CALL: Irish Journal for Culture, Arts, Literature and Language

Volume 1
Issue 1 *Language, Migration and Diaspora*

Article 5

2016

Little to Lose and Everything to Gain: L1 Maintenance and L2 Attainment in Long-Term Migrants

Conny Opitz
Trinity College Dublin, opitzc@tcd.ie

Little to lose and everything to gain: L1 maintenance and L2 attainment in long-term migrants

Conny Opitz
Department of Russian and Slavonic Studies
Trinity College Dublin, Ireland
opitzc@tcd.ie

Abstract
This paper reports on a study of adult migrants' L1 and L2 proficiency after extensive residence abroad, focusing on the predictive power of maturational and usage-based accounts respectively. The former perspective assumes age-related constraints on adults' capacity to become proficient in an L2, while the latter argues for the importance of environmental factors. The study adds a novel dimension to this debate by considering both L1 and L2 development. German speakers in Ireland completed German- and English-language tasks and responded to questionnaires. The data provide evidence of a moderate amount of L1 attrition, a high degree of L2 attainment in English, attrition in other L2s and a great amount of inter-individual variability, challenging both the monolithic view of L1 proficiency, and the deficit view of adult second-language acquisition. Although several variables were found to be influential, the findings overall support a usage-based account. Thus, in migration, adult bilinguals have the potential to develop both native-like proficiency in L2, and maintain their L1.

Keywords: migration; adult bilinguals; language acquisition; language attrition; language maintenance; age; language use

In research and in life, opinions on the ability of adults to acquire and use an L2 proficiently are divided. A common view is that children ought to start learning languages as early as possible to maximise their chances of achieving a high level of L2 proficiency, since adults are seen (and see themselves) as capable of acquiring L2 only with great effort, and little chance of success.

This view, encapsulated in maturational perspectives on language development, in particular the well-known critical period hypothesis (henceforth CPH) and its modifications, is based on the assumption that both first and second language acquisition are biologically determined by age-related neurological changes. Therefore, age of acquisition is seen as the crucial factor in

determining the outcome of language acquisition processes (ultimate attainment).[1] For L1, the language or languages children acquire from birth, CPH implies uniformity of acquisition ("guaranteed success", "inevitable perfect mastery"),[2] and immutability/stability after puberty in healthy adults. Conversely, second language acquisition (henceforth SLA)[3] is seen as effortful at best, and impossible at worst ("ineluctable failure"[4] to acquire L2 to native-like levels). Cases of advanced L2 acquisition by late bilinguals tend to be discounted as "exceptional"[5] and even "pathological"[6] by proponents of this perspective. Likewise, variability amongst native speakers is invisible from the perspective of the monolingual "native speaker standard", against which (adult) second language learners are usually measured.[7]

This paper is not about to argue that the age at which one starts to learn L1 or L2 does not matter, or that age effects do not exist in second language acquisition. However, what is contested, here and by others, is what underlies observed differences between first and second language acquisition, between the relative success of children and adults in SLA, and just how categorical these differences are. Alongside age, many variables have been proposed to play a part in linguistic development: individual characteristics such as linguistic aptitude, linguistic needs, attitudes and motivations; contextual factors such as language input and use, formal or informal learning contexts; social variables such as education level and social context; and linguistic factors, such as the typological distance between languages. This paper is particularly concerned with the language input/use factor which is emphasised in usage-based accounts of language acquisition,[8] and its relative importance vis-à-vis age.

---

[1] For reviews and critiques of the CPH, see, for example, David Singleton: 'Critical Period or General Age Factor(s)? Age and the Acquisition of English as a Foreign Language'. In: María del Pilar García Mayo and María Luisa García Lecumberri (eds.): *Second Language Acquisition Vol. 4*. Clevedon, Buffalo, Toronto, Sydney: Multilingual Matters, 2003, p. 3-22. David Birdsong: Age and Second Language Acquisition and Processing: A Selective Overview. In: *Language Learning* 56.s1 (2006), p. 9-49.

[2] Robert Bley-Vroman: 'What Is the Logical Problem of Foreign Language Learning?' In: Susan M. Gass and Jacqueline Schachter (eds.): *Linguistic Perspectives on Second Language Acquisition*. Cambridge: Cambridge University Press, 1989, p. 41-68, p. 44.

[3] As is common practice, I use "second language" as a cover term for any language other than the first language. I do not here differentiate between acquisition (unconscious knowledge internalisation) and learning (conscious rule memorisation).

[4] Bley-Vroman, Logical Problem, p. 44.

[5] Niclas Abrahamsson and Kenneth Hyltenstam: The Robustness of Aptitude Effects in Near-Native Second Language Acquisition. In: *Studies in Second Language Acquisition* 30/04 (2008), p. 481-509. p. 481.

[6] Bley-Vroman, Logical Problem, p. 44.

[7] For recent research highlighting first-language variability, see Ewa Dąbrowska: Different Speakers, Different Grammars. Individual Differences in Native Language Attainment. In: *Linguistic Approaches to Bilingualism* 2/3 (2012), p. 219–253.

[8] See for example, Thorsten Piske and Thorsten Young-Scholten (eds.): *Input Matters in Sla*, Vol. 35. Bristol: Multilingual Matters, 2009.

Adult migrants, the participants in the study reported here, are a particularly interesting group in this regard. It has been argued that the age variable in attainment studies is usually confounded by contextual issues.[9] Adult migrants differ from most second language learners, and resemble child acquirers, in being exposed to the L2 in a naturalistic and potentially input-rich immersion context. However, adult migrants may also potentially be subject to first-language attrition, a temporary or longer-term reduction in the fluency, accuracy and/or complexity dimensions of a person's first language proficiency, which, given the assumed immutability of L1 post-puberty, constitutes a real theoretical problem for maturational accounts of language development.[10]

In the remainder of the paper, I first describe the study, followed by a summary of the proficiency data in L1, L2 English and other languages. "Native-like" attainment is operationally defined as scores within the score range of the relevant controls. Various predictor variables are then tested as to their power in relation to the language attainment of the participants. The paper concludes by relating the findings to the two perspectives outlined at the beginning of the paper. It argues that they support a usage-based account of both language acquisition and attrition, and calls for a positive revaluation of adults' potential as second-language learners.

Method[11]

Participants

[9] Ellen Bialystok and Kanji Hakuta: 'Confounded age: Linguistic and Cognitive Factors in Age Differences for Second Language Acquisition'. In: David Birdsong (ed.), *Second Language Acquisition and the Critical Period Hypothesis*. Mahwah, NJ: Lawrence Erlbaum Associates, 1999, p. 161-181; Birdsong, Age and Second Language Acquisition, p. 19f.

