

First language attrition

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“We know a fair amount about how people learn languages; we know remarkably little about how language skills, once learned, are forgotten - whatever that means precisely [...].”
(Lambert, 1982:6).

This statement opens the first collection of papers that specifically consider the deterioration of linguistic knowledge (LAMBERT & FREED, 1982), a field which in one of the papers in the volume is referred to as being in an “antenatal” state (Berko-Gleason, 1982:22). Thirty years down the line, while some researchers investigating language acquisition might quibble with the claim that ‘a fair amount’ is known in that field, it is still a fact that far less is known about the loss or attrition of language skills.

Language attrition research has developed in several relatively clearly delimited phases spanning, roughly, each of the three decades between 1982 and 2012 (see Köpke & Schmid, 2004 for a more detailed overview and analysis). The first phase was an era of stocktaking, with a number of symposia, collected volumes and special issues of journals. All of these collections cast their net widely, attempting to cover not only what, under the current terminology, would be considered ‘attrition proper’, namely the non-pathological loss of previously acquired first or second language skills in adult speakers (Köpke & Schmid, 2004:5), but also such diverse phenomena as incomplete acquisition, language contact and death, dialect change and death, pathological language loss, and the deterioration of sensitivity to phonetic input among infants (this last aspect is treated by Burnham, 1986). These were usually accompanied by reports on small-scale or pilot studies which were intended to lay the background for larger and sometimes very ambitious investigations. Unfortunately, most of these were never actually carried out or completed. A clear theoretical orientation was often lacking in these collections and pilot studies (as is, for example, pointed out in Hill’s 1989 review of the 1986 volume by WELTENS, DE BOT & VAN ELS (eds).).

In 1991, the first collection that specifically focussed on changes to the *native* language appeared (SELIGER & VAGO (eds), 1991), marking the beginning of a decade of a more focused, theoretically and empirically driven approach to language attrition, characterized mainly by a limited number of comparatively large-scale investigations of first language attrition, usually in the form of PhD projects.¹ This resulted in more clearly defined theoretical foundations and predictions for the field from a variety of perspectives, such as the impact of socio-/ethnolinguistic factors, psycholinguistic questions of accessibility and linguistic and grammatical models. What was (largely) lost from the earlier period was the intensive interaction and exchange between researchers that had taken place in the numerous meetings and collected publications, as the work that was carried out was largely confined to the typically solitary existence of the graduate student.

From 2002 onwards, numerous efforts were made to again create a community and network of attrition researchers and to arrive at commonly agreed methodological approaches as well as a sound theoretical underpinning for this research. This last decade has seen a number of international symposia dedicated solely to attrition research as well as panel sessions at larger conferences on bilingualism, the formation of a graduate network and the publication of numerous collected volumes and special issues of journals. It is probably fair to say that this has resulted in a better visibility of language attrition research and the recognition

¹ An overview of PhD theses on language attrition as well as, where known, sources from which they can be obtained can be found on <http://www.let.rug.nl/languageattrition/dissertations>. The following timeline treats only PhD studies which are either available in book form or of which summary articles have been published.

that the contribution of research and findings from this area can provide important further insights into highly topical research questions, such as the issue of interfaces in grammar and bilingualism (e.g. Sorace, 2005; TSIMPLI ET AL., 2004) and the question of maturational constraints in second language acquisition (e.g. BYLUND, 2009; SCHMID, 2009). Again, a fair number of PhD projects on a variety of languages and settings were carried out in this period, many of which adopted the test battery proposed within the attrition community (made available on www.let.rug.nl/languageattrition and described in detail in SCHMID, 2011a).

The overview presented below focuses on studies investigating first language attrition; articles on second language attrition, incomplete acquisition or child language attrition, heritage or indigenous minority languages etc. are not included. I also do not list general overview, handbook or encyclopaedia articles. Where not otherwise indicated, participants in the studies are post-puberty long-term migrants (minimum length of residence 7 years). The items represented in the timeline represent the following themes:

1. Theoretical frameworks
 - a) Generative theory
 - b) Psycholinguistics and neurolinguistics
 - c) Language contact and language change
 - d) Regression
 - e) Multicompetence and Dynamic Systems Theory
2. Comparisons of attrition and other linguistic developments
 - a) L1 acquisition and attrition
 - b) L2 acquisition and attrition (in particular studies investigating maturational constraints)
 - c) Attrition and heritage languages
 - d) Attrition and language change
3. Attrition as a selective process
 - a) Lexical access and fluency
 - b) Restructuring of the semantic and conceptual space
 - c) Morphological and morphosyntactic attrition
 - d) Syntactic attrition
 - e) Phonetic and phonological attrition
4. Socio- and ethnolinguistic considerations
 - a) The impact of L1 use and behaviour
 - b) Attitudes and identity
 - c) Attrition and aging
5. Methodological considerations
 - a) The appropriateness and validity of various tasks
 - b) Testing the impact of external factors
 - c) Baseline and point of reference
6. Overview papers/collections and general considerations

Table 2: *Applied studies of L1 attrition in an L2 context*

Study	Findings	Strand
Lambert R.D. & B. Freed (1982). <i>The loss of language skills</i> . Rowley, MA: Newbury House.	<p>This collected volume was the outcome of a research meeting at UPenn in 1980. It was the aim of this conference to arrive at a common foundation upon which language attrition research could be conducted. The papers collected in this volume focus on the linguistic and extralinguistic variables which should be considered in attrition research (Andersen), the instruments that might be used to measure it (Clark; Oxford) and the social factors (in particular attitude and motivation) that should be taken into account (Gardner). Researchers from neighbouring areas, such as language death (Dorian), child language acquisition (Berko-Gleason), instructed L2 learning (Valdman), neurolinguistics (Obler) and language policy (Levy; Lowe) give an account of how the findings from their fields should inform and shape attrition research.</p> <p>Lambert & Freed put together an extremely useful collection of papers and an excellent starting point still for anyone wishing to begin a research project on language attrition. Unfortunately, it has not been used as widely and consistently as it might have been. A better uptake would no doubt have benefitted attrition research at large enormously.</p>	6
Els, T. van. 1986. An overview of European research on language attrition. In WELTENS, DE BOT & VAN ELS (eds), 3-18.	<p>This is the paper usually credited with first proposing a taxonomy that is very often cited in the introductory sections of attrition studies. It classifies the type of attrition research in a two-by-two design by attriting and environmental language (L1 and L2, respectively). However, only two of these types - L1 attrition in an L2 setting, and <i>vice versa</i> - have developed into actual areas for attrition research, while the other two (dialect loss and L1 'regression' among older migrants) have never played a consistent role and are considered debatable cases of attrition. The usefulness of the taxonomy has been questioned e.g. by Köpke & Schmid (2004).</p> <p>Although van Els is almost invariably cited to support this taxonomy, it was first proposed in a 1985 paper by de Bot & Weltens, published in Dutch.</p>	6
Jaspaert, K., S. Kroon. & R. van Hout (1986). Points of reference in first-language loss research. In WELTENS, DE BOT & VAN ELS (eds), 37-49.	<p>This paper discusses one of the most important methodological considerations for language attrition studies: how to obtain a solid baseline for comparison. Pre-/posttest designs are usually not feasible due to the long incubation period (see DE BOT & CLYNE 1989, 1994); they also come with the potential of a retraining effect so that the actual investigation might prevent the very phenomenon it is looking for (SCHMID, 2011a). This paper contains the first explicit and detailed discussion of longitudinal studies vs. static group comparisons, of their feasibility and of respective advantages and disadvantages. The argument is further developed in JASPAERT & KROON (1989) where the authors address (and criticize) a strategy commonly used in language loss research at that time: The adoption of an idealized baseline that is 100% in compliance with prescriptive models (dictionaries, grammars) – that is, the assumption that unattrited native speakers make no errors, and that all instances of deviance are thus evidence for attrition. Jaspaert, Kroen & van Hout point to the inadequacy of this model and the fallacy of assuming that 'native' speech always conforms to such prescriptive norms.</p>	5c
Weltens, B., K. de Bot & T. v.	Like LAMBERT & FREED (eds, 1982) this volume is the outcome of a workshop meeting. In addition to	6

