

## Processes of Interdependence between Languages. The Case of Immigrant Students in Catalonia

José-Luis Navarro, Ángel Huguet, and Clara Sansó

University of Lleida

### Abstract

Currently, a high number of immigrant students can be found in schools in the Spanish state in general and in Catalonia in particular, where the educational system is organized under the parameters of bilingual education. In this context, one of the theoretical assumptions underlying this educational model is the Linguistic Interdependence Hypothesis. With this framework, this study focused on a sample of 533 students of immigrant origin (49.16% boys and 50.84% girls), who completed a series of parallel tests assessing their competences in Catalan and Spanish, designed and validated by the Department of Education of the Government of Catalonia. In addition, we specifically analyzed one of the immigrant groups, whose home language was Arabic. Accordingly, we confirm the validity of the aforementioned Hypothesis in the case of immigrant students in general, as well as for the specific group whose L1 was Arabic. Moreover, we also present data enabling to discern which competences are transferred. Also, some educational implications are discussed.

*Keywords:* interdependence, transfer, Catalan, Spanish, immigrant students.

### Resumen

Actualmente se constata una presencia elevada de alumnado de origen extranjero en los centros educativos del Estado español en general y en Cataluña en particular, donde el sistema educativo se halla organizado bajo los parámetros de la educación bilingüe. En este contexto, uno de los presupuestos teóricos que sustenta este modelo educativo es el de la Hipótesis de Interdependencia Lingüística. Con este marco de fondo, este estudio se centra en una muestra de 533 estudiantes de origen inmigrante (49.16% alumnos y 50.84% alumnas), que completan una serie de pruebas paralelas, diseñadas y baremadas por la Consejería de Educación de la Generalitat de Cataluña, que evalúan sus habilidades en catalán y castellano. Además, se analiza específicamente uno de los grupos que lo conforman, cuya lengua familiar es el árabe. En este trabajo se concluye la validez de la mencionada Hipótesis en el caso de los escolares inmigrantes en general, así como en el grupo específico cuya L1 es el árabe. Por otra parte, se presentan datos que permiten discernir qué habilidades se transfieren. Asimismo, se plantean algunas implicaciones educativas.

*Palabras clave:* interdependencia, transferencia, catalán, castellano, estudiantes inmigrantes.

*Acknowledgements:* This work is part of the development of research projects financed by the Ministry of Economy and Competitiveness of the Government of Spain (REF. EDU2014-54093-R) and the Agència de Gestió d'Ajuts Universitaris and the Recerca of the Generalitat of Catalonia (REF. 2014 SGR 208).

Correspondence concerning this article should be addressed to José Luis Navarro Sierra, Department of Pedagogy and Psychology. Faculty of Education, Psychology and Social Work, University of Lleida. E-mail: jnavarro@pip.udl.cat

### Introduction

The arrival of people and families who come from other countries, as a result of the migratory phenomenon, has as a consequence the presence of pupils of foreign origin in the educational centers. Specifically, according to the revision of the Municipal Register of inhabitants of January 1 2014, foreigners represent 10.7% of the total population of Spain. And in Catalonia, context in which this study is developed, these people accounted for 14.5% of the inhabitants (Instituto Nacional de Estadística, 2014).

Evidently, this situation affects the educational centers. Thus, in Spain as a whole, the pupils who do not have Spanish nationality in non-university education during the year 2013-2014 accounted for 8.7% of the total number of pupils. As far as Catalonia is concerned, these pupils represented 12.7% (Ministerio de Educación, Cultura y Deporte, 2014).

In any case, the diversity of languages of origin and, especially, the different levels of competence in the language used in the classroom of those recently arrived, are probably some of the elements that currently generate greatest concern in our schools. In many cases, the origin of a great part of the difficulties that arise in the education-learning processes oriented towards these students is usually attributed to this problem (Huguet, Navarro, Chireac, & Sansó, 2013; Navarro &

Huguet, 2010; Navarro, Huguet, & Sansó, 2014; Vila, 2006).

This situation leads to challenges that, in certain cases, are similar to those which bilingual education has tried to respond to throughout the xxth century, but in others they are clearly different (Huguet, 2008). All of this has provoked interest in researching into the effectiveness of the bilingual programs at an international level. Thus, recently, and beyond the North American context, a meta-analysis has been carried out in Europe (Reljić, Ferring, & Martin, 2014) which concludes the positive effect of bilingual education, when it offers teaching in the language of the home and the language of the school. On the other hand, the authors highlight that there is an overrepresentation of American studies on this topic in psychology journals.