[10] First-language attrition research is still a relatively recent phenomenon, but the last decade has seen intensive research activity. I list here some representative work; many of the authors worked on PhD theses in the area and came together in the Graduate First-Language Attrition Network referred to further on in the text. See contributions in Barbara Köpke et al. (eds.): *Language Attrition. Theoretical Perspectives*. Vol. 33. Amsterdam/Philadelphia: John Benjamins, 2007; contributions in Monika S. Schmid et al. (eds.): *First Language Attrition: Interdisciplinary Perspectives on Methodological Issues*. Vol. 28. Amsterdam/Philadelphia: John Benjamins, 2004; Merel Keijzer: *Last in First Out? An Investigation of the Regression Hypothesis in Dutch Emigrants in Anglophone Canada*. Vrije Universiteit, 2007; Esther de Leeuw: *When your native language sounds foreign: A phonetic investigation into first language attrition*. PhD thesis. Queen Margaret University, 2008; Susan Dostert: *Multilingualism, L1 Attrition and the Concept of 'Native Speaker'*. PhD thesis. Heinrich-Heine Universität Düsseldorf, 2009; Mirela Cherciov: *Between Attrition and Acquisition: the Dynamics Between Two Languages In Adult Immigrants*, PhD thesis. University of Toronto. 2011; Dorota Lubińska: *Förstaspråksattrition Hos Vuxna: Exemplet Polsktalande I Sverige* [with Summary in English; Adult First Language Attrition: The Case of Polish Speakers in Sweden]. PhD thesis. Stockholm University, 2011; Conny Opitz: *First Language Attrition and Second Language Acquisition in a Second Language Environment*. PhD thesis. Trinity College Dublin, 2011.

[11] The methodology employed is discussed in detail in Opitz, *First Language Attrition and Second Language Acquisition*, p. 82-142.

German-English bilinguals of German (N = 25), Austrian (N = 1) and Swiss (N = 1) extraction, who were long-term residents of Ireland (mean length of residence = 19.5 years, range 8-34 years), participated in a cross-sectional investigation aimed at establishing whether they had suffered any first-language attrition, and to what degree they had acquired L2 English and developed/maintained other L2s in migration (Table 1).[12] While German and English are cognate languages, which may facilitate both L2 English acquisition and L1 maintenance to a degree, the uniformity of L1 development, and the impossibility of native-like SLA claimed by maturational accounts applies to all languages and their combination in principle. Therefore, the findings of this study are generalisable to other language pairings within the constraints imposed by group size and the particular instruments and measures used.

The participants had grown up as German monolinguals and had migrated to Ireland or the UK in their adult years (mean age on arrival = 26.7 years, range 22-42 years). Most had learned English as a school subject, but significant exposure to the language only began with their migration. The majority had also learned other languages at some stage in their life. Since one of the study's concerns was to tease out possible interactions between language proficiencies in multilingual development, participants were required to have a meaningful level of proficiency in English, operationalised as a self-rating of at least 3 ("good") on a 5-point scale. On a background questionnaire returned prior to the study (N = 24), two participants (8%) rated their level of English at the time of testing as "good", eight (33%) as "very good" and 14 (58%) as "excellent".

Table 1: Participants

Participants	**Bilingual group**	**German controls**	**Irish controls**
Number	27	20	18
Females	21 (78%)	16 (80%)	14 (78%)
Males	8 (22%)	4 (20%)	4 (22%)
Mean age on arrival (AOA)	26.8	n/a	n/a
Mean length of residence (LOR)	19.5	n/a	n/a
Mean age at testing (A@T)	46.3	44.2	41.2
Mean years in education	16.3	16.7	16.2

[12] In the remainder of the paper, I use the term bilingual to refer to a person's knowledge of at least two languages.

Matched bilingual groups of 20 German native speakers and 18 Irish native speakers of English served as controls for tasks in the relevant language (see below). The controls were also required to meet minimal L2 proficiency criteria assessed in the same way as in the experimental group, but were distinguished from the latter by being resident in the L1 environment and not having experienced long-term immersion in the L2. The choice of bilingual controls rather than monolingual ones as is usually the case was motivated by the argument put forward by Grosjean, Cook and others that bilingual minds differ from monolingual ones in non-trivial ways.[13] The German controls' self-ratings of their English proficiency were: 5% "low", 45% "good", 40% "very good" and 10% "excellent"; while the Irish controls rated their German language proficiency as: 6% "low", 24% "good", 41% "very good" and 29% "excellent".

Materials

The materials used in the study were designed to establish participants' language proficiency across the range of their languages, but principally their L1 German and L2 English, with both quantitative and qualitative analyses. Participants completed a comprehensive test battery of five language tasks in parallel German and English versions and a linguistic aptitude test, and responded to several questionnaire instruments (Table 2).

The 65-item sociolinguistic questionnaire, the background and attitude questionnaires were developed specifically for this investigation, but were aligned with materials contained in the Language Attrition Test Battery (LATB), which was developed within the Graduate Attrition Network (2002-2004) with the aim of harmonising methodologies across L1 attrition studies.[14] Other instruments are in the public domain and were used with minor modifications: the Lognos linguistic aptitude test battery (LAT);[15] the verbal fluency tasks (Fluency in Controlled Associations, FiCA);[16] the Charlie Chaplin film retelling (SFI procedure);[17] and the

[13] François Grosjean: Neurolinguists, Beware! The Bilingual Is Not Two Monolinguals in One Person. In*: Brain and Language* 36/1 (1989), p. 3-15; Vivien Cook: 'The Consequences of Bilingualism for Cognitive Processing'. In: Annette de Groot and Judith F. Kroll (eds): *Tutorials in Bilingualism. Psycholinguistic Perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates, 1997, p. 279-299; Vivian Cook: Background to the L2 User. In: Portraits of the L2 User. Vivian Cook (ed.): Second Language Acquisition. 1 ed. Clevedon: Multilingual Matters, 2002, p. 1-28.

[14] Monika S. Schmid: *The Language Attrition Test Battery. A Research Manual*. Amsterdam. 2004, p. 8, 15ff., 41ff; Monika S. Schmid: A New Blueprint for Language Attrition Research. In: Monika S. Schmid et al. (ed.): *Language Attrition: Interdisciplinary Perspectives on Methodological Issues*, Vol. 28: Studies in Bilingualism. Amsterdam: John Benjamins, 2004, p. 348-363.

[15] Paul Meara, James Milton, and Nuria Lorenzo-Duz: *Language Aptitude Tests*. 1st ed. Newbury: Express Publishing, 2001. English version, parts B, C and D.

[16] Based on Arthur L. Benton, P. J. Eslinger, and A. R. Damasio: 'Normative Observations on Neuropsychological Test Performances in Old Age'. In: Louis Costa and Otfried Spreen (eds.): *Studies in*

can-do scales (43 statements relating to listening, reading, speaking and writing skills in German and English).[18] The C-test, film retelling and can-do scales are also included in the LATB.[19]

Table 2: Test battery

Questionnaire instruments:
Personal background questionnaire[1)]
Sociolinguistic questionnaire[1)]
Part 1: Language use questionnaire
Part 2: Language proficiency/attitudes questionnaire
Can-do scales[1)]
Attitudes towards foreign language learning/bilingualism[2)]
Language tasks:
C-test[1)]
Verbal fluency tasks (FiCA, Fluency in Controlled Associations)[3)]
Film retelling[3)]
Picture description[2)]
Sentence generation task[2)]
Linguistic aptitude test (LAT) (English version)[1)]

Provenance of materials: [1)] LATB; [2)] author; [3)] published material

The battery was administered in the following order, usually in a single session:

- Part 1 of the sociolinguistic questionnaire
- Language tasks – German or English
- Language aptitude test
- Language tasks – German or English
- Part 2 of the sociolinguistic questionnaire.

