

# On how age affects foreign language learning\*

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## Abstract

The effects of age on second language acquisition constitute one of the most frequently investigated and debated topics in the field of Second Language Acquisition. Two different orientations may be distinguished in age-related research: an orientation aiming to elucidate the existence and characteristics of maturational constraints on the human capacity for learning second languages and an orientation purporting to identify age-related differences in foreign language learning often with the aim of informing educational policy decisions. Because of the dominant role of theoretically-oriented studies that aim at explaining age-related outcome differences between children and adults, it may be argued that research findings from naturalistic learning contexts have been somehow hastily generalized to formal learning contexts and the results of classroom research have been interpreted in the light of the assumptions and priorities of the former.

In this talk I will present an analysis of symmetries and asymmetries that exist between a naturalistic learning setting and a foreign language learning setting with respect to those variables that are crucial in the discussion of age effects in second language acquisition, among them *ultimate attainment*, *length of exposure*, *initial age of learning*, *age of first exposure*, *significant exposure*, *aging effects* and *maturation effects*. On the basis of the differences observed, I will argue that the amount and quality of the input bear a significant influence on the effects that age of initial learning has on second language learning. This influence explains the older learners' persistent advantage in rate of learning as well as the difficulty that younger learners have to show any long-term benefits due to an early start in a school setting.

**Keywords:** age effects, natural and instructed settings, SLA, the BAF project

## 1. Introduction

Learners' age has been identified by researchers – no matter whether their particular orientation is theoretical or applied – as one of the crucial issues in the area of second language (L2) acquisition. The effects of age have been the object of research predominantly in natural settings where the immigrants' level of proficiency in the target language has been examined on the basis of their age of arrival in the L2 community. The results of comparing younger and older starters have consistently shown an advantage for those who arrived early in life over those who arrived at an older age. These results have been thought to provide positive evidence for the Critical

Period Hypothesis (CPH) according to which there exists a period in life after which language acquisition may be imperfect or incomplete (Lenneberg 1967). Lenneberg posited a lower bound for that period at the age of 2 and an upper bound around puberty. This separated pre-puberty learners from post-puberty learners and hypothesized that while the former will unfailingly be successful, the latter will – with only very rare exceptions – attain native-like proficiency<sup>1</sup> (Bley-Vroman 1989). In contrast, the influence of age on L2 acquisition in a foreign language setting has not attracted the same degree of attention and research findings have not appeared to be so consistent. Nevertheless, the advantages of an early start observed in a natural setting have been influential for educational decisions concerning the optimum time for students to embark on foreign language learning in schools.

In fact, the general opinion concerning the age at which children should begin learning a foreign language in schools is strongly influenced by findings obtained in naturalistic language learning settings, as the following quote from a teacher starting a young learners' programme in a British school illustrates:

“The bilingual children I have met over the years learnt their skills at a very young age. When a child arrives in school with no English they learn quickly.” (Enever forthcoming)

This teacher's words clearly reveal the sources that have fed her belief. First of all, the situation of early bilingualism, where children usually learn their two languages in the family or in the environment, that is to say, in a natural setting. Similarly, the second sentence refers to the situation in which a child from a non-English speaking family is immersed in the target language in the school and in the environment, that is to say, it again refers to learning an L2 in a natural setting.

Another quote, this time from a parent of a young learner of English in Spain, illustrates the general opinion that children 'soak up' languages like sponges: “The younger they are, the more they are like sponges, the more they absorb, the more they retain.” (Torras, Tragant and García 1997: 142)

As above, the idea about the way in which children learn languages corresponds to naturalistic language learning, that is, to learning that takes place in a context with unlimited access to quality input. In sum, both the outcome and the process of learning a

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<sup>1</sup> However, empirical work has shown that nativelikeness among post-puberty learners although not typical is not rare (e.g. Ioup *et al.* 1994, Bongaerts *et al.* 1997, Bongaerts 1999).

second language in a natural setting have been generalized to the situation of foreign language learning.

