPH	48**	50**	53**	46**	42**	03	88**	90**	1 00		
SIMLETCL	75**	65**	67**	57**	- 01	06	41**	43**	35**	1 00	
SIMSYLST	56**	65**	67**	67**	52**	- 10	70**	74**	55**	44**	1 00
OBJECSIM	80**	85**	88**	84**	47**	10	89**	90**	77**	67**	81**
SIMRAT	82**	88**	91**	86**	35**	02	82**	82**	67**	68**	77**

* - Signif LE 05 ** - Signif LE 01 (2-tailed)

	objecsim	simrat
OBJECSIM	1 00	
SIMRAT	95**	1 00

Appendix 5.3

The categories of Dutch and English names for the images in the picture-naming experiment, without the practice items and multi-stem items. Given are the frequencies per million (Dutch, English, Average), and, at the bottom of the table, a summary of the mean and median frequencies per category.
The means were calculated by dividing the total given frequencies by the total number of members per category. NL means that that particular word was not listed in the frequency lists.
The last three columns for each category give the length-in-letters of the Dutch and English words, and the average over Dutch and English length-in-letters. Since /ij/ is considered one letter in Dutch it is counted as one, despite being typed as two letters here.
* indicates that the picture did not occur in Snodgrass and Vanderwart (1980)

TYPES OF PICTURE NAMES AND THEIR FREQUENCY

1 Phonol. highly similar / same number of syllables (identical)

			FREQUENCY			LENGTH		
	DUTCH	ENGLISH	Dut	Eng	Aver	Dut	Eng	Average
code								
016	glas	glass	91	99	95.0	4	5	4.5
017	bus	bus	85	34	59.5	3	3	3.0
018	voet	foot	46	70	58.0	4	4	4.0
019	klok	clock	73	20	46.5	4	5	4.5
020	ring	ring	10	39	24.5	4	4	4.0
021	ladder	ladder	20	19	19.5	6	6	6.0
022	ster	star	7	25	16.0	4	4	4.0
023	anker	anchor	7	15	11.0	5	6	5.5
024	appel	apple	7	9	8.0	5	5	5.0
025	uil	owl	13	2	7.5	3	3	3.0
026	hamer	hammer	7	8	7.5	5	6	5.5
027	kam	comb	7	6	6.5	3	4	3.5
028	kanon	cannon	3	7	5.0	5	6	5.5
029	kangaroe	kangaroo	nl	nl	nl	8	8	8.0

2 Phonol. similar / same number of syllables

			FREQUENCY			LENGTH		
	DUTCH	ENGLISH	Dut	Eng	Aver	Dut	Eng	Average
code								
031	zon	sun	91	111	101.0	3	3	3.0
032	neus	nose	85	59	72.0	4	4	4.0
033	vis	fish	61	35	48.0	3	4	3.5
034	sigaret	cigarette	40	26	33.0	7	9	8.0
035	schroef	screw	10	20	15.0	7	5	6.0
036	schoen	shoe	15	14	14.5	6	4	5.0
037	sigaar	cigar	13	10	11.5	6	5	5.5
038	olifant	eliphant	12	7	9.5	7	8	7.5
039	gitaar	guitar	nl	19	9.5	6	6	6.0
040	ballon	balloon	8	10	9.0	6	7	6.5
041	giraf	giraffe	nl	nl	nl	5	7	6.0

3 Phonol. dissimilar / same number of syllables

			FREQUENCY			LENGTH		
	DUTCH	ENGLISH	Dut	Eng	Aver	Dut	Eng	Average
code								
046	paard	horse	75	117	96.0	5	5	5.0
047	stoel	chair	109	66	87.5	5	5	5.0
048	been	leg	53	58	55.0	4	3	3.5
049	jurk	dress	13	53	33.0	4	5	4.5
050	hek	fence	15	30	22.5	3	5	4.0
051	kaars	candle[1]	5	18	11.5	5	6	5.5
052	citroen	lemon	3	18	10.5	7	5	6.0
053	konijn	rabbit	7	11	9.0	5	6	5.5
054	paraplu	umbrella	8	8	8.0	7	8	7.5
055	ezel	donkey	10	1	5.5	4	6	5.0
056	bijl	axe	5	6	5.5	3	3	3.0
057	eend	duck	3	2	2.5	4	4	4.0
058	wortel	carrot	nl	1	0.5	6	6	6.0

4 Phonol. similar / different number of syllables

			FREQUENCY			LENGTH		
	DUTCH	ENGLISH	Dut.	Eng	Aver	Dut.	Eng.	Average
code								
061	lippen	lips	35	69	52.0	6	4	5.0
062	*orkest	orchestra	29	61	45.0	6	9	7.5
063	naald	needle	5	15	10.0	5	6	5.5
064	*elleboog	elbow	7	8	7.5	8	5	6.5
065	viool	violin	3	12	7.5	5	6	5.5
066	tomaat	tomato	8	4	6.0	6	6	6.0
067	*tulp	tulip	nl	6	3.0	4	5	4.5
068	spin	spider	3	2	2.5	4	6	5.0
069	banaan	banana	nl	4	2.0	6	6	6.0
070	asperge	asparagus	nl	1	0.5	7	9	8.0

5 Phonol. dissimilar / different number of syllables

			FREQUENCY			LENGTH		
	DUTCH	ENGLISH	Dut.	Eng.	Aver.	Dut.	Eng	Average
code								
076	bureau	desk	111	65	88.0	6	4	5.0
077	sleutel	key	35	58	46.5	7	3	5.0
078	ketting	chain	13	50	31.5	7	5	6.0
079	ui	onion	18	15	16.5	2	5	3.5
080	ton	barrel	8	23	15.5	3	6	4.5
081	lepel	spoon	18	6	12.0	5	5	5.0
082	varken	pig	13	8	10.5	6	3	4.5
083	pijl	arrow	5	14	9.5	3	5	4.0
084	knoop	button	8	10	9.0	5	6	5.5
085	schommel	swing	nl	13	6.5	8	5	6.5
086	kers	cherry	nl	4	2.0	4	6	5.0
087	kikker	frog	3	1	2.0	6	4	5.0
088	lineaal	ruler	nl	3	1.5	7	5	6.0

[1] The pair kaars/candle was misplaced, and should have been included in category 4. Later adjustments of the results for this error did not make any difference as to the pattern in the errors percentages and distracter options, whether or not any co-variant was taken into account

089	bezem	broom	nl	2	1 0	5	5	5 0

SUMMARY

CATEGORY	1 *iden*	2 *Sim /Same*	3 *Diss /Same*	4 *Sim /Diff*	5 *Diss /Diff*
number of items	14 0	11 0	13 0	10 0	14.0
median frequency	11.5	14 5	10 5	5 5	9.0
mean Dutch freq	28 9	37 2	25 5	12.9	23 2
mean Eng. freq	27 1	31 1	29.9	18.2	19 4
mean Dut length	4 5	5.4	4 8	5.7	5.3
mean Eng. length	4.9	5 6	5 1	6 2	4.8
mean similarity	1.8	1.6	0 5	1.2	0 3

Appendix 5.4

The Dutch and English names in the multi-stem categories, together with the percentage that name was used in the 1985 picture-naming task (Agreement), and the Dutch (D.) and English (E.) frequency of occurrence (when listed), and the length of the names in letters in both languages and the average length.

* indicates that the picture did not occur in Snodgrass & Vanderwart (1980).

\- indicates that the frequency was not listed.

MULTI-STEM NAMES

1985 naming score in

			% agreement Dut	Eng	frequencies D.	E	length D	E.	Av.
6 SAME-MEANING COMPONENTS (Same Cps)									
091	rolschaats	rollerskates	100	90	-	-	10	12	11 0
092	tandenborstel	toothbrush	100	100	5	6	13	10	11 5
093	schroevendraaier	screwdriver	95 3	100	2	-	16	11	13 5
094	asbak	ashtray	97 6	100	3	1	5	7	6 0
							11	10	10 5
7 DIFFERENT-MEANING COMPONENTS (Diff Cps)									
106	aardbei	strawberry	100	90.6	-	-	7	10	8.5
107	sprinkhaan	grasshopper	96 6	90 0	-	-	10	11	10 5
108	strijkplank	ironing board	97.6	90 0	-	-	10	12	11.0
109	*deegroller	rolling pin	74.4	100	-	-	10	10	10 0
							9 2	10 7	10 0
8 SINGLE-STEM IN DUTCH - MULTI-STEM IN ENGLISH (Sing.D./Mul E)									
121	ananas	pineapple	100	100	-	9	6	9	7 5
122	vlinder	butterfly	100	100	12	2	7	9	8 0
123	pauw	peacock	96 6	90	-	2	4	7	5 5
124	gieter	watering can	95 3	100	-	-	6	11	8 5
							5 7	9 0	7 4

9 MULTI-STEM IN DUTCH - SINGLE-STEM IN ENGLISH (Mul.D /Sing E)

			Dut	Eng	Freq		Length		
136	stinkdier	skunk	93 0	96 6	-	-	9	5	7 0
137	struisvogel	ostrich	96 6	90 0	3	-	11	7	9 0

138	vingerhoedje	thimble	100	100	-	1	12	7	9.5
139	broodrooster	toaster	100	100	-	-	12	7	9.5
						11	6.5	8.7	

The mean length, frequency of occurrence and similarity for Dutch, English, and the average of both languages for multi-stem words (n = 16) in the picture-naming experiment.

	category	frequency			length (letters)			Similarity
		Dut.	Eng.	Av.	Dut	Eng.	Av.	Dutch-English
6	Same-mean. components	3.3	3.5	3.4	11.0	10.0	10.5	1.0
7	Diff.-meaning comp.	0.0	0.0	0.0	9.2	10.7	10.0	0.3
8	Sing. Dut./ Mult. Eng	12.0	4 3	8.1	5 7	9 0	7 4	0.3
9	Mult Dut./ Sing. Eng	3.0	1 0	2 0	11 0	6 5	8.7	0.4

Appendix 5.5

Categories of responses which were NOT used as distracters in the recognition session, given in a pilot picture-naming experiment by dormant Dutch bilinguals.