The order of the language tasks (German or English) was counterbalanced between participants; the order of the tasks within each language set was kept constant. The sociolinguistic questionnaire was administered as a semi-structured interview by the

Neuropsychology. Selected Papers of Arthur Benton. New York, Oxford: Oxford University Press, 1985, p. 319-326; Joshua A. Fishman, and Robert L. Cooper: Alternative Measures of Bilingualism. In: *Journal of Verbal Learning and Verbal Behaviour* 8/2 (1969), p. 276-282.

[17] Peter Broeder et al. (eds): *Processes in the Developing Lexicon. Final Report on the European Science Foundation's Additional Activity on Second Language Acquisition by Adult Immigrants*. Vol. 3. Strasbourg, Tilburg and Göteborg. 1988; Clive Perdue (ed.): *Adult Language Acquisition. Cross-Linguistic Perspectives: Field Methods/The Results*, 2 vols. Cambridge: Cambridge University Press, 1993.

[18] ALTE: Association of Language Testers in Europe. 1990.

researcher, who filled in the responses. The entire testing session, with the exception of the C-test and the aptitude test, was voice-recorded; the oral productions were later transcribed. The personal background questionnaire served as a screening instrument and was administered prior to the testing session; the can-do scales and language attitude questionnaire were completed by the participants in their own time after testing. The controls completed a shorter version of the test battery including the background questionnaire, can-do scales and attitude questionnaire; all language tasks in L1, the C-test only in L2, and the aptitude test.

The tasks reported in this paper are the C-test, the verbal fluency tasks, and the film-retelling task. Data from the sociolinguistic questionnaire and other questionnaire instruments serve to corroborate and contextualise the findings.

Data[20]

Information about the pre-migratory and current levels of language proficiency of the bilingual participants (the dependent variable) comes from two sources: the self-rating instruments on the one hand, and the objective measures of the language tasks on the other. Self-ratings were elicited with the German and English can-do scales, with questions in the sociolinguistic questionnaire yielding a global indicator for German and English, and scales for the four language skills listening, reading, speaking and writing across all the languages known by the participants. The objective measures were individual scores in the German and English language tasks; a composite score (*z*-score) based on six pertinent measures across C-test, FiCA and film retelling (C-test scores, C-test time, FiCA score, Charlie VOCD, Charlie hesitation index, Charlie error rate); as well as external ratings based on the English film retelling.

The predictor, or independent, variables were partially computed on the basis of information provided in the sociolinguistic questionnaire (biographical factors, language attitude, language use), or were scores on the LAT test (linguistic aptitude). In the interview, participants were also prompted to reflect on the processes of L2 acquisition and L1 attrition with questions focusing on factors promoting acquisition/maintenance, the time course of acquisition/attrition and on areas of change within each language, yielding a considerable amount of qualitative data.

[19] Schmid: *Language Attrition Test Battery*, p. 8, 15ff., 22, 58ff.

German language proficiency

As mentioned above, all bilingual participants had grown up monolingually in a native German-speaking context and had added English, as well as other languages, at some later stage in life. All participants emigrated well into their adulthood and could thus be expected to have been fully (in the sense of typically) proficient in their L1 German at the time of emigration.[21] Indeed, 24 bilingual participants (88.9%) rated their pre-migratory level of German at the highest available point of a 6-point Likert scale labelled "native (-like) proficiency", while one participant rated her proficiency (5) "very good", and two merely (4) "good" (Table 3). This may seem surprising, however, the German controls also revealed a degree of variability in their perceived mother tongue proficiency in response to the can-do statements. Thus, the L1 proficiency of German controls and bilingual participants at the time of their migration may be seen as comparable.

Reduced post-migratory first-language proficiency ratings are interpretable as perceived first-language attrition. For the time of testing, only two-thirds of bilingual participants still rated their German proficiency at the highest point at the scale (Table 3). 22.2% felt that their proficiency was still very good, but not as good as it had been; and one felt her proficiency had dropped from the maximum "native" level to a mere "satisfactory". The differences between the ratings proved significant, indicating that as a group, the participants perceived to have suffered a degree of attrition in their native language (Wilcoxon Signed Rank test: $T = 1$, $z = -2.11$, $p = .031$ one-tailed, $r = -.29$).

Table 3: Self-ratings German proficiency (N = 27)

German proficiency	Prior to migration		At time of testing	
(3) Sufficient	-	-	1	3.7%
(4) Good	2	7.4%	2	7.4%
(5) Very good	1	3.7%	6	22.2%
(6) (Near-) Native	24	88.9%	18	66.7%

When asked whether the participants' L1 proficiency had changed since migration, 49% answered that it was still the same, and 51% said it had disimproved. In response to a related question concerning language dominance, 22.2% stated that their German was better, 14.8%

[20] For a detailed representation and discussion of the results, see Opitz, *First Language Attrition and Second Language Acquisition*, p. 143-308.

[21] David Birdsong: Ultimate Attainment in Second Language Acquisition. In: Language 68.4 (1992): p. 706-755, p. 707.

felt their English was better, and for the majority, 63.0%, the languages were on par. These replies also point to a substantial shift in perceived L1 proficiency and language dominance. The ratings on the can-do scales show a more differentiated picture with regard to the four language skills, and in comparison with the German control group. The bilinguals' self-ratings for Listening > Speaking > Reading > Writing reduce in this order, i.e. the literacy-related skills appear to be more affected than the non-literacy skills, and the productive skills seem to be more vulnerable than the receptive skills. This mirrors the normal order of skills acquisition in L1: the oral skills listening and speaking are primary to the literacy-related skills of reading and writing and are thought to be easier to acquire and maintain, while the receptive skills are thought to require less computational effort in language processing than the productive skills.[22] Consequently, the acquisition order suggests a hierarchy in skills complexity, which in an attrition situation apparently translates into a hierarchy of vulnerability of skills.[23]

The German controls, on the other hand, rated themselves as almost "perfectly" proficient across listening, reading, and speaking; writing again received a slightly lower score. Self-ratings at ceiling suggest that these skills are overlearned, as might be expected in native speakers.[24] However, despite the divergent picture, a group comparison did not result in any significant differences on any of the sub-skills or averages of each skill, with the exception of one statement within the written proficiency section ($U = 131.000$, $p = .048$ one-tailed). Thus, while the bilingual participants perceive to have been subject to a degree of L1 attrition, the L1 changes are not borne out on statistical measures of skill ratings vis-à-vis the control group. Similarly, there are no significant differences between the bilingual group and the German control group on most of the objective measures taken individually, pointing to first-language maintenance rather than attrition.

Table 4: German C-test mean scores and time taken

C-test German	**Bilingual group** (N = 27)	**German controls** (N = 20)

[22] Michel Paradis: Linguistic, Psycholinguistic, and Neurolinguistic Aspects of "Interference" in Bilingual Speakers: The Activation Threshold Hypothesis. In: *International Journal of Psycholinguistics* 9/2 (1993), p. 133-145.

[23] Peter Ecke: Language Attrition and Theories of Forgetting: A Cross-Disciplinary Review. In: *International Journal of Bilingualism* 8/3 (2004), p. 321-345; Emiko Yukawa: *Language Attrition from the Psycholinguistic Perspective: A Literature Review*. Stockholm: Centre for Research on Bilingualism, Stockholm University, 1997.

[24] Barry McLaughlin: Aptitude from an Information-Processing Perspective. In: *Language Testing* 12 (1995), p. 370-387.