## **2. Differences in age effects in natural and instructed settings**

On the contrary, in this paper I argue that the generalization across contexts should not be blindly accepted and that the characteristics of the learning context may have a bearing on the effects of age on L2 learning. Taking a broad perspective, an instructed setting where the target language is a foreign language may be seen to differ from a natural setting in some or all of the following characteristics: (1) instruction is limited to 2-4 sessions of approximately 50 minutes per week; (2) exposure to the target language during those class periods may be limited both in source (mainly the teacher) and quantity; (3) the target language is not the language of communication between peers; (4) the teacher's oral fluency in the target language may be limited; and (5) the target language is not spoken outside the classroom (see Muñoz 2008).

I take as my point of departure that there exist important differences between the two learning settings and examine four aspects that are relevant for accounts of age effects on L2 acquisition. By pointing out four crucial asymmetries between naturalistic language learning and instructed foreign language learning, I will attempt to cast doubts on the consensus view that "the earlier the better" in any place and time. Of the aspects that are examined below, the first of them is dealt with more extensively because empirical evidence is introduced that throws light on the general discussion.

### ***2.1 Age-related advantages***

As commented above, the bulk of research on age effects has been conducted in natural settings. Typically, in these studies large groups of L2 users are compared in terms of their initial ages of learning. Results have consistently shown younger starters to outperform older starters in different skills, mainly in morphosyntax (e.g. Birdsong and Molis 2001, DeKeyser 2000, Johnson and Newport 1989, Patkowski 1980), and in pronunciation (e.g. Flege 1991, Flege and MacKay 2004). This superiority refers to the learners' ultimate attainment after a long period of unlimited exposure to the target language. On the other hand, studies that have compared learners in natural settings after relatively short periods of time have found that older starters usually outperform younger starters (Snow and Hoefnagel-Höhle 1978). On the basis of this difference, Krashen, Long and Scarcella (1979) drew a distinction between rate and ultimate

attainment. The older starters advance faster in the first stages of the process of L2 acquisition, which makes them more efficient learners in the short term, that is to say, they have a rate advantage. In contrast, the younger starters are slow at first but in the long term attain a superior proficiency level which is sometimes found to be native-like or almost native-like, that is to say, they have an ultimate attainment advantage.

This ultimate attainment advantage of younger learners in naturalistic language learning settings has also been credited to younger learners in instructed language learning settings although no consistent empirical evidence has supported this generalization. In that respect, it has been suggested that the superior ultimate attainment of younger learners in a classroom setting will take a longer period to emerge because of the scarcity of the input to which these learners have access (Singleton 1989, Singleton and Ryan 2004). It is only recently that we are beginning to gather significant evidence, such as that coming from the BAF (Barcelona Age Factor) Project, that casts doubt on this generalization (Celaya, Torras and Pérez-Vidal 2001, Fullana 2005, Miralpeix 2007, 2008, Muñoz 2006b, Navés 2006).

The BAF Project aimed at exploring the effects of age on foreign language learning at different moments in time and for different language abilities. The research also aimed at following the longitudinal development of English of a large number of school learners. The following Table shows the main groups in the study, the number of learners in each group and measurement time and the initial age of learning as well as the age at testing. In order to control for amount of exposure or instruction, only those students who did not have any extracurricular exposure to English (OSE in the table) were selected for the age-related comparisons.

**Table 1. Participants and design**

	Younger children AO = 8	Older children AO = 11	Adolescents AO = 14	Adults AO = 18+
Time 1 200 h.	AT = 10;9 N = 284 OSE = 164	AT = 12;9 N = 286 OSE = 107	AT = 15;9 N = 40 OSE = 21	AT = 28;9 N = 91 OSE = 67
Time 2 416 h.	AT = 12;9 N = 278 OSE = 140	AT = 14;9 N = 240 OSE = 96	AT = 19;1 N = 11 OSE = 4	AT = 39;4 N = 44 OSE = 21
Time 3 726 h.	AT = 16;8 N = 338 OSE = 71	AT = 17;9 N = 296 OSE = 51	–	–

AO = age of onset

AT = age at testing

N = number of subjects

OSE = only school exposure

The learners in the study were Spanish-Catalan bilinguals from state-funded schools with a mixed socio-economic background. They all answered a written questionnaire which yielded relevant biographical information as well as information concerning motivation and attitude towards the target language, and learning strategies. A battery of tests was administered to intact classes that included a cloze test, a dictation, a grammar test, a listening comprehension test and a written composition. A series of oral tests was also administered to a sub-sample of the learners, including an oral interview, a picture-elicited narrative, a minimal pair discrimination test and a word imitation test; in addition, students in pairs performed a role-play and a map task (see Muñoz, 2006a, b). It is important to note that, in the situation investigated, the groups of learners with different initial age of learning were never mixed up in the same classroom, in contrast to previous studies (such as Burstall *et al.* 1974, and Oller and Nagato 1974). This was a drawback of former studies because younger learners' initial higher proficiency in the target language may have undergone a levelling down effect when learners with different proficiency levels were mixed.

