Age differences in foreign language learning

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Abstract
This article is based on the results of a project that analyses the linguistic development of English as a third language at different ages in a bilingual program. Specifically, it examines the influence of the age of introduction of English as a foreign language on general proficiency. Participants were 60 secondary school students who had Basque and/or Spanish as their first language and Basque as the language of instruction except for the subjects Spanish and English. All the students had studied English for six years but they had started learning English at different ages. Half of the students started learning English in grade 6 and the other half in grade 3. All the participants completed a battery of tests and questionnaires including different measures of proficiency in English: story telling, listening comprehension, composition, grammar and cloze test. The results indicate that older learners present a higher level of proficiency in English. The differences between older and younger students are discussed as related to several factors involved in foreign language learning.

1. Introduction
The influence of age on second language acquisition is a controversial area which has received much attention in second language acquisition research (Harley 1986; Singleton 1989,2001; Long 1990; Singleton & Lengyel 1995; Harley & Wang, 1997; Birdsong
1999). The idea that children pick up languages more easily than adults is also very popular and research studies conducted in natural language environments tend to support this idea (see for example; Harley & Wang 1997; Singleton 2001 for reviews).

The most popular explanation for the effect of age on second language acquisition has biological foundations and it is known as the critical period hypothesis. Critical periods refer to periods of time in life when human beings or animals are sensitive to external stimuli and can explain some aspects of animal and human behaviour (Immelmann & Suoni 1981; Bornstein 1987). Penfield & Roberts (1959) and Lenneberg (1967) were the first to apply this hypothesis to language acquisition. Penfield & Roberts (1959) introduced the idea that the brain loses its plasticity after the age of 9. Lenneberg (1967), adopting a nativist position, proposed that the onset of language takes place between the second and third year of life but the critical period ends at the age of 13 or puberty when the lateralization process, that is, the distribution of the functions in the two hemispheres, is complete.

Research on the critical period in second language acquisition since the 60's has provided evidence that can be regarded as controversial. The limits of the critical period proposed by Lenneberg have not been confirmed but at the same time, younger children in natural settings tend to achieve higher levels of proficiency in second language acquisition.

Evidence in child language research has demonstrated that the onset of language acquisition is much earlier than the age proposed by Lenneberg (1967). In fact, even two-month-old babies are able to discriminate prosodic aspects of languages and by six months of age, infants can categorize speech sounds in different languages (Werker & Lalonde 1988; Bosch & Sebastian 2001).

Lateralization for language takes place much earlier than the age proposed by Lenneberg (1967). Krashen (1973) considered that the lateralization process could be finished by the age of five and in fact, as Harley & Wang (1997) reported, there is not enough evid-
ence to state that the end of the critical period takes place at puberty. Another issue related to lateralization has been raised by MARINOVATODD, MARSHALL & SNOW (2000). According to these researchers, it is questionable to establish a direct link between the localization of languages in the brain and language proficiency because it is possible for children and adults to present differences in brain localization parameters or neural network that are not reflected in second language proficiency.

Studies conducted in natural settings tend to prove that older learners present initial short-term advantages in morphology and syntax but in the long run, younger learners tend to achieve higher levels of proficiency than younger learners (see SINGLETON 1989, 2001; LONG 1990; HARLEY & WANG 1997 for reviews). According to KRASHE, LONG & SCARCELLA (1979) there is the need to distinguish between rate of acquisition and ultimate achievement. The early exposure to the second language has advantages on ultimate achievement not on the rate of acquisition in the early stages. There is a large number of studies focusing on different areas that prove the advantages of younger learners in ultimate achievement. The areas that have received more attention are pronunciation (PATWOSKI 1990; THOMPSON 1991) and morphology and syntax (PATKOWSKI 1980; JOHNSON and NEWPORT 1989; JOHNSON 1992) but there are also studies in other areas such as listening comprehension (OYAMA 1978). In the case of pronunciation, FLEGE (1991) considers that exposure to the second language has to take place before the age of six to acquire native pronunciation. Similarly, HYLLENSTAM (1992) concluded that an onset prior to seven is required to achieve native proficiency in syntax and lexis.