A Anglicised name: a literal translation of the Dutch name into English, using English clusters (*e.g* 'hoofiron' for 'horseshoe')

B. Phonological approximate: an option which roughly sounds like the target name (*e.g* 'oel' for Dutch 'owl')

C Approximate strategy: prominent feature of the target name that can appear in strategy (*e.g.* 'electricity thing' for a 'plug').

D. Picture alternative: this name will be selected when the stimulus picture is completely misinterpreted (*e.g* the 'balloon' picture was interpreted as a 'lasso').

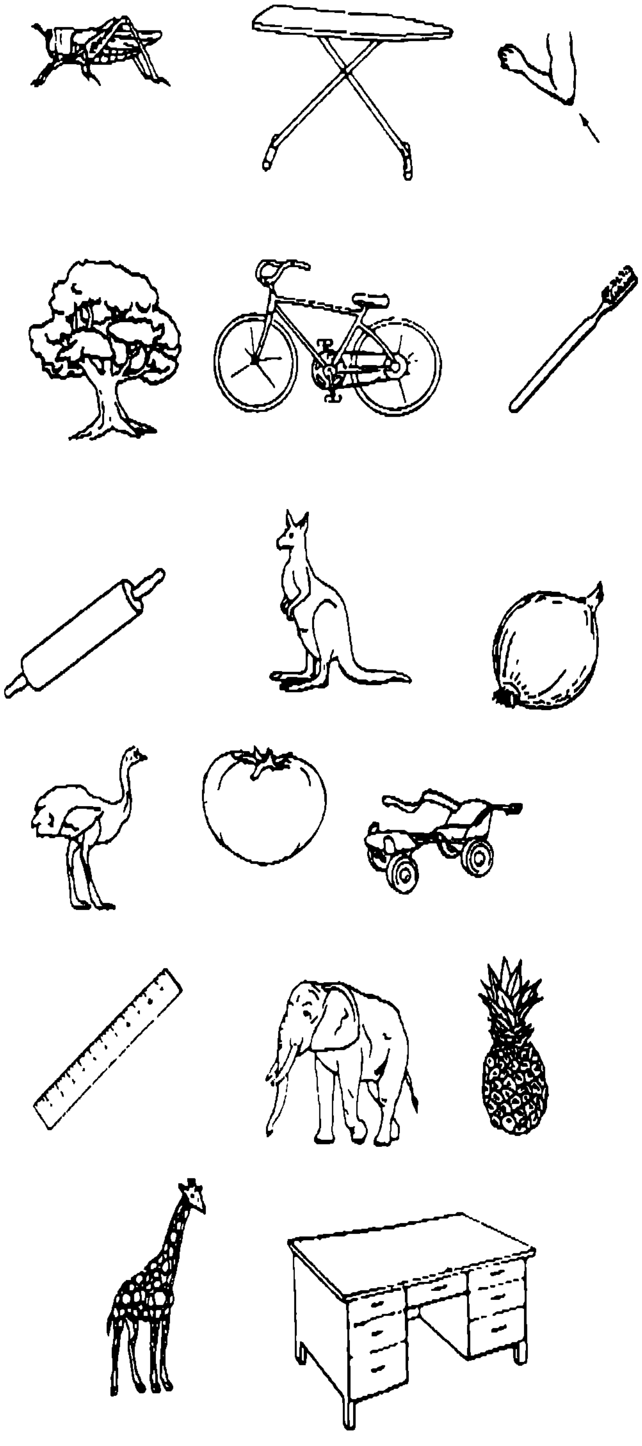
Appendix 5.6

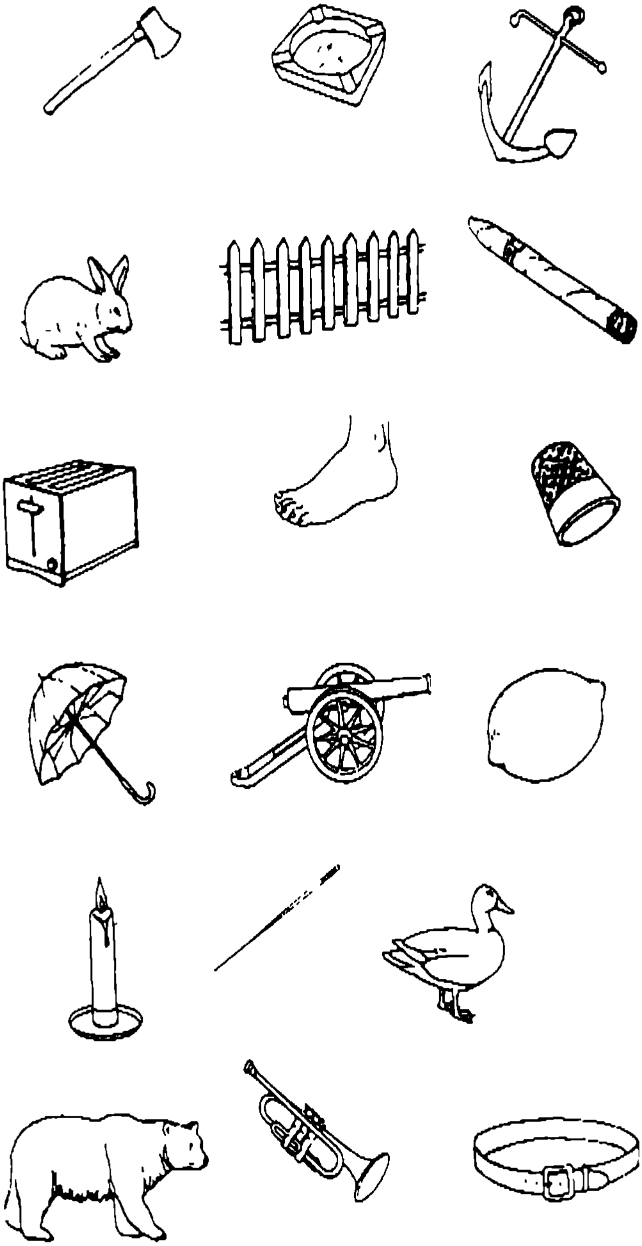
Details of operations involved in converting the Snodgrass & Vanderwart (1980) pictures to digitalised images.

Copies of the pictures from Snodgrass and Vanderwart (1980) were enlarged to 300 % of their size in the article. Then a still picture was made of these pictures with the use of an Hitachi CCTV camera, model FP71, with a fitted Sony zoom lens (1:1.8 f=12.5-75mm). It was ensured that all images retained the same size and proportion ratios as their originals by calibrating the setup with a perfect circle to avoid distortion. The stills were then digitised using an "Imaging Technology" processor on a DEC PDP 11/73. The images were digitised with 512 X 512 resolution, with an aspect rate of 4:3 in order to achieve a virtual identical match between the picture and its image on the PC-screen used to present them. Further minor corrections for the aspect ratio of the images to the original pictures were made by angling the camera. The vertical domain was collapsed by a variable 3, and the resulting enhanced 170 X 512 images were transferred to IBM DOS binary files, which in turn were displayed on the IBM PC using an IBM Colour Graphics Adapter.

The presentation on the portable IBM-PC used in the experiment itself had a resolution of 200 X 640, with an aspect ratio of 4:3. Enhancing the quality of the images into 2-line drawings, and minor corrections of flaws in the images as a result of the conversion process were corrected with the "Imaging Technology" system. All experimental items were presented via a Hercules board on the IBM-PC.

Some examples of the results are the following images:





Appendix 5 7a

Instructions used in the recall session of the picture-naming experiment presented to the Dutch-Australian emigrants (N = 76)

You will be presented with a number of drawings on a screen These are drawings of very common objects As soon as you see the drawing on the screen I want you to say the correct Dutch name loudly and clearly within the 8 second time limit Please avoid coughing, mumbling, or hesitating before naming the picture

I want you to do this task as quickly as possible The name that you give will later be played to a native speaker of Dutch in Holland, who will use it to identify the correct picture

If you do not know the name at all, or if it is on the tip-of-your-tongue but does not want to come out I want you to say this

Please do not feel embarrassed if you do not remember a word Your results will be anonymous, and kept confidential at all times

DO YOU HAVE ANY QUESTIONS?

IF NOT WE WILL PROCEED WITH TWO PRACTISE PICTURES TO SHOW YOU HOW IT WORKS

Appendix 5 7b

Instructions for the identification session of the picture-naming experiment presented to the Dutch bilinguals (N = 76)

INSTRUCTION

I will show you a subset of the same images again This time you will be asked to do a different task On the screen you will find the drawing, and a number of alternatives in the lefthand corner, including the correct Dutch name Each of these alternatives has a letter in front of it I want you to select only one option which you consider to be the correct name in Dutch If you have selected the Dutch name, I want you to say the word, and the letter in front of it, so that there is no confusion about your selection

The screen will look something like this

```
                          ___
                         /   \
                        /     \  PICTURE
A   huus               /       \
B   house             /_________\
C   schuur            |    __   |
D   huis              |   | |   |
E   bouwsel           |   | |   |
F   huiz              |___|_|___|/
```

For the sake of the task I will not tell you immediately whether you are right or wrong, but if you really want to know I will tell you after the task is finished

If you do not understand what I have written here, or if you have any other questions, do not hesitate to ask me now

Appendix 5 8

Instructions to the picture-naming experiment for monolingual native speakers of English in Australia (N = 31)

You will be presented with a number of drawings on a screen These are drawings of very common objects As soon as you see the drawing on the screen I want you to say the correct English name loudly and clearly within the 8 second time limit Please avoid coughing, mumbling, or hesitating before naming the picture
I want you to do this task as quickly as possible

If you do not know the name at all, or if it is on the tip-of-your-tongue but does not want to come out I want you to say this aloud
Please do not feel embarrassed if you do not remember a word Your results will be anonymous, and kept confidential at all times.

