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**The impact of age and exposure on bilingual development in international  
adoptees and family migrants:  
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 speakers do remain bilingual to some extent, although they cannot readily access their vestigial first language (L1) knowledge. Similarly it has been debated whether a complete switch in language use will provide a qualitative advantage for second language (L2) learning. These questions have important implications for questions about maturational constraints on second language learning, but are difficult to resolve as international adoption typically takes place before puberty.

It is argued here that the contrast between a total break in language tradition vs. continued minimal exposure can be investigated beyond the adoptee age range by taking into account Oral History testimonies of German Jews who escaped from Nazi Germany. 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 present paper investigates L1 and L2 proficiency among survivors who escaped from Germany either on a *Kindertransport* or in the context of their family, aged 9-15 years. Over the past decades, many organizations have collected testimonies from Holocaust survivors, both in their native language (German) and in the language they adopted after migration (in many cases, that language is English). A comparison of such data from both pre- and postpuberty *Kindertransport* and family migrants can provide important insights into the role of age vs. exposure for L1 attrition and L2 learning. The results from the present study suggest that age plays a more important role than context in both L1 retention and L2 development.

**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. Lenneberg, 1967; 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 surprising 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 unparalleled 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, 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 et al., 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 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; Pallier 2007).

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.

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 or Maturation Constraint Hypothesis (henceforth MCH), 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. On this view, the decreasing potential for L2 acquisition which emerges from studies that correlate age at onset and ultimate attainment is not the product of an irreversible maturational change but can be ascribed to increasing entrenchment of L1 representations (this view is compatible with other approaches to L2 learning, such as Flege's (2002) Speech Learning Model). Pallier et al. conclude that, regardless of age, the impediment to L2 learning can be removed if a total break from the L1 is achieved (Pallier et al., 2003:160).

This proposal, which Pallier (2007) terms 'interference account' (henceforth: IA) is in line with recent findings from an investigation of the consolidation of procedural memory reported by Dorfberger, Adi-Japha and 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 might indeed 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, as argued by Pallier et al.

Other investigations of international adoptees, however, come to different conclusions. Hyltenstam et al. (2009) 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 language 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.<sup>1</sup> The second group of speakers consists of four adoptees of Latin American origin, and focuses on their performance in L2 Swedish. Of those four adoptees with a Spanish-speaking background,

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<sup>1</sup> Given the extent of individual differences in aptitude, 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.

only one (who had been less than one year old at adoption) performs 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 current investigations of L2 learning: is variation in ultimate attainment best explained by increasing entrenchment of the L1, or by a maturational account in line with the MCH (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 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 as well as the attritional period, so that a speaker who was adopted in infancy might have had almost twice as much exposure to his or her L2, and been separated from the L1 for twice as long, 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 international 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, McGuinness & Blanton, 2008, Odenstad et al., 2008). These factors make it an extremely challenging task to find a comparison group of “immigrants having a similar background, and who have learned the L2 while continuing to use their L1” (Pallier, 2007:165).

In summary, the controversy on the existence of maturational constraints in second language learning could benefit greatly from an investigation that could compare the linguistic development in both the birth language (L1) and the environmental language (L2) of populations of young migrants of similar background and experience, who left their country of birth either before or after puberty, either in the company of their parents or to be placed in adoptive or foster families. Due to the circumstances surrounding international adoption, such populations are very hard to find.

## **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<sup>2</sup>. 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<sup>3</sup> 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

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<sup>2</sup> 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.

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.<sup>4</sup>, 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, 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 in the position 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 *Kindertransporte* 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*)

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<sup>3</sup> 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.

<sup>4</sup> All names referring to participants in the present study are aliases.

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 though 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., corpus investigated in the present study). 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 language has 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 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 linguistic levels.

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 these interviews 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, phrases, fragments of nursery rhymes etc. remembered from childhood). Only in nine cases was there 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, after having used German for a while, that 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, where the languages are mixed throughout, 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 latter accounts have also been investigated in order to assess whether there would be an

advantage in L2 acquisition for speakers who ceased using their L1 entirely, as predicted by Pallier et al. (2003).