Mean scores (ex 100)	90.5	93.6
Range	67-99	84-99
StD	8.0	3.9
Mean time taken (min:sec)	13:39	11:34
Range	5:52-23:27	7:03-17.25
StD	4:48	3:12

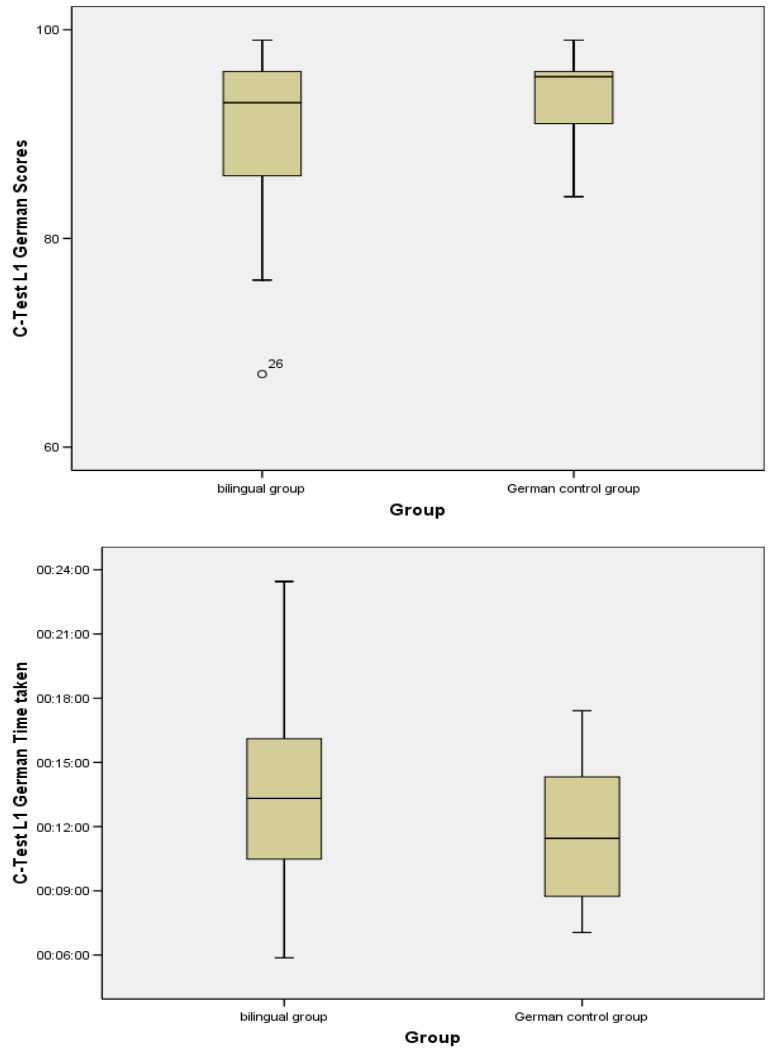

Figure 1: Distribution of German C-test measures

Table 4 shows the results of the two C-test measures: mean scores ex 100, and the time taken to solve the test; Figure 1 represents the distribution of scores graphically. Both indicate that there is substantial overlap between the two groups on both measures; however, it is noticeable that the bilingual group has a more variable performance as may be deduced from the range and standard deviations of the measures, and the presence of an outlier.

The same general picture holds for the other two tasks. There are no significant differences on any of the FiCA stimuli, and few on measures of the film retelling; nevertheless, the bilingual groups shows evidence of a more variable performance across all measures. Thus, there are individuals who fall outside the range of scores provided the controls (the native-speaker range), i.e. do not meet the criteria for native-like behaviour, on most measures. This, importantly, means that when the scores are combined on the composite *z*-score, the difference between the groups does become significant: $t(41) = -2.277$, $p = .014$ one-tailed). Moreover, detailed quantitative and qualitative analyses pinpoint trends for changes in the bilingual participants' L1 proficiency.

Language proficiency may be construed as the coming together of three dimensions: fluency, accuracy and complexity (CAF),[25] the first of which is an online, processing dimension, while the latter two relate more directly to the knowledge built up in the language. All three components should have a bearing on the C-test and error scores, while the fluency dimension may be detected in various temporal measures, such as C-test time, FiCA scores and hesitation measures in the film retelling.

With regard to the accuracy dimension, the overall scores on the C-test yielded no significant differences, as pointed out above, but an item analysis reveals higher levels of difficulty with particular items within the bilingual group. Thus, for example, the target item "zweckentfremdet" ("used for a different purpose than the one it was designed for") in one of the texts was solved correctly by all controls, but five of the bilinguals either formed non-existing, partially ungrammatical, or semantically incongruous lexemes. In other cases, the controls provided plausible, if not the intended forms, while the bilingual participants tended to leave a gap, commenting they could not remember or think of the word in question.

In the film retelling, the bilingual group's error rate is significantly higher than the control's both on lexico-semantic and morpho-syntactic errors ($U = 295.500$, $p = .006$ one-tailed; and $U = 333.500$, $p = .023$ one-tailed, respectively). Some of the errors follow trends also detectable in the control group, but have a greater magnitude. A source of error unique to the bilinguals' productions is cross-linguistic influence from L2 English on both lexical and syntactic choices in L1. For example, one participant talks about the film couple (Charlie Chaplin and the girl) being "neu verheiratet" (strictly "re-married") instead of "frisch

[25] Diane Larsen-Freeman: Adjusting Expectations: The Study of Complexity, Accuracy, and Fluency in Second Language Acquisition. In: *Applied Linguistics* 30/4 (2009), p. 579-589; Peter Skehan: Modelling Second

verheiratet" (newly-wed"), while six refer to the "foreman" as "Vormann" instead of "Vorarbeiter". There are also pragmatically implausible violations of the verb-second constraint brought on by syntactic borrowing. Many choices which were not logged as errors still reveal distributional differences in the use frequency of items, particularly of infrequent lexical items and borderline syntactic choices.

The dimension of complexity is also affected to some degree. While the lexical diversity (VOCD) of the film retellings was comparable between groups, an items analysis of the FiCA productions showed that the bilingual group used slightly less diverse and more prototypical vocabulary, in line with the prediction that in an attrition situation language is simplified through the loss of marked forms.[26]

Regarding fluency, I already mentioned that the C-test score was apparently impacted by a lack of fluent retrieval of some items by the bilinguals. Lexical retrieval difficulties and failures can also be observed in the FiCA and film retellings. A further interesting difference emerges in relation to C-test time, which correlates very highly with the bilingual participants' perceived skills of speaking, reading and writing, while there are no such interactions in the control group who rates its fluency at ceiling. The bilingual participants apparently feel that their fluency is reduced, and this is borne out in the C-test time measure. Further, in the film retelling, the bilingual participants had significantly higher word repetitions ($U = 254.000$, $p = .009$ one-tailed), which have been tied to lexical retrieval problems.[27]

The use of code-switches in both groups is also revealing. While there is a large difference in the number of uses between the groups (31 vs. 9 occurrences in the bilingual vs. the control group), code-switches are also used for different purposes: the controls quote from the film; the bilinguals show evidence of both involuntary switches, and retrieval difficulties.

Overall, the self-reported changes to the L1 suggest a similar pattern to the one observed in the proficiency data, and cut across the linguistic levels, skills and CAF dimensions (Table 5). However, on the basis of the frequency of mentions, most changes were perceived to

---

Language Performance: Integrating Complexity, Accuracy, Fluency, and Lexis. In: *Applied Linguistics* 30/4 (2009), p. 510-532.