DO YOU HAVE ANY QUESTIONS?

IF NOT WE WILL PROCEED WITH TWO PRACTICE PICTURES TO SHOW YOU HOW IT WORKS

PROBLEM SHOOTING SESSION (presented after completion of the naming experiment)

Now I will show you those items of which you were not sure Please comment on what you were thinking of at the time, and why you were not sure of the picture Any information is important

Appendix 5 9

Monolingual results of analysis of variance involving 'special contrasts' between the word categories (N = 31)

source	d f	sum of Squares	mean squares	F ratio	F prob
between groups	8	750 0395	93 7549	1 8145	0890 ns
within groups	69	3565 1723	51 6692		
total	77	4315 2118			

Appendix 5.10a

Results of Pearson correlations between the measures of frequency and length for single-stem items (n = 62) and the multi-stem items (n = 16). Also listed is the score for Fischer-Z indicating the level of significance for the difference between Dutch and English.

ALL PICTURES:

	DuFreq	EnFreq	AvFreq	DuLeng	EnLeng	AvLeng
Dut. Freq	1 00					
Eng Freq	80 **	1.00				
Aver Freq.	.95 **	.95 **	1 00			
Dut length	- 31 **	-.31 **	-.33 **	1.00		
Eng. length	-.39 **	-.41 **	-.42 **	63 **	1.00	
Aver length	-.38 **	- 40 **	- 41 **	92 **	89 **	1.00

SINGLE-STEM:

	DuFreq	EnFreq	AvFreq	DuLeng	EnLeng	AvLeng
Dut Freq	1 00					
Eng Freq.	78 **	1.00				
Aver Freq.	.95 **	95 **	1.00			
Dut. length	-.24 ns	-.16 ns	-.21 ns	1.00		
Eng length	-.34 **	- 30 *	- 33 **	43 **	1.00	
Aver length	-.34 **	- 27 *	- 32 *	.85 **	.85 **	1 00

MULTI-STEM:

	DuFreq	EnFreq	AvFreq	DuLeng	EnLeng	AvLeng
Dut Freq.	1.00					
Eng Freq	.20 ns	1.00				
Aver Freq.	.82 **	.71 **	1 00			
Dut. length	- 01 ns	-.19 ns	- 12 ns	1 00		
Eng length	-.04 ns	-.04 ns	- 05 ns	.20 ns	1 00	
Aver length	- 03 ns	-.16 ns	- 12 ns	.87 **	66 **	1 00

Appendix 5.10b

Correlation Coefficients between various lexical characteristics of the items used in the picture-naming experiment.

	SimRat	Objecs	Dufreq	Enfreq	Freqrat	Krom	Staphor	Duleng	Enleng
Objecsim	96**	1 00							
Dufreq	.16	.14	1 00						
Enfreq	.13	.12	76**	1.00					
Freqrat	.45**	.46**	48**	.44**	1 00				
Krom	.31**	-.11	-.18	-.03	-.04	-.41**	1 00		
Staphor	-.21	14	.13	.50**	.63**	.28*	-.15	1 00	
Duleng	- 15	-.18	- 23	-.20	- 23*	.21	-.28*	1.00	
Enleng	-.05	- 13	-.33*	- 33**	- 32**	.25*	- 25	63**	1 00
Pretes	- 18	-.12	11	-.02	01	-.09	08	.00	- 10
Cimage	04	- 03	- 14	-.10	- 10	.04	-.08	.01	16
Ozerrs	.03	-.02	- 07	- 11	- 15	.06	- 07	07	16

	Pretes	Cimage	Ozerrs
Cimage	- 34**	1 00	
Ozerrs	- 24*	.91**	1 00

0* - Signif LE 05 ** - Signif LE .01 (2-tailed) " . " printed if a coefficient cannot be computed

Appendix 5.11

Results of the pretest (N = 31) and picture-naming (N = 30) by 2 groups of monolingual native speakers of Australian-English. The number in front of the names is its identity code. The letters 'np' indicate that that item was not presented in the pilot picture-naming task.

code	NAME	pretest		picture-naming	difference
005	shirt	51 6%	np		
006	trumpet	90 3%	np		
007	bear	51 6%	bear	40 0%	>
008	tree	100 0%	tree	96 6%	>
009	bicycle	71 0%	np		
010	belt	93 5%	belt	93.3%	=
016	glass	96 8%	glass	90.0%	>
017	bus	100.0%	bus	100.0%	=
018	foot	100.0%	foot	100.0%	=
019	clock	100.0%	clock	100.0%	=
020	ring	100 0%	ring	90 0%	>
021	ladder	100 0%	ladder	93.3%	>
022	star	96 8%	star	96.6%	=
023	anchor	100.0%	anchor	96.6%	>
024	apple	100 0%	apple	96.6%	>
025	owl	100.0%	owl	100.0%	=
026	hammer	100 0%	hammer	100 0%	=
027	comb	100.0%	comb	100.0%	=
028	cannon	96.8%	cannon	100 0%	<
029	kangaroo	100 0%	kangaroo	86 6%	>
031	sun	100 0%	sun	100 0%	=
032	nose	100 0%	nose	100 0%	=

033	fish	100 0%	fish	100 0%	=
034	cigarette	100 0%	cigarette	93 3%	>
035	screw	100 0%	screw	100 0%	=
036	shoe	100 0%	shoe	100 0%	=
037	cigar	83 9%	cigar	96 6%	<
038	eliphant	100 0%	eliphant	100 0%	=
039	guitar	96 8%	guitar	100 0%	<
040	balloon	100 0%	balloon	100 0%	=
041	giraffe	100 0%	giraffe	93 3%	>
046	horse	100 0%	horse	100 0%	=
047	chair	100 0%	chair	96 6%	>
048	leg	90 3%	leg	100 0%	<
049	dress	90 3%	dress	83 3%	>
050	fence	90 3%	fence	100 0%	<
051	candle	100 0%	candle	100 0%	=
052	lemon	100 0%	lemon	100 0%	=
053	rabbit	96 8%	rabbit	100 0%	<
055	donkey	96 8%	donkey	100 0%	<
056	axe	100 0%	axe	96 6%	>
057	duck	100 0%	duck	100 0%	=
058	carrot	100 0	carrot	100 0%	=
061	lips	90 3%	lips	80 0%	>
062	orchestra	96 8%	np		
063	needle	87 1%	needle	70 0%	>
064	elbow	83 9%	np		
065	violin	83 9%	violin	66 6%	>
066	tomato	90 3%	tomato	90 0%	=
067	tulip	51 6%	np		
068	spider	100 0%	spider	96 8%	=
069	banana	100 0%	banana	100 0%	=
070	asparagus	77 4%	asparagus	70 0%	>
076	desk	96 8%	np		
077	key	100 0%	key	100 0%	=
078	chain	93 3%	chain	96 8	<
079	onion	96 8%	onion	93 3%	>
080	barrel	96 8%	barrel	93 3%	>
081	spoon	100 0%	spoon	96 6%	>
082	pig	100 0%	pig	100 0%	=
083	arrow	100 0%	arrow	100 0%	=
084	button	100 0%	button	100 0%	=
085	swing	100 0	swing	90 0%	>
086	cherry	77 4%	cherry	93 3%	<
087	frog	100 0%	frog	100 0%	=
088	ruler	100 0%	ruler	100 0%	=
089	broom	100 0%	broom	93 3%	>
091	rollerskate	96 8%	rollerskate	90 0%	>
094	ashtray	90 3%	ashtray	100 0%	<
107	grasshopper	74 2%	grasshopper	90 0%	<
108	ironing board	90 3%	ironingboard	96 6%	<
109	rolling pin	93 5%	rollingpin	100 0%	<
123	peacock	90 3%	peacock	90 0%	=
124	watering can	87 1%	wateringcan	100 0%	<

136	skunk	90 3%	skunk	96 6%	<
137	ostrich	77 4%	ostrich	90 0%	<

Pearson correlations Pretest x Picture-naming

	r	sign
single-stem (n = 62)	38	p = 001 *
multi-stem (n = 16)	34	p = 001 *

Appendix 5 12

Names of the potentially problematic pictures and the adjustments made to these as a result of the pre-testing by 31 monolingual native speakers of Australian-English

IMAGE	ALTERRATION
- balloon	making the bottom of the balloon slightly rounder and blacker
- asparagus	adding two more stems, blackening the lines of the picture
- apple	lengthening the stem of the apple, making the bottom rounder
- cherry	lengthening the stem
- kangaroo	deleting the joey
- needle	increasing the hole in the needle
- peacock	making the feathers more pronounced and bushy
- ruler	adding to the length of the rod
- saw	putting teethmarks on the 'sharp' edge of the saw
- door	lengthening the door, to distinguish it from a window
- cigar	making the leaves more pronounced, as well as the paperband
- dress	erasing most of the belt dividing the blouse from the skirt to make it look more like a unit
- violin	adding a chin-section to the bottom of the violin
- button	making one side of the button darker to make it appear rounder
- axe	lengthening of the handle
- swing	enlarging the holes in the swing-chain
- tulip	lenghening the stem, and adding clarity to the flower leaves
- grasshopper	re-imaging the picture, but now ensuring more detail is more visible
- ashtray	Insert marks in round section of ashtray to prevent identification of that section as a 'hole', and hence the whole as a 'nut'

Appendix 6.1

Dutch and English words were transcribed using the appropriate orthographic traditions of these languages. When it appeared clear to the transcriber that a English words was pronounced as a Dutch word (= Dutchified) these words were written in Dutch orthographics (*e.g.* "engenier"). The following symbols were used in this orthographic transcription, similar to Appendix 3.1.

