The impact of age and exposure on forgetting and retention of the birth language in international adoptees: a perspective from Holocaust survivors

Auxiliary title: Birth language attrition in international adoptees

Abstract

This paper addresses the long-term effects of being exposed to a language early in life for a limited period of time, as is the case in international adoptees. Recent findings are divided as to whether such a situation will lead to *sequential monolingualism*, or whether such speakers do remain bilingual to some extent, although they cannot readily access their vestigial L1 knowledge. These questions have important implications for questions about the Critical Period, but are difficult to resolve as international adoption typically takes place before puberty. The present paper investigates L1 and L2 proficiency among German Jewish Holocaust survivors. Between 1938 and 1939, 10,000 children between the ages of 2 and 17 were brought to England by charity organisations and placed with English-speaking foster families (*Kindertransporte*). In the same period of time, an unreported number of children of the same age range escaped to English-speaking countries in the company of family members. The results suggest that age plays a more important role than context in both L1 and L2 development.
(170 words)

Keywords: Language attrition; Critical period; International adoption

Introduction

One of the greatest explanatory challenges for linguistic research concerns ultimate attainment in languages learned from birth versus later in life: Whereas all normally developing children attain full native language proficiency, there is considerable variability in the endstate of the acquisitional process among older learners of a second language (L2). There are two competing views on this age effect: The first one takes residual optionality to be an indication of an underlying representational deficit conditioned by maturationally constrained limitations to language acquisition (the so called 'Critical Period Hypothesis', e.g. DeKeyser, 2010, Abrahamsson & Hyltenstam, 2009; Hawkins, 2003). The second approach assumes that L2 learners can establish native-like underlying knowledge, but that second language learning is impeded by the fact that the brain cannot be re-initiated to its original, 'naïve' state. On this view, L2 processing and use are hampered by competition from the first language (L1) system, and it is the increasing entrenchment of this system that accounts for the correlation between age at onset (AaO) and ultimate proficiency (Bialystok, 1997, 2001; Herschensohn, 2009, Prévost & White, 2000). These two scenarios have important implications for our understanding of the human capacity for language and in particular the degree to which the brain is specialised for language and its acquisition.

There is, however, a second aspect to language development related not so much to the age at which exposure to a language *begins*, but to the age at which it *ceases*. This concerns the effect which early exposure to a language may have later in life, for example when adult speakers attempt to re-learn a language they spoke or overheard in childhood. Some investigations of this phenomenon suggest a persistent facilitatory effect for specific linguistic processes, such as phonetic discrimination, even for infant overhearers or speakers who were only exposed to a language for the first two years of their lives (Au, Knightly, Jun & Oh,

2002; Au, Oh, Knightly, Jun & Romo, 2008; Oh, Jun, Knightly & Au, 2003; Tees & Weker, 1984). There are even individual reported cases of apparently entirely forgotten languages re-emerging under hypnosis (As, 1962; Fromm, 1970; Dan Slobin, p.c.).

While these accounts may be treated as an interesting basis for speculation and further investigation, they cannot in themselves be taken as hard evidence, due to methodological limitations. These predominantly concern the measurement (or lack thereof) of the amount of input which the speakers had received beyond infancy and the proficiency levels they had attained while they were still exposed to the language in question. In the Tees & Weker study, it is merely briefly reported that the subjects (low-proficiency students of Hindi as an L2 at the University of British Columbia) claimed to have been exposed to this language until they were about two years old, but not beyond that. In the absence of more detailed information on the family and language learning background of these speakers, such relatively vague statements cannot serve as a basis for generalizations of the beneficial effects of early input followed by the cessation thereof, and similar caveats apply to the two hypnosis case studies.

This point is underscored by Footnick (2007) who also conducts a case-study on the possibility of re-activating a forgotten L1 through hypnosis. She investigates a young man who was born and spent most of his life in France, but was exposed to a variety of Ewe during childhood when he lived in Togo with his mother for ca. 3 years. Upon their return to France (when he was six years old), his mother was advised by the boy's teacher to use only French with her son, and at the time of the study he claimed to be unable to understand anything but the most basic words of Ewe. After a few hypnosis sessions, the speaker was able to recover a substantial amount and even retain this knowledge out of hypnosis. Footnick ascribes this suprising effect to the fact that the speaker had, in fact, continued to overhear Ewe regularly at family gatherings, but had been told not to use it and so built up a mental 'block' against the language which the hypnosis had removed. To what extent the speakers tested in the other

studies named above might also have retained such minimal input cannot be ascertained. It therefore is vital for any investigation of the long-term effects of early exposure to a language to obtain detailed and accurate information on the amount of input which the childhood overhearers had received at what ages.

Age at onset and language replacement: the case of international adoptees

In recent years, a number of quantitative studies have attempted to investigate the long-term effects of early language learning among populations of speakers who experience an otherwise unparallelled break in linguistic tradition: international adoptees. This interest is partly of a practical nature, as international adoption, in particular to affluent Western countries, has increased dramatically over the past decade and continues to rise (Hyltenstam, Bylund, Abrahamsson & Park, 2009). In such situations, parents often struggle with the decision of whether to attempt to provide the child with the opportunity to retain his or her native language, or whether it is best to achieve as clean as possible a break with the former language, culture and environment.

However, even in contexts where the adoptive parents take the former course of action, these efforts are often not successful. For example, an acquaintance who adopted two L1 Spanish-speaking male siblings of around age five from Latin America reports that all attempts to provide L1 input through family holidays in Spain and efforts on the part of the parents to learn and use it did not succeed in motivating the children to maintain their birth language. Similarly, Isurin (2000) reports a case study of a Russian child adopted (at age 9) by American parents who asked the researcher to provide regular interaction with the child in her L1. Her attempts notwithstanding, Isurin reports a rapid breakdown of first language proficiency, which after a relatively short period (around one year) was followed by a refusal

of the subject to interact at all in Russian with the investigator. In general, extremely rapid loss (over a space of months or even weeks) of the ability and willingness to use the L1 appears to be a hallmark of international adoption (e.g. Glennen & Masters, 2002, see also the overview in Hyltenstam et al., 2009).

In such situations it is common both for the parents and later on for the adoptees themselves to wonder whether there are any lasting, possibly deeply buried, remnants of the early linguistic experience. The most dramatic results in this context reported to date stem from a neurolinguistic investigation of adoptees of Korean origin in France, reported in a series of articles by Pallier and colleagues (e.g. Pallier, Dehaene, Poline, LeBihan, Argenti, Dupoux & Mehler, 2003; Pallier, 2007; Ventureyra & Pallier, 2004; Ventureyra, Pallier & Yoo, 2004). The adoptees investigated in this study had been between 3 and 10 years old at the time of adoption and were young adults at the time of data collection. Among the experiments conducted were language identification tasks of full sentences or familiar series of words (e.g. the numbers from one to ten or the days of the week), where the subject was asked to indicate on a 7-point confidentiality scale whether the language s/he had just heard was Korean or not.