Study	Findings	Strand
Els (eds) (1986). <i>Language attrition in progress</i> . Dordrecht: Foris.	general overview articles (VAN ELS) it contains a number of papers on dialect loss and language shift, and research reports. These latter consist of mainly reports on small-scale studies (Cohen) or preliminary reports (de Bot & Lintsen; Jordens et al.; Weltens & van Els - unfortunately, with the exception of the last one, none of these were eventually completed). The only larger study that was able to report results (although they remain descriptive and no quantitative analysis is presented) is Olshtain, who investigates L1 Hebrew returnee children after a period spent in an L2 English environment and finds an age effect.	
de Bot, K. & M. Clyne (1989). Language reversion revisited. <i>Studies in Second Language Acquisition</i> 11, 167-77.	<p>Clyne's investigation of Dutch speakers in Australia remains the only truly longitudinal and empirical study of L1 attrition among a larger population (as opposed to, e.g., collections of letters from a single individual as analysed by Jaspaert & Kroon, 1992 and Hutz, 2004). His research in the early 1970s suggested a phenomenon which came to be known as 'reversion' among elderly migrants, through which they would suffer attrition in the environmental language that they had used for decades and come to over-rely on their L1. In extreme cases, even communication within the family allegedly broke down where children were not proficient in their parents' L1.</p>	4c
Jaspaert, K. & S. Kroon (1989). Social determinants of language loss. <i>Review of Applied Linguistics (I.T.L.)</i> 83/84, 75-98.	<p>de Bot & Clyne discuss self-evaluation data of proficiency in English and Dutch elicited from a subgroup (n=40) of the same speakers in 1987, and focus particularly on the ten speakers who report a decrease in English proficiency. They hypothesize that language reversion is linked to the Critical Threshold proposed by Neisser (1984) in that migrants who have reached a relatively high level of proficiency in the L2 will be protected against reversion. The L1 Dutch language proficiency of this population, on the other hand, appeared extremely stable in the intervening period (see also DE BOT & CLYNE 1994). SCHMID & KEIJZER (2009) shed further doubt on the assumption of widespread regression among long-term elderly migrants.</p> <p>In the late 1980s and early 1990s, Jaspaert & Kroon launched a highly ambitious investigation of Italian in the Netherlands and Flanders. The study, which was to comprise 800 first, second and third generation speakers of Italian, was to be concerned largely with the impact of sociological and sociolinguistic factors on language attrition. The 1989 paper outlines a number of problematic areas for such studies, such as the appropriateness of various measures (free speech, language tests), the baseline issue already addressed in JASPAERT, KROON & VAN HOUT (1986) and the confound of language proficiency and metalinguistic knowledge. It then introduces a pilot study comprising 30 speakers, used to assess the validity of five language loss tests (comprising correction, editing, lexical and comprehension tasks). Their results suggest that education is an important factor in language retention, possibly due to the fact that higher education levels may facilitate maintaining input through the written medium and through a higher socioeconomic status, allowing more travel. The amount of contact with the L1 in the migration setting, on the other hand, does not play a role. In general, the authors express their surprise at the minimal amount of loss that their tests appear to have detected (which they explicitly ascribe to a very high level of language maintenance in the community, and not to a failure of the tasks to detect attrition).</p> <p>A follow-up to this study with a larger population (n=300) was published by the same authors in 1991.</p>	4a, 5a

Study	Findings	Strand
Sharwood Smith, M.A. 1989. Crosslinguistic influence in language loss. In K. Hyltenstam & L K. Obler (eds), <i>Bilingualism across the lifespan</i> . Cambridge: Cambridge University Press, 185-201.	<p>This paper contains a careful consideration and statistical evaluation of the way in which sociological and sociolinguistic background factors as well as factors pertaining to language use and language choice interact and pattern together. This analysis is not combined with an analysis of actual linguistic data, and no further findings from this very interesting study were published.</p> <p>This paper discusses theoretical concepts and frameworks that are relevant for language attrition research. “Loss” is conceptualized here as a type of development where forms that diverge from the standard target (e.g. as produced by more advanced ‘language losers’) are used as evidence for grammar building by the attriter (this ‘vicious cycle’ approach is also invoked by GROSJEAN & PY 1991). Therefore, “developing competence in loss and developing competence in acquisition can be seen as related processes”(p. 188) and the forms developed in this process often lead to an enriched form of the attriting language.</p> <p>Sharwood Smith approaches attrition from a psycholinguistic point of view, speculating about whether it will affect underlying knowledge systems (and will thus manifest itself consistently in the speech of a particular attriter) or rather the control of knowledge that is still represented in the brain (manifested incidentally/variably) Based on the speculations made by Andersen (1982) and Preston (1982), he draws up a list of potential outcomes of attrition, classified into ‘processes’ (performance) and ‘results’ (competence). He further lists properties of the two contact languages that he labels as “loss-inducing”, such as typological or structural similarity.</p>	1b
Altenberg, E. P. (1991). Assessing first language vulnerability to attrition. In SELIGER & VAGO (eds), 189-206.	<p>This case-study of a married couple with L1 German living in the United States compares the attrition of lexical, syntactic and morphological features based on their acceptability/unacceptability in English and German. No baseline data from unattrited speakers are invoked. Altenberg very properly and painstakingly points out the limitations of her study: “Since these three tasks were preliminary studies, their findings must be interpreted cautiously and their limitations are obvious: future research of this type will require more subjects, more tokens, and possibly a monolingual control group” (p. 203). That said, she concludes that attrition is most likely to occur where L1 and L2 are similar (p. 204). Despite this disclaimer, Altenberg’s conclusion has been widely and largely uncritically cited in support of the claim that attrition is conditioned by typological similarity (see SCHMID, 2011a:122).</p>	1b
de Bot, K. & B. Weltens (1991). Recapitulation, regression, and language loss. In SELIGER & VAGO (eds), 31-51.	<p>This contribution introduces the Regression Hypothesis (first proposed in the context of child language acquisition, aphasia and phonological universals by Roman Jakobson in 1941), and discusses its applicability to L1 as well as L2 attrition. The predictions that language loss will be the mirror image of acquisition (also known as the LIFO - last in first out - model) are tempered by factors such as crosslinguistic influence, and some restrictions to the applicability of the hypothesis, for example its limitation to linguistic phenomena that can be demonstrated to be acquired gradually and in a fixed sequence, are pointed out. De Bot & Weltens conclude that this hypothesis, which has been widely cited in speculations on attrition, has received surprisingly little attention in actual empirical investigations. This statement holds to this date: aside from some initial reports on a smaller-scale investigation in Jordens et al. (1986; 1989) there is only one larger study of first language attrition framed explicitly within the regression paradigm, namely KEIJZER (2007).</p>	1d