### *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 ( $r^2 = -.250$ ,  $p = .065$ ). 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, 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**

### *Speakers*

The corpus available for the present study is described in Schmid (2002). 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 a subgroup of speakers who were within the age range of the *Kindertransport* migrants (n=9) represented in the corpus. The youngest *Kindertransport* survivor had been 11 years and the oldest 15 at the time of migration (mean age 13.8). In order to assess the impact of age at migration, those interviews conducted with family migrants who had emigrated up to the same maximum age were also selected (n=18, mean age 11.7, range 9-15 years). Of these 27 interviews, 16 were conducted in German (7 *Kindertransport* and 9 family migrants) while 11 were in English (2 *Kindertransport*, 9 family migrants). The average length of the interviews was around 5,000 words with a total number of around 75,000 words in the German and around 50,000 words in the English interviews.

/ 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. This was unavoidable, as we could not control the language choice or biographical backgrounds of the speakers represented in the corpus and did not have access to other corpora at the time of the investigation. 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.

#### *Language choice*

The division of predominantly German and predominantly English interviews noted in Table 2 above may seem somewhat surprising, in particular in view of the fact that the majority of the *Kindertransport* survivors (who are predicted to have more dramatic L1 loss) chose to conduct their interview in German. This somewhat surprising preference already indicates that the speakers investigated here have not lost their native language to the same degree as the international adoptees investigated in other studies, even though there are only a few years older than the oldest adoptees investigated in the Pallier study.

There are two possible explanations for this (which are not mutually exclusive): on the one hand, the retention of the L1 may be due to the fact that all *Kindertransport* speakers represented in this study emigrated above age 11 (a sudden drop in susceptibility to attrition around that age would be in accordance with the Maturation Constraint Hypothesis); on the other hand, the process of language replacement might not have been as drastic or radical as that commonly experienced by international adoptees, due to differences in circumstance. In

order to investigate the latter possibility, an investigation of these speakers' L1 exposure after migration is necessary.

*Language exposure: self reports*

In 1998, all 54 speakers represented in the overall corpus investigated by Schmid (2002) were sent a letter explaining the purpose of the investigation and containing a questionnaire enquiring about their language use post emigration. Both the letter and the questionnaire were included in an English as well as a German version (letter and questionnaire can be consulted in Schmid 2002; Appendix II). 43 of the speakers were kind enough to return the questionnaire, and it is available from 22 of the 27 speakers investigated in the present study (14 of 18 family migrants and 8 of 9 *Kindertransport* survivors).

Among other things, participants were asked to indicate how frequently they had used German with their parents, siblings, spouses and children. The results indicate that family migrants did indeed have some degree of continued exposure after their migration: 58% indicate that they 'always or frequently' used their L1 with their parents, 24% continued to use it with siblings, 32% spoke it with their partner or spouse and 14% used German when speaking to their children. All of the *Kindertransport* migrants, on the other hand, indicate that they never used German in any of these contexts.

Statements from the individual interviews as well as from open questions contained in the questionnaire corroborate these accounts. Schmid (2002) quotes the example of a married couple who had, in fact, known each other prior to their emigration in Düsseldorf. The wife, referred to as Ruth K., was brought from Germany in 1939 on a *Kindertransport* at age 13, while the husband escaped a year earlier, in the company of his parents. In response to my question of whether there is anything more she would like to tell me about how she feels about the German language, Ruth K. states

I was physically *unable* to speak German [...]. When I visited Germany for 3 or 4 days in 1949 - I found myself unable to utter one word of German although the Frontierguard was a dear old man. I had to speak French in order to answer his questions! (Ruth K., questionnaire; her emphasis)

This statement is corroborated by her husband:

My wife in her reply to you will have told you that she *could and did not want* to speak German because they killed her parents. So we never spoke German to each other not even intimately. (Fritz K., questionnaire; his emphasis)

Given these statements, as well as the fact that shortly upon their arrival in an English-speaking context their host country and country of origin were at war with each other (which made using German in any public setting impossible until at least 1945) it does appear that the *Kindertransport* migrants represented in the present study experienced a break from their L1 and full immersion in their L2 that is comparable to that of international adoptees. Family migrants, on the other hand, appear to have continued to have used (or heard) German at least to some degree – in particular with the previous generation, somewhat less with their own, and less still with the next one.

On the other hand, the questionnaire also enquired about the ease with which speakers were able to use German at the time of the study.<sup>5</sup> A comparison of the family migrants and *Kindertransport* survivors investigated in the present study shows surprising parallels with respect to their own perceived proficiency (see Table 3).