Astonishingly, the adoptees were no better at identifying Korean, even in highly familiar series, than the monolingual French controls. Pallier et al. (2003) also conducted fMRI scans to determine whether there was any language-specific activation due to the adoptees' early exposure to Korean, but similarly failed to find any trace left of the language. On the other hand, the adoptees performed very similar to the French monolingual controls on a range of tasks and scans probing the L2 (Ventureyra, 2005).

These findings led Pallier and colleagues to propose that the age effect in L2 learning is not due to maturational effects, as proposed by the Critical Period Hypothesis (CPH), but to interference from an increasingly deeply entrenched L1 in that "the presence of processes and

representations attuned to the first language acts as a filter that distorts the way a second language can be acquired" (Pallier et al., 2003: 160). In situations where L1 input ceases totally, the neural network that normally subserves L1 retention may then be 're-set' and hence allow L2 acquisition to bypass the 'filter' of L1 interference. This account of the age effect in SLA has been termed the 'Impediment Hypothesis' (IH) by Hyltenstamet al. (2009).

In the absence of detectable memory traces, Pallier and his team further speculate whether there might be a retention effect which might become apparent upon retraining, resulting in a learning advantage. In an attempt to put to the test the findings reported from populations of childhood overhearers, Ventureyra et al. (2004) and Ventureyra (2005) therefore attempted to determine whether Korean phonological contrasts which are difficult to perceive for native French speakers would become available to the adoptees upon re-exposure through visits to Korea or through formal training. The authors conclude that, if there is any advantage at all, it is minimal and not readily available for the adoptees. They ascribe the difference between their own findings and the results reported by Au et al. (2002), Oh et al. (2003) and Tees and Werker (1984) to the difference in surrounding circumstances between adoptees and childhood overhearers, in particular the total cessation of exposure experienced by the former group.

Pallier et al.'s proposal is in line with recent findings from an investigation of the consolidation of procedural memory reported by Dorfberger, Adi-Japha & Karni (2007). This study set out to test the long-standing assumption that children have an advantage in the consolidation of procedural memory. The study involved training children and adolescents in a motor sequence task, and measured the consolidation and delayed gains on this task across groups. No evidence was found for a childhood advantage in the retention or consolidation of this skill. However, when the same populations were subsequently trained on a different

motor sequence, the older participants proved to be more susceptible to interference from the previous task. Dorfberger et al. conclude that

> the ability to co-consolidate different, successive motor experiences […] diminishes after puberty, suggesting that a more selective memory consolidation process takes over from the childhood one. Only the adult consolidation process is gated by a recency effect, and in situations of multiple, clashing, experiences occurring within a short time-interval, adults may less effectively establish in memory experiences superseded by newer ones. (p. 1)

Of course motor sequences such as the ones employed in this study are different from the procedural memory skills underlying linguistic processing and use. However, the findings and conclusions reported by Dorfberger et al. do suggest the possibility that older language learners might not be less efficient at attaining knowledge, but more prone to interference from the previously established language. If this were to be the case, one would expect older L2 learners to be as efficient as younger ones under the condition that a true and complete break with all types of exposure to and use of the L1 could be achieved.

The Impediment Hypothesis proposed by Pallier, Ventureyra and colleagues is challenged in a recent paper by Hyltenstam et al. (2009). The authors investigate data from two groups of adoptees in Sweden. The first group consists of 21 Korean adoptees (age at adoption between 0;3 and 10;5) who were studying Korean at a Swedish university. These speakers are compared to 11 native Swedes taking the same course. Hyltenstam et al.'s study shows no advantage for the adoptees on syntactic tasks, but does suggest that there is an advantage in phonological discrimination, in particular among adoptees with a higher age at adoption.[i] The second group of speakers consists of four adoptees of Latin American origin, and focuses on their performance in L2 Swedish. The findings show that of those four adoptees with a Spanish-speaking background, only one (who had been less than one year old at adoption) performed at native levels across a range of tasks measuring proficiency in Swedish.

Hyltenstam et al.'s (2009) findings therefore conflict with those by Pallier et al. on two points: they do find remnants of the L1 which give the adoptees a re-learning advantage, and they also conclude that, despite surface appearances, post-infancy adoptees may not reach fully native levels in their L2 (the adoptive language). Both findings are tempered by age at adoption, leading the authors to suggest that a maturational account yields the best explanation of their findings: "the later the time of adoption occurs, the better are the chances for access to L1 remnants in the process of re-exposure to this language. [...] there was no evidence that the adoptees were at all different from comparable L2 learners who had maintained their L1." (Hyltenstam et al., 2009:134).

The conflict between the two accounts proposed by the French and the Swedish research teams thus goes to the heart of one of the fundamental issues of contention in studies on L2 learning: is variation in L2 learning best explained by interference from the L1, or by a maturational account in line with the CPH (see the discussion in Hyltenstam et al., 2009:134)? While there is no doubt that studies of L2 learners in a setting where there is continued exposure to L1 vs. those who experience a complete environmental language replacement (adoptees) may provide valuable evidence in this context, such studies are faced with the problem that it is generally not possible to study the impact of this factor beyond the crucial age at which maturational changes are assumed to occur: most international adoptees are infants, only a limited number are older than 6 years (Hyltenstam et al., 2009:121), and post-puberty adoption is extremely rare if not unheard of. Nevertheless, Pallier et al. hypothesize that their account predicts a similar 'total loss/total gain' scenario in older learners: "We might obtain similar results if we could study a population of subjects who had been delocalized to a new country and severed from their home language late in life, after puberty." (160)

Investigations of adoptees face two further complications: firstly, the studies summarized above all investigate young adults. In such populations variability of the age at adoption has important implications for the amount of exposure to the L2, so that a speaker who was adopted in infancy might have had almost twice as much exposure to his or her L2 as someone who had been ten years old at adoption.

The second difficulty concerns the fact that there is often little information available about the adoptees' cognitive and linguistic development prior to adoption, nor of the circumstances in which they had been raised. There are a number of studies which show that adoptees are more likely than average to suffer from learning disabilities and other cognitive disorders such as ADHD, and it has been proposed that these disorders may be linked to a lack of attention or cognitive stimulation which these children had received from the caregivers in the country of origin (e.g. Beverly, McGuinnes & Blanton, 2008, Odenstad, Hjern, Lindblad, Rasmussen, Vinnerljung & Dalen, 2008).

