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Bilingual education enhances third language acquisition: Evidence from Catalonia

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ABSTRACT
Studies on the acquisition of a third language (L3) in a bilingual context have shown that literacy in two languages facilitates the acquisition of a third (Cenoz & Valencia, 1994; Swain, Lapkin, Rowen, & Hart, 1990). The present study seeks to contribute to this line of research by comparing the acquisition of English as an L3 by Catalan/Spanish bilingual high school students in an immersion program with the acquisition of English by Spanish monolinguals. Data from 201 participants were submitted to a hierarchical multiple regression analysis, rendering results that show that bilingualism indeed has a positive effect on the acquisition of an L3. The evidence is discussed from a cognitive perspective.

Since the 1960s, research on the impact of bilingualism on cognition has associated bilingualism with positive effects on a number of internal variables, including intelligence (Peal & Lambert, 1962), metalinguistic awareness (Ben-Zeev, 1977; Bialystok, 1991), cognitive flexibility and processing mechanisms (McLaughlin & Nayak, 1989; Nation & McLaughlin, 1986; Nayak, Hansen, Krueger, & McLaughlin, 1990), and even a more democratic disposition (Pandey, 1991). Bilingualism – or biliteracy, to be precise – results in more efficient language learning, as shown by studies comparing bilinguals' and monolinguals' acquisition of a foreign language, in terms of both general language proficiency (Cenoz & Valencia, 1994; Swain et al., 1990) and the acquisition of specific parameters (Klein, 1995).[1]

This research has also shown that the effects of bilingualism on internal, cognitive variables are mediated by key external factors related to particular sociolinguistic situations. This double face of bilingualism, clearly expressed in Lambert's (1981) distinction between additive and subtractive bilingualism, warrants further investigation of additional evidence from different sociolinguistic contexts. The purpose of this study is to contribute to this line of research with evidence from Catalonia.

Two studies on the relationship between bilingualism and the acquisition of

a third language (L3) have produced contradictory results. On the one hand, Wagner, Spratt, and Ezzaki (1989) concluded that L1 (Berber) illiteracy does not hinder L2 (Arabic) or L3 (French) literacy, based on their own evidence from Morocco. Therefore, the authors suggested that UNESCO's recommendation to teach children to read in their L1 would be an unnecessary burden on countries like Morocco, which lacks a strong economic base and where a substantial portion of the population speaks a language without a writing system. On the other hand, Cenoz and Valencia (1994) found that in the Basque Country students in Basque immersion schools outperformed students in majority language (Spanish) schools in their English proficiency test. Cenoz et al.'s results are in conformity with those of Swain et al. (1990), who investigated the impact of L1 literacy on L3 (French) proficiency in the Toronto metropolitan area. Results from the Basque and the Canadian studies disprove the general belief that literacy in the L1 interferes with or retards achieving control over the L2 and L3 (Swain et al., 1990). Obviously, the positive evidence provided by two out of three studies does not allow for universal generalizations on the effects of bilingual education on L3 acquisition.[2]

There are many differences among these studies, which may account for their contradictory results. For one, there is the issue of methodology. Wagner et al.'s (1989) was a 6-year longitudinal study of primary school literacy in three languages. Both Swain et al.'s (1990) and Cenoz and Valencia's (1994) designs were cross-sectional, focused on general linguistic ability (oral and written), and included older students as participants. A problem for bilingualism and applied linguistics scholars is their inability to formulate general conclusive statements because of the small number of studies; the variety of methods, samples, and variables used; and the lack of replication studies (Sanz, 1997a).

A key distinction made in these three studies is that of bilingualism versus biliteracy. Wagner et al. (1989) compared bilinguals literate in the L2 with monolinguals, while Cenoz and Valencia (1994) compared bilinguals literate in both the L1 and L2 with monolinguals. None of the studies separated oral proficiency from written proficiency in two languages or bilingualism from biliteracy. In contrast, Swain et al.'s study isolated both variables by comparing biliterate bilinguals with bilinguals literate only in the L2. Based on their evidence, Swain et al. concluded that the key to the cognitive advantage reflected in more efficient L3 acquisition is biliteracy and not bilingualism. Bilinguals illiterate in their L1 did not perform significantly better than the monolingual group. In the present study, as in Cenoz and Valencia (1994), all participants in the bilingual sample were biliterate, while all monolingual participants, unlike those in that study, were true monolinguals who lived in a monolingual area. Cenoz and Valencia's monolingual participants lived in a bilingual area and attended a school where Basque was taught for 4 hours a week. Any advantage found in favor of the bilingual group could be assumed to be the result of their "fully developed bilingualism": that is, control over, and frequent use of, the four skills (reading, writing, speaking, and understanding) in both languages – the outcome of attending a bilingual program.

Another variable that Swain et al. (1990) investigated is the typology of the three languages involved. They hypothesized that bilinguals whose L1 belonged

to the Romance family would benefit the most from their bilingual experience and the positive influence it would exert in the acquisition of the L3 (French, likewise a Romance language). The evidence confirmed the hypothesis. In the present study, like Cenoz and Valencia (1994) and Wagner et al. (1989), language typology was not a variable under analysis. However, the three studies differed tremendously in the typology of the languages involved: Wagner et al.'s participants were native speakers of Berber learning Arabic as an L2 and French as an L3; Cenoz and Valencia's participants were native speakers of Basque or Spanish in a Basque bilingual program with English as their L3. In these studies, the three languages belonged to different families. In light of Swain et al.'s research, the relationship among the languages involved might also account for differences in the results of research on the effects of bilingualism on L3 acquisition. In the present study, the participants were learning English as an L3, and both their L1 and L2 were Romance languages.