/insert Table 3 here/

In both groups, there is one speaker who indicates having great difficulty using German, half of them state that they can use it with some effort, and just under 15% find that speaking their native language comes to them without effort. Interestingly, while all of the speakers who say that they use German effortlessly also choose to speak it in the interview, three of the ones

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<sup>5</sup> It was a deliberate choice not to couch this question in terms of self-perceived language proficiency, as I thought that having to indicate that a speaker's present level of German was, for example, 'very poor' might be hurtful.

who claim to use it with some effort as well as both of those who find it 'very difficult' also opted for this language.

It thus seems that for the present population, comprised of speakers who emigrated at an age that is above the normal adoptee age range, the context (family migration or a situation that is comparable to international adoption) does not play the overriding role that it does for younger migrants. In order to substantiate this assumption, the following sections will look at language proficiency, as evident in the interviews, in more detail.

### *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 a deeper and more holistic impression of speakers' proficiency. Her analysis is similar to the ones called for in the more recent CAF (complexity, accuracy and fluency) framework in second language learning (Housen & Kuiken, 2009; Van Daele, Housen, Kuiken, Pierrard & Vedder (eds), 2007). For the purpose of the present study, the analyses were confined to the subcorpus of speakers within the *Kindertransport* age range who had spoken German in the interview (n = 16; family migrants n=9, *Kindertransport* migrants n=7).

### *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. German differs from English in morphological complexity with respect to these variables: it has a four-case and three-gender system, and both these features interact with each other and with definiteness. Gender is largely unpredictable on the basis of phonological form, as is plural allomorphy (for an in-depth discussion see Schmid, 2002).

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 (e.g. Jordens, de Bot & Trapman, 1989), 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.

Where VP morphology is concerned, English and German 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 do 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. The proportion of simple vs. periphrastic past tense was therefore established in the same subcorpus of 1,000 words per interview.

With respect to *syntactic complexity*, three factors pertaining to obligatory word order in German were assessed (for this analysis, the strategy of analysing 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 (ex. (1)), but if any other element is topicalized, the subject has to appear behind the verb (ex. (2a) and English-style word order (XSV(Y)) is ungrammatical (ex. (2b)).

(1)	mein Schwager	hat	bis vor einiger Zeit	nie	darüber	geredet
x	my brother-in-law	has	until some time ago	never	about it	talked
(2a)	bis vor einiger Zeit	hat	mein Schwager	nie	darüber	geredet
x	until some time ago	has	my brother-in-law	never	about it	talked
*(2a)	bis vor einiger Zeit	mein Schwager	hat	nie	darüber	geredet
x	until some time ago	has	my brother-in-law	never	about it	talked

“Until recently my brother-in-law never talked about it.”

It was therefore counted how many main clauses of the type XVS(Y) 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: 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, subordinate clauses etc. (see ex. 1 and 2 above). 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 (ex. (3)), not verb-second like main clauses. The total number of subordinate clauses from each interview (SUB) was also recalculated per 1,000 words.

(3a)	ich	weiß	nur	daß	wir	oft	dort	vorbeigegangen	sind
	I	know	only	that	we	frequently	there	went past	have
*(3b)	ich	weiß	nur	daß	wir	sind	oft	dort	vorbeigegangen
	I	know	only	that	we	have	frequently	there	went past

“I only know that we often went past there.”

Again, the total number of subordinate clauses used by each speaker was determined and recalculated per 1,000 spoken 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)

#### *Fluency*

In order to determine fluency, two variables were established for each interview: the frequency of filled pauses (*ahem, uh* etc.) 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 4.

/ insert Table 4 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.

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 for the 16 speakers investigated here. 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 5 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 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)<sup>6</sup>. 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.

### *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 whose identification is less sensitive to issues of individual perception. 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 no significant differences between family and *Kindertransport* migrants.

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<sup>6</sup> Note that for the German subcorpus, text length was eliminated as a potentially confounding factor by limiting the

/ insert Table 6 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.

/ insert Table 7 here /

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 an advantage with respect to their L2 proficiency over the family migrants with respect to any of the phenomena measured here.

In summary, the two populations under investigation here – *Kindertransport* and family migrants do not, on the whole, differ from each other with respect to complexity, accuracy and fluency in either their L1 or their L2 language use. The only area where a difference was found was accuracy on morphological inflection in the domain of the German noun phrase, where family migrants were somewhat more on target than *Kindertransport* migrants.

