

AGE AND THE SECOND LANGUAGE LEXICON

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1. Introductory. Age and the L2 learner: an overview

There is now a wide consensus (see, e.g., Cook 1991; Ellis 1994; Harley 1986; Harley – Wang 1997; Long 1990; Singleton 1989, 1997) that the balance of evidence relative to age and second language (L2) learning broadly favours the line taken by Krashen, Long and Scarcella (1979) – namely, that in “naturalistic” situations

- (a) older children, adolescents and adults tend to outperform younger beginners – at least in some respects – in the initial stages of learning,
- but (b) as far as long-term outcomes are concerned, generally speaking, the earlier exposure to the target language begins the better.

There are indeed studies (see, e.g., Snow – Hoefnagel-Höhle 1978) which appear to provide direct evidence of younger beginners catching up with and beginning to outstrip adolescent and adult beginners after a year or so.

With regard to formal L2 learning, the consistent finding (e.g., Burstall – Jamieson – Cohen – Hargreaves 1974; Oller – Nagato 1974) is that learners who experience primary school-level exposure to an L2 and who are then at secondary school mixed in with pupils without such experience do not maintain an advantage for more than a modest period over pupils who begin to learn the language only after age 11. The apparent discrepancy between evidence of this kind and the naturalistic evidence can, however, be related to the blurring effect which must result from mixing beginners and non-beginners in the same classes (see, e.g., Singleton 1995a; Stern 1976) and can, in any case, readily be accounted for in terms of the large differences in exposure time between naturalistic and instructed learners (see Singleton 1989: 121, 235ff.).

Both naturalistic evidence and formal instructional evidence can, therefore, be interpreted as compatible with the “younger = better in the long run” account of the role of age in L2 learning. However, the empirical evidence does not license the simplistic “younger = better in all circumstances over any timescale” version of the Critical Period Hypothesis (CPH) promoted by folk wisdom and by some early treatments of the topic (see, e.g., Stengel 1939; Penfield – Roberts 1959; Lenneberg 1967). Nor can even the “younger = better in the long run” version of the CPH in respect of L2 be stated in terms other than those of a general tendency, since both research and workaday experience suggest that an early start in an L2 is neither strictly necessary nor universally sufficient for the ultimate attainment of native-like proficiency. Even CPH high priests such as Penfield (cf. Dechert 1995) have conceded that under some circumstances an individual adult beginner *might* become a “master” of his/her target L2 (see, e.g., Penfield – Roberts 1959: 24) – a concession which has been strongly supported by recent studies (see, e.g., Bongaerts – Planken – Schils 1995; Bongaerts – Palmen 1997; Bongaerts – van Summeren – Planken – Schils 1997; Ioup 1995). Moreover, the literature on early bilingualism contains innumerable illustrations of the fact that the age at which one first encounters an L2 is only one of the determinants of the ultimate level of L2 proficiency (see, e.g., Romaine 1989: 232-244).

The present paper focuses on lexical acquisition, with a view to determining whether or not this aspect of L2 learning conforms to the above-noted pattern in respect of age effects. It reviews some typical relevant studies from the second language acquisition literature and then goes on to present some pertinent recent findings from the Trinity College Dublin Modern Languages Research Project.

2. Age and lexical development

Before considering the specifically L2 dimension of age and lexical development, it is worth pausing to note that L1 vocabulary acquisition represents perhaps the clearest demonstration of the fact that there is no absolute cut-off point for language acquisition at the end of the childhood years. It continues well beyond childhood. One can cite in this connection, for example, Carroll's conclusion (1971: 124) that L1 lexical development continues well into middle-age and Diller's (1971: 29) suggestion that such development may come to an end only with the ending of life itself. Turning now to the question of age and L2 lexical development, there is no evidence, here either, of a maturational point beyond which it is impossible to make progress in learning L2 lexis. Service and Craik (1993) investigated the relative capacity of 20 young English-speaking adults (mean age 25) and 20 older English-speaking adults (mean age 72) to learn non-English equivalents for a list of unrelated English words. The non-English items in question were either Finnish words or

pseudowords resembling English words. Overall the younger group of subjects performed markedly better than the older group. However, the older subjects certainly did not find the task impossible, and indeed some of them attained quite reasonable levels of performance, especially those who had had previous experience with word mnemonics and foreign languages (Service, personal communication). These findings show in respect of L2 lexical acquisition what other studies have shown in respect of L1 lexical acquisition, namely that new words can be learned at any age.