In addition, and returning to the context of schools, it is necessary to mention some of the contributions of Cummins (2000) when he points out the enormous difference that exists in the skills implied in the use of the language in informal situations (*Basic Interpersonal Communicative Skills*) and in formal situations (*Cognitive Academic Language Proficiency*). In other words, it is not the same to be able to use the language conversationally face to face, in which a multitude of nonlinguistic signals appear that allow to access the meaning and sense of the linguistic produc-

tions of the interlocutor, as in a formal scope in which the interlocutor is not present and his intentions can only be acceded to by means of the linguistic procedures of the actual speaker.

Evidently, so that the students develop the capacity to use the language in decontextualized situations, the only way is to learn to use it in very contextualized communicative situations (Bruner, 1986), which is particularly significant in the case of educational models which use a language different from the L1 of the learner.

In any case, and referring to the review of studies on bilingual education, as described by Cummins (2000) or Reljić et al. (2014) in an international context, or Huguet (2008, 2014) in a Spanish context, it is necessary to point out that, probably, the most relevant theoretical instrument available to explain them, and at the same time the conceptual basis on which the models of bilingual education adopted in Catalonia are sustained, is the Hypothesis of Linguistic Interdependence (Cummins, 2000). This hypothesis proposes the idea that the language skills developed in a certain language (Lx) can be transferred to another (Ly) providing there are certain conditions: (1) adequate exposure to the Ly; and (2) motivation to learn the Ly.

For the case of the students of Catalonia, for example, this would imply that the teaching in Catalan, that would allow to develop reading

and writing skills in this language, would not only foment the impulse of skills in Catalan, but at the same time would also make possible a deeper conceptual and linguistic competence and intimately linked to the development of Spanish; a language that enjoys a strong social presence and that receives specific curricular treatment. Evidently, it implies the existence of an underlying cognitive-academic competence and common to all the languages that makes the transfer possible (Common Underlying Proficiency), despite the fact that superficial aspects of the language, such as pronunciation or fluency, remain separated. That is to say, that general language competence would not refer to what is commonly considered specifically linguistic, forms or concrete rules, but rather would be related to general aspects that govern the use of the language (Huguet & Janés, 2013).

This approach has been represented through the model known as the “double iceberg” (Baker & Hornberger, 2001; Cummins, 1984, 1996), thus emphasizing to what extent the experience in any language can promote the development of the competence that underlies both languages. In this way, when a pupil attends a school in which the language of the teaching does not coincide with his or her L1, if the school really makes it possible for the pupil to be more and more competent in the second language (L2), besides reaching

this objective, the pupil will manage to develop the general linguistic competence common to both languages, as long as the person in question can also use L1 in a social and/or family environment, as then that person will be able to also transfer to L1 the abilities developed in L2 and vice versa. And it is evident that a favorable social attitude towards these languages will act as a catalyst of the process as a whole (Baker, 1992).

The aforementioned in the previous paragraph seems independent even for languages which are similar or very different to each other. In the first case, the transference is made up of both linguistic and conceptual elements, whereas in the case of typologically different languages it consists primarily of cognitive and conceptual elements, as for example occurs between English and Japanese (Cummins, 1984) or Spanish and Nahuatl (Francis, 2000).

With this framework, it is advisable to exemplify with research carried out in bilingual educational scenarios some studies made in Spain on the Hypothesis of Linguistic Interdependence and its implications for a multilingual school. In any case, in the Catalan context, it is necessary to highlight the shortage of studies that analyze this question in depth. It has only been possible to locate those carried out by Huguet (2008, 2014), Oller (2008), Oller and Vila (2011), carried out in Catalonia.

With regard to Huguet (2008), it must be pointed out that the sample and tests used were the same as in Navarro and Huguet (2010), where the language competences in Catalan and Spanish of pupils of immigrant origin in relation to their native peers were analyzed (121 schoolchildren: 93 natives and 28 immigrants). Therefore, we refer to the use of the same data. However, the explanatory possibilities, and limitations, offered by the Hypothesis of Linguistic Interdependence are examined when trying to understand the mechanisms involved in the acquisition of new languages by immigrant schoolchildren in multilingual contexts. More specifically, the analysis undertaken seems to indicate that the processes of interdependence and linguistic transference take place, but certain linguistic skills are more susceptible to be transferred than others.