Insights from a historical perspective: language acquisition and attrition among German-Jewish refugees

Additional insight into the question of how total cessation of L1 input vs. continued (albeit minimal) exposure after puberty may impact on L1 attrition and L2 acquisition can be gained through taking a historical perspective. In order to do so, the present paper will investigate a corpus of Oral History testimonials from Holocaust survivors who escaped from Germany to English-speaking countries before the onset of World War II[ii]. Due to the historical situation, these speakers were under immense pressure to accommodate to the language of the environment. In particular for those who fled in the months between the pogrom of Nov. 9th, 1938 and Germany's invasion of Poland on Sept. 1st, 1939 (after which

time emigration became virtually impossible), abandoning the German language and acquiring and using English happened almost immediately and as a matter of necessity.

Some witnesses[iii] relate that speaking German was felt - both by themselves and by those around them - to be offensive, and one reports categorically "When the war broke out [...], I vowed I would not speak, write nor read German ever again" (ct. in Schmid, 2002: 71). Many other interviewees express similarly negative attitudes towards the German language, e.g.:

> When I was a child I hated speaking German because I was ashamed of being different from the other children. As an adult I had such animosity towards Germany because of its slaughter of Jews, that I would not let my children take German in high school even though they wanted to. I was insistent as a child that my parents, who did not speak English, learn English immediately. For most of my life my brother and I spoke only English to our parents. (ct. in Schmid, 2002: 71)

While these attitudes indicate a strong motivation on the part of these speakers to effect a 'clean break' with their L1, in most cases there still was some vestigial exposure through parents or other relatives who would sometimes use their L1 among each other in private. In particular, many seem to have felt less reluctant to speak German with aging grandparents, who often found it very difficult to acquire English. For example, Ruth K.[iv], while stating "I was physically *unable* to speak German" (her emphasis) later qualifies this total rejection: "I never minded speaking German to my Grandmother who never managed to speak English perfectly" in a letter to the author of this paper.

However, there is one group of German-Jewish migrants whose circumstances are comparable to international adoptees: those survivors who escaped from Germany on what came to be known as *Kindertransporte* ('children transports'). After the pogrom, international Jewish organizations and private individuals came together in an effort to rescue 10,000 children from Nazi persecution. These children were sent to England by their parents, and placed in foster families or boarding schools (e.g. Göpfert, 1999, Benz, 2004).

It is hard to imagine how traumatizing these experiences must have been. The children were taken to the train station by their parents to be sent alone, in the company of several

hundred similarly dislocated children, towards an unknown country, an unknown language and an unknown future. For the short time that their parents were still allowed to write to them and receive their letters, these correspondences provided a tenuous link to the home country, but in most cases those letters ceased quickly, after a brief note that the family was to be 'relocated'. The pressure to accommodate to the new environment and the new language must have been overwhelming, and language replacement happened fast. One of the witnesses of the *Kindertransport* relates how quickly he managed to acquire English:

> Six weeks later I wrote to my parents in English "I no longer speak German." I never have, and I've never been able to relearn it. (Kurt Fuchel, quoted from the documentary film *Into the Arms of Strangers*)

The loss of the L1 thus happened at a rate that is certainly comparable to the experiences of international adoptees, even among those fortunate ones who had remained in the company of a sibling. Edith Milton, who went on the transport with her older sister together with whom she was subsequently placed in a foster family, similarly locates the loss of her L1 within a few months of her arrival in England:

> That fall [of 1939, MSS] I begin to forget my German.
> This is in part because my German is being replaced by English, which I now speak without having to think about it. But there may have been an almost willed through unconscious element in my assiduous forgetting of the first language I spoke and wrote and read. (Milton, 2005: 11).

Other survivors similarly link the moment when they 'replaced' German with English to the beginning of the war. At that time, many of them became the victims of a terrible historical irony: on the one hand, their caregivers worried that, in the event of a German invasion, there would be repercussions for those who had provided support and shelter for Jews. On the other, German Jews were now often feared and suspected - because they were German, and Germany had become the enemy (cf. interview with Gertrud U.). Under those circumstances, learning English quickly and perfectly, and severing all links to all things German, was the only option.

Oral History testimonies

To exploit historical events which have caused an unprecedented amount of suffering and traumatisation with a view to providing insight into an intellectual question (the underlying reasons for the age effect in language learning and language forgetting) is something I do with immense reluctance, and I am fully aware that such an endeavour may appear distasteful, if not cynical. However, I am also aware that questions about hidden, long-buried memories of childhood, 'native' languages and the search for one's 'roots' may be a torment for many international adoptees as well as for *Kindertransport* survivors, and that it is important to try and obtain a better understanding of these issues.

That notwithstanding, it has to be pointed out that such analyses address extremely sensitive and painful issues, and that the researcher has to be aware and respectful of the limitations imposed by ethical considerations. The thought of an experimental approach to these speakers' proficiency, either in their L1 or their L2, forbids itself: anyone who has suffered what these survivors have suffered, and subsequently heard the horrifying accounts of the 'experiments' conducted in the camps, may not be subjected to experimental research, of whatever nature, relating to these experiences.

There is, however, a source of data which may be investigated in order to gain some insight into L2 acquisition and L1 attrition processes: since the 1990s, many historical organizations have collected Oral History testimonies from Holocaust survivors. Some of these accounts are in German, some in the language of the country to which migration took place. All constitute a rich and moving source of data. Given the settings in which these interviews were conducted, and in particular the fact that they were never collected with a view to linguistic analysis, they are also representative of naturalistic, informal language use.

Linguistic analysis of free spoken data: the CAF framework

Compared with controlled experimental data, free spoken data have advantages as well as disadvantages where the assessment of overall proficiency is concerned. On the one hand, naturalistic language use gives the speaker the opportunity to avoid constructions and items that s/he feels uncertain about. On the other, such data do require the speaker to draw on all aspects of her/his language knowledge and integrate them online in real-time processing and production, while specific tasks which probe a particular aspect of language knowledge often do not necessitate such a cognitively complex and realistic manipulation of all levels of knowledge.

The problem of the measurement of proficiency in naturalistic data has recently been addressed in terms of the framework of *Complexity, Accuracy and Fluency* (CAF). In this context it is proposed that

> constructs of L2 performance and L2 proficiency are multi-componential in nature, and […] their principal dimensions can be adequately, and comprehensively, captured by the notions of complexity, accuracy and fluency (Housen & Kuiken, 2009: 461).

An analysis of such data which encompasses these three dimensions can therefore compensate for avoidance strategies. Schmid (2002, 2004) illustrates such an approach on the basis of an in-depth investigation of a set of 35 Oral History interviews with German-Jewish Holocaust survivors. For the purpose of the present paper, a subset of that corpus will be looked at in more detail. This investigation will be augmented by a set of further interviews which did not form part of the original study.