With regard to L2 development at the earlier end of the age-scale, the findings in relation to lexis are on the whole in line with those which relate to morphosyntax. That is to say, all short-term “naturalistic” studies, almost all short-term formal instructional studies and all long-term formal instructional studies show adult and adolescent beginners progressing more rapidly than children in acquiring vocabulary, and older children progressing more rapidly than younger children; on the other hand, long-term “naturalistic” studies suggest that the younger one starts the better the proficiency one is likely to attain eventually in lexis as in other areas. Especially interesting in this connection are the studies of Snow and Hoefnagel-Höhle (1978), which have already been mentioned. These show adult and adolescent “naturalistic” acquirers of Dutch outscoring younger beginners in the short term on a version of the Peabody Picture Vocabulary Test – but starting to be overtaken by their juniors after about a year.

As far as short-duration formal instruction-based experiments are concerned, a typical school-based investigation is that of Stankowski Gratton (1980), which involved a younger and an older group of Italian primary school pupils (mean age 6 and 8, respectively) following a beginners' course in German over a school year. The end-of-year test, half of which was focused on lexis, revealed the older group to be substantially ahead of the younger group. The one piece of short-duration instruction-based research that fails to conform to the trend illustrated by the Stankowski Gratton study is that of Yamada et al. (1980), which appears to show an *immediate* vocabulary-learning advantage for younger L2 beginners. The subjects for this study were 30 Japanese elementary school pupils distributed across three age-groups (10 7-year-olds, 10 9-year-olds, 10 11-year-olds). The experiment focused on the degree of success of these subjects, none of whom had had any previous experience of English, at learning 4 English lexical items, along with pictures corresponding to their denotata, in two sessions separated by 24 hours. In subsequent individual tests it was found that mean learning scores decreased with age. The inconsistency of these results with those of other research involving instructed learners might perhaps be connected with the artificial, decontextualized and very limited nature of the learning task in question. In any case, however, the clear trend of findings from

other instruction-based studies is for younger beginners to perform less well at L2 lexical learning in the short term.

As far as longer-term investigations of L2 lexical gains from instruction are concerned, the findings of a study that was mentioned earlier in the more general discussion, that of Oller and Nagato (1974) will serve very well as illustrative material in the present context. This looked at 233 Japanese learners of English as a foreign language from the 7th, 9th and 11th grades of a private elementary and secondary school system for girls, and at each grade included some pupils who had experienced six years of foreign language in the elementary school (FLES) and some pupils who had not. These learners were required to complete a 50-item English cloze-test, a separate test having been constructed for each grade-level. The test results are summarized by Oller and Nagato as follows: "The first comparison shows a highly significant difference between FLES and non-FLES students at the seventh grade level. This difference is reduced by the ninth grade though still significant; at the eleventh grade it is insignificant." (Oller – Nagato 1974: 18). The obvious implication of these results is that older beginners can assimilate as much in five years as younger beginners can in eleven. The relevance of these findings to L2 lexical development derives from the fact that the instrument of assessment was a cloze test, which – on similar grounds to those outlined below in respect of the C-test – can be seen as making essentially lexical demands.