As pointed out in Cenoz and Valencia (1994), probably the most important factor determining the results of the three studies is the type of sociolinguistic situation, which results in additive or subtractive linguistic consequences. According to Lambert (1981), when members of the majority group learn an L2 in order to become bilingual, bilingualism results in additive linguistic consequences. However, when members of the minority language group learn an L2 which might replace their native language, bilingualism results in subtractive linguistic consequences. Thus, bilingualism has a positive outcome depending on the status of the languages involved. In the rural areas of the Moroccan Atlas, the population is divided between native speakers of Arabic and those of Berber. Arabic is a written language that enjoys a long cultural tradition and international stature. It is the language of instruction in all Arab countries and is, moreover, the sacred language of the Koran. Arabic enjoys a privileged status with respect to Berber, a minority language without a writing system. The situation in the Moroccan Atlas, where the Berber minority is instructed in Arabic, stands in stark contrast to the relationship described in Cenoz and Valencia's study of bilingualism in the Basque Country, where speakers of the majority language (Spanish) attend immersion programs in the minority language (Basque).

Since 1978, when Basque and Spanish were declared co-official by the Spanish constitution, progressive political autonomy has provided the Basque government with the tools to recover Basque from the 40 years of linguistic repression that followed the Spanish Civil War – repression that resulted in widespread use of Spanish in the area, making it the majority language. The Basque language is now spoken by 30% of the population, and Basque monolinguals, who could once be found in a few isolated rural areas, have disappeared. To ensure that all students graduate with some knowledge of both languages, three linguistic models (A, B, and D), incorporating both Spanish and Basque to different extents, were created. A fourth model (X), which does not incorporate Basque in any way, still remains. Model A has Spanish as the only language of instruction; Basque is taught as an L2 for 4 hours a week. Model B combines both Basque and Spanish. Model D has Basque as the sole language of instruction; Spanish is taught for 4 hours a week (Artigal, 1993).[3] All three programs include 4 hours of a foreign language, English. In recent years, enrollments have

increased in those models that give prominence to Basque, although the numbers remain low, and the language is more valued and widely used, including by the media and government (Cenoz & Valencia, 1994).

Cenoz's dissertation study (1991), elaborated in Cenoz and Valencia (1994) and Cenoz (1996), compared the acquisition of English as a foreign language by 320 high school seniors in majority (type A) and minority (type D) language programs. A number of independent variables were grouped into four different types of factors: (a) cognitive (i.e., intelligence); (b) social/psychological (i.e., attitudes toward the language community and motivation); (c) educational (i.e., number of years of English study); and (d) sociostructural (gender and SES). Overall language proficiency was the dependent variable. In Cenoz and Valencia (1994), multiple regression analyses identified intelligence, age, motivation, exposure, and bilingualism as factors predicting English achievement, and the inclusion of bilingualism in the equation increased the percentage of variance explained. Given the lack of significant interactions, the researchers concluded that bilingualism predicts L3 achievement independently of all other factors.

Unlike Berber children, who are illiterate in their L1, the students in immersion schools (type D schools) in the Basque country are likely to graduate with a balanced knowledge of Spanish and Basque and thus will benefit from their linguistic experience. Cummins's (1976) threshold hypothesis links social and educational variables to cognitive ones. According to this hypothesis, learners must develop age-appropriate knowledge of the language in both the L1 and the L2 to enjoy cognitive abilities over monolinguals. Sociolinguistic contexts that promote additive bilingualism, like the one characterizing the Basque Country and its immersion program, create the social conditions necessary for the cognitive benefits of bilingualism to appear. An example of such an advantage is the more efficient acquisition of an L3 (Cenoz, 1991).

Also within Spain, the population of Catalonia, a bilingual area where Spanish is the majority language sharing official status with Catalan, assumes the same positive effects. Results from a survey on attitudes toward bilingualism and bilingual education in Catalonia (Strubell & Romaní, 1986) showed that, given the choice between a monolingual and a bilingual school, both bilingual and monolingual respondents would choose a bilingual school for their children. One of the reasons interviewees provided for their choice was the belief that proficiency in Spanish and Catalan would help their children learn a foreign language. Multilingualism, and specifically knowledge of English, is highly valued in a region that proudly embraces its European identity and the benefits of its membership in the European Community. Is the population right to think that bilingual education pays not only double but triple dividends? Can this "hunch" be confirmed?

It has been argued that bilingualism has a double face (i.e., societal and individual), and that individual bilingualism is determined in most cases by societal bilingualism. Thus, in the end, it is the social aspect of bilingualism, and especially the availability of bilingual education, that determines the development of cognitive benefits deriving from experience with two languages, including the benefits involved in the acquisition of an L3. Therefore, the Basque and the Catalan sociolinguistic situations are similar enough to expect comparable ef-

Table 1. *Evolution of knowledge of Basque between 1986 and 1996*

Knowledge of Basque	1986 (%)	1991 (%)	1996 (%)
Euskaldun[a]	24.6	26.3	30.9
Biliterate	15.3	17.8	23.5
Partially biliterate	6.6	6.1	5.5
Illiterate	2.7	2.3	1.9
Quasi Euskaldun[b]	17.4	19.8	19.7
Literate	10.6	17.8	12.9
Partially literate	3.7	3.5	3.2
Illiterate	3.1	3.6	3.6
Erdaldun[c]	58.4	53.9	49.4
Total Population	2,089,995	2,068,927	2,062,525

Note: From the Basque Government Statistics Office's Web page, http://www.eustat.es.
[a]Euskaldun: "Understands and speaks Basque well"; related to the root *eusk-* 'Basque'.
[b]Quasi Euskaldun: "Has problems understanding and/or speaking Basque."
[c]Erdaldun: "Does not understand or speak Basque"; related to the root *erda-* 'foreigner'.

fects of schooling in the minority language on L3 acquisition. However, differences in linguistic genealogy, social use of the languages involved, and methodological issues justify further research.