- PICT stand for a particular subject during the experiment.
- English syllables, words and phrases are marked by '. (*e g* "Ik zag 'the man'...")
- ' after words indicates a clause boundary marked by a change in intonation
- Erm indicates a filled pauze
- . . .. indicate a silent pause.
- / is used to separate the comments by the interviewer from those of the interviewee (*e.g.* " /Hoe heeft U lere fietse?/.. Erm, ik heb 't..")
- ___ underlining of words and sentences indicates that these were uttered during the retrospective session
- [ ] indicates that the underlined remark in between these form a remark by the subject during the retrospective session.
- { } indicates remarks by others than the interviewer and interviewee
- xxxxx . marks a segment that was not intelligible.

Appendix 6.2

Some examples of the variety of verbal reports and attempts to recall (1) and recognise (2) Dutch words in the picture-naming experiment (N = 76).

---

(1) RECALL SESSION

The generalisations similar to those in Appendix 3.2 were made Some examples illustrate the similarity.

PICT79 (tandenborstel/toothbrush) "...te- **toes..toest... bussel** ."No, not a' bussel **'I don't know, something like that anyway!'** LAUGH"

PICT82 (giraf/giraffe) "...'n sje...giet ge . **'Don't know how to say it in Dutch, but it'd be the same!'** .'It is a' gi .raf? /ahum/"

- Comments of frequency of usage:

PICT7 (orkest/orchestra) "....Orkest . t. /Ahum/ Ja, orkest.. **'I haven't said those words for thirty years'...**"

PICT16 (broodrooster/tooster) " .Nee, **'never had a toaster'** LAUGH"

PICT49 (pauw/peacock) ". . .'Oh, **I never know that!'** . LAUGH"

PICT28 (konijn/rabbit) " Oh. **'Noo, can't remember...** izk.."

- Approximations.

PICT25 (lineaal/ruler) ". Erm. .Lineaa- .lijnier... lijnier?...**'It is a long time ago I used one of those!'** LAUGH"

PICT48 (strijkplank/ironing board) " **'Iron is a' strijkijzer** Is 'n strijkijzerbord? Ja? . Nee LAUGH"

PICT42 (gieter/wateringcan) " . **'n giet..emmer.** 'N giet- gieter Giet..gIEter."

PICT45 (bezem/broom) " ..veger"
PICT15 (bezem/broom) " erm. .**zweepertje** .erm..'n bezem "
PICT15 (struisvogel/ostrich) " .**ooievaart** "

- Morphologically incomplete attempts:
PICT16 (varken/pig) " .**vark.**"
PICT42 (varken/pig) " .. 'n vark k ken..Vark, varken? . Varken .Vark? vark... Vark...**On varken?..Twee varken** Kweet 't niet. Vark Hoeveel varken heb je? Ik heb EEn vark.. EEn varrek LAUGH Ja? Probeer 't maar "

- Nursery rhyme:
PICT25 (spin/spider) ". Spin **'It is like being retarded, having to think for words, it is so simple.'**/xxxxxx/ 'I don't know with these ones.' 'Becoz that is, some of them I can directly translate, I mean.. look- think about in English, and over they-... But' spin 'Ni, I don't erm.. I don't know how I got that one.'. .. 'Trying to think of a nursery rhyme I think. Visualise a nursery rhyme '
PICT28 (schoen/shoe) ". Schoen. /Ja, how did you do that?/**Erm, 'just sort of thinking- I guess almost thinking about the childhood phrases, erm' "je je 'Put on your' sokjes en je, en je-"** 'and then the next one comes, yeah, the next word comes.' ... "
PICT28 (sigaar/cigar) ".. Sigaar, of?. . /Yeas?/'Well, if it is cig- Well, a' s- sigaar **'My grandfather used to smoke them and I'm sure that is what I used to call them.'** LAUGH"

- TOT states and semantically related names
PICT13 (citroen/lemon) "..erm....'now',' ... HAHA 'It was there a minute ago!'....erm Citroen.. Yeah .**'I knew it was something with' OE 'I couldn't get tha- LAUGH where the word came from.'"**
PICT64 (varken/pig) ".............'No.....**I think it starts with' aard** but I'm not sure.'"
PICT67 (kikker/frog) "...Oh!...erm..ke- **'It is no-It is not a' kerk, 'but it is s-..It is** "church", .erm...TZK..No. LAUGH"
PICT55 (tulp/tulip) "...erm .'Tulip'. **Bloemen.**"

---

(2) IDENTIFICATION SESSION

- Recognition of an unrecalled item.

PICT87 (orkest/orchestra) " ..hmn . Yeah, that is an orchestre' maar .. 'Oh!, of course!', Orkest *A*, 'so simple! I knew it was so simple as Dutch '

- The verbalisations could be very poor:

PICT86 (broodrooster/toaster) "................... broodrooster, '*D*'

Verbalisations could sometimes provide insight into the selection process.

- The subject considers a number of cases before deciding on the target Dutch word, and the distracter that best represents his response:

PICT79 (jurk/dress) ". .'n jurk.. kleren, 'n dres, 'n rok, 'What did I say?' 'I said' 'n rok Rok, 'is a skirt, and erm, and' 'n jurk 'is a dress'..so I'm right if I say *B*.' LAUGH.../Goody/...'And I was wrong before.'

- The verbalisations could provide information about the reasoning behind the selection of one distracter. For example, the subject could only know the phonological form:

PICT87 (paraplu/umbrella) "'I know it is a' paraplu 'but how do you spell it?' .Ja *D*, paraplu... /Ja/...'I didn't know what is the spelling '

- Verbalisations could highlight confusions surounding the choices:

PICT80 (hek/fence) " Hek! ..'Yeah, *C*, afscheiding. "Hek" 'is more the actual gate, isn't it?' /ahum/ 'Yeah, ok.'

- **The verbalisations could provide information on competition with synonyms throughout the selection process.** For instance, native speakers in the example below preferred the word 'ton' for a barrel, but almost synonymous was the subject's initial response 'vat' The result is uncertainty

PICT87 (ton/barrel) " .'Ah, what did I say? I sai- Did I say' vat?. 'n faat?..'n vat..'That is the same thing, though.'...'N ton Ja..'It is a' ton, '*A*.'"

- **Most subjects tended to select the option via elimination:**

PICT85 (giraf/giraffe) : .Aha! 'It is not a zebra, and it is not a' dier .'I just have to get the spelling right....*B*' ...'ger' af geraf...LAUGH."

- **The elimination process could operate in a number of ways. For instance the subject could pronounce all options to see which are phonologically most plausible:**

PICT79 (kaars/candle) "...kendel, 'candel', . kandelaar, lamp.. Kendul, *B*."

- **The subject could select the distracter that was most familiar:**

PICT86 (asperge/asparagus) ". .asparegus.. . 'Oh, witlof!' *F*."

Or least familar when the others were considered inappropriate:

PICT79 (asperge/asparagus) ". fff...es per gus, aspergus, asperregus, witlof, It is no' witlof! 'That is comPLETEly different!.' ...'Yeah, which is the one, I don't know ' . Asperregus .asperkus, asperge,. erm, I'd have to say *D*. I'm wrong?..."

- **The subject could select the semantically most transparent option:**

PICT67 (deegroller/rolling pin) ". '*A*', deegroller .../Yeah?/ 'Yeah, as in' deeg 'is pastry, or something, isn't it?'"

- **The subject could pick the first plausible option:**

PICT79 (riem/belt) "erm '*B*', I knew- Oh! Hang on! There's another' riem! ...Riem 'and' riem. . Riem..'It is a' *B*."

- **The subject could select the Dutch semantic superordinate to save face:**

PICT79 (tulp/tulip) ".. .'tulip, tulip, tulip, tulip' Bloem, 'No'.......'I suppose, erm well, I said' bloem, 'which is *B*'...'and that would be the safe one to say.' 'So I'll say' bloem! . /Ok/ 'I don't know.'"

or because no other option appeared feasible:

PICT79 (spin/spider) . SIGH...spijder 'It doesn't say it anyway ' . .'I'd say *B* for' INsekt /ahum/."

- **The subject could eliminate options by means of English:**

PICT79 (pijl/arrow) " 'n speer, arrow, arroo ' I don't know' 'n arroo...'But which arrow I don't know,' .'Oh well, the English arrow is A, double R, O, double U, so it must be the other arrow LAUGH'.. '*C*, yeah'"

- **The subject could select an option by using metalinguistic knowledge of Dutch spelling:**

PICT79 (pijl/arrow) " .Pijl, 'That is what it is!'.. 'Yeah, but which one is it?'. ..erm *B*, because it is I J in the Dutch' ./yeah?/ 'Is that right?'"

- **The subject could also satisfice:**

PICT79 (elboog/elbow) ". Elbow, elboo. elbo KniE, 't is nie knie! Elboo, 'yeah, which one?' . 'Oh, *B* will do LAUGH.'"

- **The subject could eliminate an option by ruling out the response made during the previous recall attempt,** even though subjects were not told that during the second session they were presented with the unsuccessfully recalled items One subject found out (PICT 58) and used her knowledge of what her initial reaction was to eliminate the distracters:

PICT58 (hamer/hammer) "....ssspijker...'Is that a' spijker? 'I have to say' spijker..'if hammer wasn't right'.... hAMer, 'I said, didn't I?' ..'Isn't a' spijker 'a nail?' ..'If' spijker 'is a nail ... that would be...*F*', hamer . 'Didn't I say' hamer 'before?'"

- **The subject could eliminate options by using a phrase in which that option could occur:**

PICT87 (rolschaats/rollerskate) ".'N rolle- ...rolleschaatse, rolle-..sch- .rolless .kaate?...rolschaat,..'No' skaats? . 'n rolschaats...'and it'd have to be the top one, because it is only one- it is one- one' rolschaat ..'or is it a' rollerschaats? ..tzk .Rollerschaats? rollerskaats?...skaat ..."Je gaat sgAAten" 'It is gotto be the top, *A*'.."