The comparisons of the scores obtained by the different groups of learners in the BAF Project, both in the longitudinal sub-sample and in the cross-sectional one, show that the older learners generally outperformed the younger learners in all the measurement times. This confirmed the superior learning rate of older learners or, in other words, the fact that they are more efficient learners. A long-term superiority on the part of the younger learners was not confirmed, however. At most, the differences were reduced or became non-significant in the tests that were less cognitively-demanding. In addition, the evolution of the more cognitively-demanding skills such as those elicited by the cloze test or the dictation showed an influence of the growth in cognitive maturity associated with puberty, which was not visible in the evolution of the less cognitively-demanding skills, such as those elicited by the listening comprehension test, or in the measurements of fluency, for example. The results led to the conclusion that "if the older learners' advantage is mainly due to their superior cognitive development, no differences in proficiency are to be expected when differences in cognitive development also disappear with age" (Muñoz, 2006a: 34). In sum, the BAF Project confirmed the rate advantage of older starters and provided significant evidence that allowed to argue that in an instructed foreign language learning setting an early start does not automatically confer an ultimate attainment advantage. This may be considered

to be a crucial age-related difference between a foreign language learning setting and a naturalistic language learning setting.

### ***2.2 Age of acquisition***

The age of acquisition in a natural setting has been found to be a very good predictor in age-related studies. The age of acquisition or age of onset is taken to be the beginning of significant exposure, or the beginning of immersion in the L2 context (Birdsong 2006). This landmark is distinguished from age of first exposure in those studies in which learners have had instruction in the target language in the home country before immigration or before immersion. Age of first exposure to the target language by means of instruction, in contrast, has not been generally found to be a good predictor of ultimate attainment (e.g., DeKeyser 2000, Johnson and Newport 1989, but Urponen 2004 is an exception), the explanation being that it has provided only *insignificant* exposure (my italics) (White and Genesee 1996).

In studies concerned with the influence of age on foreign language learning, it is the initial age of learning at school that is taken to be the crucial variable, following a presumed parallelism between the two settings. But this point in time signals, as we saw above, the beginning of only *insignificant* exposure (see for a discussion Muñoz, 2008). Accordingly, it may be argued that in a foreign language learning setting the whole age range over which learning takes place should be taken into account because it may have more influence on the process and the final outcome than the initial age when the corresponding amount of exposure (and learning) is minimal. In sum, it can be claimed that the initial point of learning cannot play the same role in one and the other context, and that this is another important difference concerning age effects in a foreign language learning setting and in a naturalistic language learning setting.

### ***2.3 Length of exposure***

In naturalistic language learning studies, the length of exposure is equated to the length of residence in the target language community, extending from the age of acquisition (or immigration) to the age at testing. Because of the rate advantage of older starters, it has been argued that comparisons have to be conducted after a period that is long enough to ascertain that it is ultimate attainment rather than rate effects that are being measured (see Krashen, Long and Scarcella 1979, Snow 1983). For example, DeKeyser (2000)

suggests that a minimum of 10 years is necessary to ensure that it is ultimate attainment and not rate effects that are being picked up.

Although equating time of immersion with time of instruction is a gross generalization, an estimate of the number of hours in which a naturalistic language learner has access to L2 input after 10 years of residence exceeds 50,000 hours. The distribution of this amount of hours into weeks with 4 one-hour periods of instruction results in more than 200 years. The comparison may be absurd but it compellingly conveys the idea that the magnitude of the difference in the quantity of input received by naturalistic and instructed learners is enormous. Comparisons of the quality of the L2 input are similarly striking, both in terms of the linguistic characteristics and in terms of the variety of speech acts, topics and situations. In sum, the differences in both quantity and quality of the input to which learners have access in a natural setting and in a typical foreign language setting are too important to be disregarded.