While Catalan and Spanish are both Romance languages, Basque does not share a common origin with Spanish. Research by Swain et al. (1990) showed that language genealogy is a key variable in L3 research. In addition, Catalan enjoys a higher level of knowledge and broader use than does Basque with respect to Spanish – in part due to the lack of genetic relationship between Spanish and Basque – which makes Basque, compared to Catalan, much more difficult to learn for immigrants from other monolingual areas in Spain. In addition, Catalan nationalism defines its identity on the singularity of its culture, of which the Catalan language is the quintessential expression. Basque nationalism has preferred other signs of identity, such as race and religion, and has at times paid little or no attention to the language (Conversi, 1997). Despite long periods of linguistic repression, which erased Catalan from formal contexts such as the media and education, Catalan has always enjoyed high status because of its traditional association with the powerful industrial upper bourgeoisie. Basque has commonly been associated with speakers from rural areas.[4] Finally, Catalan was introduced in public education much earlier than Basque, which still relies on a well organized system of Basque private schools, the *ikastolas*. Table 1 summarizes information on knowledge of Basque among the population of the Basque Country. It is necessary to clarify that the distribution of Basque speakers in the three provinces[5] that make up the Basque Country is irregular: 49.7% in Gipuzkoa, 23.7% in Bizkaya, and only 14.6% in Araba.[6]

Table 2. *Evolution of Catalan proficiency in Catalonia between 1986 and 1991*

Skill	1986 (%)	1991 (%)
Understands	90.60	93.80
Speaks	64.20	68.30
Reads	60.70	67.60
Writes	31.	39.90
Total Population	5,856,435	5,949,177

Note: From the Catalan Government Web page, http://cultura.gencat.es.

The goal of the present study was to investigate the relationship between biliteracy in the minority and majority languages and the acquisition of English as a foreign language. This was done by comparing the English proficiency of high school juniors attending a monolingual school in a monolingual area of Spain with their peers in a bilingual school of similar characteristics in a Catalan bilingual area. Specifically, the study isolated a number of independent variables, including bilingualism, that could contribute to the acquisition of an L3 in order to answer the following research questions: Does Catalan/Spanish biliterate bilingualism contribute to more efficient acquisition of English as an L3? Is that contribution independent from that of other predicting factors, such as intelligence, motivation, or sociolinguistic status?

THE STUDY

Sociolinguistic background

Catalan, a Romance language, has shared co-officiality with Spanish since 1976. In Catalonia, although the presence of Catalan is growing every day, Spanish is still widely used, especially in the capital of Barcelona, as a consequence of almost 40 years of repression and waves of immigrants from monolingual regions of Spain during the second half of this century. This last phenomenon significantly changed the linguistic composition of Catalonia: the percentage of Catalan speakers decreased from 75% in 1940 to only 60% in 1975. The assimilation of these immigrants was not encouraged; on the contrary, migration took place at a time when Catalan was strictly banned from the public arena. Catalan speakers became accustomed to addressing strangers in Spanish and to using Spanish in formal contexts like the workplace.

In the early 1980s, the Catalan autonomous government created the General Secretariat for Linguistic Policy, which implemented the Catalan Normalization Law (passed by the Catalan Parliament) in an attempt to change the sociolinguistic situation by strengthening the presence of Catalan in the public domain. Three fronts were identified: linguistic awareness, the media, and education. Catalan was declared by law the *llengua vehicular* 'language of instruction' in all Catalan schools. Table 2 summarizes data from the 1986 and 1991 censuses

Table 3. *Catalan proficiency in Catalonia based on the 1996 census*

Population	Understands (%)	Speaks (%)	Reads (%)	Writes (%)
2–14 year olds	97.00	83.50	70.60	59.30
15–29 year olds	**98.30**	**90.40**	**90.20**	**78.70**
30–44 year olds	**96.80**	**74.90**	**76.20**	**41.60**
45–59 year olds	94.30	63.60	63.00	25.50
60–74 year olds	90.30	63.10	58.40	22.50
75–84 year olds	85.80	65.40	56.60	23.30
85 and older	83.90	66.60	52.40	20.30

Note: Population total: 5,984,000. From the Institut d'Estadística de Catalunya Web page, http://www.idescat.es.

on knowledge of Catalan, and Table 3 presents similar data from the latest census (1996). In Table 3, percentages are arranged by age group; two groups appear in boldface so that they may be compared more easily. The differences in Catalan language literacy between the groups attest to the success of the measures taken by the Catalan institutions.

In 1980, there were a number of private schools with a Catalan curriculum already in place. The data for this study come from one such school. In 1990, 40% of all students attended schools where Catalan was the language of instruction. By the late 1980s, Catalan immersion programs were implemented in schools in the Barcelona metropolitan area, where immigrants tend to settle in Spanish-speaking neighborhoods. Although the presence of Catalan was still less important in private than in public schools, the number of schools with Catalan as the language of instruction increased slowly but surely. Beginning with the graduating class of 1992, all high school graduates in Catalonia graduated with language skills in Catalan that would allow them to conduct administrative and educational tasks in both Catalan and Spanish. Today, a goal of the educational system is to provide students with equal proficiency in both languages. Spanish, the majority language, and its literature are taught in Spanish for 8 hours a week. English is taught for 4 hours per week.

METHOD

Participants

Well over 200 individuals participated in the study, but only the 201 students (77 monolinguals and 124 bilinguals) who completed all tests and questionnaires formed the final sample. The participants were male (62%) and female (38%) high school juniors from two private schools situated in urban areas of northern Spain. Both are Jesuit schools; consequently, they share not only many important characteristics imposed by government-generated standards and regulations, but also a common approach to education and goals characteristic of all Jesuit schools. They serve a similar population and implement similar rules in areas

such as student failure, consequently imposing limitations on the range of SES and age values. The main difference between the two schools lies in the language of instruction (i.e., Catalan vs. Spanish).

Answers to the questionnaire completed by all bilingual participants (see Appendix) confirmed that they used both Catalan and Spanish on a daily basis in and out of school and for activities as varied as shopping, watching TV, practicing sports, and taking notes. Almost 50% of the participants were born in bilingual homes, where one parent spoke Catalan and the other spoke Spanish. As high school juniors, they were preparing for the state exam that grants access to college. The exam requires academic written ability in both Spanish and Catalan. The monolingual participants lived in a monolingual area and therefore were exposed to only one language. Participants from multilingual households (with languages other than Spanish or Catalan) were eliminated from the final sample.