Study	Findings	Strand
de Bot, K., P. Gommans & C. Rossing (1991). L1 Loss in an L2 Environment: Dutch Immigrants in France. In SELIGER & VAGO (eds) 87-98.	de Bot, Gommans & Rossing present an investigation of 30 long-term Dutch migrants in France. They assess a number of skills and investigate the interaction of proficiency, length of residence and amount of contact. They conclude that there is indeed an impact of contact and time, but that length of residence becomes significant only for those speakers who have few contacts. The approach taken here was later replicated by Soesman (1997) and Schmid (2011b), and the results were largely confirmed.	4a
Grosjean, F. & B. Py (1991). La restructuration d'une première langue: l'intégration de variantes de contact dans la compétence de migrants bilingues [The restructuring of a first language: the integration of contact variants into the competence of bilingual migrants]. <i>La Linguistique</i> 27, 35-60.	Grosjean & Py 's investigation of 15 Spanish migrant workers (long-term residents in a Francophone environment in Switzerland) argues that even stable adult linguistic competence is vulnerable to restructuring under L2 influence. They use a very interesting variant of the acceptability judgment task: for five linguistic items which they judge to be vulnerable to change under contact conditions they ask their participants not only whether it is <i>acceptable</i> in Spanish but also whether they have heard <i>attestations</i> of this form in their linguistic community (independently of whether or not this form is correct, has the participant heard it used or used it herself?). The standard Spanish structures score higher than the Francophone variants on both tasks, and there is more variance on the judgments for the migrant varieties. Grosjean & Py conclude that even mature, adult competence is open to a certain degree of restructuring for speakers who become bilingual and use both languages on a regular basis.	1b, 2d
Olshtain, E. & M. Barzilay (1991). Lexical retrieval difficulties in adult language attrition. In SELIGER & VAGO (eds), 139-150.	Olshtain & Barzilay investigate 15 native speakers of American English who are long-term residents in Israel. No information on age of migration (AoM) is given, but it is asserted that all speakers had "full competence in their first language before immigrating to Israel" (p.141). A control group of 6 speakers of American English is also tested, making this the first investigation of L1 attrition since Sharwood Smith (1983) to invoke an unattested baseline. Free speech data is elicited by means of the Frog story, and individual instances of deviant use of lexical items (in particular over- and underspecifications) are discussed, but the overall results are not quantified or analysed statistically. The authors conclude that attrition leads to problems in vocabulary retrieval (p. 150).	3a
H. W. Seliger & R. M. Vago (eds). (1991) <i>First language attrition</i> . Cambridge University Press.	This collection is the first to focus on changes to the native language and exclude issues involved in foreign language attrition, and it marks the starting point of the divergence of the two research strands. The theoretical and methodological focus of the contributions is more clearly defined than in the earlier collections. All contributions are framed within a particular theoretical perspective and address a specific research question (given the largely unfocused and pre-theoretical nature of some of the earlier collections, this marks an important step forward). The introductory chapter by Seliger & Vago briefly discusses L1 attrition from a variety of perspectives (psycho- and sociolinguistic, linguistic and theoretical). As a fundamental question, they return to the issue of which aspects of attrition are <i>core</i> or <i>competence</i> phenomena, and which can be considered as belonging to the <i>periphery</i> or <i>performance</i> (a question that is taken up again in the contribution by SHARWOOD SMITH & VAN BUREN 1991) The first part of the volume is dedicated to theoretically oriented meta-analyses which approach attrition from various perspectives. Two contributions concern attrition (SHARWOOD SMITH & VAN BUREN and DE BOT & WELTENS) others include considerations relating to aphasia (Obler & Mahecha)	6

Study	Findings	Strand
Sharwood Smith, M. & P. van Buren (1991). First language attrition and the parameter setting model. In SELIGER & VAGO (eds), 17-30.	and language contact (Maher). This is followed by quantitative investigations and case studies. Again, a number of these are set within the heritage/language shift context (Dressler; Schmidt; Huffines) or are case-studies investigating the deterioration of a linguistic system among very young individual speakers (Kaufmann & Aronoff; Seliger; Turian & Altenberg; Vago), but for the first time, the volume also includes a number of quantitative and qualitative investigations of L1 attrition 'proper' in the studies by ALTENBERG, DE BOT, GOMMANS & ROSSING, OLSHTAIN & BARZILAY and SILVA-CORVALÁN.	
Silva-Corvalán, C. (1991). Spanish language attrition in a contact situation with English. In SELIGER & VAGO (eds), 189-206.	Sharwood Smith & van Buren develop the questions on attrition of knowledge vs. control posed in SHARWOOD SMITH (1989) and ask to what extent an attriter may come to model the grammar underpinning his or her L1 on the L2. In particular, they consider the practicalities of establishing whether attrition phenomena in an individual language user are indications of competence or performance change and the role that explicit/metalinguistic knowledge (as opposed to tacit/implicit knowledge) can play in this respect.	1a
Major, R.C. (1992). Losing English as a first language. <i>Modern Language Journal</i> , 76, 190-208.	Silva-Corvalán presents an investigation of Mexican-American Spanish-English bilinguals from three generations (n=14 of whom six belong to the first generation; there is no control group). She approaches her analysis of Spanish verb forms from a simplification/markedness perspective and finds a "clear-cut qualitative difference between first generation immigrants" who retain a full-fledged variety of spoken Spanish, and speakers from subsequent generations. The latter group has a reduced system of verbal morphology lacking, for example, future morphology and exhibiting simplifications in tenses such as the preterite, the pluperfect indicative and the subjunctive (p. 161). She concludes that the markedness hierarchy proposed by Muysken (1981) is a valid predictor for her results, but stresses that this is a descriptive and not an explanatory account of the changes she observed (p. 165). In what is the first and for 15 years (until de Leeuw's 2009 PhD study) remained the only investigation of phonetic L1 attrition, Major investigates changes to VOT in the L1 and the L2 of five speakers of Brazilian Portuguese who are long-term residents in the US. This study is reminiscent of Flege's 1987 investigation of VOTs in French and English which, although it was not cast within an attrition framework, already established bidirectional influence in bilingual speech which increased with experience. In the present study, VOTs for voiceless plosives are measured in formal and casual speech, and Major concludes that the mutual interaction of L1 and L2 can affect L1 phonetics (p. 204).	2c, 3c 3e
De Bot, K. & M. Clyne (1994). A 16 year longitudinal study of language attrition in Dutch immigrants in Australia. <i>Journal of Multilingual and Multicultural Development</i> 15.1, 17-28.	In this paper, the population whose self-evaluations in their L1 (Dutch) and their L2 (English) had been assessed and tested for indications of language reversion in DE BOT & CLYNE (1989) are investigated linguistically for lexical and morphosyntactic attrition phenomena in free speech. These results are compared to data from the same speakers dating from 1971. This comparison reveals that very little change has occurred in the intervening 15 years, and de Bot & Clyne conclude that, after the first decade of emigration, L1 skills appear to be extremely robust.	4c
Håkansson, G. (1995). Syntax and morphology in language	Håkansson presents the first quantitative investigation of L1 attrition from a parameter-setting perspective. She investigates the V2 rule as well as NP agreement in the written Swedish of five	1a, 3c, 3d