We come finally in this section to evidence from long-term naturalistic research, typified by a long-term Swedish study, conducted by Hyltenstam (1992). Hyltenstam studied subjects who had migrated to Sweden before (in one case during) puberty and whose period of residence in Sweden exceeded 5 years (except in one case where the length of residence was 3 years). Swedish data, both oral and written, were elicited from these subjects, and similar data were obtained from a control group of Swedish native speakers. When subjects' errors were analysed it emerged that the numbers of errors – both grammatical and lexical – produced by subjects who had arrived in Sweden after age 7 were consistently in a higher range than the numbers of errors produced by the native speakers, whereas the range of numbers of errors produced by subjects who had arrived in Sweden before age 6 overlapped with those of the other two groups.

3. Some data from the Trinity College Dublin Modern Languages Research Project

The Trinity College Dublin Modern Languages Research Project (henceforth MLRP) was established to provide a framework for the long-term investigation of foreign-language learning at university level. MLRP data collection ceased in 1995, but the data gathered continued to be analysed. The data reported in

the present paper are interview and C-test data elicited from students of French participating in project – specifically, a group of ten students recruited from the 1990-91 intake of first-year students (French Group A) and a second group of ten recruited from the 1991-92 intake (French Group B).

With regard to the interview data, these come from a set of loosely structured interviews designed to elicit information about subjects' motivation, but which, as it turned out, yielded other interesting information besides. As for the C-test data, these were elicited by a reduced redundancy instrument – the C-test – (see, e.g., Klein-Braley 1997). Simplifying somewhat, the procedure for creating a C-test is to take a written text and, leaving the first sentence intact, thereafter to delete the second half of every second word. One-letter words are ignored, and in the case of words with an odd number of letters one more letter is removed than is left standing. The advantages presented by the C-test as an instrument for lexical research (cf. Little – Singleton 1992) are obvious: since the testees are unable to alter the order of elements of the mutilated text, the knowledge probed by the test is for the most part clearly lexical in nature – knowledge of content words, grammatical words, word-structure, grammatical class adherence, subcategorization frames, collocability, etc. To encourage as natural as possible a treatment of the mutilated text, the C-tests that in the MLRP were based on somewhat longer texts (about 150 words) than those of the "classic" C-test (60-70 words). The pattern of C-test data collection was as follows: each year two C-tests (C-tests 1 and 2) were administered in December and a further two (C-tests 3 and 4) were administered in May. Each subject encountered the same two pairs of C-tests each year as long as he/she continued to study French.

Beginning, then, with some interview data, the following comments were offered by one of MLRP subjects in response to the question: "to what in particular do you attribute your success or progress in French or lack of success or progress, depending on how you think things are going?"

well I think since I came to college it's been more obvious that / well last year that fact that I had a French girlfriend which did help a lot / another was the fact that I was being reintroduced to words that I knew when I was a child / do you know what I mean? / so I began to identify myself with my primary school again / the French school / which was like more or less the beginning of my life / and whereas in school you don't / you know / use everyday words like frog and things like that / whereas I began to remember / so I became / I don't know / I just became much happier / having some sort of past behind me and things like that / so / because it was very important / it was very strong because everything was through French / I think that being able to tie those two things up together / yeah I felt like wow I remember this / I can / and then I was able to slip back into it / whereas when I'd left at eight and went on to an ordinary / another school / it was just an ordinary school and the standard

of French was just average and it wasn't the same thing / so it went down again / but here it's come back / and that must be a help / a cause if you like ... (Ushioda 1996: 343)

What this subject appears to be saying is that the French words he encountered at the beginning of primary school years – in a French-medium school – had come back to him when he had taken up French at university, and that this had helped and supported him in his French studies.

The experience reported above is precisely in line with Penfield's claim (Penfield 1958: 34ff.) concerning "a ganglionic record of past experience which preserves the individual's current perceptions in astonishing detail". Indeed, Penfield relates early memories to language learning success much as our MLRP subject does, insisting that his own children's immersion in German and French in the nursery and at kindergarten greatly facilitated their coming to grips with these languages later in the setting of an English-medium school. Of course, not only the MLRP subject's evidence but also Penfield's (cf. Dechert 1995) are anecdotal rather than "scientific". However, it would be rash simply to discount such evidence, especially since the experiences related have interesting common elements. One notes that both the MLRP subject and Penfield were referring to memories established by very early experiences of the L2 (before age 6) and that the experiences concerned were of L2 immersion – i.e., characterized by very plentiful input.