Materials and scoring procedures

The participants completed a release form, and all tests and questionnaires were completed in two 50-minute sessions in their own classrooms in May of 1996. During the first session, the participants signed the release form, answered the questionnaire, and completed one section of the Raven's Progressive Matrices Test (Foulds & Raven, 1950) rather than the full version (due to time constraints). During the second session, the participants completed the vocabulary and structure sections of the CELT English proficiency test (Harris & Palmer, 1970). Both sections followed a multiple choice format, and each included 75 items. The participants also completed a questionnaire (presented in its full version in the Appendix), which was divided into the following parts.

1. Personal information included age, gender, and SES.[7] The questionnaire asked for approximate income and profession of both parents. Each parent was then assigned into a category where 1 stood for working class; 2, middle class; and 3, upper middle class (based on Cenoz, 1991). By combining both parents in each household, five different categories were obtained: 2 through 6. Previous research has based SES solely on the father's data. In urban areas of Spain, however, a significant percentage of women work and contribute to household income. A majority (65%) of the households belonged to category 2; 20%, category 3; 38%, category 4; 21%, category 5; and 14%, category 6.
2. Intelligence was measured via the Raven's Progressive Matrices Test.
3. Exposure to English included the number of English courses and the hours per course at school as well as in after school programs and in summer programs in Spain and abroad. The score was calculated by adding the number of hours of English instruction at school, in after school programs and tutoring, and in summer programs in Spain or abroad. Special attention was paid to eliciting detailed information on informal exposure to English (e.g., music, television, pen pals, etc.), which was scored by adding the number of items mentioned. For example, participant A commented that she listened to music in English and watched CNN, for which she was given a score of 2; participant B said he had an American pen pal, watched MTV, and read graded readings, for which he was given a score of 3. Formal and informal exposure were introduced as separate independent variables in the analysis.[8]

4. Motivation to learn English was measured by means of a Likert-format questionnaire (adapted from Gardner, 1985, and Cenoz, 1991). This questionnaire included ten statements to which the participant reacted by choosing among the following: totally agree, agree, no opinion, disagree, totally disagree. The questionnaire included positive and negative statements, such as "I will use English after graduation" or "Learning English is difficult." A score was calculated for each participant by adding the scores from the ten items in the questionnaire. Raw scores were used in the analyses.

5. Attitudes toward the British and U.S. population and their varieties of English were elicited by means of a questionnaire that followed Osgood's semantic differentials format. It consisted of five pairs of antonyms that were applied to each population group (variables 8 and 9). Two other antonyms were applied to the two linguistic varieties (variables 10 and 11). The adjectives chosen were used successfully in Sanz (1992), a study with a similar population, and were presented following this example: "What do you think people in the United States are like?" "cultivated ___ ___ ___ ___ ___ ignorant." The participants were expected to choose one among the five spaces provided. For this variable, the score for each participant was calculated by adding the scores from the five semantic differential items on the questionnaire.[9]

This part of the questionnaire was administered in Spanish. The bilingual group completed a second part of the questionnaire (administered in Catalan), which included numerous items that elicited their knowledge and use of both languages. The monolingual group was addressed in Spanish, and the bilingual group was addressed in Catalan. The participants were informed that the study included groups from different areas in Spain. Data were coded, a database was created implementing a form generated with Microsoft Access®, and the data were then transferred to SAS (SAS Institute Inc., 1996), with which all analyses were performed.

Analysis

Following Cenoz and Valencia (1994), a hierarchical multiple regression analysis was applied to assess the relationship between biliterate bilingualism and the acquisition of English as a foreign language. The dependent variable was English proficiency, calculated as the sum of the scores from the vocabulary and structure tests. Table 4 summarizes the means and standard deviations for all variables.

RESULTS

The goal of the present study was to contribute Catalan data to the body of research on the interface between bilingualism and L3 acquisition. Specifically, it attempted to isolate the effects of additive bilingualism on proficiency in English as a foreign language by partialing out the effects of all other factors. To achieve this goal, a sequence of regression analyses, including a hierarchical regression analysis, was performed following a series of steps. Step one consisted of a regression analysis to identify the factors associated with higher

Table 4. *Means and standard deviations for all variables*

Variable	Mean	*SD*	Min.	Max.
Intelligence	10.71	1.25	0	12
Age	16.53	.59	16	18
SES	4.17	1.11	2	6
Motivation	4.59	5.34	–14	18
Attitudes toward U.K.	1.47	3.89	–12	10
Attitudes toward U.S.	.40	3.67	–12	9
Attitudes toward U.K. language	.42	2.05	–4	4
Attitudes toward U.S. language	.12	1.88	–4	4
Exposure	1026.6	355.76	156	2376
Informal exposure	1.72	1.0	0	5
Achievement (bilinguals)	46.169	9.058	23	66
Achievement (monolinguals)	40.18	8.444	22	62

Note: $N = 201$.

Table 5. *Multiple regression of all variables on English achievement*

Variable	Parameter estimate	*T*	r^2
IQ	.613	.191	
Gender	.173	.890	
Age	–.106	.916	
Father SES	–.507	.544	
Mother SES	1.483	.052	
British	.075	.568	
American	–.020	.880	
Motivation	.756	.000**	
Exposure	.003	.043*	
Informal exposure	.670	.300	
			.26

*$p < .05$; **$p < .01$.

performance on the English test. As shown in Table 5, which presents the results of this first analysis, only two predictors – exposure and motivation – significantly contributed to language achievement. In both cases the relation was positive, since high scores on exposure and motivation were associated with high scores on the English tests. The overall regression effect was significant, $F = 8.5$, $p < .0001$, $r^2 = .26$.