Regarding the work of Oller (2008), it was developed from a sample of 1,141 students of 12 years of age, from different educational centers, who were studying the last course of Primary Education (626 native and 515 immigrants). All of them were evaluated in their knowledge of Catalan and Spanish. In addition, aspects were controlled such as: L1, the length of stay in Catalonia, the educational level and the socioprofessional situation of the family, the sociolinguistic context, the concentration of foreign pupils per

classroom, among others. Starting from the analysis of different language skills, and the effect of the abovementioned variables, the goal was to research the establishment of relations of language interdependence. In this regard, it was concluded that the knowledge of Catalan and the L1 provided feedback for each other based on the consideration that a great part of the immigrant schoolchildren had already developed previously cognitive-academic abilities from their own language, which led to think that they could transfer them to Catalan if from a social and educational context they developed conversational language skills in this language. Consequently, in this study it is concluded that the L1 is an influential factor in the process of acquisition of the school language, and that mediates in the establishment of interdependence relations, expressing its influence of different way based on the implied linguistic abilities and of the sociolinguistic context. Consequently, in this study it is concluded that the L1 is an influential factor in the process of acquisition of the educational language; and that it mediates in the establishment of interdependence relations, expressing its influence differently based on the language skills involved and the sociolinguistic context.

A later analysis of these same data (Oller & Vila, 2011), referring to the immigrant schoolchildren of

the previous sample whose L1 was Spanish (221 subjects), Rumanian (44 subjects) and Arabic (131 subjects), established that the relations of interdependence and Catalan-Spanish transfer, and vice versa, occur both between L1 and L2, for the case of the Spanish speakers, and between L2 and L3, for the students of Rumanian and Arab origin. However, these relations do not affect in equal measure the cognitive-academic skills, more linked to the written language than to the conversational, more to the spoken language, and that it is among the former where the transfer is principally detected. But in addition, both are modulated by the sociolinguistic environment, the length of stay, and the home language.

Finally, concerning the work of Huguet (2014), carried out in Catalonia with 237 students whose L1 was Spanish (123 native and 114 immigrants), it is concluded from the data analyzed that the Hypothesis of Linguistic Interdependence explains the results of these two groups of students with the same maternal language. On the one hand, a different development of both groups in their language competences in Catalan and Spanish is perceived; on the other hand, in the case of the immigrants, high correlations are observed in the general indices and subtests of the test used, which demonstrates the language transfer and the processes of interdependence between the two languages analyzed. In any case,

the data indicate that the interdependence and the language transfer appear more intensely in the written tests than the spoken.

With this theoretical framework, and retaking the problem of the access to the educational language by those who have recently arrived, the objective of our research is to study the relations of interdependence and language transfer in the students of present day Catalonia, with special reference to the pupils of immigrant origin. That is to say, the idea is to deeply analyse the fact how students of very diverse linguistic origins (L1), and attending class in Catalan (L2), transfer skills from this language towards Spanish (L3). Also, it should not be ignored that, although some of the immigrant students' L1 is Spanish, they use different Latin American varieties of this language.

Finally, one of the groups of students of immigrant origin will be studied more in depth: those whose L1 is Arabic. In this case we are interested in analyzing if the interdependence also occurs in the case of a more distant language.

In this context, our hypothesis is that the process of interdependence and transfer between Catalan and Spanish will occur among the immigrant pupils as a whole, including those that have a more distant L1 from the school languages, and that there will be differences between tasks of a written and spoken type.

## Method

### Participants

Our study was directed towards those students who had finished each of the cycles that make up the Obligatory Secondary Education: the 2nd and 4th courses of ESO. Pupils of 14 and 16 years of age ( $M = 14.80$ ,  $SD = 1.32$ ), respectively, with the degree of maturity necessary to answer the selected tests detailed in the section that follows.

Once excluded those who failed to complete some of the tests to be carried out, as well as those immigrant pupils of most recent incorporation who had not attended school in their country of origin, our sample was conformed by a total of 533 participants (262 boys and 271 girls – all immigrant students), from 10 state schools: 4 in the province of Barcelona, and 2 in each of the other Catalan provinces (Tarragona, Lleida and Girona), based on the data provided by the Department of Education. These students present 30 different languages. Regarding the length of stay in the country, 31.9% had been in the country less than three years, 35.27% between three and six years and 32.83% more than six years.

From this sample, the second part of the study is focused on one of the sub-groups: those students with Arabic as L1, in order to analyze the case of a totally different

language from a linguistic point of view. In this case the total number of students was 88 (39 boys and 49 girls).