The data

The analysis reported here is based on a corpus of 54 interviews with former residents of the city of Düsseldorf, Germany, which were conducted by historians affiliated with the

Mahn- und Gedenkstätte Düsseldorf (MGD) between 1994 and 1996. The participants were mainly visited in their homes in England or North America, although some gave the interview at the MGD during a visit to Düsseldorf (the city council invited survivors who were former citizens on such visits). The choice of the language (English or German) was left to the interviewee, as the following (typical) opening of one of the interviews illustrates:

> Also, bei dem Gespräch kommt's mir drauf an, daß Sie erzählen. Von ihrer Kindheit, hier in Düsseldorf, von der Familie, von den Freunden, von der Schule. Ich frag auch immer zwischendurch aber ruhig so in der Art wie Sie's erzählen möchten, bis hin zu Auswanderung, wie's in England weitergegangen ist, wie Sie im Endeffekt jetzt in Kanada leben. Also, ruhig von vorne, einmal ganz durch, ich frag zwischendurch und dann frag ich auch nochmal nach. Und die Sprache können Sie wählen. [switch to English] ***You may tell it in English in German, as you like it.***
>
> Okay, what is important to me is that you simply tell me things. About your childhood, here in Düsseldorf, about your family, friends, your school. I'll ask questions in between, but do feel free to tell it in any way you like, up until your migration, how things were in England, and about your life in Canada. So, do feel free to start at the beginning and work your way through, I'll ask questions in between, and I'll also ask you some more at the end. And the language is completely up to you. [switch to English] You may tell it in English in German, as you like it.

All interviews were transcribed by the author of this paper and checked with the help of a number of student assistants. The linguistic analysis was conducted by permission of the MGD and of the interviewees, who were contacted by letter. The speakers were between 65 and 92 years old at the time of the interview, and had emigrated between age 8 and 33. Nine of the speakers left Germany on a *Kindertransport*, aged between 11 and 15.

On the basis of the transcripts it was determined what the base language was for each of the interviews. In 34 cases, the language used was predominantly German (7% or less of the words used were English), and a further 11 were mainly in English, with 2% or less of German items (often chunks or phrases remembered from childhood). Only in nine cases was there indication of very substantial language mixing, and in three of those the interview fell into two clearly discernible stretches, one in English and one in German. Two of these speakers explicitly state that, after having used German for a while, they would now prefer to switch to English and subsequently stick to that language, the third uses a similar strategy

without overtly flagging the switch. The remaining six interviews were excluded from the analysis. Schmid (2002) then focussed exclusively on the German-language interviews (and the predominantly German portion of one of the mixed interviews mentioned above) and conducted no further analysis of the English ones. For the purpose of the present paper, these will also be investigated.

Language choice

A Pearson correlation between age at migration (AAM) and the proportion of English in the interview reveals a marginally significant trend for speakers who were younger when they migrated to use English (n=55, r^2 = -.250, p = .065). A closer look at the distribution reveals an interesting aspect of the data: no-one who had been younger than 11 at migration chose to speak German (see Fig. 1). It should be noted that there are no *Kindertransport* migrants in this age group, so all of these speakers did, in all likelihood, experience at least minimal input of German after their migration and until they left their family homes as adults.

/ insert Fig. 1 here /

For the speakers who were above age 11 at the time of migration (n = 49), the choice of language does not correlate with AAM (r^2 = -.014, p = .923).

The choice of language among the *Kindertransport* migrants, on the other hand, appears similar to that of the overall population:

/ insert Table 1 here /

This suggests that for overall language preference, AAM may be a more reliable indicator than the setting and the amount of exposure which was encountered in the host country. In particular, there are some indications of a breakoff around age 11, with no one who was below that age electing to conduct the interview in German.

Analysis

In order to determine the differential impact of AAM on the one hand and continuity of L1 exposure on the other, an analysis was conducted on those speakers in the corpus who were within the age range of the *Kindertransport* migrants represented here (that is, below 16 years at the time of migration). This yielded the following subcorpus:

/ insert Table 2 here /

In order to conduct this analysis, the author requested to be again granted access to the recordings of the previously transcribed interviews (see above) by the *Mahn- und Gedenkstätte Düsseldorf*. Unfortunately, this was not possible for all cases, as some of the recordings had been mislaid or returned to the interviewee with no copies retained. In those cases where access to the original recordings was not possible, the analysis presented below is therefore based on the original transcript (which had been checked for accuracy against the recording by at least two persons at the time of transcription).

Unfortunately, the analysis of the development of the L2 is based on a number of interviews which is not only smaller than the one available for the L1 analysis, but also strongly biased towards family migrants: 11 interviews were available, of which only two are from *Kindertransport* survivors. The findings presented here can therefore only be interpreted

as very preliminary and tentative indications, and it is hoped that future investigations may be able to achieve a larger and more balanced data sample.

Attrition and maintenance of the L1

Schmid (2002, 2004) provides a detailed account of the analyses that were conducted on the German language interviews in her corpus. She attempted to go beyond traditional analyses of L1 attrition in that her investigation focussed not only on deviant language use ('errors') but also tried to get an impression of speakers' language use in terms of what recent approaches to second language learning have labelled the CAF framework: complexity, accuracy and fluency (Housen & Kuiken, 2009; Van Daele, Housen, Kuiken, Pierrard & Vedder (eds), 2007).

Complexity

Complexity was assessed on the lexical, morphological and syntactic level. *Lexical complexity* was determined by an analysis of a stretch of 1,000 words from each interview (from which hesitations, false starts and repetitions had been eliminated). A type-token analysis (TTR) was then conducted on all lexical items (nouns, verbs and adjectives in their lemmatized forms) from this stretch of text. Furthermore, the average frequency of the content words that each speaker had used was assessed on the basis of the entire corpus (AVERAGE FREQUENCY) and it was determined what proportion of content words in the repertoire from each speaker had occurred only once in the corpus (UNIQUE LEXICAL ITEMS).

Where *morphological complexity* was concerned, three variables concerning the inflection of NPs were looked at: case, gender and plural. Since theoretical approaches to L1 attrition had hypothesized that this development might, for example, be characterized by

tendencies which have been witnessed in language change processes, such as an overall internal reduction of the case system where all oblique cases are conflated into one, or only the nominative prevails, a stretch of 1,000 spoken words was analyzed to determine what proportion of NPs had been assigned what case. Similarly, for all nouns referring to inanimates, the proportion of masculine, feminine and neuter nouns was assessed. Lastly, it was determined what proportion of noun phrases was in the plural.

German differs from English in morphological complexity with respect to all of the NP variables mentioned above (for an in-depth discussion see Schmid, 2002). Where VP morphology is concerned, the two languages are less markedly different from each other, as both mark person and tense in a relatively similar fashion (although German has a richer system of allomorphy). However, there is one feature where an interesting linguistic difference can be observed, namely aspect. English encodes aspect in the past tense through the distinction between simple and periphrastic past: "I lived there for two years" => I am no longer living there, "I have lived there for two years" => I am still living there (or did so until very recently). Grammatically, German has the same two options: "Ich lebte dort zwei Jahre lang" and "Ich habe dort zwei Jahre lang gelebt". However, these two options to not make an aspectual distinction but are characteristic of different speech styles (the simple past being used mainly in written language). In a corpus of the present type (informal, spoken language), a stronger degree of L2 influence might therefore be visible in an overuse of the simple and an underuse of the periphrastic past. It was therefore investigated in the same subcorpus of 1,000 words per interview was therefore in what proportion of past tense contexts the simple past was used.