The second step consisted of performing a hierarchical multiple regression analysis, first to partial out the effects from the two predicting factors identified and then to observe the effects of bilingualism on L3 acquisition. This was done to avoid multicolinearity, since the variables could be intercorrelated (Cenoz &

Table 6. *Multiple regression of motivation, exposure, and bilingualism on English achievement*

Variable	Parameter estimate	r^2	*F* value
Motivation	.809		
Exposure	.003		
		.24	35.067**
Bilingualism	5.310	.33	32.611**

**$p < .01$.

Table 7. *Multiple regression of motivation, exposure, and bilingualism on English achievement and interactions*

Variable	Parameter estimate	r^2	*F* value
Motivation	.858	.244	64.251**
Bilingualism	4.337	.294	41.241**
Motivation/Bilingualism	.276	.30	.1918
Exposure	.006	.054	11.394**
Bilingualism	7.156	.189	23.199**
Exposure/Bilingualism	.000	.189	15.388

**$p < .001$.

Valencia, 1994). In this part of the analysis, the key factors were motivation, exposure, and bilingualism. All the other factors were not introduced in the analyses as they had proven not to be significant predictors ($p > .05$).

First, motivation and exposure were introduced to observe the overall regression effect, which was significant, $F = 35.06$, $p < .0001$, $r^2 = .24$. Then, bilingualism was introduced, resulting in greater predictive power, $F = 32.61$, $p < .0001$, $r^2 = .33$. Table 6 summarizes the results. Third, two sets of multiple regressions were carried out to identify any possible significant relationship between bilingualism and the two predicting factors identified in step one. It was important to be certain that the effects of bilingualism were totally independent of the effects of the other two factors. Motivation and exposure were entered first in the analysis, followed by bilingualism and finally by the interaction between motivation and exposure and bilingualism. Table 7 summarizes the results, which show significant levels for both factors as well as how the addition of bilingualism significantly increases the percentage of variance (explained by 5% in the case of motivation and by 13% in the case of exposure). The results from this last set of analyses also show no significant interaction between the factors and bilingualism, which means that bilingualism is associated with higher performance in the achievement test independently from other factors.

These results replicate those of Cenoz and Valencia (1994). As in the case of the Basque immersion program, students in the Catalan immersion program

showed an advantage as L3 learners compared with students in a monolingual school. Catalan bilingualism, like Basque bilingualism, explains superior English achievement independently from other variables. Another commonality between Cenoz and Valencia's results and those presented here is the significant role that both motivation and exposure play as factors predicting L3 proficiency. In contrast with data from the Basque Country, however, L3 proficiency does not appear to be related to age or intelligence. Methodological reasons account for these differences. The sample in Cenoz (1991) was made up of students in private and public schools, where students who are not promoted can stay in school for a maximum total of three extra years, which explains the wide range of ages of students in the same class. In private schools in general and in Jesuit schools in particular, such a practice is rare, thus reducing age variation. In the present sample, ages ranged between 16 and 17, except for three 18-year-old students.

As for intelligence, another factor expected to predict L3 achievement, limitations in the testing procedure were responsible for a lack of significant results. The reader may recall that only one part of the Raven's Progressive Matrices Test was administered due to the limited contact time available with the participants. Sections have twelve items, and all participants scored within the 8 to 12 range. As in the case of age, the intelligence factor was not significant due to the small amount of variation allowed by the narrow range of scores.

To sum up, despite different sociolinguistic contexts, different measurements, higher control over language exposure in the monolingual sample, and the different genealogies of the languages involved, results from the present study replicate those from Cenoz and Valencia (1994), showing that immersion programs in the minority language, whether in the Basque Country or in Catalonia, produce more efficient L3 learners.

DISCUSSION

The goal of this article was to evaluate the impact of bilingualism on L3 proficiency. Evidence is provided in favor of a positive relationship between Catalan/Spanish biliterate bilingualism and knowledge of English as a foreign language, thus adding to the evidence contributed by Swain et al. (1990) from English-speaking Canada and by Cenoz and Valencia (1994) from the Basque Country. These studies show that L1 and L2 literacy has a positive effect on L3 learning; the next step is to explain these effects. Two questions come to mind. What aspect of language acquisition is positively affected? Why is it affected? Although the study reported here does not operationalize factors, such as enhanced working memory or metalinguistic awareness, that could explain the advantage of bilinguals over monolinguals on L3 acquisition, it is still possible to offer some hypotheses.

Research suggests three aspects of the acquisition of nonprimary languages that need to be considered: route or acquisitional stages, rate, and final attainment. Route seems impervious to external or internal influences, including age, context of acquisition, and language typology. However, rate and final attainment vary to a great extent (Larsen-Freeman & Long, 1991). Therefore, it can be hypothesized that bilinguals will be more efficient language learners, since they will learn an

L3 faster and will reach a higher level of attainment than monolinguals. It can be further hypothesized that both bilinguals and monolinguals will follow the same acquisitional route. A study by Klein (1995) tested these hypotheses.

Klein (1995) was interested in investigating the effects of prior linguistic experience on the acquisition of preposition stranding by a group of 17 monolingual immigrants and 15 multilingual immigrants learning English as an L2. Her results showed that both groups of learners produced the same type of errors, which she interpreted as evidence that the route leading to acquisition of the parameter was the same. However, the rate at which both groups acquired the parameter was significantly different, with multilinguals resetting the parameter earlier than monolinguals. Klein differentiated between the acquisition of the syntactic structure, on the one hand, and the acquisition of the lexical items related to it (the specific verbs and prepositions), on the other. She observed that the multilingual group learned a higher number of the lexical items responsible for triggering parameter resetting. Klein interpreted these results as a consequence of enhanced cognitive skill on the part of multilinguals, which helped them pay closer attention to potential triggering data in the input.

Within a cognitive approach to language acquisition, the learner is seen as a limited capacity processor. To understand and react to new information, the learner uses controlled processes that make heavy requirements on attention and consequently demand cognitive effort and time. Automatic processes are fast and efficient. Learning is seen as the automatization of processes as a result of experience. In a series of empirical studies (McLaughlin & Nayak, 1989; Nation & McLaughlin, 1986; Nayak et al., 1990), McLaughlin and his associates suggested that language learning experience contributes to the automatization of basic subskills involved in input processing and frees up resources that can then be devoted to focus on form. This is related to Klein's (1995) reference to bilinguals' enhanced cognitive skill. From the perspective of McLaughlin and his associates, Klein's multilingual participants had resources available to focus on key items in the input. Because input is a requirement for language acquisition, input processing heavily influences language learning. Any advantage at this point is critical to explaining why bilinguals are more efficient language learners.