### Material

Being aware of the arguments that the concept of language skills involves, as well as the problem of the criterion of measurement in scholastic evaluation, the decision was taken to use tests of language competence referring to scales rather than level tests. In other words, the knowledge of the language was evaluated and not the objectives of a specific course.

Thus, the language competence was evaluated in the languages Catalan and Spanish through two tests designed and validated by the Council of Education of the Generalitat of Catalonia. These tests, parallel in their internal structure, analyze the following aspects: Oral Comprehension (CO), Morphosyntax (MS), Spelling (ORT), Written Comprehension (CE), Written Expression (EE), Oral Expression Lexicon- Morphosyntax (LMS), Oral Expression Organization of Information (OI), Phonetics (FON), Reading Correction (LE-C) and Reading Intonation (LE-E). All the sections receive a score that oscillates between 0 and 100 points based on the number of correct and incorrect answers and, finally, two marks can be obtained: PG1 and PG2. The first index comes from the mean of the first five subtests

that are written tests and are carried out collectively, whereas the second index involves all the tests (the previous tests plus the rest that are speaking tests and are undertaken individually).

An individual notebook is necessary to carry out the tests, and each subtest has a limited time of application. As has been indicated, the tests of Catalan and Spanish are parallel, and although their internal structure is the same, in each case the contents, texts, vocabulary, etc of the activities are different.

The indices of difficulty, correlations and reliability, following the "split half" method, are widely described in Bel, Serra and Vila (1991). In any case, the Pearson indices of correlation obtained to measure the reliability of the subtests oscillated between  $r = .61$  ( $p < .001$ ) and  $r = .80$  ( $p < .001$ ).

Finally, it must be pointed out that these tests have successfully been used both in the study of traditional bilingual contexts (Huguet, Vila, & Llorca, 2000), and in immigration contexts (Navarro & Huguet, 2010).

### Procedure

From the data provided by the Department of Education the 10 centers with a marked presence of immigrant pupils were selected, accounting for between 20% and 59% of the total number of pupils of these centers.

Later, the provincial education authorities and the educational centers involved were contacted with the object of clarifying the reasons of the study. The days on which the interviews and applications of the tests would take place were decided, and a press conference with the directors of the centers was held, asking for their collaboration and informing them of the anonymity of the answers and results of the pupils.

The staff responsible for the application and correction of protocols was specially trained to this end. The time used for the collective and individual parts of the tests was 75 and 20 minutes, respectively, in each of the two languages.

### Data analysis

In agreement with the quantitative nature of the collected data, descriptive statistics, correlational techniques and simple regression analysis have mainly been used.

This type of analysis, besides providing us with an index of correlation between the marks corresponding to the knowledge of Catalan and Spanish, helped us define a hypothetical line that determines the degree of intensity of the relation between both languages. In addition, some separated indices were obtained based on their L1.

In any case, the statistical treatment was carried out with the aid of the integrated package “Statview for Windows”, version 5.0.1., and the level of significance used was .05.

### Results

Now follows the data of the results in two corresponding sections: the whole set of participants of immigrant origin in the study, and the group of students whose L1 is Arabic, respectively.

In the first section, Figure 1 shows the results of the regression

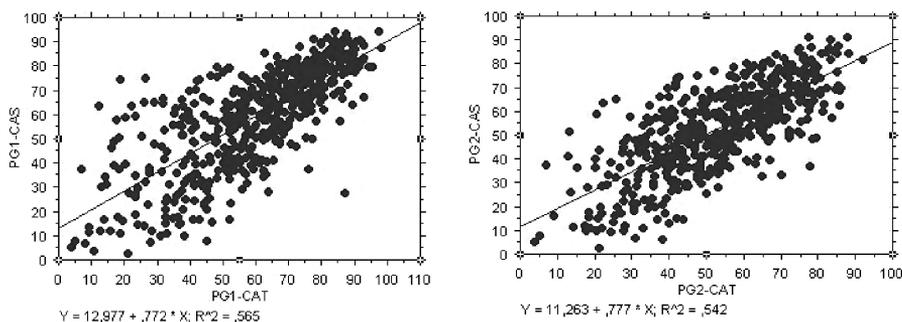


Figure 1. Regression lines corresponding to the set of immigrants (indices PG1 and PG2 respectively).

lines corresponding to the knowledge of Catalan and Spanish for the total of the sample, in which the Independent Variable is Catalan (X axis, abscissae) and the Dependent Variable Spanish (axis Y, ordinates).

As can be seen, the conjunction of the knowledge of Catalan and Spanish of each of the students agglutinates around the hypothetical line that indicates the place where the confluence of the acquired level of competence is located in both languages.