Turning now to the C-test data, the present discussion updates an age-oriented analysis of French C-test data elicited in 1990-91 and 1991-92 which was originally presented in conference papers in 1992 and 1993 and published in 1995 (Singleton 1995b). French C-test data elicited from French Group A and French Group B were organized into two sets – data elicited from subjects who had begun learning French before age 12 and data elicited from subjects who had begun learning the language beyond age 12. Age 12 was selected as the dividing line because certain researchers (e.g., Long 1990) specifically refer to it as the maturational watershed as far as language acquisition is concerned. Unfortunately, the subjects comprising Group A had all begun French relatively late, and so the range of beginning ages represented in this group is relatively narrow (10-12). Group B, on the other hand, presents quite a wide spectrum of ages at which French was first encountered (3-12). Since there was no possibility of separating out the age variable from the length of exposure variable within the constraints of the MLRP framework, it was recognized that any advantage found for earlier beginners would have to be seen as merely consistent with the possibility of age playing a role. Superior or equal performance from later beginners, on the other hand, could not but be interpreted as indicating faster L2 lexical learning on their part.

As far as Group A was concerned, the mean scores for the under-12 beginners and the 12+ beginners (see Table 1) showed neither subset to be consistently ahead of the other. This suggests that the lexical proficiency of those subjects in this group who had started French before age 12 was more or less on a par with that of those who had begun French after age 12, despite the differential in terms of amount of exposure to the language. Since French Group B was recruited only in 1991, the results from this group (see Table 2) available for the analysis concerned were obviously more limited. Interestingly, however, these results diverged in their pattern from the French Group A results, in the sense that the under-12 beginners in this case consistently outperformed the 12+ beginners – all differences between the two sets of scores attaining significance at (at least) the $p < 0.1$ level on a one-tailed t-test.

Table 1. Mean C-test scores (1990-92) obtained by French Group A subjects who had begun French before age 12 and beyond age 12 respectively. (Maximum possible score = 50) (based on Singleton 1995b: 17, table 1)

	Dec 1990		May 1991	
	French C-test 1	French C-test 2	French C-test 3	French C-test 4
Under-12 beginners	(N = 6) 41.0 38.2		(N = 6) 42.7 36.8	
12+ beginners	(N = 4) 39.5 36.0		(N = 4) 42.8 38.0	
	Dec 1991		May 1992	
	French C-test 1	French C-test 2	French C-test 3	French C-test 4
Under-12 beginners	(N = 6) 41.3 41.5		(N = 6) 42.8 37.4	
12+ beginners	(N = 4) 43.0 40.3		(N = 4) 44.3 41.0	

Table 2. Mean C-test scores (1991-92) obtained by French Group B subjects who had begun French before age 12 and beyond age 12 respectively. (Maximum score = 50) (based on Singleton 1995b: 18, table 2)

	Dec 1991		May 1992	
	French C-test 1	French C-test 2	French C-test 3	French C-test 4
Under-12 beginners	(N = 7) 38.7 32.4		(N = 5) 39.6 34.2	
12+ beginners	(N = 3) 30.3 27.0		(N = 3) 33.3 26.0	

We have already seen that French Group B contained some subjects who had begun to be exposed to French at a much younger age than the early beginners in French Group A. Given this, the difference between the Group B results and the Group A results seemed to be interpretable (cf. Singleton 1995b: 18), as offering support to those researchers (e.g., Hyltenstam 1992; Long 1990) who, while positing the onset of puberty as the end of the Critical Period for L2 learning, also take the view that the chances of achieving native-like competence in an L2 diminish progressively if one begins after age 6. However, it had to be borne in mind (see above) that any explanation of Group B's 1991-92 results in terms of an age factor had to be qualified by the recognition that an explanation was also possible in terms of a length of exposure factor. In any case, these results certainly could not be read as indicating a straightforward or absolute relationship between age of starting to learn the L2 and eventual outcome, it being by no means consistently the case that the earlier learning started the better the performance recorded (see Table 3).