Based on general cognitive principles, VanPatten (1996) elaborated a series of principles that are relevant for the present discussion. Given learners' cognitive limitations, meaning and form compete for attention. According to the first principle, learners process input for meaning before they process it for form. According to the second principle, processing forms of low communicative value happens only after processing input for comprehension has been automatized, leaving space in working memory – the space where input is stored and processed in real time (Harrington & Sawyer, 1990). Therefore, working memory space is shared by two different functions. The more space is occupied by processing, the less space there is for storage. Automatic processes do not require as much space as controlled processes, and so they free up space for storage and processing, thereby increasing the amount of intake (i.e., processed linguistic data) available for integration into the learner's system. It is unclear whether working memory is stable or whether it can be developed by factors such as enhanced exposure to input; the question of whether bilinguals have access to one

or two working memories[10] is also under discussion. Three empirical studies have established a relationship between working memory and the acquisition of nonprimary languages (Geva & Ryan, 1993; Harrington, 1991, 1992; Harrington & Sawyer, 1990), but the direction of the causal relationship is still unknown. Nation and McLaughlin's (1986) study on the acquisition of a miniature artificial language by novices (monolingual participants) and experts (multilingual participants) offers indirect evidence indicating that the direction originates in prior linguistic experience, which facilitates the automatization of language processing.[11]

Finally, other factors may contribute to this edge in language processing for acquisition. One of them, metalinguistic awareness (or explicit knowledge of the language), is one of the best-documented differences between bilinguals and monolinguals. Research by Bialystok (1986, 1987, 1991), Diaz (1985), Galambos and Goldin-Meadow (1990), Yelland, Pollard, and Mercury (1993), and Ricciardelli (1992a, 1992b) found bilinguals to have greater explicit knowledge of the language. The weak interface position in L2 acquisition theory (Ellis, 1994) proposes that, while explicit knowledge cannot be transformed into implicit knowledge of the L2, it can help in the acquisition process by acting as an advanced organizer, focusing learners' attention on the relevant features of the language.[12] That is, heightened metalinguistic awareness, which results from exposure to literacy in two languages, gives bilinguals the capacity to focus on form and pay attention to the relevant features in the input. Just as more efficient use of memory space enhances the amount of input that can be processed into intake, metalinguistic awareness enhances the quality of the intake that feeds into the interlanguage system. Bilinguals may naturally show the behavior that different researchers working within the focus on form tradition (Doughty & Williams, 1998) are trying to induce in classroom language learners.

LIMITATIONS AND FUTURE RESEARCH

A limitation present in the design of this study originates in the test administered to evaluate the participants' proficiency in English. As a consequence of the short period of contact time allowed (data gathering took place one week before final examinations), the test included only a structure section and a vocabulary section. Therefore, and in contrast with Cenoz and Valencia (1994) and with Swain et al. (1990), I cannot make claims about the participants' reading and oral skills. However, in light of Cenoz's (1996) chapter, in which she investigated every skill component separately and found that participants in the immersion group outperformed those in the monolingual group on every skill except reading, I would not expect important findings. Other measurements implemented in this study need to be refined and better administered to avoid ceiling effects.

The question of reliable, precise measurements is also of importance if future research is to locate an explanation for the positive relationship between bilingualism and L3 acquisition. For example, research is needed on the effects of prior linguistic experience on awareness. Studies such as Klein's (1995), as well as the present article, have argued that heightened awareness at the level of noticing gives experienced language learners the edge. Evidently, experimental studies that include think aloud protocols in their design and compare bilinguals

and monolinguals while processing input are necessary if we are to claim that the groups differ in their processing strategies and basically their point of departure (Leow, 1997).

A limitation inherent to observational research of the variety exemplified by this study is the possible bias that comes with sampling. In a true experimental study, participants are randomly assigned to each experimental group. In research that compares bilinguals and monolinguals, as in research on the effects of smoking on men and women, for example, randomization is impossible. One solution, suggested by Hakuta (1986) and applied in Hakuta and Diaz (1984), is to focus on the bilingual sample and to look at those factors that predict cognitive advantages. Sanz (in progress) is one such study. It centers around general factors identified in the literature on the acquisition of nonprimary languages (Ellis, 1994; Skehan, 1998), such as age of acquisition of the L2 and knowledge of both languages (i.e., balance).

While all normal children have completed L1 acquisition by age 5, L2 learners start and complete acquisition of the L2 at different ages. The role of age in L2 acquisition is a critical issue, both for practical (i.e., when to introduce the L2 in the school curriculum) and theoretical reasons related to access to universal grammar, including the type of access (full, partial, or no access at all) after a certain age and the age itself. There is evidence suggesting that the age at which the L2 is acquired affects rate of acquisition and final success in that language. However, Sanz (in progress) investigated the relationship between the age at which the L2 was acquired and success in the acquisition of the L3. The hypothesis that earlier bilinguals (i.e., simultaneous bilinguals and those who have acquired the L2 before age 6) have benefited from extended practice with two languages and therefore show greater ability in learning the L3 could not be confirmed. The need to examine L3 acquisition in bilingual contexts from multiple perspectives is determined by the number of variables involved and their multiple interactions, making L3 acquisition a highly complex phenomenon.[13] The issue of the role of age in language acquisition is a good example.

The balance issue began with Peal and Lambert (1962), who, after an extensive review of all previous literature, concluded that only true bilinguals could be compared with monolinguals. In their 1962 study, they included only balanced bilinguals and found that they were superior to monolinguals in different measurements, including nonverbal intelligence and some types of verbal intelligence. However, a substantial number of subsequent studies yielded contradictory results on the cognitive advantages (and disadvantages) of bilingualism, which needed to be explained. Cummins' threshold hypothesis (1976) is an attempt to do just that.