In any case, it is possible to observe that, in the case of these immigrant schoolchildren, there is a great dispersion along the hypothetical line. This aspect is in relation to the low results obtained by a large part of these pupils regarding the levels of language competence reached (Navarro & Huguet, 2010; Navarro et al., 2014) and also with the long periods of time necessary to reach an adequate degree of command in the most formal and academic aspects of the language, in spite of their rapid advance in conversational skills (Cummins, 2000).

However, it should not be forgotten that, as can be seen in Figure 1, the processes of interdependence and language transfer occur in the case of the students of immigrant origin, corroborated by the values obtained:  $R = .752$ ,  $R^2 = .565$ ,  $F = 690.314$ ,  $p < .001$ ,  $b = 0.772$ ,  $\beta = .752$ ,  $t = 26.274$ ,  $p < .001$  for PG1; y  $R = .736$ ,

$R^2 = .542$ ,  $F = 627.362$ ,  $p < .001$ ,  $b = 0.777$ ,  $\beta = .736$ ,  $t = 25.047$ ,  $p < .001$  for PG2. In addition, it can be observed how a slightly greater intensity appears in the relations between the written tests (PG1), considered separately, than when the spoken tests are also taken into account (PG2).

Finally, confirmation of the aforementioned can be observed with greater detail when analyzing the correlation matrix between the different subtests that make up the global test. As can be appraised in Table 1, the obtained indices of correlation for the equivalent subtests of Catalan and Spanish are really high in most of the activities undertaken, which is translated in positive levels of significance in all cases. In particular, Fisher's test showed the following values: CO ( $r = .585$ ,  $p < .001$ ), MS ( $r = .678$ ,  $p < .001$ ), ORT ( $r = .630$ ,  $p < .001$ ), CE ( $r = .673$ ,  $p < .001$ ), EE ( $r = .471$ ,  $p < .001$ ), LSM ( $r = .391$ ,  $p < .001$ ), OI ( $r = .308$ ,  $p < .001$ ), FON ( $r = .492$ ,  $p < .001$ ), LE-C ( $r = .539$ ,  $p < .001$ ) and LE-E ( $r = .436$ ,  $p < .001$ ).

In addition, another relevant question can be deduced on close inspection of the above table. When drawing the two cartesian axes that separate the written tests from the speaking tests, four quadrants are obtained: in the first are the interactions between written tests in Catalan and Spanish, in the second between the written tests in Spanish and the speaking tests in Catalan,

Table 1

*Correlation Matrix Corresponding to Each One of the Subtests of Catalan (Columns) and Spanish (Rows) between the Students of Immigrant Origin (N = 533)*

	Written tests					Speaking tests				
	CO	MS	ORT	CE	EE	LMS	OI	FON	LE-C	LE-E
CO	.585	.603	.392	.560	.393	.411	.311	.392	.283	.294
MS	.596	.678	.524	.626	.477	.446	.297	.509	.394	.334
ORT	.394	.544	.630	.494	.494	.354	.224	.473	.387	.327
CE	.571	.688	.529	.673	.518	.486	.309	.467	.333	.297
EE	.353	.453	.466	.410	.471	.304	.158	.355	.264	.257
LMS	.416	.431	.402	.411	.406	.391	.209	.484	.297	.267
OI	.323	.365	.340	.330	.272	.277	.308	.317	.287	.259
FON	.280	.283	.334	.263	.313	.284	.044*	.492	.187	.159
LE-C	.308	.445	.425	.417	.351	.302	.280	.297	.539	.401
LE-E	.242	.327	.327	.290	.305	.226	.250	.291	.475	.436

*Note.* The correlation indices between the equivalent tests of Catalan and Spanish appear diagonally. The non-significant correlations are also indicated ( $p > .05$ ).