More recent analysis of further C-test data has yielded even less conclusive results. Because of the attrition of MLRP numbers, no meaningful comparison of under-12 beginners and 12+ beginners is possible beyond the 1992-93 round of data collection. With regard to the 1993-93 data, the Group A results shows just one statistically significant difference between the under-12 and the 12+ beginners. This does admittedly favour the under-12 beginners, but set against the general pattern of the results, it hardly seems like a cause for great excitement. As for the Group B results, the marked overall differences between the under-12 and 12+ beginners noted in respect of the 1991-92 C-test data do not persist in the 1992-93 data, where no statistically significant difference between the under-12 and 12+ scores emerges in respect of any of the C-tests.

The speculation based on the 1991-92 results (see above) that the fact that Group B contained some subjects who had begun French very early might have

Table 3. Individual French Group B C-test scores (1991-92) in relation to age at which learning of French commenced. (Maximum score = 50) (based on Singleton 1995b: 19, table 3)

Score	Ages of French Group B subjects achieving the specified scores on the different C-tests administered in 1991-92			
	French C-test 1	French C-test 2	French C-test 3	French C-test 4
47			8	
44	8	8		8
42			11	
41	3			
39	8			
	11			
38	7		3	
			11	
37	11			11
36		7		
35			12	
			12	
34				3
33	6	3	8	
	12			
32	12	8		
31				12
30		11	12	
29				8
28		12		
27	12	6		11
		12		
26		12		
25		11		12
22				12

made a difference in the apparent advantage of the Group B under-12 beginners does not look very plausible in the light of the 1992-93 results for this group, where, falling numbers notwithstanding, the under-12 beginner subset continued to have within its ranks one subject who had begun French at age 3, another

who had begun French at age 6 and – as far as the December 1992 tests were concerned – two further subjects who had begun French at age 8. Accordingly, I find myself, alas, constrained to withdraw the suggestion I tentatively made at an earlier date (Singleton 1995b: 21ff.) that the Group B C-test results might “at last begin to offer some concrete and quantifiable evidence of the long-term benefits of foreign language learning in the primary school.”

4. Concluding summary

We have seen that there is no evidence with regard to L2 learning any more than with regard to L1 learning that the capacity to acquire new lexical items becomes inoperative at any particular maturational point or that it necessarily falters significantly even in senescence. It appears from published research findings that the age factor affects L2 lexical acquisition in much the same way as it affects other aspects of L2 learning. That is to say, older children, adolescents and adults generally exhibit an advantage over younger learners in the early stages of coming to grips with the lexis of an L2, but this advantage tends to be progressively eroded, the younger beginners eventually catching up with them and overtaking the older beginners.

This pattern is clear in the naturalistic evidence, and most of the evidence from studies focused on formal instruction can be interpreted as not inconsistent with this conclusion, provided that due account is taken of the very much longer timescale that is almost certainly required for the eventual advantage of an early start to manifest itself under conditions of sparse exposure. Just one study yields findings suggesting an immediate advantage for younger beginners learning L2 vocabulary in a formal environment (Yamada et al. 1980), and this is based on a learning task that is far removed not only from natural conditions but also from normal classroom conditions.

As far as the MLRP results reported here are concerned, these are entirely compatible with the above-outlined view of the role of age in L2 lexical acquisition. They contain nothing which contradicts the notion that an early start can confer a long-term advantage, but neither do they demonstrate a clear advantage – within the normal time-scale of school and university education – for subjects whose instruction in the L2 began before the purportedly critical age of 12.

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