## **Discussion**

The present study set out to investigate whether the dramatic attrition effects found in earlier studies for pre-puberty adoptees would also obtain for migrants who had emigrated

under similar circumstances, but after puberty. 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 more than five 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 the assumption that post-puberty adoptees should experience a total language replacement similar to the one they found in their prepubescent participants (Pallier et al., 2003:160). 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. This process appears irreversible and largely impermeable by later linguistic experience: the 8 out of 9 *Kindertransport* migrants from whom self-reports were available stated to have had no exposure to their L1 for upwards of 50 years.

In order to establish to what degree this stabilization process can be ascribed to maturational processes vs. a straightforward entrenchment account, further investigations are necessary which compare populations similar to the ones investigated here, but with younger ages at onset. Such a comparison would allow to determine whether there is a dropoff in retention rates around puberty (indicating a maturational change around this age), or whether the age at onset – attrition function is linear and thus compatible with the entrenchment/interference view.

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 was 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.

One possibility that has to be considered in this context is that there is some fundamental difference between the populations investigated here and the international adoptees in previous studies, possibly due to geographical or typological proximity. With respect to the former, it seems likely that the onset of World War II acted as a barrier between the two countries that will have been at least as effective as the distance between Europe and Korea. The impact of typological proximity is more difficult to judge: investigations similar to the number-recognition task conducted by Pallier et al. would probably be futile in the context of English-German bilinguals, since even most English monolinguals would probably be able to recognize sequences such as *eins*, *zwei*, *drei*. To what extent proximity between L1 and L2 allow adoptees to retain part of their native language knowledge has not been investigated, but appears an interesting area.

One anonymous reviewer raised the interesting possibility that the very trauma that particularly *Kindertransport* migrants experienced might have led to more language retention due to the “constant and intense preoccupation” with traumatic experiences that were associated in the L1, which might have kept that language active at a subconscious level. This suggestion, while very intriguing, is impossible to validate. However, Schmid (2002) established that those German-Jewish migrants who had suffered more traumatic experiences prior to their emigration had stonger levels of L1 attrition, which would seem to argue against this possibility.<sup>7</sup>

Further investigations are necessary, comparing larger populations as well as migrants with a younger age at onset, and contrasting their performance in both L1 and L2 with native

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<sup>7</sup> A further case in point comes from the story of a young asylum seeker in the Netherlands, whose account of his origin was doubted by the authorities since he did not speak or comprehend the tribal language with which he claimed to have grown up. The young man’s lawyer asked me to provide an assessment of whether it was possible to forget a native language under the circumstances described, and provided me with the transcripts of the relevant interviews. According to this narrative, his village was raided when he was nine years old, his parents killed before his eyes, and he was abducted to work as a slave on a plantation, where only Arabic and English were spoken. In an interview where he is asked to provide proof of his account, he re-tells this event, and how he shouted at his mother not to resist. The interviewer asks him to repeat this phrase in his tribal language, which he is unable to do. He does state that he is

speakers of these languages. If such investigations can validate the implicit suggestion that arises from the present data that a qualitative change in the susceptibility to L1 attrition takes place around puberty, that this change is relatively unaffected by the context of migration, and that there is no qualitative advantage of L2 learners who are severed from their native language environment, this would go a long way towards refuting Pallier et al.'s interference account. Such findings would, in turn, provide strong evidence in favour of some kind of maturational constraint on multilingual development.

## **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).

In comparison with previous studies of the linguistic development in international adoptees has two important shortcomings: it investigates a relatively small number of speakers, and it has to rely on free data (as opposed to rigorous, controlled tasks). The former issue can be remedied through further research, and a currently ongoing investigation at the University of Groningen is aiming at establishing a larger corpus of interviews with similar populations, where the relevant factors are balanced. The second problem, however, cannot be

overcome: even if the ethical concerns pointed out above did not prevent experimental studies, a speaker who was 17 years old in 1939 would be close to 90 years today.

These limitations notwithstanding, the comparisons conducted here 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 do not appear to be 'sequential monolinguals', the differences between family migrants and *Kindertransport* migrants are quantitative rather than qualitative.