\* Non-significant correlations (1)

Table 2

*Size of the Effect from the Correlation Matrix of Table 1.  $d$  of Cohen. (N = 533)*

	Written tests					Speaking tests				
	CO	MS	ORT	CE	EE	LMS	OI	FON	LE-C	LE-E
CO	1.44	1.51	0.85	1.35	0.85	0.90	0.65	0.85	0.59	0.61
MS	1.48	1.84	1.23	1.60	1.08	1.05	0.62	1.18	0.85	0.70
ORT	0.85	1.29	1.62	1.13	1.13	0.74	0.45	1.07	0.83	0.69
CE	1.39	1.89	1.24	1.81	1.21	1.11	0.64	1.05	0.70	0.62
EE	0.75	0.88	1.05	0.89	1.06	0.63	0.32	0.75	0.54	0.53
LMS	0.91	0.95	0.87	0.90	0.88	0.84	0.42	1.10	0.62	0.55
OI	0.68	0.78	0.72	0.69	0.56	0.57	0.64	0.66	0.59	0.53
FON	0.58	0.59	0.70	0.54	0.65	0.59	0.08	1.13	0.38	0.32
LE-C	0.64	0.99	0.93	0.91	0.74	0.63	0.58	0.62	1.27	0.87
LE-E	0.49	0.69	0.69	0.60	0.64	0.46	0.51	0.60	1.05	0.96

in the third the speaking tests in Spanish and the written in Catalan, and in the fourth the speaking tests in Catalan and Spanish.

On this basis, in the table as a whole, only 1 of the 100 correlations is non-significant ( $p > .05$ ), and it is situated in the last quadrant: that corresponding exclusively to the speaking tests. On the other hand, the size of the effect from the correlation matrix of Table 1 appears in Table 2.

As can be appreciated, only one of the values is lower or equal to 0.20 (little effect). The rest corresponds to values of medium, high or very high effect. In short, the data obtained seem to indicate that the relations of interdependence and language transfer appear with greater intensity between the written subtests of the test used than when the speaking subtests are also considered.

As for the second section, that is to say those immigrant students whose L1 is Arabic, indices PG1 and PG2 also appear separately. Figure 2 shows the results of the regression lines corresponding to the knowledge of Catalan and Spanish, in which the Independent Variable is Catalan (X axis, abscissae) and the Dependent Variable Spanish (Y axis, ordinates).

Also, in this case, the conjunction of the knowledge of Catalan and Spanish of each of these schoolchildren is agglutinated around the hypothetical line that indicates the place where the confluence of the acquired level of competence is located in both languages.

It is also possible to observe here that, in the case of those immigrant schoolchildren whose L1 is Arabic, dispersion is produced along the hypothetical line.

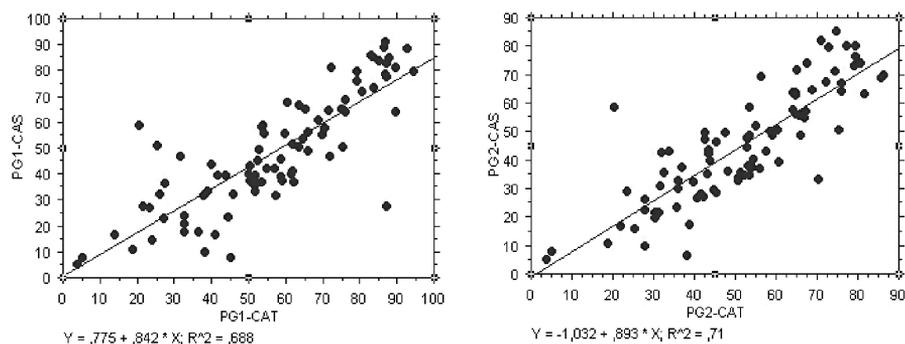


Figure 2. Regression lines corresponding to the group of immigrants whose L1 is Arabic (indices PG1 and PG2 respectively).

And as in the previous case (the group of immigrant pupils), as can be appreciated in Figure 2, the processes of interdependence and language transfer occur in the case of these students, fact validated by the values obtained:  $R = .830$ ,  $R^2 = .688$ ,  $F = 189.759$ ,  $p < .001$ ,  $b = 0.842$ ,  $\beta = .830$ ,  $t = 13.775$ ,  $p < .001$  for PG1; y  $R = .842$ ,  $R^2 = .710$ ,  $F = 210.171$ ,  $p < .001$ ,  $b = 0.893$ ,  $\beta = .842$ ,  $t = 14.497$ ,  $p < .001$  for PG2.

In fact, what is interesting is that these indices are superior to those observed in Figure 1 (referring to the immigrant pupils as a whole). Similarly, the confirmation of this can be observed with greater detail when analyzing the

correlation matrix between the different subtests that compose the global test. As can be seen in Table 3, the obtained correlation indices for the equivalent subtests of Catalan and Spanish are really high in most of the activities undertaken, which is translated in positive levels of significance in all cases bar 3 of the 100 correlations. Specifically, Fisher's test showed the following values: CO ( $r = .616$ ,  $p < .001$ ), MS ( $r = .838$ ,  $p < .001$ ), ORT ( $r = .708$ ,  $p < .001$ ), CE ( $r = .780$ ,  $p < .001$ ), EE ( $r = .609$ ,  $p < .001$ ), LSM ( $r = .637$ ,  $p < .001$ ), OI ( $r = .392$ ,  $p < .001$ ), FON ( $r = .542$ ,  $p < .001$ ), LE-C ( $r = .549$ ,  $p < .001$ ) and LE-E ( $r = .457$ ,  $p < .001$ ).