- **The subjects could reconstruct the word from the distracters:**

PICT31 (schroevendraaier/screwdriver) "....Schroevendraaier 'is it?' 'Is that the word?'...'It is' schroevendraaier, *F*. /'Is that a guess or what?'/ 'I really don't know!'..'Well, it hAs to be because the other words are obviously wrong ' Werktuig, xxxx..xx. 'Must be'. 'Never heard the word' schroevendraaier. 'I can't remember that word '"

- **The subject could guess at the correct option:**

PICT82 (bijl/axe) " ...erm.. ....'Take a guess on this one, erm *C*, *C*, a' bijl."

Guessing could take place when **neither of the options appeared feasible or all seemed equally appropriate**

PICT82 (hemd/shirt) "....erm ..*F*, 'n trui....hmn. hmn wats..klee- .. 'Well, it is not a' trui 'and it is not' kleding. Kleding 'is is all of it ' 'It is not a' hemd, 'it is not a' shirt, 'a short, a shirt' trui.... erm ..*F*, trui Hmn ..'That is closest to it '"

- **The subject could guess when he did not recognise any option, and "hit" the target word which is pronounced incorrectly:**

PICT86 (schroevedraaier/screwdriver) ".. ..../No idea?/ No.......'*C*?'../And the word is?/ erm schrui-vv.. schruivdraaier.. "

- **The subjects could recognise the word, pronounce it correctly, but select an incorrect distracter.**

PICT60 (bijl/axe) "....'n bijl..erm...LAUGH.. Zal wel 'n *AA* zijn "

- **The subject mispronounced the word but could select the correct option:**

PICT87 (asperge/asparagus) "..Groente erm..yeah, 'it is asperregus..But how tha-' As-..'How do you spell it?' Asperegoos, 'no' asperregus, groente...Asperrege..'*B*'..Asperrege?.. 'Is that right?..'God!'"

PICT79 (lineaal/ruler) "....lienaal...lienaal, 'a ruler' roeler, roler, ..'n dr- meter, 'n roeler...erm..is 'n linAAl. ,but which one? ."How do I-? lin- lien- aal, lien,..olien,..'I'll have to say *A*'... 'Wrong?' ./No/ ..'I'm right' .. I'm learning, am I!'"

- **The subject could mispronounce the word and select an incorrect option:**

PICT86 (skelet/skeleton) " hmn...'Don't even know that one '. beenderen skullet..skeLET.. skelleton...skel... t .. 'I'll say *A*'...'*A*'.. beenDAAren.."

- The subject could not recognise any of the distracters:

PICT79 (piramide/piramid) "Piremied, pirre, pirremied...piere...pieremiede ..'Am I allowed to guess? or should I say I don't really know?' .'I think *B*' /Which is the word?/ Pieremiet "

- The subject could recognised all distracters but could make a decision:

PICT79 (gieter/watering can) " . waterkan, *D*?. 'Oh, yeah, you see, I would say' wateringkan, wateringkan, waterkan, erm ....waterkan...'N gieter, erm, it is too, it is also a' gieter .. /Which one?/ 'I don't know!' Waterkan! /'*B* or?/ Wateringkan waterkan '*B* will do.'. .'Can be any of those three, can't it?' .'I mean, I've answered- I answered .*B*, right?' /Ahum....It is actually' gieter / erm.."

- The subject could make an incorrect choice because of semantic confusion:

PICT85 (hek/fence) " 'I thought a' hek 'as in *B*' 'was a erm more the hEDge, the plAnts, you know, the'...'And then I thought fEnce wasn't right,' fens..Ja, 'they say' fens. '*A*'"

- The subject could be very sure of an incorrect distracter:

PICT86 (walvis/whale) ". Oh, wAAl .'yeah..*A* '"

Some possible problems with the methodology also became evident in the verbalisations:

- Some subjects gave the **English alphabet letter in a Dutch context** which caused confusion when the option was similar to another phonologically related option with a similar sounding letter:

PICT84 (bijl/axe) "....'*A*' bijl../E of 'A'?/ '*A*' bijl."

- **Subjects changed their minds after the reply had been keyed in** by the experimenter.

PICT87 (hemd/shirt) "Kleding..Shirt, hemd 'Well' kleding. ..'*A*' 'or' Hemd "

Appendix 6.3

The classification used for elements of strategic recall behaviour observed during the picture-naming experiment (*cf.* Appendix 3.2). PICT and a number indicate the subject who gave the example. Related categories are separated.

- **English:** the subject used an English word in the attempt to recall the Dutch name for the picture The English word could be the English name for that picture, as well as a related name. English could either be the only response (rare), or accompanied by 'Don't know' or an attempt to approximate, guess or reconstruct the Dutch name. An example is PICT85 (stinkdier/skunk) ".. erm. **'Skunk'**"

- **Dutchified:** the subject's attempt was interpreted as an adjusting of the English equivalent name to Dutch rules of orthography/phonology. An examples are PICT85 (pauw/peacock) " erm.. .e **piekok** ..'Don't know' " and PICT25 (stinkdier/skunk) ". **'n skunk.** LAUGHS...**'That is a Dutchified skunk!'**"

- **Literal Translation:** the subject's attempt was interpreted as an attempt to directly translate components of the English equivalent into Dutch Examples are
PICT13 (vlinder/butterfly) " 'Butterfly' **'butter', boter ...'fly', vlieg...'Butterfly',..botervlieg?** ."
PICT15 (ui/onion) "...'n erm ..SIGH.... Oh, **unjun**...Nee. erm 'No'"
PICT85 (strijkplank/ironing board) " .erm... 'n strijk tafel.... **'I translated this'**

- **Approximation:** the subject's response was interpreted as indicating an attempt to arrive at the correct form of the Dutch target. An example is PICT26" **ei...euu** " for the target "Ui". PICT15 (aardbei/strawberry) ".. Dat 's 'n **uidebaa**, erm erm.. erm 'n aardbei."

- **Paraphrase:** the attempt was interpreted as indicating description, circumlocution or paraphrase of aspects of the meaning of the target name Example of single-word and multi-word paraphrases are PICT13 (elboog/elbow) ".. Armbocht...**arrembocht** " and PICT47 (gieter/wateringcan) " ..Oh!. .SIGH .'What is it in English?'...erm erm.. Erm, **'The thing you fill- put water in if the plants with.'**.....'That will do' LAUGH . 'Wateringcan'"

- **Semantically related neighbour:** the response was interpreted as a semantically related neighbour of the target form. This response could occur on its own as well as be part of an ongoing recall attempt. The neighbours could be in Dutch or in English. Included in this group are superordinately related words. An example is PICT78 (vlinder/butterfly) ".. erm erm erm..'Butterfly!'. LAUGH.. erm...'That is' niet 'n **mot**, Nee, nee, 'T is geen mot. ....Nee....'n vlINder!..'N vlinder ...Ja.."

- **Form related neighbour:** the response was interpreted as related in form to the target word. Excluded here are the English equivalents which are similar to their Dutch target names. Example are PICT78 (lineaal/ruler) " TZK Erm, da's 'n erm..'n 'ruler', erm....'n **lijn** TZK. 'Can't think of it.' .SIGH...'No'"
PICT44 (spin/spijder) . **Spion?** 'No, no, no' Spin erm... Spijder, spij.../Spider?/ Nee, spijder."

Semantic feature: the subject reported a semantic feature of the target word, often in an unsuccessful attempt An example is PICT29 (ketting/chain) "....erm . 'Chain' 'Chain' **metaal**, 'No I don't know what the word for chain is.'" PICT13 (ui/onion) " Oh ..erm erm .uien ..ui... /That was a hard one?/ 'Yeah ..Oh, I had to think of **what makes you cry**, and erm 'uien."

- **Form feature:** the subject reported a feature of the target word, often in an unsuccessful attempt An example is PICT85 (bijl/axe) "...erm...**'starts with' ij.** ij ....'No' "

- **Episodic feature:** the subject reported an episode from his/her own life associated with the target Dutch word Included are comments where parents had used the words, fairy-tales in which the words featured, and Dutch nursery rhymes. Examples are PICT49 (stoel/chair) ".. 'a chair'. 'A chair is a. .. chair!' Oh LAUGH. 'Chair!' **'I'm just trying to think of my father when HE says things.** TZK.. ..'Anyway' ", PICT49 (aardbei/strawberry) " .'A strawberry, I knew a strawberry 'd come up!' . **'Mum used to grow them in the garden....but I can't think what she called them.'** " and PICT58 (sprinkhaan/grasshopper) " een .een. erm ..**'Hang on, let me sing a Dutch song a minute': Daar hum hum..en zwaaide met z'n hoed..hum hum hum hum..hum..hum...'There's a sONg about him'... Een kleut- erm ern.. Klik- kikker..kikker..**'No' Da dum hum hum hum. hum. 'Oh, I don't know '"

- **Specification:** the subject added a further specification to the target word. An example is PICT64 (sleutel/key) " .sleutel **Lips** sleutel.", PICT25 (stoel/chair) "....Stoel...'n **houten** stoel."

- **Unclear:** the subject reported that it was unclear what the picture was supposed to mean An example is PICT85 (asperge/asparagus) "... **'What is this supposed to look like?'** /hmn/ Oh! erm..aspERchés .".

- **Uncertain:** the subject gives an indication by a rising intonation or an overt comment that he is unsure whether the response given is accurate or not. An example is PICT78 (hek/fence) "...'n hek...'or a fence'...erm ... /Which one?/ Palings paling, Oh, 'n hEk...**'I don't think that is right, but.'**.."