## **Notes**

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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<sup>8</sup>

	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

<sup>8</sup> 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: Self-perceived ease of using German

	Family migrants (n = 14)		Kindertransport migrants (n = 8)	
effortless	5	38.46	3	37.5
with some effort	7	53.85	4	50
with great difficulty	1	7.69	1	12.5

Table 4: 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	<b>Case errors/1,000 words</b>	<b>0.81</b>	<b>0.81</b>	<b>2.35</b>	<b>1.78</b>	<b>-2.42*</b>	<b>.03</b>	<b>.28</b>
		Gender errors/1,000 words	0.39	0.56	0.94	.78	-1.71	.11	.16
		<b>Plural errors/1,000 words</b>	<b>0.11</b>	<b>0.18</b>	<b>0.71</b>	<b>.62</b>	<b>-2.94*</b>	<b>.01</b>	<b>.37</b>
		<b>VP errors/1,000 words</b>	<b>1.13</b>	<b>1.10</b>	<b>3.58</b>	<b>2.86</b>	<b>-2.48*</b>	<b>.03</b>	<b>.29</b>
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
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 5: 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
		<b>Gender errors/1,000 words</b>	<b>.488*</b>	<b>.040</b>
		Plural errors/1,000 words	.055	.829
		VP errors/1,000 words	.281	.259
Fluency	Syntactic errors	XVS errors/1,000 words	-.288	.262
		DWO errors/1,000 words	.028	.914
		SUB errors/1,000 words	.457	.065
Fluency	Pauses		-.340	.182
	Filled pauses		-.224	.387

Table 6: Comparisons of L2 English CAF measures between family and *Kindertransport* migrants (Mann-Whitney)

		Family migrants	Kindertransport	Mann-Whitney Test		
		(n = 9)	migrants (n = 2)	U	p	r
		mean	mean			
Lexical complexity	D	93.71	97.71	7.000	.727	.13
	Average frequency	97.34	97.56	8.000	.909	.07
	Percentage unique content words	5.24	5.04	7.500	.727	.10
Morphological complexity	%simple past	87.37	90.05	6.000	.410	.30
	% periphrastic past	2.21	1.50	9.000	.769	.12
	% progressive	3.56	3.83	9.000	.769	.12
Accuracy	lexical/semantic errors	1.26	1.06	9.000	.769	.12
	function word errors	3.28	3.18	9.500	.769	.09
	morphosyntactic errors	3.89	2.77	8.000	.641	.18
	word order errors	2.41	1.33	4.000	.231	.42
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 7: Pearson correlations of L2 English CAF measures and AAM

	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
Fluency		
Filled pauses	-.459	.155
repetitions	.102	.766
retractions	-.035	.918