With respect to *syntactic complexity*, three factors pertaining to obligatory word order in German were assessed (for this analysis, the strategy to analyse a stretch of 1,000 words per interview was abandoned in favour of a count of the entire corpus): in main clauses, it was

determined how frequently sentences contained a topicalized element other than the syntactic subject. The Germanic V2 rule stipulates that whenever another syntactic constituent occupies the *Vorfeld* (the initial, pre-verbal position in the clause), the subject has to appear behind the finite verb. This means that straightforward SVX sentences are grammatical, but if any other element is topicalized, English-style word order (XSV...) is ungrammatical. It was therefore counted how many main clauses of the type XVS there were in each interview, and this value was standardized per 1,000 words.

A second variable with respect to obligatory verb placement pertains to the discontinuous word order rule which stipulates that in sentences with a finite (auxiliary, modal, main verb) and a non-finite (infinitive, participle, particle) verb element, the two are split to frame other constituents such as postverbal subjects, objects, prepositional phrases etc. The total number of main clause constructions in which this discontinuous word order (DWO) was used was determined for each interview, and recalculated to 1,000 words.

Lastly, it was assessed how many subordinate clauses each speaker had used. Like many other Germanic languages, German has a different surface word order in subordinate clauses, which are verb-final, not verb-second like the main clauses. The total number of subordinate clauses from each interview (SUB) was recalculated per 1,000 words.

Accuracy

In addition to the overall distribution of the morphosyntactic variables discussed above, it was also assessed to what extent speakers might, on occasion, have used them inaccurately. In each interview, the following types of errors were therefore counted and then standardized per 1,000 words:

Morphological errors:

- Case marking (CAS)

- Gender agreement (GEN)
- Plural allomorphy and agreement (PLU)
- Verb phrase morphology (VP)

Syntactic errors

- SVX/XVS placement in main clauses (XVS)
- discontinuous word order in main clauses (DWO) (i.e. structures where the non-finite part of the verb is extraposed to the end of the clause)
- verb-final placement in subordinate clauses (SUB)

Foreign accent rating

In addition, it was assessed to what degree these speakers would be perceived as natives vs. foreigners by native Germans. A group of 13 native raters listened to excerpts from each interview and were asked to rate the speaker on a scale of 1 (native speaker of German), 2 (uncertain) and 3 (not a native speaker of German). A second rating was invited subsequently, asking for a 3-point evaluation of each speaker in terms of the lexicon, syntax, fluency, and accent. From these five judgments, an overall average was calculated for each speaker. Interrater reliability was excellent, (Cronbach's $\alpha = .95$) indicating that the judgments awarded to the individual speakers by the different judges were extremely consistent. The judgments from the 13 raters were averaged to the variable *foreign accent rating* (FAR).

Fluency

In order to determine fluency, two variables were established for each interview: the frequency of filled pauses (ahem, ah) and the frequency of unfilled pauses. These values were then recalculated per 1,000 words of spoken data. Due to the size of the corpus and the variable quality of the recordings, it was unfortunately impossible to measure pauses

individually. The raters transcribed a pause when they felt that the speaker was interrupting the flow of the speech, that is, when a perceptible hesitation occurred.

Statistical analysis

For all of these variables, independent t-tests were conducted in order to determine whether there was a difference between the *Kindertransport* and the family migrants. The results of this analysis are summarized in Table 3.

/ insert Table 3 here /

The only difference evident here between *Kindertransport* and family migrants concerns the category *accuracy*. It is evident that the *Kindertransport* migrants have more problems than the family migrants with the targetlike application of some of the morphological rules: there are significantly more errors in the domains of case marking, plural allomorphy and tense marking in this group. Grammatical gender, on the other hand, is not significantly affected by the context of migration. With respect to the targetlike application of obligatory verb placement rules there are no differences between the two groups.

On the other hand, none of the variables measuring lexical diversity, overall morphosyntactic complexity and fluency show any difference between the two groups. The Kindertransport migrants are also not perceived to be less native-like by the native judges than the family migrants.

In order to assess the impact of AAM on L1 attrition, Pearson correlations between this factor and of each of the dependent variables described above were conducted. Only one of these correlations reached significance: speakers who were younger at the time of migration tended to be less accurate in the application of grammatical gender agreement than younger

speakers. Accuracy on verb placement in subordinate clauses approached significance (p = .065).

/ insert Table 4 here /

In conclusion, it can therefore be said that there were some indications that *Kindertransport* migrants were overall less accurate, in particular in the area of morphological agreement in their L1 within the NP, than family migrants. Complexity and fluency in the L1, as well as perceived nativeness, on the other hand, appeared unaffected by migration context. The age at which speakers had emigrated had little impact on their L1 performance.

Ultimate attainment in L2

The 11 interviews available for the present investigation which were conducted predominantly in English were analysed according to the same principles of CAF as laid out above for the investigation of L1 German.

Complexity

Lexical complexity was determined with the help of the CLAN program, which was developed in the CHILDES project (http://childes.psy.cmu.edu/, see also MacWhinney, 2000). One of the tools offered by this program is the calculation of the lexical complexity index D, which is a TTR-based measure that is robust to differences in text length (Malvern & Richards, 2002). This index was calculated together with the two measures of lexical sophistication discussed above (average frequency of content words in the overall corpus and proportion of unique lexical items).

The assessment of *morphological* and *syntactic complexity* is less straightforward for English than for German. English has few deterministic processes of morphological inflection or word order, and none that are not also present in German. Where the morphological structures analysed in the German data are concerned, German-English bilinguals thus have to accommodate a many-to-few or many-to-one relationship (e.g. in the case of plural allomorphy, which is less complex and more rule governed in English than in German, or for grammatical case, which is only marked morphologically on pronouns in English but on all elements in the NP in German). Similarly, as was pointed out above, the word order which obtains in English is, in most cases, also grammatical in German, but the reverse is not true. Overall, it can therefore be assumed that English morphosyntax poses relatively few challenges for advanced L2 learners with German as a native language. Only two variables pertaining to aspect were therefore investigated for the present study: the proportion of simple and periphrastic past tense in all past tense context (see above) and the proportion of all verb phrases using the progressive aspect, which is not marked morphologically in German.

Accuracy

An analysis of overall accuracy, along the lines explained for L1 above, was conducted for the categories lexical/semantic errors, errors affecting function words, morphosyntactic errors and word order errors.