Some longitudinal studies have also proved that the advantages of younger learners disappear in the long run. For example, SNOW & HOENAGEL-HÖHLE (1978) proved that younger learners outperformed adolescents and adults after approximately one year of exposure in a natural environment. Nevertheless, not all the studies have reported advantages for younger learners. Some studies conducted
with highly proficient non-native speakers who were not exposed to the second language at an early age, prove that older learners can acquire native-like competence in the second language. For example, Bongaerts et al. (1997) were able to identify speakers of English as a second language who had achieved native-like pronunciation even though they had not been exposed to English until the age of 12. White & Genesee (1996) and Birdsong (1992) also reported that highly successful second language adult learners presented native-like competence in some Universal Grammar principles.

Research supporting the existence of sensitive periods for second language acquisition has important implications for formal contexts, and particularly for the early introduction of foreign languages in the school curriculum. If there are sensitive periods for language acquisition, schools should introduce second and foreign languages earlier so as to provide optimal conditions for language learning.

Literature on the age factor tends to distinguish between natural and formal contexts of language acquisition and most research supporting sensitive periods has taken place in natural contexts where extensive natural exposure to the language is combined with formal learning. Nevertheless, in order to study the effect of age, the important distinction is between second and foreign language situations, that is, between situations in which there is exposure to the target language with or without formal instruction and situations in which exposure to the language is limited to the school context and usually to a very limited number of hours per week. Learners in foreign language contexts have very limited exposure to the language and typically have non-native teachers and no communicative need to use the foreign language outside the classroom. These learners can also present different attitudes and motivation towards learning the target language than learners in natural contexts. The limited exposure to the foreign language in these contexts helps to explain the slow progress in the target language and has implications for the study of the effect of age on second or foreign language acquisition.
Most studies conducted in formal settings confirm the advantages presented by older learners (Asher & Price 1967; Politzer & Weiss 1969; Burstall et al., 1974; Oller & Nagato 1974; Ekstrand 1976; Muñoz 2000) and the evidence supporting the advantages of younger learners in school contexts is extremely weak (Singleton 1989:82-83). The good results obtained by older learners have also been confirmed by Canadian immersion programs. Genesee (1987) and Harley (1986) report that learners who experience intensive exposure to the second language in late immersion in the first year(s) of secondary school present similar levels of proficiency in the second language as children who have experienced more exposure to the second language in early immersion programs.

Trilingualism is becoming a linguistic goal for a large number of European citizens and particularly, for those who live in bilingual communities and need to acquire a third language for intra-European and international communication (Cenoz & Jessner 2000). In these communities (The Basque Country, Catalonia, Friesland, Wales, etc) three languages are often included in the school curriculum, the official languages of the community and a foreign language. The introduction of a third language in bilingual education has also been affected by the recent trend to start teaching foreign languages from the first years of primary school or even in kindergarten.

The study reported here is based on a project on the linguistic development of English as a third language at different ages in a bilingual program in Basque and Spanish in the Basque Country. Specifically, it analyses the influence of the age of introduction of a third language on general proficiency when students are in their sixth year of English. This specific bilingual program has Basque as the language of instruction (D model) and serves both as a total immersion program for students whose first language is Spanish and a first language maintenance program for students whose first language is Basque (Cenoz 1998). English is taught as a third language to all the students and traditionally, the English language was introduced in grade 6 (10-11 years old) and when the Spanish Educational Reform
was implemented in 1993 foreign languages were introduced in the third grade when children are 7-8 years old (CENÖZ & LINDSAY 1994).

2. Methodology

Sample. Participants were 60 elementary and secondary students (48.3% male; 51.7% female) in a Basque school in the province of Gipuzkoa. Students used Basque and/or Spanish at home but Basque was the main language of communication at school and the language of instruction for all subjects except for Spanish and English language classes. Basque was the only language used at home for 38% of the students, Spanish was the home language for 23% of the students and the rest of the students (39%) used both Basque and Spanish at home. All the students were exposed to Spanish, the majority language at the community level, and also studied Spanish as a school subject.