[26] Herbert W. Seliger, and Robert M. Vago: 'The Study of First Language Attrition: An Overview'. In: Herbert W. Seliger and Robert M. Vago (eds.): *First Language Attrition*. Cambridge: Cambridge University Press, 1991, p. 3-15.

[27] Heather Hilton: The 'Pausological' Interface between Language Knowledge and Production Skill. EuroSLA 17. 2007; Heather Hilton: The Link between Vocabulary Knowledge and Spoken L2 Fluency. In: *Language Learning Journal* 36/2 (2008), p. 153-166.

concern the lexico-semantic area and to be caused either by difficulties in fluent retrieval or by cross-linguistic influence, which in turn impact on the complexity and accuracy dimensions of L1 proficiency.

Table 5: Reported changes in L1 proficiency

Changes in L1 German	Mentions (N (%))
Phonology	
L2 accent in German	1 (3.7%)
Lexicon	
Smaller size of lexicon	6 (22.2%)
Speed and precision of lexical retrieval/fluency	17 (63.0%)
Insecurity in choice and precise shape of words/expressions	5 (18.5%)
Insecurity in relation to spelling	4 (14.8%)
Interferences, innovations	8 (29.6%)
Morpho-syntax	
Loss of sensitivity for grammatical distinctions, accuracy	1 (3.7%)
Loss of automaticity of rule application	1 (3.7%)
Syntactic transfer	5 (18.5%)
Pragmatics	
Appropriacy of formal/informal address	2 (7.4%)
Facility for being witty	1 (3.7%)
Facility for partaking in complex discourse	2 (7.4%)
Facility for using expressive means	1 (3.7%)

It should be pointed out that several participants emphasised that their L1 was just "a little bit worse", or that their German had recently returned to a more fluent level, as a result of work- or family-related changes, and the greater accessibility of German media due to technological advances. Many also take advantage of more affordable travel for visits to the country of origin, leading to better maintenance levels of their L1.

On the basis of the combined proficiency and self-report data, we can thus surmise that the L1 proficiency of some of our bilingual participants has indeed been affected by their experience of living abroad and speaking another language in daily life. However, given that the differences between the groups only reach statistical significance after being combined, the scale of negative changes is evidently very small, and may lie within the bounds of nativeness. Indeed, many changes are not unique to the bilingual group, differing from those found in the control group mainly in degree. Thus, there appears to be a continuum of

"native-speakerness",[28] with individuals differing considerably in their degree of L1 maintenance/attrition.

English and other language proficiency

In contrast with the very homogenous level of German language proficiency prior to migration, the bilingual participants' English-language proficiency was far more varied at that time. None of the participants rated themselves at the highest, native-like level (6), while 25.9% reported that they knew English (5) "very well" (Table 6). The majority stated that their level of English at the time of emigration was (4) "good". The remainder rated their initial proficiency even lower.

Table 6: Self-ratings English proficiency (N = 27)

English proficiency	Prior to migration		At time of testing[29]	
Very low	3	11.1%	-	-
Low	1	3.7%	-	-
Sufficient	4	14.8%	-	-
Good	12	44.4%	3	11.1%
Very good	7	25.9%	6	22.2%
(Near-) Native	-	-	18	66.7%

By the time of testing, the proficiency ratings had improved to a minimum rating of "good" (4), with two-thirds now rating their proficiency as native-like. None of the participants felt that their L2 proficiency had decreased, and the improvement registers as a large positive change (Wilcoxon Signed Rank test: $T = 0$, $z = -4.53$, $p = .000$ one-tailed, $r = -.62$). These global ratings, and the participant's can-do ratings, seem to be reasonably in tune with their actual capabilities. All self-rated skills, except listening, correlate highly with the C-test score, C-test time and the *z*-score (Table 7). Listening fails to reach significance only in relation to C-test time, and the absence of that correlation is not particularly surprising given that it is a written task.

[28] See Susan Dostert: *Multilingualism*, p. 76ff, for an application of prototype theory to the concept of the native speaker.

[29] These ratings are similar, but not identical to the ones provided on the Background questionnaire at the screening stage.

Table 7: Significant correlations between English can-do ratings and objective measures for the bilingual group

Can-do ratings	C-test score	C-test time	*z*-score
English listening	$r = .658$, $p = .01$	-	$r = .743$, $p = .01$
English speaking	$r = .692$, $p = .01$	$r = -.661$, $p = .01$	$r = .789$, $p = .01$
English reading	$r = .643$, $p = .01$	$r = -.526$, $p = .05$	$r = .717$, $p = .01$
English writing	$r = .642$, $p = .01$	$r = -.767$, $p = .01$	$r = .733$, $p = .01$

The English can-do scales produce very similar results to the German data. In the bilingual group, we again find a hierarchy of skills – Listening > Speaking > Reading > Writing – following the order of computational effort. The control group's average scores, on the other hand, vary only minutely, with just the two literacy skills being rated a fraction lower, again pointing to overlearned skills.

The difference between bilinguals and controls is significant for all four skills, with 21 out of 43 individual statements returning a significant difference, but is much more pronounced in the literacy-related skills. Reading and writing are significantly different at the .001 level, while the ratings for listening and speaking are significant at the .05 level (all *p*s one-tailed; listening: $U = 80.500$, $p = .025$, reading: $U = 39.500$, $p = .000$, speaking: $U = 78.000$, $p = .016$, writing: $U = 45.500$, $p = .000$). Nevertheless, the overall level of the can-do ratings is quite high for adult learners, with averages ranging from 88.74 for writing to 95.95 for listening, and by far exceeds that of the German control group (from 57.65 for writing to 64.56 for listening).

The same trends emerge when comparing the groups on the objective measures. Significant group differences obtain on the C-test score; one-third of the FiCA stimuli; the rate of silent pauses and repetitions on the film retelling; several error types (lexico-semantic, function words and form errors), as well the composite *z*-score. According to these findings, the bilingual participants differ from the Irish controls as a group, but many of them have become very proficient in their L2. Moreover, they are also quite different from the German controls, who did not have the benefit of long-term residence abroad. Table 8 presents the data for the English C-test, while Figure 2 diplays the information graphically.