Study	Findings	Strand
attrition: A study of five bilingual expatriate Swedes. <i>International Journal of Applied Linguistics</i> 5.2, 153-171.	heritage speakers (returnees) and five L2 learners of Swedish from various language background, and also briefly considers reports on monolingual aphasics. Her findings suggest that, while L2 learners struggle with both V2 and NP agreement, the heritage attritors have no problem with the former, but are comparable on the latter features. She points out that, rather surprisingly, violations of the V2 rule are also common among monolingual aphasics, who do not have a competing grammar that offers alternatives to this rule. Håkansson interprets her findings from the point of view of markedness. Her data are reinterpreted later by Platzack (1996) from a minimalist perspective.	
Ammerlaan, T. (1996). <i>You get a bit wobbly. Exploring bilingual lexical retrieval processes in the context of first language attrition</i> . Ph.D. dissertation, Katholieke Universiteit Nijmegen.	Ammerlaan 's PhD study investigates lexical accessibility among Dutch speakers in Australia. He conducts a series of lexical tasks (verbal fluency, picture naming and picture-word-matching) with 88 Dutch L1 speakers in order to test attrition processes as they relate to lexical access and retrieval. He finds that these processes are influenced by factors such as AoM and length of residence (LOR), but also by similarities between L1 and L2 items (in particular in the picture-word matching task, distractors that were based on English items were often chosen instead of the target). His conclusion is that, while access and retrieval to the L1 may become compromised to some extent after extended periods of residence in an L2 environment, these difficulties are temporal, not structural, and can be overcome. This is expressed in the quote from one of the participants who likens his knowledge of the native language to the skill of riding a bicycle: "you never forget it, but you get a bit wobbly" (cited on the title page). An report of this study is published in Ammerlaan (1997).	1b, 3a
Waas, M. (1996). <i>Language attrition downunder</i> . Frankfurt: Peter Lang.	Waas supplies the first monograph treatment of language attrition, presenting a socio- and ethnolinguistic investigation of the attrition of German among adult long-term migrants in Australia and the impact of affective variables on this process. In addition to a largely qualitative investigation of free speech she elicits data on language proficiency by means of a controlled task (verbal fluency) as well as by self-assessments, and investigates to what extent ethnic affiliation impacts on the attritional process. To this end, she divides her sample into two groups, Permanent Residents vs. Naturalized Citizens, subdivided into speakers with or without 'Ethnic affiliation' (ie., membership of a German club, church etc.). The attritors are outperformed by a monolingual German control group on both the controlled task and the self-assessments. No difference is found for the ethnic affiliation parameter on the controlled task, but people without such affiliations rate their own L1 skills lower. Waas concludes that "L1 attrition in an L2 environment is inevitable, even after a stay of only 10 to 20 years" and that "socio-demographic factors such as citizenship and (non-)affiliation have an impact on the extent of L1 attrition" (p. 171).	4b
Polinsky, M. American Russian: Language loss meets language acquisition. In W Browne, E. Dornisch, N. Kondrashova & D. Zed (eds.), <i>Annual workshop on formal approaches to Slavic linguistics: The Cornell meeting</i>	Polinsky 's work represents the beginning interest in heritage languages and how they differ from the language as spoken in the country of origin. In her earlier work (Polinsky, 1994) she presented investigations of the development of Eastern European and Asian languages in the US, the present study focusses on American Russian. Polinsky investigates the grammatical knowledge of 'semi-speakers' (attritors and heritage speakers) who arrived in the US before they had reached adulthood. She introduces a distinction that does not only take into account the order in which the languages have been acquired (L1 vs. L2) but also their role for the speaker (primary/dominant or secondary). Based	2c, 3c

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1995. Ann Arbor: Michigan Slavic, 370-406.	<p>on this latter distinction, she distinguishes Émigré Russian and American Russian, concluding that the latter, but not the former, is characterized by structural change, while both varieties use lexical borrowing (p. 372).</p> <p>Her analysis of the Russian data investigated here is based on speech from 19 American Russians with AoMs between 5 and 18 and one speaker who was born in the US. She describes a reduced system of case and verbal inflection, and points out that there is a correlation between grammatical variables as well as between grammatical and lexical change in her data. The paper ends with an analysis of the incidence of structural change and AoM, LOR and period of disuse.</p>	
Yağmur, K. (1997). <i>First language attrition among Turkish speakers in Sydney</i> . Tilburg: Tilburg University Press.	<p>In his PhD study, Yağmur builds on WAAS' (1996) work on the impact of affective variables, framing his investigation within the framework of Ethnolinguistic Vitality Theory (EVT, as formulated e.g. by Giles, Bourhis & Taylor, 1977). This framework allows a more sophisticated quantification of the affective and ethnolinguistic variables invoked in earlier investigations such as WAAS (1996) or JASPAERT & KROON (1989, 1991) in that it measures not only individual attitudes but also community-level factors such as language prestige and institutional support. Yağmur elicits data by means of several controlled tasks (verbal fluency, relativization) from Turkish speakers in Australia as well as from a control group. He also presents a largely qualitative investigation of spontaneous data elicited from the attritors by means of Frog Story retellings and compared to some earlier findings from Turkish monolinguals. Yağmur acknowledges earlier findings on the role of education for language attrition (as pointed out e.g. by WAAS and JASPAERT & KROON) by dividing both his experimental and his control population into high and low education subsamples of n=20 (total n=80). He finds that the attritors exhibit some reduction of L1 lexical accessibility and syntactic proficiency, and that attrition effects do not appear to be trade-offs with L2 proficiency (speakers with low levels of skills in L2 show more loss in L1 than more proficient L2ers) (p. 96). More highly educated attritors generally outperform migrants with lower education levels. EVT, however, does not provide a sufficiently explanatory framework for attrition (p. 100f.). A report of this study is published in Yağmur, de Bot & Korzilius (1999).</p>	4b
Köpke, B. 1999. <i>L'attrition de la première langue chez le bilingue tardif: Implications pour l'étude psycholinguistique du bilinguisme</i> . PhD dissertation, Université de Toulouse-Le Mirail.	<p>Köpke presents a psycholinguistic investigation of L1 German attritors in two different linguistic settings, an L2 English environment (Canada) and in France. She investigates attrition at various linguistic levels (lexical and morphosyntactic), asking to what extent the attritional process can be deemed to have affected underlying knowledge as opposed to being a performance phenomenon, and what the impact of typological (dis)similarity in the contact languages is. Based on three tasks (picture description, sentence generation and grammaticality judgment) she concludes that in late bilinguals, attrition is confined to the level of access in production and does not affect underlying knowledge. She finds the lexicon to be more affected by attrition than morphosyntax, and the crosslinguistic similarity of languages to be a determining factor. There is considerable variation between her two bilingual populations, which she accounts for by sociolinguistic factors. Reports on this study are published in Köpke (2000; 2001) and Köpke & Nesporoush (2001).</p>	1b
Gross, S. (2000). <i>The role of</i>	<p>This is one of a series of PhD investigations, conducted at the University of South Carolina under the</p>	1c

Study	Findings	Strand
<i>abstract lexical structure in first language attrition: Germans in America.</i> Ph.D. dissertation, University of South Carolina.	supervision of Carol Myers-Scotton and applying her 4-M model to language contact and change (Myers-Scotton & Jake, 2000, based in turn on Levelt's (1989) Speaking model) to incomplete acquisition and attrition in migrant children of Hungarian (Bolonyai, 1999) and Russian (Schmitt, 2001; 2004) as well as to attritors of German in Gross 's investigation. The 4-M model predicts a hierarchy in vulnerability to processes of change, loss and attrition such that content morphemes (lemmas) will be affected first, followed by early system morpheme lemmas (such as determiners), which are indirectly elected by the content morpheme. Late system morphemes are structurally assigned and least vulnerable to processes of change and attrition. A report of this study is published in Gross (2004).	
<i>Language loss and language processing. three generations of Dutch migrants in New Zealand.</i> PhD dissertation, Katholieke Universiteit Nijmegen.	Hulsen continues the research strand started in AMMERLAAN (1996), investigating lexical access among New Zealand Dutch. Invoking speakers of three generations, she attempts to assess the impact of L1 use within a Social Networks framework. Her findings show that while productive skills decrease within generations, receptive skills remain largely unchanged. She argues that the difficulties encountered by attritors are retrieval problems, and do not constitute 'loss' in the sense of being 'erased from memory' (p. 188). The use of Dutch within a speaker's primary social network is a powerful predictor for the retention of the L1. An report of the study is published in Hulsen, de Bot & Weltens (2002).	3a, 4a
<i>Linguistic characteristics of second language acquisition and first language attrition: Turkish overt versus null pronouns.</i> Ph.D. dissertation, McGill University, Montreal, Canada.	Gürel assesses bilingual development from the perspective of the Government and Binding framework. Her PhD thesis investigates Turkish pronouns in L2 acquisition by native speakers of English and L1 attrition in Turks immersed in an L2 English environment. Through a series of tasks (written interpretation, truth value judgment, picture identification) she assesses to what extent the binding properties of the Turkish overt and null pronouns have been acquired/retained in her populations. She finds evidence that for both her attritors and her L2ers the binding properties of Turkish overt pronouns are being replaced by those of English (p. 179) which she interprets as evidence for selective transfer effects in ultimate L2 and L1 grammars (p. 191). In two later articles, Gürel (2004a, 2004b) reassesses her findings from a variety of perspectives, including the psycholinguistic framework of the Activation Threshold Hypothesis (Paradis, 1993). In Gürel & Yilmaz (2011) data elicited by means of the same test battery from first and second generation Turkish-Dutch bilinguals are assessed, and similar patterns of attrition and restructuring are found. An analysis of a similar grammatical property and its bilingual acquisition as well as L1 attrition in Korean is presented by Kim, Montrul & Yoon (2010), who use a truth value judgment task modelled on the one developed for Gürel 's study. They find that early bilinguals are similar to L2 learners, while there are no signs of attrition among the late bilinguals.	1a, 1b, 3d
<i>Incomplete acquisition and attrition of Spanish tense/aspect distinctions in adult bilinguals.</i> <i>Bilingualism: Language and Cognition</i> 5.1, 39-	In the first of a series of pioneering contributions on incomplete acquisition and attrition of Spanish in the US (in particular also Montrul, 2004; 2008), Montrul approaches the phenomenon of the impact of the L2/dominant language on the L1/heritage language from the point of view of generative linguistics theory. She argues for a substantial difference in ultimate attainment based on age of onset: while sequential and, in particular, late bilinguals have a L1 mental grammar that shows little evidence	2c, 1a