All the participants in this study were in their sixth year of English but they were divided into two groups according to their grade: students in grade 8 had a mean age of 13.1 and students in grade 11 had a mean age of 16.2. The characteristics of the sample are summarized in table 1.

Table 1

<table>
<thead>
<tr>
<th>CHARACTERISTICS OF THE SAMPLE</th>
<th>GRADE 8</th>
<th>GRADE 11</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>13.1</td>
<td>16.2</td>
</tr>
<tr>
<td>Years of English</td>
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<td>6</td>
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<tr>
<td>Hours of English</td>
<td>564</td>
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**Instruments and procedure.** All the participants filled in a battery of English oral and written tests and a background questionnaire.

The oral tests included the picture story ‘Frog, where are you?’ (MAYER 1969) and another story the participants had used in their classes. The frog story consists of 24 pictures and it has been used in a large number of contexts with different languages both with children and adults (BERMAN & SLOBIN 1994). Several corpora of oral productions based on this story are also part of the Childes project data base (MACWHINNEY 2000). The second story was different for the two age groups: ‘Wallace and Gromit’ was the story chosen for grade 8 and the film ‘Sleepless in Seattle’ for grade 11.

The stories were recorded, transcribed and analysed in order to examine different aspects of oral production. First, the number of tokens, types, utterances and words per utterance produced by the three age groups when re-telling the two stories were obtained. Then an overall evaluation of the oral production including pronunciation, vocabulary, grammar, fluency and content was carried out.

Students also completed a listening comprehension test, (36 points); a cloze test (34 points); a grammar test (31 points) and a composition. In the composition students were asked to write a letter to an English family. The composition was graded according to JACOBS et al.’s (1981) holistic approach by using scales corresponding to content, organization, vocabulary, language use and mechanics (total score 100 points).

Once the results of the tests were codified and the oral tests were fully transcribed analyses were conducted by using the Childes Clan program for the oral tests and the SPSS statistical package.

### 3. Results

**Frog story.** Figure 1 includes the results of the T-tests comparing the number of tokens, types, utterances and words per utterance for the two age groups:
The results indicate that there are significant differences when the mean number of tokens ($T= -2.39, S=.02$) and types ($T= -2.52, S=.01$) corresponding to the two age groups are compared. When the number of utterances is considered, no overall significant differences were observed but the results indicate that there are significant differences in the number of words per utterance used by the different groups ($T= -4.78, S=.00$). Therefore, in three of the four analyses grade 11 students obtained significantly higher scores than grade 8 students.

**Second Story.** The results of the analyses of variance corresponding to the stories used in class with the two age groups are presented in figure 2.
The results indicate that there are significant differences in the four analyses: tokens ($T=-6.39, S=.00$), types ($T=-6.20; S=.00$), utterances ($T=-3.21, S=.00$) and words per utterance ($T=-10.01, S=.00$). In all cases older students obtained significantly higher scores than younger students.

**Overall evaluation of oral proficiency.** The results of the T-tests corresponding to the overall evaluation of the students' oral production are presented in figure 3. The five scales used were pronunciation (max=10), vocabulary (max=10), grammar (max=10), fluency (max=10) and content (max=10):
The results indicate that the differences between the means are significant for vocabulary \((T= -5.66, S=.00)\), grammar \((T= -5.15; S=.00)\), fluency \((T= -4.75, S=.00)\) and content \((T= -4.10, S=.00)\). In four of the five bands the results corresponding to grade 11 are significantly higher than those corresponding to grade 8. In pronunciation grade 8 students obtained significantly higher results than grade 11 students \((T=2.41, S=.01)\). The overall results indicate that grade 11 students obtained higher scores \((T= -4.54, S=.000)\).