Table 8: English C-test mean scores and time taken

C-test English	Bilingual group (N = 27)	Irish controls (N = 18)	German controls (N = 18)

Mean scores (ex 100)	84.3, *	92.7	57.4***B
Range	49-98	89-97	21-86
StD	11.5	2.8	18.1
Mean time taken (min:sec)	17:20	14:55	21:11***B
Range	8:05-25:00	6:34-20:30	14:59-25:00
StD	5:09	4:10	3:01

*B Results are significant at p = .017 (Bonferroni corrected p)
***B Results are significant at p = .0003 (Bonferroni corrected p)

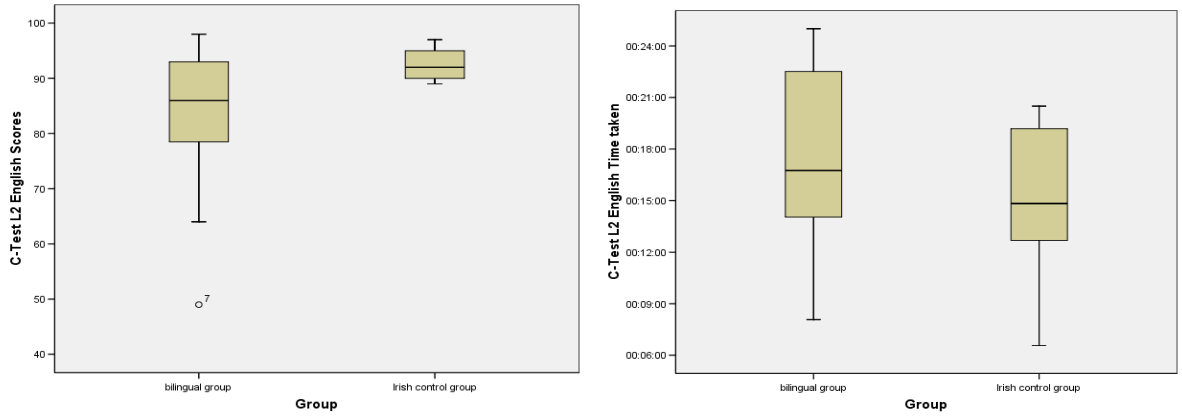

Figure 2: Distribution of English C-test measures

The graph for the C-test score is illuminating in that it illustrates both the group differences at the group level, as well as the fact that there are several bilingual individuals who do fall within, and one even above, the native-speaker range. The C-test time measure shows a much more pronounced overlap between bilinguals and the Irish controls and did not yield a significant group difference. However, on both measures, the bilingual group outperforms the German control group by a large margin.[30]

Regarding the CAF dimensions, the picture is almost the converse of the German results regarding fluency, which does not appear to be an issue here as shown by the absence of retrieval difficulties, partially on items which drew a gap in German. Accuracy as measured in errors on the film retellings is lower than the controls', but there are fewer distributional differences than in German. The complexity dimension, as gleaned from lexical diversity scores, also appears to be largely comparable.

[30] The relevant results from the significance tests are as follows: C-test score: Kruskal-Wallis H = 37.29, 2df, p < .001; bilingual group-Irish controls: Mann-Whitney with Bonferroni correction U = 128, p < .017; bilingual group-German controls: U = 49, p < .0003; C-test time: One-Way ANOVA: Welch F(2, 39) = 14.82, p < .001, Games-Howell - the pairwise comparison for the bilingual group-Irish controls is not significant, while that with the German controls is.

As a further test of degree of attainment, I again compared the results to the native-speaker range. On the individual measures, between 40% and 50% of the bilinguals' scores fall within the native-speaker range. On the *z*-score, this figure rises to 56% of the bilinguals' scores, even though the comparison resulted in a significant group difference ($t(41.184) = -3.154$, $p = .003$). It appears that the differences between the bilinguals and the Irish controls come largely down to two markedly different individuals. This is also borne out in external global proficiency ratings provided by two linguistically trained native speakers who were asked to judge the bilingual participants on the basis of the film retellings using the CEF proficiency levels.[31]

These ratings paint a very clear picture: all scores bar one were in the C1 (15%), C1-C2 (37%) or C2 (44%) categories. The ratings correlate highly with the *z*-scores ($r = .742$, $p = .000$), and with the English C-test scores ($r = .520$, $p = .005$). Alongside positive evaluations of participants' command of grammar and lexicon ("native-like grammatical and lexical control", "very colloquial, native-like vocabulary"), the raters also commented on other features, such as the use of colloquialisms, idiomatic phrases and accent. 33% of participants were described as having acquired features of distinctly Irish pronunciation, such as post-vocalic /r/ and Irish vowel values ("significant Irish/Hiberno-English influence on phonology"; "sounds like native speaker phonology"), while 22% were "evidently" or "identifiably non-native" in that regard. A high level of fluency was noted for 11% ("very proficient vocabulary and fluency of speech").

Thus, the bilingual participants have indeed attained a high level of bilingualism/L2 proficiency, with fluency gains exceeding complexity/accuracy attainment. The data also show relatively little transfer from L1. There is again large inter-individual variability, and in parallel with the German data, it is feasible to argue in favour of a continuum of native-speakerness and learners.

But what about other languages participants had learned during their lives? Almost all participants (92.6%) know or knew at least one other language apart from English. Other languages were mentioned 59 times across all participants, the majority of which (49) had been studied first prior to migration, while the remainder was added post-migration. Most participants had knowledge of three or four languages including their mother tongue (29.6% and 25.9% respectively), but a sizeable number knew five or six languages (18.5% and 14.8% respectively). The list is topped by one individual with knowledge of eight languages. Most

[31] ALTE: Association of Language Testers in Europe. 1990.

of the participants thus have had extensive experience of studying and/or "picking up" foreign languages.

Between them, the participants know ten different second languages – English is, of course, known by all, followed by French (21 mentions), Latin (13) and Spanish (11). The remaining languages are Italian (five mentions), Russian (four), Irish (two) and Dutch, Ancient Greek and Japanese (one each). This distribution is representative of the German educational system, where English and French are the most frequently studied foreign languages. Latin was also widely taught at the time when many participants attended school, while the other languages were usually taken up on participants' own initiative after leaving school.

The level at which these languages were known prior to migration varies, but the majority of the 49 languages studied had been known with low, sufficient or good proficiency, while fewer had achieved higher levels of proficiency (Table 9). It would appear that the bilingual participants are a typical group of language learners, whose achievements in their foreign languages are fairly normally distributed across the languages.

Table 9: Self-ratings other language proficiency (49 languages)

Other language proficiency	Prior to migration		At time of testing	
No proficiency	-	-	3	6.1%
Very low	3	6.1%	14	28.6%
Low	13	26.5%	13	26.5%
Sufficient	13	26.5%	13	26.5%
Good	12	24.5%	4	8.2%
Very good	6	12.2%	1	2.0%
(Near-) Native	2	4.1%	1	2.0%

For the time of testing, the results are more sobering. The ten languages picked up since migration did all (naturally) improve, but mostly only to "very low" proficiency (7 languages), while two participants rated their proficiency as "sufficient", and just one as "good". Of the 49 languages learned before migration, the vast majority (73.5%) disimproved, three disappearing entirely. Only three languages (6.1%) improved, while the remainder (20.4%) was maintained at the same level. Overall, the participants have not been very successful in maintaining their other languages, a fact that was commented on mostly with indifference, and occasionally regret.

Thus, we are dealing with a group of bilinguals who have become very proficient in their second language English, while only showing slight changes, mostly relating to access and fluency, in their mother tongue. However, few have maintained a high level of proficiency in their other languages. The next section discusses the impact of potential predictor variables on the participants' language proficiencies.

Predictor variables in language acquisition and attrition

Many variables – individual and contextual – have been proposed as playing a part in language attrition and indeed acquisition. Information about potential predictor variables was collected with the sociolinguistic questionnaire, the attitudes questionnaire, and the language aptitude test, and subsequently combined into the following variable groups: a) biographical factors; b) language use; c) language attitudes, d) language aptitude. For each of these variable groups, I ran correlations with the bilingual group's *z*-scores (Table 10). I now comment on these in turn, followed by a brief exposition of participants' thoughts on what had helped them become proficient in English, and maintain German and other languages.