Regarding the parallelism between age effects in a naturalistic language learning context and in an instructed language learning context, it has been observed that length of residence ceases to be a predictor of L2 proficiency level after an initial period (Cummins 1981, Long 2007, Patkowski 1980). Obviously this cannot be the case in classroom learning in which the amount of input that would be equivalent to the “initial period” in a natural setting may never be provided. In such a context, learners’ amount of instruction can be expected to correlate with proficiency scores, although research has shown that the relation of time spent learning a language and the level of proficiency achieved is not always linear (Alderson 1999, Kalberer 2007, see Murphy 2001 for a discussion).

#### **2.4 Learning mechanisms**

According to Lenneberg (1967: 176) “... *automatic* acquisition from mere exposure to a language may disappear after puberty” (my emphasis). In fact, this is the strict formulation of the CPH, reformulated by DeKeyser (2000: 518) as follows: “... between the ages of 6-7 and 16-17, everybody loses the mental equipment required for the *implicit* induction of the abstract patterns underlying a human language...” (my emphasis). It is clear from these formulations that the maturational constraints apply to implicit learning mechanisms, at which children are believed to be superior (in fact, DeKeyser (2000: 518) interprets the CPH narrowly to refer only to implicit learning of abstract structures). However, implicit learning works slowly and requires many years

of massive input and interaction, that only a total immersion program can provide, not a program with a few hours of foreign language per week (DeKeyser 2000: 520, DeKeyser and Larson-Hall 2005:101). In other words, in the case of typical foreign language learning settings, children are not provided with the massive amounts of input that their implicit learning mechanisms require. Referring back to the sponge metaphor that compares children's capacity for absorbing language to the sponge's capacity for absorbing water, we can compare the situation in which children do not have access to enough input to the situation in which the sponge does not have enough water: in the absence of water the sponge will not be able to exhibit its absorption capacity.

In contrast, instructed settings provide explicit instruction that is suited for adolescent and adults because of their higher level of general cognitive maturity. This would explain the lasting advantage of older learners over younger learners in instructed settings: they have first of all an initial faster rate of learning and in addition they are benefitted by the fact that school instruction is better fitted to their capabilities (see Muñoz 2006a).

### **3. Conclusion**

The previous section has argued that there exist important differences between a naturalistic language learning setting and a foreign language learning setting that prevent the generalization of findings from one to the other context. In particular, it has been seen first of all that the long-term advantage of younger starters is not found in a foreign language learning setting. It has also been claimed that instructed language learners do not have access to the amount and type of input that immersion in the L2 community entails and that, as a consequence, the lack of enough (massive) exposure prevents children from benefiting from their alleged superiority at implicit language learning. At the same time, the explicit instruction provided by the classroom favours explicit language learning, at which older learners are superior because of their greater cognitive maturity.

It was stated at the beginning of this paper that studies in natural contexts have consistently shown that "the earlier is the better" in language learning. In the absence of relevant empirical evidence, this finding has been traditionally generalized to any situation independently of learning conditions such as amount and quality of exposure, and pedagogical considerations. This paper has claimed that recent studies in instructed contexts, not only from the BAF Project but also in other contexts (e.g. Cenoz 2002,

García Mayo and García Lecumberri 2003, Kalberer 2007), have provided empirical evidence that allows us to refine that finding: the earlier may be the better but provided that it is associated with enough significant exposure (other not least important conditions include that exposure to young learners should be intensively distributed, and that learners should be given opportunities to participate in a variety of L2 social contexts).

The differences found between the two learning settings should guide researchers in educational contexts to set research goals that are specific to and relevant for the field of classroom learning. Among those, Muñoz (2008) suggests the following: (1) to determine the amount of exposure required for an early start to be effective in promoting language learning; (2) to focus on the relative gains of different-age pupils with different types of time distribution; (3) to determine short-term and long-term benefits of starting at different ages; and (4) to compare the learning rate of different-age learners to inform educators about what to expect after  $n$  years of foreign language instruction from the different age groups.

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