- **Appeal:** the subject asked the experimenter to help out. An example is PICT49 (kangoeroe/kangaroo) "... . 'Kangaroo?'.... 'No, I wouldn't know what a kangaroo was in' .. Hollands ... LAUGH **'What is a kangaroo in Holland?'**"

- **Don't know:** the subject indicated that the word was not known, forgotten, or temporarily unavailable This could be either the only response given, or follow an attempt or guess. Occasionally a 'don't know' could be followed by the correct target, showing that either the subject felt too uncertain about the response, the subject continued to search the lexicon even though (s)he had indicated it might not be useful. Forgetting seems temporary. An example is PICT85 (deegrol/rolling pin) " . **'I don't know what it is called.'**"

Appendix 6.4a

Mean number of times a particular strategic element or combination of elements were used during the attempts by the bilinguals to name 78 pictures in Dutch.

	mean	std dev.
English response	5.6	(9.0)
Dutchified response	1 5	(2 9)
Literal Translation	0 2	(0 9)
Approximation	2.1	(1.6)
Paraphrase	0.8	(1.2)
Dutchified/English	0 1	(0.3)
Dutchif./Literal Translation	3 0	(3 0)
Dutchif./Lit.Transl /Approx.	3 0	(2.6)
Dutchif./Lit.transl./Paraphr.	0.2	(0 4)
Dutchif./Sem Neighbour	0.2	(0 5)
Semantically related neighbour	3.4	(2.0)
Semantic /formal neighbour	0.5	(0.8)
Formal neighbour	0 1	(0.4)
Semantic feature	0.3	(0.6)
Formal/semantic feature	0 6	(1.0)
Episodic feature	0.2	(0.5)
Specification	0.1	(0.4)
Unclear image	1.2	(1.5)
Uncertainty	1.4	(1.7)
Appeals for assistance	0 1	(0.4)
Don't know	12.5	(11.8)

Appendix 6.4b

Combination of strategy elements in order to simplify the calculation of distributional properties of features reported during the naming attempts (N = 76).

English-based elements	=	English only, English used, Dutchified.
Dutch-based elements	=	Phonological/semantic neighbours, paraphrases, approximations.
Form related elements	=	Phonological neighbours, features and incorrect pronunciation
Meaning rel. elements	=	Semantic neighbours and features, subordinate, superordinate.
Form related strategies	=	Phonological neighbours, features and approximations.
Meaning related strategies	=	Semantic neighbours and features, subordinate, superordinate and paraphrases
Communication strategies	=	Approximation and Paraphrase.
Problematic elements	=	Unclear, hesitation, appeals, specifications
Reported features	=	semantic/ episodic comments, semantic/ phonological features

Appendix 6.4c

Correlations between background variates and the distribution of combined strategic features used by bilingual subjects (N = 64).

	TCLI	TDUTCH	TSEMAN	TFORMAL	DK	IMAGE	APPEAL
SE1	-.01	.17	.25*	-.06	-.19	.17	.11
SE2	-.31*	.05	.15	-.02	-.14	.04	.23
SE3	-.11	-.32*	-.28*	- 01	.09	-.23	-.02
SE4	-.24	-.25*	- 23	-.15	-.59**	.08	04
SE5	.01	-.08	- 12	-.01	-.12	-.02	-.28*
ATT1	.05	.19	.25	06	-.31*	.25*	- 13

ATT2	-.15	-.06	02	09	-.03	.04	04
BIO1	-.24	- 01	.07	.04	- 53**	.32*	10
BIO2	- 04	07	.09	-.20	-.12	.03	06
BIO3	-.02	-.07	-.18	- 03	- 15	-.02	- 12
BIO4	.06	.11	.19	21	- 19	.12	.10
BIO5	-.27*	- 12	- 07	- 05	-.31*	14	22

* - Signif. LE .05 ** - Signif. LE .01 (2-tailed)

Appendix 6.4d

Mean frequency of the combined categories of strategic elements per word category (N = 76).

1. IDENTICAL (n = 14)

	Mean	std.dev.
CLI-based	0.90	(0.91)
Dutch-based	0.32	(0.18)
Semantically-related	0.40	(0.47)
Form-related	0.18	(0 25)
Don't know	4.29	(4.14)
Uncertain	1 21	(1 72)
Appeals	0.14	(0 54)
Ambiguous image	0 36	(0 93)
Dutchif /lit.transl /Approx	3 29	(3 97)
Dutchif./lit.transl /Paraph.	0 21	(0.80)
Dutchif /semantic neighbour	0 00	(0 00)
Specification	0.07	(0.27)

2. SIMILAR/SAME NUM. OF SYLL. (n = 11)

	Mean	std.dev
CLI	0 64	(0.51)
Dutch- based	0.41	(0.31)
Semantically- related	0.42	(0.62)
Form-related	0.09	(0 20)
Don't know	4.00	(6 19)
Uncertain	1.54	(1 29)
Appeals	0.00	(0.00)
Ambiguous image	1 27	(2.15)
Dutchif./lit.transl./Approx	4.73	(7.66)
Dutchif./lit.transl /Paraph.	0 00	(0.00)
Dutchif./semantic neighbour	0 09	(0.30)
Specification	0.27	(0.47)

3. DISSIMILAR/SAME NUM. OF SYLL. (n = 13)

	Mean	std.dev.
CLI	2.06	(1.39)
Dutch- based	1.13	(0.57)
Semantically- related	1.72	(1.38)
Form-related	0 35	(0.59)
Don't know	13.69	(8.32)
Uncertain	1.15	(1 07)
Appeals	0 15	(0.38)
Ambiguous image	0 61	(0.87)
Dutchif /lit transl /Approx	0.31	(0 63)
Dutchif /lit.transl /Paraph.	0.08	(0 28)
Dutchif /semantic neighbour	0 15	(0.38)
Specification	0.31	(0.63)

4. SIMILAR/DIFF. NUM. OF SYLL. (n = 10)

	Mean	std dev.
CLI	2.52	(1.12)
Dutch- based	1.56	(1.72)
Semantically- related	2.73	(4 08)
Form-related	0.20	(0.35)
Don't know	8.90	(8 09)
Uncertain	1.30	(1 16)
Appeals	0.00	(0 00)
Ambiguous image	4.90	(6.59)
Dutchif./lit.transl./Approx	10 50	(7 73)
Dutchif./lit transl./Paraph.	0.10	(0.32)
Dutchif /semantic neighbour	0.20	(0.42)
Specification	0.10	(0.32)

5. DISSIMILAR/DIFF. NUM. OF SYLL. (n = 14)

	Mean	std.dev.
CLI	2.11	(0 79)
Dutch- based	1.31	(0.82)
Semantically- related	1 71	(1.70)
Form- related	0.32	(0.54)
Don't know	17.42	(8.75)
Uncertain	1.57	(1.65)
Appeals	0.07	(0 27)
Ambiguous image	1 79	(4.53)
Dutchif./lit.transl./Approx	0.42	(0.51)
Dutchif./lit.transl./Paraph.	0.00	(0.00)
Dutchif./semantic neighbour	0.93	(2.13)
Specification	0 14	(0 36)

6 SAME COMPONENTS (n = 4)

	Mean	std.dev.
CLI	1.55	(0.75)
Dutch-based	1 34	(0 73)
Semantically- related	0 83	(1 23)
Formal- related	0.12	(0.25)
Don't know	13.00	(3.56)
Uncertain	1.25	(1.26)
Appeals	0 00	(0.00)
Ambiguous image	0.75	(0.96)
Dutchif./lit.transl./Approx	11.00	(6.22)
Dutchif./lit transl./Paraph.	0.00	(0 00)
Dutchif./semantic neighbour	0.50	(1.00)
Specification	0 00	(0.00)

7 DIFF. COMPONENTS (n = 4)

	Mean	std dev
CLI	2 90	(1 37)
Dutch based	1 66	(0 98)
Semantically- related	2 33	(3 58)
Formal- related	0 12	(0 25)
Don't know	24 75	(2 52)
Uncertain	1 50	(1 29)
Appeals	0 00	(0 00)
Ambiguous image	2 25	(3 86)
Dutchif /lit transl /Approx	2 75	(2 75)
Dutchif /lit transl /Paraph	2 75	(4 86)
Dutchif /semantic neighbour	0 25	(0 50)
Specification	0 00	(0 00)

8 SINGL.Dut/ MULT.Eng (n = 4)

	Mean	std dev
CLI	2 90	(1 46)
Dutch- based	1 44	(0 55)
Semantically- related	1 17	(0 58)
Formal related	0 25	(0 29)
Don't know	20 00	(6 78)
Uncertain	1 75	(0 96)
Appeals	0 25	(0 50)
Ambiguous image	0 25	(0 50)
Dutchif /lit transl./Approx	0 75	(0 97)
Dutchif./lit transl /Paraph	3 25	(5 85)
Dutchif./semantic neighbour	0 50	(0 57)
Specification	0 00	(0 00)

9 MULT.Dut/ SINGL.Eng (n = 4)

	Mean	std dev
CLI	5 65	(2 57)
Dutch based	2 31	(0 61)
Semantically- related	3 25	(0 88)
Formal- related	0 37	(0 25)
Don't know	34 00	(4 97)
Uncertain	4 00	(2 58)
Appeals	0 25	(0 50)
Ambiguous image	2 75	(2 98)
Dutchif./lit transl /Approx	0 75	(0 96)
Dutchif /lit transl./Paraph	0 25	(0 50)
Dutchif /semantic neighbour	0 50	(1 00)
Specification	0 00	(0 00)

Appendix 6.5

Results of various relevant contrasts between categories, with items as cases, on naming and identification errors after adjustment for FreqRat and DuLeng (n = 78).