Table 10: Significant correlations between predictors and *z*-scores[32]

	German (Ger)	**English (Eng)**	**No correlation**
Biographical factors	LOR (*r* = -.441*) Education level (*r* = .524**) Nationality (*r* = .585**)	Gender (*r* = .445*) No. of languages (*r* = .429*) L1 of partner (*r* = -.597**)	Age of acquisition Age at time of testing Children
Language use (LU)	Ger LU (r = .545**) Ger vs. Eng LU (*r* = .452*)	Eng vs. Ger LU (*r* = -.567**)	
Language attitudes	Bilingual orientation (*r* = -.526*)	Foreign language orientation (*r* = -.471*) Eng language orientation (*r* = -.540**)	
Language aptitude	Visual memory (*r* = .477*)	Visual memory (*r* = .584**) Rule inference (*r* = .541**)	Aural recognition

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).

[32] Conny Opitz: A Dynamic Perspective on Late Bilinguals' Linguistic Development in an L2 Environment. In: *International Journal of Bilingualism*. Online first (2012).

Biographical factors

The variables tested for their predictive power relating to L1 and L2 (English) proficiency were length of residence (LOR), age at time of testing; gender, education and the number of languages known by the bilingual; nationality, the first language of/language of communication with the partner (English or German), and children living with the family. Interestingly, most biographical predictors correlate with one, but not the other dependent variable (Table 10).

Thus, for the German *z*-scores, significant correlations were obtained with LOR, education level and nationality. The direction of the effects mean that German is maintained better by people who have stayed in Ireland for shorter periods of time, who have a higher level of education and who have kept their German nationality.[33] Put differently, both input (LOR/perhaps education) and attitude (citizenship/education?) dimensions seem to be involved. English language proficiency, on the other hand, correlates significantly with gender, the number of languages known and the L1 of the partner. In other words, females, whose partner is Irish (or English-speaking) and who know more languages, attained higher English proficiency, pointing to the importance of input factors (partner) and possibly an element of language awareness/linguistic aptitude (knowing several languages). Since the females tended to have an English-speaking partner, in contrast with the males, who, with one exception, all had German-speaking partners, it would appear that the gender dimension is confounded with input.

It is also interesting to note which combinations did not result in significant correlations. In view of the present argument, the most important result is probably the absence of any effects for age of acquisition. For German, the L1, age of acquisition is constant, so any inter-individual differences must be due to other factors. The age of acquisition of English varies between participants – most had started studying the language in school between the ages of 10-12, achieving typical levels of attainment, but one had started in pre-school aged 4, and another two began acquiring English as adults aged 26 and 42 respectively, when they came to Ireland. Despite these differences, age at acquisition does not yield a significant correlation with the English *z*-scores, and, contrary to what might be expected from a maturational perspective, both late starters received high proficiency ratings of C1/C2 from the external

[33] Very few people had changed their passport, since double citizenship only became possible recently.

judges on account of their "native-like vocabulary and grammatical structures" and "very proficient vocabulary and fluency of speech" respectively.

Similarly, age at time of testing does not seem relevant for either L1 maintenance or the level of L2 proficiency, and LOR does not play a role (anymore) in L2 attainment. These two variables, not surprisingly, correlate highly with one another (r = .764, p = .000). Level of education appears to be less relevant for L2 acquisition in naturalistic settings, while having a partner with whom to speak the language does make a difference. On the other hand, the presence or absence of children with whom one can speak either language curiously does not yield as a significant result.

Language use

Language contact is often seen as a major predictor for language maintenance/acquisition. On the basis of the responses to the questionnaires, we computed two language use variables (Table 10). The first, "German language use", combines responses to questions relating to how often German is used by the bilinguals overall, ranging from "never" (lowest score) to "all the time" (highest score). The second index, "Bilingual language use", relates to the amount/frequency with which English and German are used for particular purposes. It ranges from "English only" (lowest score) to "German only" (highest score).

There was a strong positive correlation between the overall amount of German use and the German *z*-scores. Thus, bilinguals who use German more maintain German better. Similarly, the bilingual index shows that participants who use more German have a higher level of L1 proficiency, and those who use more English have a higher proficiency in English. While this is in line with expectations, these effects have not always been proven.

Language attitudes

Attitudes are a multi-componential phenomenon, encompassing identity issues, and attitudes towards other languages and cultures, so in a similar procedure to the language use question, the data was computed into several distinct attitude indices. Index 1, "Orientation towards English and other L2s", combines statements that probed participants' disposition towards languages other than L1. The lowest score indicates the strongest level of orientation towards L2. Index 2, the "Bilingual index", is a combination of statements that try to assess the value placed on knowing more than one language. This is similar, but not identical to Index 1, where positive attitudes towards L2 might be interpreted as an orientation away from L1. The lowest score indicates the strongest bilingual orientation. Finally, Index 3, "Orientation

towards German", combines several statements, which were conceived of as giving an indication of a person's identification. The highest score corresponds to the strongest level of L1 orientation.

Index 1 and 3 both correlate highly with the English scores, meaning that the more a person values English and foreign languages, the higher their attainment. However, the opposite is not true, as the lack of correlation with the German scores shows. Instead, the German scores correlate with Index 2, indicating that the higher a person values bilingualism, the higher their level of L1 maintenance. This is a very interesting and slightly unexpected result in relation to the German data. Perhaps these ratings reflect the realities of living in an integrative bilingual situation, where the exclusive use of the mother tongue is neither possible nor desirable, so value is placed on keeping both languages active instead of an exclusive orientation towards German.

Linguistic aptitude

Correlations were run separately for each sub-test. The aural recognition sub-test employed an artificial test language and did not result in a significant correlation with either proficiency score. However, the English scores do correlate very highly with the other two sub-tests, which used basic English words as stimuli. As with all correlations, we cannot be sure of the direction of cause and effect – it may be possible that higher English language proficiency made it easier to complete the task, or that those with high aptitude had achieved a high level of L2 proficiency. Conceivably, both explanations are true, given that on the one hand, participants were acquiring English mostly in a naturalistic learning environment where input is not pre-structured, but on the other, their level of L2 proficiency before migration may have provided them with sufficient access to the language, diminishing the role for aptitude. The most interesting result is the correlation between the visual memory (word-learning) task and the level of L1 maintenance, since linguistic aptitude is usually only considered for its role in L2 acquisition. This result may mean that those participants who have higher verbal skills find it easier to maintain their mother tongue, which, given the abundance of lexical retrieval difficulties in the German data, seems plausible.

Participant testimonies

One question of the sociolinguistic questionnaire asked what participants thought would promote successful language learning. In relation to their L2 English, participants overwhelmingly pointed to their experience of living abroad, and the opportunities available

for speaking and discovering the language in meaningful contexts, for listening – to the radio or television - and copying others, for watching films and news in the original, as well as reading books. Several participants also mention the role of significant others in providing feedback, input and opportunities for language use, and more than half highlight the need to be prepared to take risks by trying out the language and taking the initiative.

This is in contrast to how they described their prior experience of learning English, and indeed other languages, in instructional settings, which even those with a genuine interest in languages often found boring and far removed from reality. However, many agree that having a basis in a language prior to experiencing immersion is helpful and speeds up the progress. On the other hand, the case of the two essentially self-tutored participants would seem to indicate that it is not a necessary prerequisite.

When asked about language maintenance (in German and other languages), it is interesting that the participants essentially list the same strategies, emphasising above all meaningful input.