Study	Findings	Strand
68.	<p>of erosion in comparison with an unattrited reference population, simultaneous and early bilinguals are more similar to L2ers, in particular where functional categories are concerned. The earlier the age of onset of bilingualism and the more intense the exposure to the sociolinguistically dominant language, the more incomplete the adult grammar may turn out to be. She concludes that an early age of onset may be a necessary but not a sufficient condition for convergent language acquisition (p. 61).</p> <p>Schmid approaches the question of attitudes and motivation in L1 attrition previously investigated by, among others, WAAS (1996) and YAĞMUR (1997). Her data are drawn from a corpus of Oral History interviews conducted with German-Jewish refugees who escaped Nazi persecution in the 1930s and settled in English-speaking countries. She situates her analysis within the historical framework of progressive radicalization of persecution measures and assesses to what extent the L1 attrition of speakers who emigrated during three clearly delineated periods differs. Her analysis of free speech data comprises both an assessment of errors and of target-like language use. She concludes that, in her sample, persecution appears to be the most important predictor for attrition effects (p. 189). A summary of this study is published in Schmid (2004).</p>	4b
Cook, V. (ed). 2003. <i>Effects of the second language on the first.</i> Clevedon: Multilingual Matters.	<p>In this volume, Cook introduces a perspective on language attrition from his framework of multicompetence, pioneering the view that attrition is not an exotic and rare phenomenon exhibited by speakers under extreme circumstances (long-term separation from the language environment with little intervening use), but a natural linguistic development common to all bilingual language users. His approach thus differs from earlier investigations of L1 attrition in that he does not assume long-term residence in an L2 environment as a necessary condition under which L2 effects on the L1 can occur. He posits that “the first language of people who know other languages differs from that of their monolingual peers in diverse ways” (p. 1) in that all languages residing within the same mind “must form a language super-system at some level rather than be completely isolated systems” (p. 2). The investigations collected in this volume thus comprise both studies carried out within the ‘traditional’ attrition settings of migrants immersed in an L2 environment (Jarvis; Laufer; Pavlenko; Porte), early bilingual populations (Balcom; Murphy & Pine) and studies of instructed L2 learners in their country of origin (Cenoz; Dewaele & Pavlenko; Cook, Iarossi, Stellakis & Tokumaru). From the lexicon through syntax to pragmatics, all linguistic levels are touched upon.</p>	1e
Dussias, P. E. (2004). Parsing a first language like a second: The erosion of L1 parsing strategies in Spanish-English bilinguals. <i>International Journal of Bilingualism</i> 8.3, 355-371.	<p>The investigations that Dussias presents here and in Dussias & Sagarrá (2007) constitute the first neurocognitive analyses of L1 attrition. By means of an eye-tracking investigation of participants reading Spanish sentences containing embedded relative clauses, it is demonstrated that language-specific preferences for relative clause attachment are vulnerable to crosslinguistic interference: while Spanish monolinguals favour high attachment, Spanish-English bilinguals are similar to English monolinguals in that they come to prefer low attachment, even after a relatively short immersion period.</p>	1b, 3d
Mennen, I. 2004. Bi-directional interference in the intonation of Dutch speakers of Greek.	<p>If investigations of phonetic L1 attrition are scarce, studies considering suprasegmentals are almost unheard of. Mennen presents the first of only two reports that investigate this phenomenon (the second is de Leeuw, Mennen & Scobbie, 2012). She studies the production of peak alignment among five</p>	3e

Study	Findings	Strand
<i>Journal of Phonetics</i> 32, 543-563.	Dutch-Greek bilinguals and finds that four of them show evidence of crosslinguisitic interference in both their L1 and their L2, while a fifth speaker (who was younger than the others at migration) appears to be exempt. Similar interpersonal variation is found in de Leeuw et al. (2012) where one of the ten German-English bilinguals shows no sign of attrition in L1 German. It thus appears that susceptibility to phonetic attrition may vary considerably among individuals.	
Pavlenko, A. 2004. L2 influence and L1 attrition in adult bilingualism. In M. S. Schmid, B. Köpke, M. Keijzer & L. Weilemar (eds.), <i>First language attrition: Interdisciplinary perspectives on methodological issues</i> . Amsterdam: John Benjamins, pp. 47-59.	This is one of a series of papers in which Pavlenko investigates the question of transfer from L2 to L1 (see also Pavlenko, 2003; 2010; Pavlenko & Jarvis, 2002, among others). The population under investigation are Russian college students in the US and in Russia. She focusses her analysis on particular semantic fields – in the present study, these are emotion terms; in the 2010 paper, she focusses on verbs of motion – and the way in which an entire field may show a certain extent of restructuring in an intensive language contact situation. This restructuring may be semantic in nature – for example, the English term <i>privacy</i> , which has no clear Russian equivalent, is discussed – but it may also concern the way in which an event is framed and conceptualized. In the present paper, a typology of language contact and attrition phenomena is introduced, which SCHMID (2011a) develops and recommends as a highly suitable taxonomy for attrition studies at large.	3b
Scherag, A., L. Demuth, F. Rösler, H. J. Neville & B. Röder (2004). The effects of late acquisition of L2 and the consequences of immigration on L1 for semantic and morpho-syntactic language aspects. <i>Cognition</i> 93, B97-B108.	Scherag et al. present a psycholinguistic investigation of German L1 attrition and L2 acquisition using a priming paradigm to assess grammatical gender and semantic congruency effects. They study L1 speakers who are either short term or long term residents in the US, L1 speakers of English who are long-term residents in Germany, and a German control group. Their findings show that while all groups benefit from semantic priming, morphosyntactic priming is absent for the late learners of German, but does not seem to be affected by L1 attrition, as all three German native groups show processing gains from both semantic and morpho-syntactic congruency.	1b, 3c
Schmid, Köpke, Keijzer & Weilemar (eds.) (2004). <i>First language attrition: Interdisciplinary perspectives on methodological issues</i> . Amsterdam/Philadelphia: John Benjamins	This collection is a conference volume, comprising contributions presented at the first <i>International Conference on First Language Attrition</i> (ICFLA) in Amsterdam in 2002. The overall focus of the volume is on establishing a common methodological framework for future studies in attrition. The introduction by Köpke & Schmid, giving a historical overview of the field to date, and the annotated bibliography by Schmid can to some extent be considered precursors for the present timeline. The volume is further structured into three parts: the first section focusses on theoretical models and methodological aspects, with considerations of how to define (Pavlenko) and measure (Altenberg & Vago) attrition, as well as its embedding in sociocultural theory (Jiménez Jiménez) and frameworks of language dominance and emotions (Dewaele). The second part introduces a number of largely descriptive studies, while the third part assesses how such studies may be used in the building and validation of linguistic theories. The volume concludes with a tentative outline of the Language Attrition Test Battery (which is further developed in SCHMID, 2011a).	5, 6
Tsimpli, I., A. Sorace, C. Heycock & F. Filiaci, F. (2004). First language attrition and	Tsimpli et al. 's investigation of the production and interpretation of null and overt pronouns in the L1 (Greek and Italian) of very advanced L2 speakers of English introduces the study of attrition from the perspective of linguistic interfaces, testing the hypothesis that “the changes in L1 syntax will be	1a, 3d