---

* * * * m u l t i p l e   r e g r e s s i o n   * * * *

	mean	std dev	label:
Nam Err	31.751	23.725	Percentage naming errors
Rec Err	9.976	10.664	Percentage identification errors
Freqrat	4.125	1 016	Frequency rating
Duleng	5.949	2 573	Length in letters of the Dutch picture name

NAMING

dependent variable   NamErr

block number 1. Method. enter freqrat duleng

variable(s) entered on step number 1.. Duleng let length of dutch pict name

2.. Freqrat

Restricted

			Analysis of variance		
multiple r	72423				
r square	52452		Df	sum of squares	mean square
adj r square	.51184	Regression	2	22733 66998	11366.83499
Standard error	16.57652	Residual	75	20608.58388	274.78112

F = 41.36687   Signif f = .000

------------------ Variables in the equation ------------------

variable	b	se b	beta	t	sign t
duleng	3 443142	.754244	373419	4.565	0000
Freqrat	-12.627753	1.909923	- 540834	-6.612	.0000
(Constant)	63.358002	10 095873		6.276	.0000

Extended:

			Analysis of variance		
multiple r	.87003				
r square	75696		Df	sum of squares	mean square
adj. r square	.72069	Regression	10	32808.37257	3280.83726
Standard error	12.53882	Residual	67	10533.88129	157.22211

F = 20 86753   Signif f = .000

------------------ Variables in the equation ------------------

variable	b	se b	beta	t	sign t
Duleng	1.726963	.876259	.187294	1.971	.0529
Freqrat	-9.051577	1 672442	-.387670	-5.412	0000
C23_45	- 386821	.075850	-.308948	-5.100	0000
C6_7	-2.194055	1.129998	- 119233	-1.942	.0564
C4_5	564779	220274	.157251	2.564	.0126
C2_3	- 640250	.218576	- 180164	-2.929	.0046
C1_2345	- 243034	.064431	- 238283	-3.772	.0003
C67_89	- .310594	412667	-.047741	- .753	.4543
C8_9	-1 827897	1.254360	-.099335	-1 457	.1497
Singmult	- .194933	.068535	-.260455	-2.844	.0059
(Constant)	58.815340	8.623762		6.820	.0000

$$F = \frac{(R^2_{extended} - R^2_{restricted}) / (df_{extended} - df_{restricted})}{(1 - R^2_{extended}) / (df_{residue\ after\ extension})} \quad \frac{(0.757 - 0.524) / (10 - 2)}{(1 - 0\ 757) / (67)} = \frac{0\ 0291}{0\ 0036} = 8\ 01 \quad p = 0000$$

IDENTIFICATION

<u>Restricted:</u>

dependent variable . Precogn
block number 1. Method· enter Freqrat Duleng
variable(s) entered on step number 1.. Duleng let length of Dutch pict name
2. Freqrat

multiple r	.52450	Analysis of variance			
r square	.27510		Df	sum of squares	mean square
adj. r square	25577	Regression	2	2408.76973	1204.38487
Standard error	9 19945	Residual	75	6347.23988	84.62987

F = 14 23120 Signif f = .000

------------------ Variables in the equation -----------------

variable	b	se b	beta	t	sign t
Duleng	.255774	.418582	.061716	.611	.5430
Freqrat	-5.319661	1.059947	-.506903	-5.019	.0000
(Constant)	30.398035	5 602892		5.425	.0000

<u>Extended.</u>

multiple r	.70038	Analysis of variance			
r square	49053		Df	sum of squares	mean square
adj r square	41449	Regression	10	4295 05337	429.50534
Standard error	8.15974	Residual	67	4460.95624	66.58144

F = 6.45083 Signif f = .000

------------------ Variables in the equation -----------------

variable	b	se b	beta	t	sign t
Duleng	- .529311	.570233	-.127719	- 928	.3566
Freqrat	-4.154878	1.088356	-.395912	-3.818	.0003
C23_45	- .168607	.049360	-.299609	-3 416	.0011
C6_7	.500389	.735356	.060501	.680	.4986
C4_5	.324237	.143345	.200854	2.262	.0270
C2_3	- .024370	.142240	-.015257	- .171	.8645
C1_2345	- .075269	.041929	-.164189	-1.795	.0771
C67_89	- .376988	.268546	-.128921	-1.404	.1650
C8_9	.395407	.816285	.047808	.484	6297
Singmult	-.102810	.044600	-.305621	-2 305	0243
(Constant)	30.263556	5.611985		5.393	.0000

$$F = \frac{(R^2_{extended} - R^2_{restricted}) / (df_{extended} - df_{restricted})}{(1 - R^2_{extended}) / (df_{residue\ after\ extension})} \quad \frac{(0.490 - 0.275) / (10 - 2)}{(1 - 0.490) / (67)} = \frac{0\ 0269}{0.0076} = 3\ 54 \quad p = .0000$$

TYPE OF CONTRAST	Notation	NAMING t	NAMING p	IDENTIFICATION t	IDENTIFICATION p
single-stem vs multi-stem	C12355_6789	-2 844	006	-2 305	024
identical vs highly sim	C1_2	0 494	623	-0 091	928
MORPHOLOGICAL	C23_45	-5.100	000	-3 416	.001
phonological (simple) same syllables	C2_3	-2 929	.005	-0 171	864
phonological (simple) diff. syllables	C4_5	2.564	.013	2.262	027
PHONOLOGICAL	C24_35	-0 486	628	1.300	.198
morphological (simple) phon. similar	C2_4	-6.344	.000	-3.628	.001
morphological (simple) phon. dissimilar	C3_5	-1 211	230	-1.451	152
same multi-stem vs diff. multi-stem	C67_89	-0.753	.454	- 1 404	.165
semantic transparancy	C6_7	-1.942	056	0 680	499
stem agreement	C8_9	-1.457	150	0 484	.630

SAMENVATTING: YOU GET A BIT WOBBLY

Deze dissertatie beschrijft een gedeelte van een onderzoek naar de rol van 'cross-linguistic similarity' (tussentaalse overeenkomst) op eerste taal (T1) verlies in Australie Hiervoor werden 88 Nederlandse emigranten in Victoria - wier moedertaal was "ingeslapen" door jaren van niet-gebruik - gevraagd mee te werken aan een experiment en een reeks taken uit te voeren Doel hiervan was te bestuderen of hun kennis van het Nederlandse vocabulair was verloren (loss) en/of de verwerkingsprocessen (processing) van die T1 kennis waren aangetast doordat deze taal niet-gebruikt werd Het argument dat men het Nederlands was "verloren" werd door de emigranten vaak gebruikt als excuus voor hun verengelst Nederlands

In de eerste twee theoretische hoofdstukken wordt het verengelst Nederlands van emigranten in Australie kort beschreven, gevolgd door mogelijke redenen uit de linguistiek en sociolinguistiek waarom sommige typen Nederlandse woorden meer verdwijnen dan andere Beide benaderingen voor wat betreft 'structuur' en 'gebruik' van de informatie zijn ook al bestudeerd in psychologische literatuur over 'vergeten' Deze literatuur voorspelt dat 'vergeten' van T1 vocabulair onwaarschijnlijk is, en dat selectief niet-gebruik eerder wijst op mogelijk verstoorde taalproduktieprocessen De taalproduktieprocessen van eentaligen worden beschreven in Levelt (1989), waarbij onder andere een onderscheid gemaakt wordt tussen processen als 'access' (ophalen) en 'retrieval' (ophalen en uitspreken) van lexicale informatie Lexicale informatie omvat lexicale vormkenmerken in het lexeem en betekeniskenmerken in het lemma van een woord

Levelt's beschrijving blijkt ook toe te passen op bevindingen van studies over tweetaligheid Herinterpretatie van tweetalig onderzoek toont een aantal variabelen aan die van invloed zijn op tweetalige taalproduktieprocessen Deze variabelen werden gebruikt in een experiment om nader te onderzoeken welke rol ze spelen op de produktie van 'ingeslapen' Nederlandse woorden

In het experiment moesten de emigranten plaatjes hun Nederlandse naam geven en bij problemen de namen later proberen te herkennen Het experiment werd gebruikt om te bestuderen welke typen en maten van tussentaalse overeenkomst in woordvorm tussen een-stammige en meer-stammige zelfstandige naamwoorden en hun Engelse vertaalequivalenten het ophalen (recall) en herkennen (recognition) van niet-gebruikte Nederlandse woorden zou verbeteren De Nederlandse namen verschilden in aard en graad van gelijkheid op fonologisch en morfologisch (aantal lettergrepen en letters) terrein, en het aantal woord-stammen Overige lexicale variabelen als woordfrequentie en -lengte werden in de 9 woordcategorieen zoveel mogelijk constant gehouden

In de analyses werden diverse typen communicatiestrategieen betrokken, de fouten tijdens de benamings- en herkennings-sessies, en het type afleider dat bij niet-herkenning werd gekozen De resultaten van deze analyses werden vergeleken met de biolinguistische (*i e* biografische and sociolinguistische) achtergrond van de betrokken proefpersonen Gegevens daarover waren verkregen uit een vragenlijst en uit diverse taalvaardigheidstoetsen

Analyse van het achtergrondkenmerken van de proefpersonen wees uit dat de meeste van deze emigranten nauwelijks Nederlands gebruikten, en dat nog voornamelijk mondeling passief Het taalvaardigheidsniveau van de ondervraagde groep bleek echter hoger dan men zelf had verwacht Zowel opmerkingen van de emigranten tijdens de sessies, als berekeningen aan de hand van achtergrondgegevens toonden aan dat vooral de leeftijd bij vertrek van de emigrant de belangrijkste sleutel-variabele in de gegevens was Dit bepaalde onder andere het vaardigheidsniveau in het Nederlands nu, alsmede de perceptie van het T1 niveau Daarnaast bleken de vrouwelijke proefpersonen meer gelegenheden aan te grijpen om hun Nederlands te oefenen dan de mannelijke

In het experiment kwam een grote verscheidenheid aan communicatiestrategieen en puntje-van-de-tong-situaties voor, die aangaven dat diverse geheugenvelden, waaronder het Engels, werden geraadpleegd Wanneer zij zich het woord niet meteen herinnerden, bleken de proefpersonen toch vaak een goed idee van de klankvorm te hebben, de context, en de relatie tot het Engels De strategie om Engelse vertaalequivalenten te 'ver-nederlandsen' om toch een naam te geven werd beinvloed door ongelijkheid in woordvorm tussen het Nederlands en het Engels en door laag taalvaardigheidsniveau