Foreign accent rating

Foreign accent was assessed in the same way as had been done for the German interviews: The experiment conducted by Schmid (2002), which was described above, was replicated with the help of Prof. Jeanine Treffers-Daller and Dr. Esther de Leeuw of the University of the West of England, Bristol, who very kindly collected native speaker ratings

from 66 of their students. These listeners provided ratings on short excerpts (10 to 20 seconds) from all interviews which contained unswitched passages in English lasting for more than 30 seconds, so that FAR data are available for a total of 16 speakers.

Fluency

With respect to fluency measures, it was decided not to include empty pauses, since their distribution as it had originally been transcribed could no longer be verified in the absence of some of the recordings (see above). The assessment of fluency is therefore based on the distribution of filled pauses. In addition, all interviews were coded for instances of repetitions (REP) of words or phrases as well as of retractions or self-corrections (RETR) (for a detailed description of the identification and coding of repetitions and retractions see Schmid & Beers Fägersten, 2010).

Statistical analysis

In view of the asymmetric distribution of the L2 English data across categories, parametric statistics were deemed unsuitable for the present analysis. Instead, Mann-Whitney tests were conducted on the variables described above. This analysis revealed only one single significant difference between family and *Kindertransport* migrants, namely for foreign accent ratings. On this measure, the *Kindertransport* migrants scored worse than the family migrants, that is, they had a stronger perceived foreign accent. No other significant differences emerged.

/ insert Table 5 here /

It was then again assessed by means of Pearson correlations to what extent these CAF measures might have been impacted on by AAM. These analyses showed no contingency

between any of the complexity, accuracy or fluency measures and AAM, with the exception of a strong correlation with perceived foreign accent, indicating that speakers who were older at the time of migration were rated less native-like than the younger migrants.

/ insert Table 6 here /

The correspondence between accent and AAM probably explains the fact that the *Kindertransport* migrants were perceived to be less target-like than the family migrants, since the two *Kindertransport* migrants investigated here were at the higher end of the age spectrum investigated. The linear relationship between accent on the one hand and AAM on the other becomes even more clear when the correlation is extended to encompass those speakers who were 16 years or older at the time of migration, as illustrated in Fig. 2.

/ insert Fig. 2 here /

This graph suggests that the age effect on perceived foreign accent is independent of the migration context. In other words, there is no evidence for a complete language replacement for the *Kindertransport* migrants, who had no further input from their L1. These speakers seem to score within the expected range of their age group.

The findings from the analysis of L2 English data therefore did not substantiate the assumption that *Kindertransport* migrants would experience 'sequential monolingualism' and, in the absence of any further input from their L1, become native speakers of their L2. They do not appear to have any advantage with respect to their L2 proficiency over the family migrants with respect to any of the phenomena measured here.

Discussion

The findings presented above allow for some interesting observations and speculations, notwithstanding the limitations posed by the size and asymmetric nature of the dataset. Firstly, with respect to the data on L1 attrition and retention of German, only a very limited advantage was found for those speakers who had migrated together with their families and therefore continued to have some vestigial exposure to and input from that language. On all measures of complexity and fluency, these speakers did not outperform those witnesses who had been rescued as part of the *Kindertransport* efforts, severing all links to their native language. It is only in the area of accuracy, and specifically of NP inflection and agreement, that the family migrants adhere more closely to the native target than the *Kindertransport* migrants. However, the proportion of errors made in these categories is comparatively small even for *Kindertransport* migrants: Schmid (2009) established that even the speaker included in the present investigation who had the highest number of errors and the most strongly accented speech (one of the youngest *Kindertransport* migrants) still compared very favourably with a highly advanced L2 learner of German on these measures.

The higher levels of morphological inaccuracies exhibited by *Kindertransport* migrants, in conjunction with the lack of such an effect for syntactic categories, suggest that any difficulties that they are experiencing are largely due to the demands of rapid on-line integration of knowledge and features from different linguistic levels required in naturalistic speech. Such problems can probably be ascribed to the competition of the highly active L2 system which they have spoken exclusively for six decades. In other words, the differences we can observe between family and *Kindertransport* migrants are likely to be the outcome of problems of access and activation, not of the deterioration of underlying knowledge or a wholesale replacement of L1 by L2.

The finding that, irrespective of the lack of continuance in L1 input, post-puberty migrants remain comparatively proficient and fluent speakers of their native language is in stark contrast to the total deterioration of the L1 system among Korean adoptees found by Pallier et al. (2003). It furthermore strongly contradicts their the assumption that post-puberty adoptees should experience a total language replacement similar to the one they found in their prepubescent participants. The lack of any measurable differences on overall complexity and fluency in the L1 between those speakers who migrated in the company of their German-speaking family members and those who did not suggests that native language proficiency does stabilize around puberty (note that the youngest participant in the present study is only slightly older than the oldest adoptees investigated by Pallier and colleagues). These findings are thus more compatible with a Critical Period account of bilingual development than with the Impediment Hypothesis.

With respect to the development of L2, the findings from this study have to be treated as tentative and preliminary indications, since only a limited number of interviews were available for this investigation, and of those, only two were from *Kindertransport* speakers. With these restrictions in mind, however, it can be said that the lack of any detectable disadvantage of *Kindertransport* speakers with respect to the retention of L1 found in this study was mirrored in a similar absence of an L2 advantage. While it emerged from the above analyses that those speakers who were older at the time of migration apparently failed to fully reach the L2 target with respect to foreign accent, there was no difference between family and *Kindertransport* migrants on any of the measures applied here. Again, these findings are incompatible with Pallier et al.'s Impediment Hypothesis, suggesting that the continued use of a previously learned first language does not impact negatively on the development of a second language in an immersion setting. The Critical Period Hypothesis, on the other hand, can account for the findings on both L1 and L2 development in the present study.

Conclusion

This investigation has taken a historical approach in order to supply data that would make it possible to investigate previous theories on language development in adoptees beyond the age range of puberty, through a comparison of two populations of German-Jewish refugees. An investigation of language proficiency in both L1 and L2 between *Kindertransport* migrants and family migrants was conducted. Oral history testimonies provided by these speakers were analyzed according to the criteria of Complexity, Fluency and Accuracy (CAF). The comparison did not yield evidence for a disadvantage with respect to L1 retention for those speakers who had experienced a complete severance from their L1, nor did they appear to have an advantage in ultimate attainment in the L2. Slight differences between populations with respect to accuracy in German NP morphology were judged to be the outcome of problems of access and activation, not of an underlying deterioration of the L1 morphological system.

These findings suggest that previous assumptions about the impact of dramatic language replacement, such as has been found among international adoptees, may not be accurate. The populations investigated here are clearly not 'sequential monolinguals', and their L2 skills are, to some extent, tempered by the age of acquisition, suggesting a Critical Period effect.

Notes

[i] Given the extent of individual differences in aptitutde, motivation and ultimate attainment in L2 learning, re-training effects are extremely hard to measure; in particular since the nature of such investigations implies that finding suitable groups of otherwise comparable learners will be difficult if not impossible.