Cummins did not claim that only balanced bilinguals benefit from the bilingual experience, but that an upper threshold must be reached to observe cognitive benefits. Cummins defined the upper threshold as "age appropriate skills in both languages." The threshold hypothesis is a working hypothesis that needs to be developed. For example, the concept of "age appropriate skills" is not specific enough. Sanz (in progress) divided participants into three groups, from least to most balanced, based on their reported control over both oral and written skills. It was hypothesized that the control over both languages would make a

difference in their ability to learn an L3. The regression analysis showed that, while balance in the participants' ability to listen and understand in Spanish and Catalan did not predict higher L3 scores, balance of the written skills is a significant predictor of L3 scores. Specifically, it is the English scores from the group with the highest balance that significantly contrast with the other two groups. These results, like those from Swain et al. (1990), show biliteracy rather than "oral bilingualism" to be the factor determining cognitive advantages.

The goal of immersion programs is to produce fully biliterate bilinguals with a superior level of control over both languages and who frequently use both languages as required by the sociolinguistic situation that surrounds them. As shown by the present study, one of the outcomes of immersion programs is more efficient language learners.

CONCLUSION

One of the attractions of research on L3 acquisition in bilingual contexts is the possibility of studying language acquisition from multiple perspectives. This study demonstrates the importance of viewing bilingualism as both a social and an individual phenomenon. The relationship between bilingualism and cognitive development and its positive contribution to L3 learning processes is intrinsically linked to the particular social context in which the research is conducted. Specifically, this study confirms Cenoz and Valencia (1994) and Swain et al. (1990) research conducted in developed areas but counters Wagner et al. (1989) research in the Moroccan Atlas. Therefore, further research is needed on the impact of bilingualism on L3 acquisition in different bilingual communities. But this research must be psycholinguistic in nature and must understand and describe in detail the specifics of the sociolinguistic situation, including the status of the languages involved and the issues related to biliteracy. Identification of a positive effect of bilingual programs on L3 acquisition in developed areas of the world does not mean that we can assume the same results for all bilingual programs, including those in the United States, for example. Catalans expect their children to be better language learners if they attend a bilingual school whose goal is promoting additive bilingualism. This positive attitude has the effect of motivating young language learners, whether learning an L2 or an L3. The present study has found this "hunch" to be right: bilinguals beat monolinguals by three to one.[14] Can we expect the same motivation to learn a foreign language from working class minority language learners in a transitional program in the United States, where attitudes toward other linguistic communities and expectations for language learning would be different from those in Catalonia? Such a program would probably be more similar to the school setting in Wagner et al.'s Moroccan study than to the Canadian, Basque, or Catalan programs, and therefore we might expect similar results.

Evidence from research on L3 learning has implications for the general field of language acquisition. As we have seen in the Discussion section, the effects of prior linguistic experience on language acquisition processes and strategies may shed light on hotly debated issues in processing approaches to L2 acquisition, such as the role of attention on input processing and the use of strategies to

optimize the use of attention given its space limitations, as well as on the effects of variables such as age, order, knowledge and use of the L1 and the L2 on L3 acquisition.

APPENDIX

CONCESIÓN DE PERMISO

El/La aquí firmante se compromete a participar en un experimento de lenguas no nativas que se realiza en varios puntos de la península, y está informado/a de que los resultados de este trabajo de investigación NO influirán de ninguna manera en las notas de ninguno de sus cursos, y que su nombre y el resultado de los diversos tests no aparecerán nunca juntos en público. Toda la información que recojan estos materiales será en todo momento confidencial.

Firmado: _____

Nombre y apellidos: _____

Colegio: _____

Gracias por tu cooperación
Cristina Sanz
Profesora del Departamento de Castellano y Portugués
Universidad de Georgetown
Washington, D.C.

Cuestionario personal **Edad:**
Esta información se mantendrá siempre confidencial **Mujer / Hombre**

1. Estudios de inglés en el colegio: -número de cursos incluyendo el presente
-horas por semana para cada curso

2. Estudios de inglés fuera del colegio:

ciudad	total de horas
ciudad	total de horas
ciudad	total de horas
ciudad	total de horas
ciudad	total de horas
ciudad	total de horas

3. ¿Has estudiado o estudias otras lenguas extranjeras?

4. ¿Se habla inglés o alguna lengua que no sea el castellano en tu casa?

5. ¿Estás en contacto con el inglés de manera informal? Por ejemplo, tienes amigos con los que hablas o con los que te escribes en inglés, cantas en inglés a menudo, ves vídeos en inglés, tu familia ha vivido en un país de lengua inglesa, etc.? Por favor da detalles.

¿Tu padre trabaja?	¿Cuál es su profesión?	¿Salario aprox.?
¿Tu madre trabaja?	¿Cuál es su profesión?	¿Salario aprox.?

Lugar de nacimiento de tu padre:
Lugar de nacimiento de tu madre:

Lo que siguen son algunas opiniones sobre el aprendizaje del inglés. Por favor elige la opción que mejor exprese tu propia opinión. Todas las respuestas son aceptables, por favor sé honesto/a. Elige UNA opción y márcala con una cruz.

(ADA) indica si estás absolutamente de acuerdo; (DA) de acuerdo; (SO) sin opinión; (ED) en desacuerdo; (AED) absolutamente en desacuerdo.

	(ADA)	(DA)	(SO)	(ED)	(AED)
1. Me gusta oir hablar inglés					
2. Si pudiera, me gustaría ver la televisión en inglés					
3. El inglés debe ser obligatorio en todos los colegios					
4. Para un español, es una pérdida de tiempo estudiar inglés					
5. Me gusta hablar inglés					
6. El inglés es difícil de aprender					
7. Probablemente usaré el inglés después del colegio					
8. Querría que en donde vivo el inglés fuese tan importante					
como la(s) lengua(s) propias de la zona.					
9. Me gustaría que varias asignaturas se enseñaran en inglés					
10. Si tengo hijos, espero que hablen inglés bien.					

En general, ¿cuál es tu opinión sobre las personas de los siguientes países?