Table 3

*Correlations Matrix Corresponding to Each One of the Subtests of Catalan (Columns) and Spanish (Rows) between the Students of Immigrant Origin whose L1 is Arabic (n = 88)*

	Written tests					Speaking tests				
	CO	MS	ORT	CE	EE	LMS	OI	FON	LE-C	LE-E
CO	.616	.695	.438	.651	.474	.522	.447	.546	.438	.332
MS	.618	.838	.615	.758	.694	.593	.480	.588	.526	.435
ORT	.454	.624	.708	.576	.642	.511	.405	.600	.466	.350
CE	.607	.801	.577	.780	.683	.614	.483	.637	.532	.460
EE	.403	.605	.572	.544	.609	.492	.240	.535	.411	.336
LMS	.401	.584	.590	.577	.633	.637	.453	.644	.479	.385
OI	.343	.509	.345	.504	.474	.461	.392	.446	.367	.284
FON	.321	.306	.405	.286	.326	.359	.102*	.542	.182*	.122*
LE-C	.350	.527	.454	.592	.519	.407	.519	.380	.549	.480
LE-E	.231	.462	.463	.463	.439	.416	.365	.287	.519	.457

*Note.* The correlation indices between the equivalent tests of Catalan and Spanish appear diagonally. The non-significant correlations are also indicated ( $p > .05$ ).

\* Non-significant correlations (3)

When making the same analysis in the four quadrants, in the table as a whole only 3 of the 100 correlations are non-significant ( $p > .05$ ), and are located in the last quadrant: those corresponding exclusively to the speaking tests, and specifically in the phonetics section.

As in the previous case, the collected data seem to indicate that the relations of interdependence and language transfer appear with greater intensity between the writ-

ten subtests of the test used than when also considering the oral subtests.

Likewise, and as with the data of the group of immigrant pupils, the size of the effect from the correlations matrix of Table 3 appears in Table 4 (pupils whose L1 is Arabic).

In this case a similar situation also occurs. Only one of the values is lower or equal to 0.20 (little effect). The rest correspond to values of medium, high or very high effect.

Table 4

*Size of the Effect from the Correlation Matrix of Table 3.  $d$  of Cohen ( $n = 88$ )*

	Written tests					Speaking tests				
	CO	MS	ORT	CE	EE	LMS	OI	FON	LE-C	LE-E
CO	1.56	1.93	0.97	1.71	1.07	1.22	0.99	1.30	0.97	0.70
MS	1.57	3.07	1.55	2.32	1.92	1.47	1.09	1.45	1.23	0.96
ORT	1.01	1.59	2.00	1.40	1.67	1.18	0.88	1.50	1.05	0.74
CE	1.52	2.67	1.41	2.49	1.87	1.55	1.10	1.65	1.25	1.03
EE	0.88	1.51	1.39	1.29	1.53	1.13	0.49	1.26	0.90	0.71
LMS	0.87	1.43	1.46	1.34	1.63	1.65	1.01	1.68	1.09	0.83
OI	0.73	1.18	0.73	1.16	1.07	1.03	0.85	0.99	0.78	0.59
FON	0.67	0.77	0.88	0.59	0.68	0.76	0.20	1.28	0.37	0.24
LE-C	0.74	1.24	1.01	1.46	1.21	0.89	1.21	0.82	1.31	1.09
LE-E	0.47	1.04	1.04	1.04	0.97	0.91	0.78	0.59	1.21	1.02

### Discussion

The results of this study allow to corroborate to what extent education in a language different from L1 of the students does not necessarily mean a negative influence in the processes of transfer inherent to the Hypothesis of Linguistic In-

terdependence (Cummins, 2000). This is the case of the immigrants students in Catalonia, receiving education in Catalan (Huguet, 2014). These results are endorsed by this study, where correlational techniques have been used different to those which have habitually been used in similar studies.

In any case, the main interest of this study has to do with the results obtained by the pupils of immigrant origin, in Obligatory Secondary Education, both in the global result ( $N = 533$ ), as with the sub-group whose L1 was Arabic ( $n = 88$ ).