Study	Findings	Strand
<p>syntactic subjects: A study of Greek and Italian near-native speakers of English. <i>International Journal of Bilingualism</i> 8.3, 257-277.</p> <p>Keijzer, M. (2007). <i>Last in first out? An investigation of the regression hypothesis in Dutch migrants in Anglophone Canada</i>. PhD dissertation, VU University Amsterdam (published in 2010 under the title <i>First language acquisition and first language attrition: Parallels and divergences</i>, Saarbrücken: LAP Lambert Academic Publishing)</p> <p>Köpke, B., M. S. Schmid, M. Keijzer & S. Dostert (eds) (2007). <i>Language attrition: Theoretical perspectives</i>. Amsterdam/Philadelphia: John Benjamins.</p>	<p>restricted to the interface with the conceptual/intentional cognitive system" (p. 257, see also Sorace, 2005; Tsimpli, 2007). They conclude that their data support the hypothesis that attrition does not affect purely formal, uninterpretable features, but does show up on syntactic/pragmatic, interpretable features (p. 274).</p>	1d
<p>Levy, B. J., N. D. McVeigh, A. Marful & M. C. Anderson (2007). Inhibiting your native language. The role of retrieval-induced forgetting during second-language acquisition. <i>Psychological Science</i> 18.1, 29-34.</p>	<p>This volume, based largely on the contributions and presentations from the second <i>International Conference of First Language Attrition</i> (Amsterdam, 2005) is an attempt to integrate the study of language attrition into the mainstream of bilingualism research. A number of theoretically oriented contributions from predominant researchers in the field approach the topic from a variety of perspectives, such as psycho- and neurolinguistics (Gürel, Köpke, Paradis, Pallier), the MOGUL framework which combines Jackendorf's model of the language faculty with a developmental perspective (Sharwood Smith), Dynamic Systems Theory (de Bot) and the Interface Hypothesis (Tsimpli). The predictions and claims made here are put to the test in research reports, such as Schmid's investigation of the impact of the use of the L1 on attrition (formulated within the framework of Paradis' (1993) Activation Threshold Hypothesis) and Footnick's case study on the reactivation of a 'lost' language by means of hypnosis.</p>	1
<p>Kim, S. H. O. & D. Starks (2008). The role of emotions in</p>	<p>This study investigates problems of L1 lexical access under conditions of second language learning (retrieval-induced forgetting) through a picture naming task, with items to be named in either English or Spanish, depending on a color cue, administered to English native speakers engaged in learning Spanish at the University of Oregon. Levy et al.'s findings show that participants who are less fluent in Spanish have problems accessing the English form of items that they had previously named several times in Spanish, but that there is no such inhibition effect among more fluent speakers. They conclude that "native-language words are most vulnerable to forgetting when people struggle to produce foreign vocabulary, as might occur to novices during immersion", but that this inhibition effect is limited to phonology and does not affect the semantic level (p. 33).</p>	1b
	<p>Kim & Stark attempt to assess the developing patterns of L1 and L2 proficiency among late Korean-English bilinguals in New Zealand in the context of emotion-related language choice (ERLC). To this</p>	4a, 4b

Study	Findings	Strand
L1 attrition: The case of Korean-English late bilinguals in New Zealand. <i>International Journal of Bilingualism</i> 12.4, 303-319.	end, they relate self-reported data on language choice in a variety of situations to accuracy, fluency, complexity and lexical diversity in an L1 story-retelling task. They find a difference between their experimental and control population on accuracy and lexical diversity, but not on fluency or complexity (p. 308). The participants exhibit a continued preference for their L1 in most situations related to emotions, with the exception of language use ‘when angry’ (confirming the findings reported e.g by Dewaele, 2004). There furthermore appears to be a substantial correlation between accuracy in L1 on the one hand and preference for this language in a variety of emotionally-laden contexts on the other, suggesting that “as late bilinguals gain confidence in fluency in the L2, they lose confidence in using the L1 due to their decreasing L1 accuracy” (p. 315).	
Bylund Spångberg, E. 2009. <i>Age differences in first language attrition</i> . PhD dissertation, Stockholm University.	This PhD thesis consists of four articles published separately (Bylund 2009a, 2009b, Bylund et al., 2010, Hyltenstam et al., 2009), reporting a series of tests on Spanish-Swedish bilinguals. The focus of the study is on the impact of age of migration on L1 attrition, and Bylund finds that there is a great deal more variability in the retention or attrition of the L1 Spanish among speakers for whom this took place before the onset of puberty. This variability is related to a general aptitude for language learning for pre- but not for post-puberty migrants. The overall findings are interpreted within a Critical Period account of second language acquisition and L1 attrition and argued to be consistent with the existence of maturational constraints in bilingual development.	2b
Linck, J. A., J. F. Kroll & G. Sunderman (2009). Losing access to the native language while immersed in a second language: Evidence for the role of inhibition in second-language learning. <i>Psychological Science</i> 20.12, 1507-1515.	This study builds on the investigation of the impact of inhibition on L1 access by LEVY ET AL. (2007) by comparing two populations of L2 learners of Spanish at similar levels of proficiency: one which was immersed in a Spanish-speaking environment (in a study abroad setting), the other comprised classroom learners in the native English environment. The tasks consists of a verbal fluency task and an experiment where the participant has to determine whether a given English word is the correct translation of a Spanish item. The latter task contained English distractor items that were similar to the Spanish item in either form or meaning. Linck, Kroll & Sunderman ’s findings suggest “that access to the L1 is attenuated during language immersion. In both comprehension and production, the L1 was less accessible for the immersed learners than for the classroom learners.” (p. 1512).	1b
Schmid, M. S. & M. Keijzer (2009). First language attrition and reversion among older migrants. <i>International Journal of the Sociology of Language</i> 200, 83-101.	Schmid & Keijzer set out to test the reversion hypothesis proposed by DE BOT & CLYNE (1989) which proposes that elderly migrants show a tendency to regress in terms of their L2 proficiency, even if they have used this language predominantly for decades, and to return to their L1. In order to assess the L1 skills of long-term elderly migrants, they test lexical diversity, fluency and performance on a verbal fluency task among five different age groups. They find that the performance of the oldest groups of migrants is less different from their monolingual age-matched peers than that of the younger groups, but ascribe this to a more marked decline with age among the monolinguals. In essence, these controls appear to be ‘catching up’ with the attriters in terms of lexical access and disfluency problems. Schmid & Keijzer ascribe this to the effect of cognitive decline with aging against which long-term bilinguals might to some extent be protected (as suggested by e.g. Bialystok et al. 2004).	4c
Schmid, M. S. (2009). On L1 attrition and the linguistic	In this article, Schmid proposes that the study of L1 attrition may provide a useful approach in resolving controversial issues in L2 acquisition studies, such as the question of whether advanced late	2b