[ii] It should be noted that, prior to emigration, all speakers were largely monolingual speakers of German (some had limited instructed knowledge of English and/or Hebrew). In particular, there were no speakers who were German-Yiddish bilinguals.

[iii] In German, the narrators of Oral History interviews are referred to as *Zeitzeugen*, literally: witnesses to historical events. For the purpose of the present paper, the term 'witnesses' will therefore be adopted to refer to the interviewees.

[iv] All names referring to participants in the present study are aliases.

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Table 1: Language choice according to migration setting

	Family migrants	Kindertransport migrants
German	26 (57.8%)	7 (77.8 %)
mixed	9 (20%)	0
English	10 (22.2 %)	2 (22.2 %)

Table 2: Corpus investigated in this study[1]

	Family migrants				Kindertransport migrants			
	n	total # of words	mean AAE	range AAE	n	total # of words	mean AAE	range AAE
Interview predominantly German	9	46,872	12.78	11-14	7	28,700	13.86	11-15
Interview predominantly English	9	33,931	10.33	7-14	2	15,055	13.50	13-14

[1] Schmid (2004) has established to what extent there are indications of language attrition in the overall corpus through comparison with an unattrited German control group. In view of the fact that the present investigation aims at assessing the impact of group-internal factors, namely AAM and migration context, it was decided not to invoke a native baseline for the present comparison.

Table 3: Independent t-tests (two-tailed) of L1 CAF variables between Kindertransport and family migrants (variables where differences are significant are marked in bold)

			Family migrants (n = 9)		Kindertransport migrants (n = 7)		Group comparison (t-test)		
			mean	stdev	mean	stdev	t (15)	p	r
Lexical complexity		TTR	0.25	0.03	0.23	0.02	1.23	.240	.09
		Average frequency	46.82	5.53	45.22	4.83	.606	.554	.02
		Percentage unique content words	5.98	3.25	8.21	2.36	-1.529	.149	.13
morphological complexity	case of NPs	%nom	57.02	5.25	56.67	5.82	.13	.90	.00
		%dat	21.11	4.78	19.68	4.04	.64	.53	.03
		%akk	20.86	3.96	22.58	3.07	-.96	.35	.06
	gender of NPs	%fem	47.02	7.97	44.57	1.03	.55	.59	.02
		%masc	23.75	6.16	24.98	7.35	-.37	.72	.01
		%neut	29.23	6.21	30.44	11.08	-.28	.78	.01
	singular/plural	%plu	22.09	7.87	24.93	5.93	-.79	.44	.04
	aspect	proportion simple past tense	65.66	13.25	58.48	13.37	1.07	.30	.07
syntactic complexity		XVS/1,000 words	33.28	6.27	28.74	8.87	1.09	.30	.07
		DWO/1,000 words	37.16	6.98	38,32	12.13	.22	.83	.00
		SUB/1,000 words	18.95	7.93	23.40	4.05	1.15	.28	.08
Accuracy	Morphological errors	**Case errors/1,000 words**	**0.81**	**0.81**	**2.35**	**1.78**	**-2.42***	**.03**	**.28**
		Gender errors/1,000 words	0.39	0.56	0.94	.78	-1.71	.11	.16
		Plural errors/1,000 words	**0.11**	**0.18**	**0.71**	**.62**	**-2.94***	**.01**	**.37**
		VP errors/1,000 words	**1.13**	**1.10**	**3.58**	**2.86**	**-2.48***	**.03**	**.29**
	Syntactic errors	XVS errors/1,000 words	0.62	0.74	1.23	1.40	-1.18	.26	.08
		DWO errors/1,000 words	0.78	1.98	0.74	.42	.06	.96	.00
		SUB errors/1,000 words	0.49	0.90	0.85	.85	-.83	.42	.04
	Perceived foreign accent		1.90	0.59	2.20	0.58	-1.04	.32	.07
Fluency		Pauses	65.56	41.02	57.04	41.76	.36	.72	.01
		Filled pauses	46.75	43.47	35.22	39.40	.48	.64	.02

* $p < .05$

Table 4: Pearson correlation between AAM and dependent variables (significant correlations are marked in bold)

			r	p
Lexical complexity		TTR	-.126	.618
		Average frequency	-.278	.280
		Percentage unique content words	-.178	.494
morphological complexity	case of NPs	%nom	-.154	.542
		%dat	.174	.489
		%akk	-.052	.838
	gender of NPs	%fem	.051	.847
		%masc	.171	.512
		%neut	-.180	.489
	singular/plural	%plu	.121	.645
	aspect	proportion simple past	-.265	.304
syntactic complexity		XVS/1,000 words	-.288	.262
		DWO/1,000 words	.028	.914
		SUB/1,000 words	.457	.065
Accuracy	Morphological errors	Case errors/1,000 words	-.279	.261
		Gender errors/1,000 words	**.488***	**.040**
		Plural errors/1,000 words	.055	.829
		VP errors/1,000 words	.281	.259
	Syntactic errors	XVS errors/1,000 words	-.288	.262
		DWO errors/1,000 words	.028	.914
		SUB errors/1,000 words	.457	.065
	Perceived foreign accent		-.059	.816
Fluency		Pauses	-.340	.182
		Filled pauses	-.224	.387

Table 5: Comparisons of L2 English CAF measures between family and *Kindertransport* migrants (Mann-Whitney, significant differences are marked in bold)

		Family migrants	Kindertransport	Mann-Whitney Test		
		mean	mean	U	p	r
Lexical complexity						
	DEng	93.71	97.71	7.000	.727	.13
	AvFreqEng	97.34	97.56	8.000	.909	.07
	UniqueLex	5.24	5.04	7.500	.727	.10
	%simple past	87.37	90.05	6.000	0.410	.30
	% periphrastic past	2.21	1.50	9.000	0.769	.12
	% progressive	3.56	3.83	9.000	0.769	.12
Accuracy						
	lexical/semantic errors	1.26	1.06	9.000	0.769	.12
	function word errors	3.28	3.18	9.500	0.769	.09
	morphosyntactic errors	3.89	2.77	8.000	0.641	.18
	word order errors	2.41	1.33	4.000	0.231	.42
	foreign accent rating	**1.43**	**2.02**	**1.000**	**.033**	**.60**
Fluency						
	Filled pauses	39.02	37.56	9.000	1.000	.00
	repetitions	15.04	15.10	8.000	.814	.07
	retractions	15.02	10.23	8.000	.814	.07