**Compositions.** The bands used for scoring compositions were the following: content \((\text{min}=13; \text{max}=30)\), organization \((\text{min}=7; \text{max}=20)\), vocabulary \((\text{min}=7; \text{max}=20)\), language use \((\text{min}=13; \text{max}=30)\) and mechanics \((\text{min}=13; \text{max}=30)\). The results corresponding to the three groups are given in figure 4:
The results of the T-Tests indicate that there are significant differences between the two groups in four of the five scales: content (T = -4.85, S = .00), organization (T = -8.78; S = .00), vocabulary (T = -6.51, S = .00) and language use (T = -6.50, S = .00). In these four scales students in grade 11 obtained significantly higher scores than students in grade 8. There are no significant differences between the two groups regarding mechanics of writing (T = .60, S = .55). The overall results of written production indicate that the differences between the means obtained by the two groups (grade 8 = 61.3; grade 11 = 73.1) are significant (T = -6.52, S = .00).

**Listening comprehension, grammar and cloze test.** The results of the T-Tests corresponding to listening comprehension, grammar test and the cloze test are given in figure 5.
The results indicate indicate that the differences between the two groups are marginally significant in the case of listening comprehension ($T = -1.74$, $S = .08$) and significant in the test of grammar ($T = -7.36$, $S = .000$) and the cloze test ($T = -10.36$, $S = .000$). In all cases students in grade 11 obtained higher results.

4. Discussion

The results indicate that the younger group obtained lower results in different dimensions of language proficiency than the older group. In fact, the younger group obtained significantly lower scores in most of the analyses corresponding to the frog story, the second story, overall oral proficiency, composition, cloze test and grammar. The younger group only obtained significantly higher scores than the older group in pronunciation and there were no significant differences (or marginally significant differences) between the two groups in the total number of utterances in the frog story, mechanics of writing and listening comprehension. These results indicate that students who started learning English in grade 6 (10-11 years old) present a higher degree of proficiency in English than students who have been exposed to the same
number of hours of instruction but started learning English in grade 3 (7-8 years old).

This study confirms the poor results obtained by young students in educational settings in previous studies (Burstal et al, 1974; Oller & Nagato 1974; Ekstrand 1976; Muñoz 2000) and the lowest scores obtained by the younger group could be due to several reasons. The differences observed in this study could be due to differences in cognitive maturity which can explain the higher linguistic development of the older group and their more highly developed test-taking strategies. The differences observed could also be related to the type of input or different instructional styles (see also Harley 1986; Harley & Hart 1997). The oral-based approach used with younger students could explain their better results in pronunciation and the fact that the differences between the two groups are only marginally significant in the case of listening comprehension. The more traditional approaches used with older learners could explain the higher lexical and syntactic complexity of their production and their higher scores on written tests. Older learners are also more likely to benefit from exposure to English outside the school.

An alternative interpretation is that younger learners do not present advantages because they are still in the first stages of third language acquisition and as it is the case in second language acquisition in natural settings the advantages of older students could disappear in the long run (Snow & Hoeffnagel-Höhle 1977). Other possible explanations for these results are related to multilingual acquisition. Previous studies on the introduction of English as a third language at an earlier age in kindergarten have indicated that it has no negative cognitive or linguistic effects (Cenoz 1997). Nevertheless, there is the possibility that third language learners need to acquire a higher degree of Cognitive Academic Language Proficiency (Cummins 2000) in the two languages they already know in order to benefit from the positive effects of bilingualism on third language acquisition. The older group has formally studied Basque and Spanish for three
more years than the younger group and their higher development in these languages could help them to benefit from additive bilingualism.

The fact that older students present better results does not necessarily mean that teaching English to younger students is not effective as younger children will probably benefit from longer exposure to the language in the curriculum and in the future they are likely to benefit from the effects of additive bilingualism on third language acquisition. Even though the possible explanations of the results presented here need further investigation this study provides information about the linguistic development of children who started English as a third language at different ages. The longitudinal data that are being collected will provide more information about the specific aspects of language development for these two age groups and their educational implications regarding the optimal age for the introduction of a foreign language in bilingual schools.
References


**Acknowledgements**

This study was supported by the Spanish Ministry of Education grant DGES PB97-061 and the Basque Government grant PI-1998-96.