Study	Findings	Strand
system. <i>EUROSLA Yearbook</i> 9, 212-244.	L2 learners retain a representational deficit. She presents an investigation of a group of 'typical' L1 attritors of German (long-term residents in Anglophone Canada and the Netherlands who emigrated voluntarily after World War II). Against this backdrop, she assesses data from a very strongly attrited L1 speaker of German (the most severe case of attrition that had emerged among the German-Jewish refugees investigated in SCHMID, 2002) and from a highly successful L2 learner of German with English L1. She concludes that, in particular on those features where L1 and L2 are structurally different, the attriting population in general and the individual case in particular still retain a strong resemblance to the unattrited control population, while the L2 learner of German appears qualitatively different. This is interpreted as evidence for a representational deficit in L2 learning.	
Celata, C. & J. Cancila (2010). Phonological attrition and the perception of geminate consonants in the Lucchese community of San Francisco (CA) <i>International Journal of Bilingualism</i> 14.2, 185-209.	This study, arguably the only investigation to date that considers attrition on the phonological (as opposed to the phonetic) level, investigates the perception of a phonemic contrast present in the L1 but not in the L2, namely that of singleton and geminate consonants in the Lucchese dialect of Italian among long-term migrants and second-generation speakers in the San Francisco area. They perform two phoneme identification tasks and show that the bilingual speakers are clearly outperformed by the unattrited native speakers. Furthermore, there is a marked distinction between first and second generation speakers, with the former achieving higher scores on the identification task than the latter. They conclude that the perception of this phonological feature is becoming progressively impaired in the bilingual populations.	3e
De Leeuw, E., M. S. Schmid & I. Mennen (2010). Perception of foreign accent in native speech. <i>Bilingualism: Language and Cognition</i> 13.1, 33-40.	de Leeuw et al. present the outcomes of a Foreign Accent Rating experiment in which 19 native speakers of German listen to short excerpts of free speech collected from long-term German migrants in an L2 English and Dutch setting as well as from an unattrited control group. The raters assess whether or not each speaker is a native German, and also indicate how confident they are in their judgment. The results indicate that the attritors are more likely not to be perceived as native speakers than the controls. It is further shown that the amount of informal use of the L1 (with friends and family) do not impact on the degree of perceived foreign accent, but that speakers who use this language for professional purposes (ie., in formal contexts) are less likely to be perceived as foreigners.	3e
Kim, S. H. O. & D. Starks (2010). The role of fathers in language maintenance and language attrition: the case of Korean-English late bilinguals in New Zealand. <i>International Journal of Bilingual Education and Bilingualism</i> , 13.3, 285-301.	Based on the same corpus as the one analysed in KIM & STARK (2008), the authors present an intriguing analysis of the role of the home language for the attrition or maintenance of the L1. They demonstrate that these speakers are significantly less accurate in their L1 than a population of 12-year old monolingual Koreans. While the L1 used by the mother of the participants, who emigrated from Korea to New Zealand around age 12, is not related to their current L1 proficiency, language use with the father and the siblings does have an impact. These results are ascribed to the types of interaction within the family setting.	4a
Major, R. C. (2010). First language attrition in foreign accent perception. <i>International</i>	Major presents an intriguing new approach to language attrition: instead of assessing, as he did in his earlier work (e.g. MAJOR, 1992), to what extent attritors may develop a foreign accent in their L1 he employs attritors and L2 learners of Brazilian Portuguese as well as unattrited controls and speakers	2e

Study	Findings	Strand
<i>Journal of Bilingualism</i> 14.2, 163-183.	with no experience of Portuguese as raters in a foreign accent detection experiment. Surprisingly, all his populations including the speakers with no knowledge of Portuguese, are able to reliably differentiate native and non-native speakers of that language, and there appears to be no attrition in the ability to perceive a foreign accent in the L1 among the long-term US residents with Portuguese L1.	
Ribbert, A. & F. Kuiken (2010). L2-induced changes in the L1 of Germans living in the Netherlands. <i>Bilingualism: Language and Cognition</i> 13.1, 41-48.	This study focusses on a phenomenon in which there are only minor differences between the L1 (German) and the L2 (Dutch) of the speakers, namely infinitival constructions using the complementizer <i>um/om</i> which exist in both languages but have a somewhat wider distribution in Dutch. By means of a grammaticality judgment task, Ribbert & Kuiken establish that Germans immersed in an L2 Dutch environment have trouble recognising the grammaticality of the use of this complementizer in German sentences, especially in cases where <i>um</i> is ungrammatical in German but optional in Dutch.	3c
Schmid, M. S & K. Beers Fägersten (2010). Fluency and language attrition. <i>Language Learning</i> 60.4, 753-791.	This study tests the assumption that the attenuation of lexical access that has often been witnessed in the attritional process will lead to an increase in disfluency markers. Schmid & Beers Fägersten analyse free spoken data from German and Dutch L1 attriters and conclude that disfluency markers indicating cognitive hesitation processes do indeed increase, in particular preceding lexical items. Disfluency markers with a semantic function show an adaptation to the distribution in the L2.	3a
Schmid, M. S. & E. Dusseldorp (2010). Quantitative analyses in a multivariate study of language attrition: The impact of extralinguistic factors. <i>Second Language Research</i> 26.1, 125-160.	In this paper, Schmid & Dusseldorp approach the problem of investigating the impact of external sociolinguistic and attitudinal variables on the attritional process. They acknowledge that the number and variety of factors that can be assumed to play a role in language retention or attrition makes their assessment difficult in applied investigations using real (free or elicited) linguistic data, as opposed to surveys based on self-evaluations, due to the necessarily limited sample size. Based on an investigation of German L1 attrition in a Dutch- and English-speaking environment, they demonstrate how to reduce predictors by presenting a model of combining factors and assessing their impact in a linear regression model. They conclude that in the present data, the impact of such factors is largely negligible, as the only factor they find consistently influencing the outcome is the use of the L1 in the workplace. Furthermore, LOR has some impact on lexical diversity. L1 use in informal situations (with friends and family) plays a very small and largely inconsistent role for the different measures, and attitudinal factors have no impact at all. Errors and disfluency measures (the measures most often studied in attrition research) show no relationship to any of the external variables.	5b
Stolberg, D. & A. Münch (2010). “Die Muttersprache vergisst man nicht” – or do you? A case study in L1 attrition and its (partial) reversal. <i>Bilingualism: Language and Cognition</i> 13.1, 19-31.	In a longitudinal case-study, Stolberg & Münch assess the initial attrition and partial recovery of L1 German in a long-term migrant who had virtually no exposure to her L1 for close to fifty years until the beginning of the study in 2000. Regular conversations in German were held with her every two to three months over a four-year period. The results show that over this period, the speech of the participant becomes more fluent and deviations from the target norm decrease, in particular in the lexical-semantic domain. Syntactic and morphological deviations are more variable and show a less marked decrease over time.	4a
Pavlenko, A. & B. C. Malt (2011). Kitchen Russian: Cross-	This study probes into the intriguing question of crosslinguistic differences in categorization and their vulnerability to cross-linguistic influence. Based on the premise that English and Russian base	3b