Francia			Italia		
Ignorante	....	culta	ignorante	....	culta
Divertida	....	aburrida	divertida	....	aburrida
Trabajadora	....	perezosa	trabajadora	....	perezosa
Pobre	....	rica	pobre	....	rica
de fiar	....	no de fiar	de fiar	....	de fiar
lista	....	corta	lista	....	corta
¿Cómo te suena el francés?			**¿Cómo te suena el italiano?**		
duro	....	suave	duro	....	suave
feo	....	bonito	feo	....	bonito
sencillo	....	complejo	sencillo	....	complejo

Inglaterra			Estados Unidos		
Ignorante	....	culta	ignorante	....	culta
Divertida	....	aburrida	divertida	....	aburrida
Trabajadora	....	perezosa	trabajadora	....	perezosa
Pobre	....	rica	pobre	....	rica
de fiar	....	no de fiar	de fiar	....	de fiar
lista	....	corta	lista	....	corta
¿Cómo te suena el inglés que hablan?			**¿Cómo te suena el inglés que hablan?**		
duro	....	suave	duro	....	suave
feo	....	bonito	feo	....	bonito
sencillo	....	complejo	sencillo	....	complejo

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NOTES

1. Vicenta Tena's (1989) doctoral dissertation is not reported here at length due to the present author's inability to obtain a copy of the text. Only the abstract is available. Tena (1989) compared two groups of high school students in the Philippines on reading and writing performance in English. The groups' linguistic composition differed in that one was formed by Tagalog monolinguals and the other by speakers of Tagalog as an L2. Tena reported that the monolingual group significantly outperformed the bilingual group in literacy skills and overall academic performance. The analysis identified other predictors of L3 performance: students' attitudes toward Tagalog as language of instruction, father's educational level, language spoken before schooling, father unemployed at time of testing, and home ownership. Unfortunately, unlike the present study, Tena's analysis did not isolate bilingualism from all other variables. Consequently, we cannot determine which factor is responsible for the bilinguals' poor performance on the L3 test – their prior linguistic experience or their lower social status. In this, Tena's study is not different from most research on bilingualism and cognition carried out in the United States before Peal and Lambert's (1962) milestone work.
2. As pointed out by M. Swain (personal communication, September 1999), Swain et al. (1990) differs from both Cenoz and Valencia (1994) and Wagner et al. (1989) in that the participants were minority children who were learning a minority language (French) after having learned the majority language (English).
3. In the 1997/1998 academic year, 46% of all primary and secondary school students were in type A schools; 18.2%, type B bilingual schools; and 35%, type C (Basque only) schools. Less than 1% did not get any exposure to Basque at school.
4. Conversi's Chapter 7

   > has a twofold aim: first to underline the persisting importance of language in Catalan nationalism, contrasting it with the discontinuous attention which it has received in the Basque context; and secondly, to explore how the stress on a particular core value has influenced the development of two very different nationalist ideologies. The choice of a special symbol of identity, such as language or race, can have direct political consequences, as reflected in each movement's ideological formulations. This choice is based on the availability of pre-existing cultural "material" and human resources. . . . Three related assumptions can be demonstrated: first, that where an ethnic language was scarcely spoken, its absence made the choice of another element of national identification difficult; secondly, that language was a core value for the Catalans, while it was not so for the Basques, at least till very recently – a difference related to the dissimilar diffusion of the two languages; and

thirdly, that for the Basques, the absence of a clearly identifiable core element created ambiguity and conflict in the nationalists' political programmes. We speculate on how this difference affected the development of the two nationalisms, relating this difference to their inclusive or exclusive nature. The contrast shows how minority linguistic nationalism, which is the major expression of cultural nationalism, can be *inclusive* and other kinds of nationalism (e.g., racially or religiously oriented) *exclusive*. (p. 162)

5. Basque rather than Spanish is used for names of places for which there is no English term.
6. For information on the use of Spanish and Basque, please visit EUSTAT's web page at www.eustat.es. EUSTAT is the information office of the Basque government.
7. The scores from each parent were introduced separately in the first round of analyses. However, neither the scores of the mothers nor those of the fathers reached significance.
8. Calculating the scores consisted in adding the number of items mentioned. The task was facilitated by the participants, who followed the instructions carefully.
9. The questionnaire as it appears in the Appendix includes six and three items, respectively. However, a considerable number of participants (over 80%) scored 3 on each of them (i.e., chose the middle position). This and a number of complaints from the participants in relation to those two items while completing the questionnaire suggested they had to be eliminated from the final count. The items were trustworthy/non-trustworthy and simple/complex.
10. Following the research by MacLaughlin and colleagues, the present discussion assumes the existence of only one working memory.
11. The effects are not limited to input processing. Bilinguals' enhanced memory capabilities might account for their advantage not only in processing input for comprehension and language learning, but also in producing language and in its reliance on linguistic chunks (Skehan, 1998).
12. Similarly, Galambos and Hakuta (1988) wrote that

    the bilingual experience, by requiring that the form of the two languages be attended to, enhances the ability to direct attention to the form of language and focus on it effectively . . . bilingualism does not necessarily enhance knowledge about the properties of the language, but rather alters the approach towards language, from a message-oriented approach to a form-oriented one. (pp. 141–142)

13. During the question/answer period, after I had presented a first analysis of these data at EuroSLA 97 (Sanz, 1997b), M. Long observed the high degree of complexity which makes L3 acquisition research a daunting job. I had to agree with him. Nevertheless, this line of research is of interest for all multilingual communities and needs to be carried out. Countries like Spain and the United States are clear examples of how pluralism, on the one hand, and the need to maintain the nation's status in the international community, on the other, make requirements on their people's abilities to interact in more than one language. Research on the bilingual mind and bilingualism as a social phenomenon is necessary so that the next time that the Catalan immersion system in Spain or the right to receive a bilingual educa-

tion in the United States is challenged, we will be better prepared to argue in their favor.

14. This added to other positive outcomes related to language and content learning (Swain & Lapkin, 1982).

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