Table 6: Pearson correlations of L2 English CAF measures and AAM (significant correlations are set in bold)

		r	p
Lexical complexity			
	DEng	.212	.486
	AvFreqEng	.079	.798
	UniqueLex	-.065	.832
	%simple past	.466	.109
	% periphrastic past	-.327	.276
	% progressive	.168	.584
Accuracy			
	lexical/semantic errors	-.231	.495
	function word errors	-.367	.267
	morphosyntactic errors	-.059	.864
	word order errors	-.523	.099
	foreign accent rating	**.701****	**.002**
Fluency			
	Filled pauses	-.459	.155
	repetitions	.102	.766
	retractions	-.035	.918

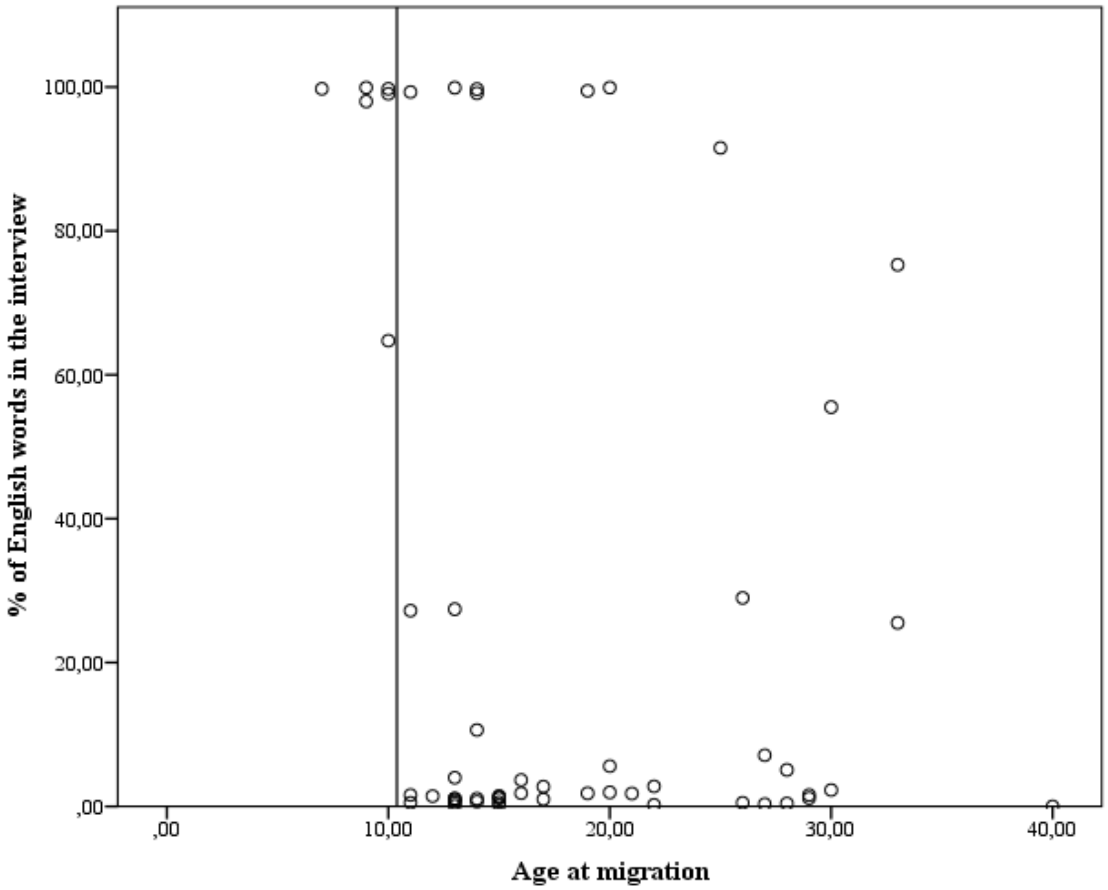

Fig. 1: Language choice in interview and age at migration

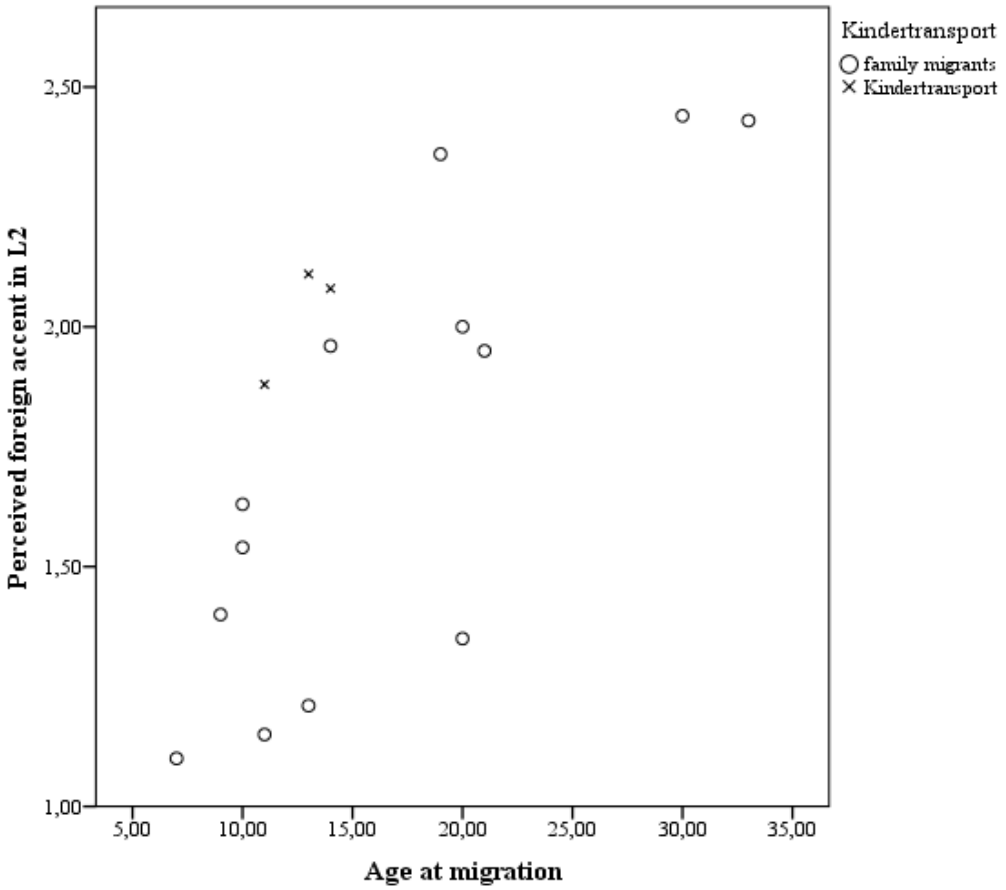

Fig. 2: Contingency effects between age at migration and perceived foreign accent in L2[2]

[2] As was mentioned above, the foreign accent rating experiment was conducted on all speakers whose interview contained a consistent stretch of English of 30 seconds or longer. That is, the analysis included a number of interviews which were otherwise largely mixed in their language use and could therefore not be investigated for other aspects of complexity, accuracy and fluency.