Study	Findings	Strand
linguistic differences and first-language object naming by Russian–English bilinguals. <i>Bilingualism: Language and Cognition</i> 14.1, 19-45.	categorization of household objects such as containers from which to drink on different features (shape, material, purpose etc.), Pavlenko & Malt conduct a classification task of 60 pictures of more or less typical household objects. Participants are grouped according to the age of onset of bilingualism (simultaneous, early and late) and the findings are compared to responses from two monolingual (English and Russian) reference groups. The authors conclude that “naming patterns for [...] common objects in one language can be swayed by exposure to patterns in another” (p. 39) and that this process is influenced by age of onset.	
Perpiñán, S. (2011). Optionality in bilingual native grammars. <i>Language, Interaction and Acquisition</i> 2.2, 312-341.	Perpiñán investigates subject-verb inversion in adult Spanish L1 attrition in the United States. She focusses on two types of construction: relative clauses, in which inversion is governed by extra-syntactic conditions and matrix questions, where it is obligatory. Her findings are in accord with the Interface Hypothesis (e.g. TSIMPLI ET AL., 2004) in that obligatory inversion is unaffected by attrition, while pragmatic/phonologically governed inversion has changed among the attriters.	1a, 3c
Schmid, M. S. (2011a). <i>Language attrition</i> . Cambridge University Press.	This is the first textbook devoted to language attrition, providing an introduction to the way in which attrition can affect the L1, as well as to the extra- and sociolinguistic features involved. It also familiarizes the reader with experimental approaches to attrition and data analysis techniques and provides hands-on guidelines on how to apply them.	6
Yilmaz, G. (2011). Complex embeddings in free speech production among late Turkish–Dutch bilinguals. <i>Language, Interaction and Acquisition</i> 2.2, 251-275.	Yilmaz approaches the question of the attrition and retention of complex embedding structures previously tested by YAĞMUR (1997). Her analysis is based on free spoken data produced by long-term Turkish migrants in the Netherlands. Applying the markedness hierarchy of different embedding strategies proposed in earlier studies on Turkish, she finds that relativization is not reduced overall, but that attriters tend to make slightly less use of the most marked of these structures (postpositional clauses) as compared to an unattrited control population.	3c
Chang, C. E. (2012). Rapid and multifaceted effects of second-language learning on first-language speech production. <i>Journal of Phonetics</i> 40, 249-268.	This study provides evidence for the assumption that language attrition is not a phenomenon confined to speakers in long-term immersion contexts: Chang investigates novice L2 learners of Korean with English L1, and finds that even after only six weeks of intensive instruction in that language at a South Korean university, their L1 speech has become acoustically assimilated to the L2 on segmental, subsegmental, and global levels. He concludes that “cross-language linkages are established from the onset of second-language learning at multiple levels of phonological structure, allowing for pervasive influence of second-language experience on first-language representations” (p. 249).	3e
Mayr, R., S. Price & I. Mennen (2012). First language attrition in the speech of Dutch–English bilinguals: The case of monozygotic twin sisters. <i>Bilingualism: Language and Cognition</i> , 15.4, 687-700.	This study presents an extensive investigation of changes in the phonetic space of a long-term L1 Dutch migrant in the United Kingdom. In order to assess changes to her vowel-system and to her production of initial plosives, controlled production (word list reading) is compared to the production of her identical twin sister (who has always lived in the Netherlands) on the same task. In this way, individual features pertaining to the articulatory apparatus, as well as social and neurological factors, are kept maximally similar between the experimental and the control subject. Mayr et al. conclude that both for VOT and for the structure of the vowel space, the experimental subject shows evidence of an assimilation to the L2 system.	3e
Cherciov, M. (2013).	This paper is one of a series of studies applying the relatively recent framework of Dynamic Systems	1e

Study	Findings	Strand
Investigating the impact of <i>attitude</i> on first language attrition and second language acquisition from a Dynamic Systems Theory perspective. <i>International Journal of Bilingualism</i> 17:6	Theory (DST, see also DE LEEUW, 2013; de Bot, 2007; OPITZ, 2013) to language attrition. Cherciov investigates the role of attitude on the L2 development and L1 attrition among Romanian migrants in the Toronto area. She points out that, from a DST point of view, such analyses are not straightforward as the interaction of factors in a DS are characterized by properties such as non-linearity, interdependence and complexity, and can thus not easily be predicted or measured. This is underlined by her analysis: while the group analyses reveal little predictive power of the measures of language use and attitude on the outcome variables, a discussion of the more complex features of these measures, as revealed in a quantitative interview, shows how various feelings (a desire to integrate, the wish to impart the L1 to the next generation, changing identities and identification, and so on) can conflict and interact. Individual migrants may respond in different ways to the complex situations they find themselves in, and this may account for the different patterns found in attrition studies, and the failure of linear, group-based statistical measures to yield explanatory power. This article is a report on the author's PhD thesis (Cherciov, 2011)	
de Leeuw, E., I. Mennen & J. M. Scobbie. (2013). Dynamic systems, maturational constraints and L1 phonetic attrition. <i>International Journal of Bilingualism</i> 17:6	In this paper, de Leeuw, Mennen & Scobbie present a re-analysis from a DST perspective of the data from de Leeuw's (2007) PhD thesis. This study investigated the lateral phoneme /l/ in the L1 and L2 of long-term German migrants in the Vancouver area, revealing L1 attrition at the group level as well as a great deal of variation between and within speakers. The authors address the long-standing problem in attrition research of how to define 'loss' and whether or not it can be assumed to be permanent. They argue that language development should not be viewed as "semi-static", that is, as being determined by maturational constraints and having discrete states such as a "final state" and "fossilization", but as "a complex process that continues throughout life" (pp. 15f.). This view entails the expectation for "language development to progress continuously, variably, and at different rates for different speakers".	1e, 3e
Hopp, H. & M. S. Schmid (2013). Perceived foreign accent in first language attrition and second language acquisition: The impact of age of acquisition and bilingualism. <i>Applied Psycholinguistics</i> 34.2, 361-394.	Hopp & Schmid investigate to what extent a perceived foreign accent can be ascribed to age of onset vs. the bilingual experience. To this end they compare late German-English/German Dutch and highly advanced late English-German/Dutch-German bilinguals on how native-like they are perceived to be by native speakers of German. They find that, while at group level, the attriters are more similar to the controls than the L2ers, the two bilingual populations overlap considerably. In particular, a substantial proportion of the L2ers are rated within the range delimited by the attriters. Extralinguistic factors, such as the frequency of use of German in daily life, have no predictive power for the attriters but do impact on perceived accentedness for the L2ers, and the amount of time spent in a German environment correlates with the degree of perceived accent for both populations.	2b, 3e
Opitz, C. (2013). A dynamic perspective on late bilinguals' linguistic development in an L2 environment. <i>International Journal of Bilingualism</i> 17:6	Opitz presents an investigation of German L1 and English L2 in long-term German migrants in Ireland. She finds that many of her participants are highly successful second language learners, performing within the reference group on a range of variables. For individual variables (C-Test, verbal fluency, free speech measures) there is no difference between the attriting group and the German control population; however, when a compound measure of all these variables is calculated, attrition effects to become visible. These are impacted on by a number of the external variables, such as LOR,	1e

Study	Findings	Strand
Yilmaz, G. & M. S. Schmid (2013). L1 accessibility among Turkish-Dutch bilinguals. <i>The Mental Lexicon</i> 7.3, 249-274.	<p>nationality, use of German and attitudes. Opitz further discusses two case studies in detail, illustrating the complex, dynamic interaction of factors across a long period of residence. This article is a report on the author's PhD thesis (Opitz, 2011)</p> <p>This study of lexical access among long-term Turkish residents in the Netherlands compares controlled production in a Picture Naming Task and lexical diversity and fluency in free speech within the framework of the Activation Threshold Hypothesis (Paradis, 1993). Yilmaz and Schmid's findings show that the attritors use a smaller vocabulary of more frequent items and hesitate more in free speech than the monolingual controls, but that their performance (speed and accuracy) on the naming task is unimpaired. An analysis of extralinguistic variables (frequency of use of L1, attitudes towards both L1 and L2) finds no significant correlations between these factors and the lexical and fluency features on which the participants appear to have attrited. The authors thus ascribe the reduction in lexical diversity and increase in hesitation markers not so much to "the process that is commonly understood to underlie attrition (a decline associated with lack of practice, i.e. a kind of 'atrophy') and more to a simple bilingualism effect: when there is more information to choose from, it takes longer to find it." (p. 268).</p>	3a

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