Eerste analyses van de foutenpercentages in het experiment lieten zien dat in eenderde van de benamingsfouten ook in de herkennings-sessie niet werden geidentificeerd Dit patroon bleek te worden beinvloed door het vaardigheidsniveau in het Nederlands (ResProf) en het type gelijkheid in het T1 woord (categorie) Hoe hoger het ResProf niveau, en hoe groter het aantal jaren dat de emigranten in Nederland gewoond hadden, hoe minder fouten er werden gemaakt in beide sessies Proefpersonen met lagere ResProf-niveaus maakten relatief meer herkenningsfouten dan emigranten met hogere taalvaardigheidsniveaus, wat suggereert dat lagere ResProf-proefpersonen ('poor') meer problemen hadden met 'access' van Nederlandse 'lexical entries' Op hogere niveaus ('middle'/'high') bleken relatief meer 'retrieval' problemen te zijn bij eigenlijke taalproduktieprocessen

Er waren ook verschillen per woordcategorie De 'retrieval' problemen leken zich vooral te concentreren op de naamgeving van plaatjes die 'cross-linguistically' minder overeenkomsten vertoonden of helemaal van elkaar verschilden Vooral morfologisch verschillen beinvloedden de 'access' van woorden negatief (Cat 4 'tomaat/tomato' & Cat 8 'vlinder/butterfly') Gedeeltelijke verschillen (bijvoorbeeld morfologisch wel maar fonologisch niet gelijkende woorden en woorden met verschillende semantische componenten in beide talen) waren gerelateerd aan 'retrieval' problemen in de hogere ResProf-emigrantgroep (Cat 3 'citroen/lemon', Cat 4 & Cat 7 'aardbei/strawberry')

Het feit dat de herinneringsresultaten beter waren dan de resultaten van de naamgevingssessies, toont aan dat niet-naamgeving niet meteen geinterpreteerd kan worden als kennisverlies

De resultaten van de herkennings-sessie werden minder beinvloed door de onderzochte overeenkomst variabelen dan die van de naamgevings-sessie Voornamelijk overeenkomst in het aantal lettergrepen verbeterde woord-herkenning bij minder ResProf-vaardige emigranten Dit suggereert dat (a) deze emigranten het meest onzeker waren over de fonologische vorm van het woord en dat (b) het dominant gebruik van het Engels de kennis-gebaseerde intuitie van de T1 had beinvloed Vergelijking van de naamgevings-- en herkennings-sessies suggereerde dat - in het algemeen - lexicale 'retrieval' processen in het Nederlands waren 'vastgeroest' in vergelijking tot het Engels Ophaalproblemen die bij de emigranten aan de basis lagen van het gevoel dat ze "het Nederlands hadden verloren" waren vooral aanwezig in de groepen met gemiddelde en hogere vaardigheidsniveaus in het Nederlands, terwijl 'access' problemen vooral in de groep met lage ResProf vaardigheid werd gemeten Wanneer de hogere ResProf-emigranten fouten maakten, dan leken deze vooral het gevolg te zijn van de invloed van Engelse lettergrepen-informatie op 'retrieval' processen in de T1 Voor de lagere ResProf-groep hielp fonologische gelijkheid het naamgeven van de plaatjes alleen als er ook overeenkomst in het aantal lettergrepen bestond Was deze overeenkomst in lettergrepen er niet, dan had fonologische gelijkheid geen effect op het naamgeven, en zelfs een storend effect bij het herkennen van de Nederlandse namen

Tussentaalse overeenkomst had verschillende effecten op het ophalen van Nederlandse plaatjesnamen Een-stammige namen werden veel beter opgehaald dan de morfologisch langere, complexere, en 'cross-linguistically' minder gelijkende meer-stammige namen van plaatjes Cognaten (bijv 'bus/bus') werden het meest succesvol naamgegeven en herkend Minder vormovereenkomst bevorderde ook tweetalige naamgeving, vooral wanneer de een-stammige woorden qua aantal lettergrepen en fonologische vorm op de Engelse equivalenten leken (bijvoorbeeld 'owl/uil' en 'table/tafel') Morfologische gelijkheid had een groter effect op naamgeving bij lagere ResProf-niveaus dan bij hogere, en morfologische gelijkheid had een groter effect als de woorden ook fonologisch op elkaar leken (Cat 2 & 4) dan als ze verschilden (Cat 3 & 5) Uit de herkennings-sessie bleek dat 'cross-linguistic similarity' in het aantal lettergrepen geen significant effect had op de 'access' van Nederlandse woorden door 'high' ResProf proefpersonen Verrassend was dat een-stammige woorden die zowel morfologisch als fonologisch ongelijk waren (bijvoorbeeld Cat 5 'desk/bureau') beter werden herinnerd als fonologisch overeenkomstig, maar morfologisch ongelijke woorden (bijvoorbeeld Cat 4 'tomaat/tomato') De 'middle' ResProf-groep maakte meer naamgevingsfouten, en de 'poor' ResProf-groep maakte meer herkenningsfouten in categorie 4 dan 5, wat suggereerde dat gedeeltelijke fonologische overeenkomst T1 naamgevingsprocessen kan storen, vooral bij ongelijk aantal lettergrepen Dit patroon zou het gevolg kunnen zijn van het uitgebreid gebruik van marginaal Engels en Nederlands in de emigranten gemeenschap door de hogere ResProf-groepen, waardoor de als 'redelijk goed' klinkende categorie-4 woorden toch acceptabel zouden kunnen zijn voor emigranten omdat de lettergrepenstructuur 'klopt'. Deze indruk werd bevestigd toen bleek dat een groep van 'fluent' Nederlandse emigranten vooral fonologisch overeenkomstige categorieen als 'gelijk met het Engels' had ingeschat

Meer-stammige woorden waren problematisch, maar het minst daar waar er semantische overeenkomst was (bijvoorbeeld Cat 6 'tandenborstel/toothbrush') Semantische transparantie had vooral effect op het naamgeven, en veel minder op het herkennen Woorden die ongelijk waren in stam waren problematischer wanneer het Nederlandse woord meer-stammig was en het Engels niet (bijvoorbeeld Cat 9 'stinkdier/skunk')

Analyse van de afleiders in de herkenningstaak liet zien dat - waarschijnlijk als gevolg van het dominant gebruik van het Engels - de op het Engels gebaseerde afleiders (maar niet de Engelse naam zelf) het meest werden gekozen Deze *Orthografisch Alternatief* en de *vernederlandste* afleiders klinken als de Nederlandse naam en lijken bekend, en wellicht is de voorkeur voor deze typen het gevolg van het feit dat de proefpersonen "de namen in hun hoofd lieten doorklinken" Het minst koos men voor de semantisch gerelateerde afleiders en de *Engelse naam*, wat aantoont dat men ondanks het niet-herkennen toch over gedeeltelijke kennis van het Nederlandse woord moet hebben beschikt Deze gedeeltelijke kennis was beinvloed door het Engels, gezien de populariteit van de *vernederlandste* afleider, vooral bij de lage ResProf-emigranten De keuze voor de *vernederlandste* optie bleek ook samen te hangen met de fonologische overeenkomst van het doelwoord hoe groter deze overeenkomst, hoe vaker de *vernederlandste* afleider werd gekozen Hogere ResProf-emigranten werden minder verleid tot het kiezen voor op het Engels gebaseerde afleiders dan lagere ResProf-emigranten Dit suggereert dat de grote geautomatiseerdheid van Engelse taalproduktieprocessen in vergelijking tot het Nederlands het ophalen van Nederlandse namen moeilijker scheiden had gemaakt van het ophalen van Engelse namen

In het algemeen bleek dat het gebruik van overeenkomst-oordelen bij de proefpersonen een essentieel onderdeel te zijn voor de Engelse en/of de Nederlandse woorden Zulke oordelen zouden in de mentale codes van de Engelse woorden kunnen zijn ondergebracht tijdens het leren van deze taal en het gebruik daarvan in de beginjaren, en tijdens het experiment kunnen zijn gebruikt bij het ophalen van Nederlandse woorden en bij beslissingsprocessen om zo de Nederlandse woorden te herconstrueren De mate van niet-gebruik van het Nederlands alsmede de relatie tussen 'retrieval' processen, woordfrequentie en 'cross-linguistic similarity' met de vertaalequivalent in het Engels beinvloeden de mate waarin Nederlandse woorden zijn 'vergeten' Deze bevindingen werden bekeken in het kader van theorieen over taalverlies en tweetaligheid

Curriculum Vitae

Ton Ammerlaan (or Tom Ammerlaan to his Anglo friends) was born on 10 February 1960 On completing his secondary education (VWO) in 1978, he went on to study English Language and Literature at the University of Nijmegen

After his B A in 1981 he studied for a M A in Applied Linguistics After one year of teaching Dutch at Liverpool University he successfully completed this degree in 1984 with a thesis on communication strategies in second language learners of English (ESL)

In 1985 he left for Monash University (Melbourne) in order to continue research on communication strategies in an emigrant context at the Department of Germanic Studies After a year he obtained a graduate scholarship from Melbourne University in 1986 In the Department of Psychology he started his investigation of the psychological aspects of language attrition, in addition to such activities as teaching Dutch, teaching ESL, editing an emigrant newspaper, lecturing M A students in research methodology and cognitive psychology at RMIT (Melbourne), and researching the behaviour of drug addicts for the Department of Health

After teaching drugs-related English in Malaysia, Singapore and The Hague he continued his research for this thesis in the Netherlands

From 1992 onwards he was a member of the Ph D Research Group ('Promotiewerkplaats') at the Department of Women's Studies, the University of Nijmegen The final stages of this dissertation were funded by teaching English at private schools and, for the past four years, by lecturing English for Business, Taxation, Legal and Information Technology-purposes at the Commercial College (HEAO) in Arnhem

"No hope . . .! Give it in . . .! No chance . . .! Doomed to fail . . .! No way you can do it . . .! Save yourself the embarrassment . . .! Pathetic . . .!"