Discussion and conclusion

To summarise, the bilingual participants in this study represent a group of fairly to very highly proficient adult second language learners, most of whom have succeeded in maintaining their mother tongue, while being less successful in maintaining other languages. Since all participants migrated post-puberty, and since the substantial growth in their L2 proficiency dates to the post-migration period, age of acquisition is not a relevant factor in their ultimate attainment, which is further confirmed by the absence of a significant correlation between age of starting to learn L2 and the *z*-scores. Instead, the participants seem to have benefited from a rich linguistic environment and sufficient input regarding English, and a lack of such an environment for the other languages, judging by their narratives, the strong correlations between the language use indices and the proficiency scores, and more indirect influences detectable on other variables.

The study thus confirms that native-like attainment is possible, as has been suggested in several recent studies on late bilinguals.[34] Birdsong, for example, argues that "nativelikeness in late L2A [second language acquisition] is not typical, but neither is it exceedingly rare"

[34] See for example, Lydia White and Fred Genesee: How Native Is near-Native? The Issue of Ultimate Attainment in Adult Second Language Acquisition. In: *Second Language Research* (1996), p. 233-265; Theo Bongaerts: Ultimate Attainment in L2 Pronunciation: The Case of Very Advanced Late L2 Learners. In: David Birdsong (ed.): *Second Language Acquisition and the Critical Period Hypothesis*. New York: Lawrence Erlbaum, 1999. p. 33-159; James Emil Flege and Ian R. A. MacKay: Perceiving Vowels in a Second Language. In: *Studies in Second Language Acquisition* 26 (2004), p. 1-34.

under conditions of "sufficient LoR and contact with natives".[35] Similarly, Bongaerts, Mennen and van der Slik conclude from their analysis "that a combination of input, motivational, and instructional factors may compensate for the neurological disadvantages of a late start".[36] Birdsong and Molis further suggest that the incidence of native-like attainment may depend on the particular L1-L2 pairing, with greater typological proximity, as in our case, possibly fostering L2 acquisition.[37] Indeed, positive attitudes to English and bilingualism, as well as linguistic aptitude[38] also contribute to the high L2 attainment scores in this study. It is highly likely that these variables interact with one another, forming impact clusters. For example, positive attitudes may impact on particular use choices, as might education.

The debate on the nativelikeness of second-language learners partially hinges on the question of whether the learners score comparably to native speakers in every last detail, in particular in relation to foreign accent. In relation to the generalisability of the present data, the following qualifications need to be made. In this study, the score range of matched bilingual native speakers is employed as the reference point for assessing nativelikeness, which is seen as a continuous concept, rather than a categorical one (i.e. native-like vs. non-native-like).[39] The findings on the incidence of nativelikeness are based on very detailed lexical, grammatical and syntactic measures, both individually and combined via the *z*-scores, while accent was included in the global assessment by the external judges, but not "scrutinized in linguistic detail".[40]

While the findings of the present study add to the growing body of research on the potential of late bilinguals to acquire foreign languages, it also finds clear evidence of L1 variability in relation to the same participants, even if the degree of language attrition is relatively small both at the group level, and for most participants. This calls into question the notion that L1 and L2 are "fundamentally" different, as posited by maturational accounts.[41] Since all

[35] Birdsong, Age and Second Language Acquisition, p. 20.
[36] Theo Bongaerts, Susan Mennen, and Frans van der Slik: Authenticity of Pronunciation in Naturalistic Second Language Acquisition: The Case of Very Advanced Late Learners of Dutch as a Second Language. In: *Studia Linguistica* 54/2 (2000), p. 298-308.
[37] David Birdsong and Michelle Molis: On the Evidence for Maturational Constraints in Second-Language Acquisition. In: *Journal of Memory and Language* 44/2 (2001), p. 235-249.
[38] Jessner's "M-factor": Ulrike Jessner: A DST Model of Multilingualism and the Role of Metalinguistic Awareness. In: *The Modern Language Journal* 92/2 (2008), p. 270-283.
[39] Unlike, for example, Niclas Abrahamsson and Kenneth Hyltenstam. Age of Onset and Nativelikeness in a Second Language: Listener Perception versus Linguistic Scrutiny. In: *Language Learning* 59/2 (2009), p. 249-306. p. 249, who use a dichotomous conceptualization to argue in favour of the impossibility of native-like attainment by second-language learners.
[40] Abrahamsson and Hyltenstam, Age of Onset. p. 249.
[41] Bley-Vroman, Logical Problem, p. 41-68.

participants are native speakers of German who were fully proficient at the time of migration, we are able to exclude age of acquisition as a predictor for the German scores. Instead, language use and positive attitudes towards bilingualism all play a part in bringing about varying levels of L1 maintenance. Of particular interest is also the role apparently played by high verbal memory, a component of linguistic aptitude. Another interesting finding is the substantial cross-linguistic influence from L2 to L1, while the influence of L1 on L2 is limited, perhaps as a result of the high L2 proficiency achieved by the participants.

The data thus provide evidence for continua of both L1 and L2 proficiency. Therefore, we must conclude that the maturational account of language acquisition is exaggerated. Post-puberty L2 attainment can be native-like subject to suitable conditions. Moreover, although this is not the focus of this paper, it seems that all language systems are subject to the same constraints. Alternative perspectives on language development, such as stochastic and connectionist learning models; dynamic approaches to language development,[42] and neurolinguistic perspectives, such as the Activation Threshold Hypothesis,[43] all emphasise the similarity of L1 and L2 processing, and the importance of language use for language acquisition and maintenance.

This paper has reported the results of a cross-sectional study investigating adult German migrants' L1 and L2 proficiency levels after long-term residence in Ireland. The results provide evidence of a moderate amount of L1 attrition and a high, indeed in several respects native-like, degree of L2 attainment by the bilinguals, while further languages did not develop well in migration. The findings lend support to a usage-based, as opposed to maturational, account of linguistic changes, challenging both the monolithic view of native-language proficiency, and the deficit view of adult second-language acquisition as "failure". Thus, under the potentially input-rich conditions of migration, adult migrants' native-like attainment of L2, with simultaneous maintenance of their L1, appears to be a distinct possibility.

---

[42] Philip Herdina and Ulrike Jessner: *A Dynamic Model of Multilingualism. Perspectives of Change in Psycholinguistics. Multilingual Matters 121*. Clevedon: Multilingual Matters, 2002; Kees de Bot: Dynamic Systems Theory, Lifespan Development and Language Attrition. In: Köpke, Barbara et al. (eds.): *Language Attrition. Theoretical Perspectives*, Vol. 33: Studies in Bilingualism. Amsterdam: John Benjamins, 2007. 53-68; Kees de Bot, Wander Lowie, and Marjolijn Verspoor: A Dynamic Systems Theory Approach to Second Language Acquisition. In: *Bilingualism: Language and Cognition* 10.01 (2007), 7-21; Diane Larsen-Freeman and Lynne Cameron: *Complex Systems and Applied Linguistics. Oxford Applied Linguistics*. Oxford: Oxford University Press, 2008; Nick C Ellis and Diane Larsen-Freeman (eds.): *Language as a Complex Adaptive System*. Chichester: Wiley-Blackwell, 2009.

[43] Paradis, "Interference" in Bilingual Speakers: Activation Threshold Hypothesis, p. 133-45.