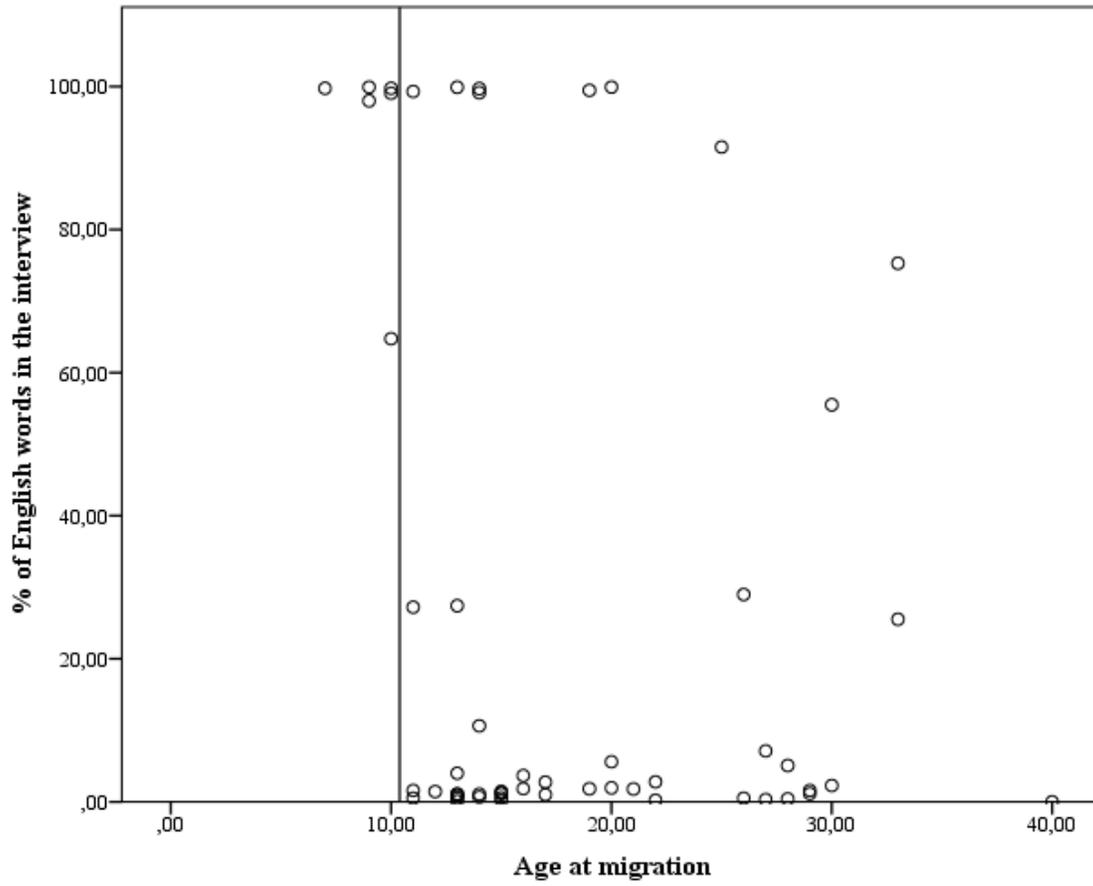


Fig. 1: Language choice in interview and age at migration

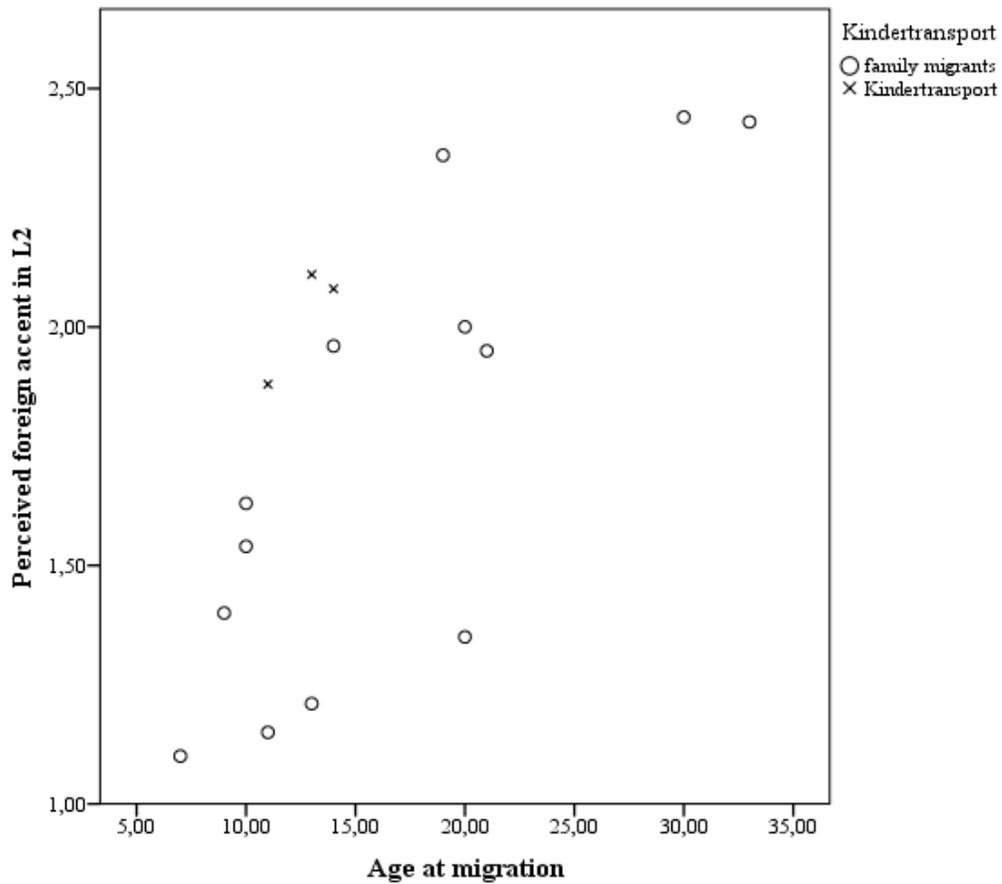


Fig. 2: Contingency effects between age at migration and perceived foreign accent in L2<sup>9</sup>

<sup>9</sup> 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.