In other words, it has been observed that the transfer and language interdependence take place in both groups, including that whose language differs greatly from Catalan or Spanish, which confirms the hypothesis of this work.

However, and although there is an evident correlation between the level of competence in these languages, there is dispersion in the results. Evidently, different elements such as motivation and attitudes towards the learning of these languages can have an affect (Baker, 1992; Lapresta, Huguet, & Janés, 2010), as well as the sociolinguistic environment, the length of stay, and the home language (Oller & Vila, 2011).

In any case, studies carried out, mainly in English speaking countries, show to what extent the total development of competences in a new language and context is a lengthy and complex process (Cummins, 2000).

But reviewing the results of the presented study, beyond the global data on the interaction between competences in the two analyzed languages, it can be indicated that the positive relation can be observed in each one of the different sections of the tests.

In this sense, it stands out that the correlations are greater between the written tests than when the speaking tests are also considered, which seems to indicate that the processes of interdependence and language transfer take place uniformly among the immigrant schoolchildren, but certain language skills are more susceptible to be transferred than others, particularly those which are located at a deeper level of linguistic competence, as opposed to those that are located at a more superficial level (Cummins, 2000; Huguet, 2008, 2014; Oller & Vila, 2011). And this can be observed when analyzing the written tests separately, as well as the speaking tests. In this sense, the results are consistent with the Hypothesis of Linguistic Interdependence, and with the hypothesis presented in this work.

And as for the educational implications of this work, it is important to point out some observations. One of them has to do with the analysis of the “traditions” in the teaching and learning of languages, in which the didactics of the language may have been very rigid, differentiating the teaching of L1, L2, foreign language, etc., and without considering the current plurilingual context. In this sense, it must be remembered that bilingual (or plurilingual) education assumes an instrumental conception of the teaching of the language (Vila, 2006) in which it is proposed that the most effective way to learn

a language is by means of its use in relation to the things carried out in school, moving from a contextualized use to a more abstract and formal use, and where the responsibility is not exclusively on the shoulders of the teaching staff who give the language classes but rather of all the educational team. A second reflection can be related to the context of Catalonia in which immersion programs have been applied (with native population) but without the same results in the case of those of immigrant origin, since the same schooling conditions do not exist: it would be necessary to rethink the programs of linguistic immersion in this new context. A third element to consider is in relation to the expectations and beliefs of a sector of the teaching staff, in the sense that they continue to think that certain students, whose L1 is very distant from the language used in the school, will necessarily have worse results than those who are closer linguistically.

Finally, and as far as the limitations of this work are concerned, it is necessary to point out that certain skills appear to be more susceptible to be transferred than oth-

ers, highlighting the necessity to promote research in this field, with wider samples which would enable us to detect, among other aspects, which elements of each Lx are relevant and at what moment of the acquisition process of the Ly, and especially if the level of language competence in the L1 of the students can be controlled. Without a doubt, all of this will lead to a deeper knowledge of the mechanisms involved in the acquisition of the language and a greater quality of the educational practices.

Also, it is necessary to indicate that it would be reductionistic to say that the psycholinguistic factors can by themselves explain all the transfer process. In this sense, it would be necessary to contemplate other elements such as the linguistic attitudes in the explanation of the level of competence reached in a certain goal language (L2, L3), or the educational practices that are developed in the school context, or the study of situations where the L1 is taught within the school framework, when this does not correspond with the language or languages of the educational system.

## References

- Baker, C. (1992). *Attitudes and language*. Clevedon: Multilingual Matters.
- Baker, C., & Hornberger, N. H. (2001). *An introductory reader to the writings of Jim Cummins*. Clevedon: Multilingual Matters.
- Bel, A., Serra, J. M., & Vila, I. (1991). *El coneixement de llengua catalana i castellana en acabar l'ensenyament obligatori el 1990*. Barcelona: Departament d'Ensenyament-SEDEC.
- Bruner, J. (1986). *Actual minds, possible words*. Cambridge, MA: Harvard University Press.
- Cummins, J. (1984). *Bilingualism and special education: Issues in assessment and pedagogy*. Clevedon: Multilingual Matters.
- Cummins, J. (1996). *Negotiating identities: Education for empowerment in a diverse society*. Los Angeles, CA: California Association for Bilingual Education
- Cummins, J. (2000). *Language, power and pedagogy. Bilingual children in the crossfire*. Clevedon: Multilingual Matters.
- Francis, N. (2000). The shared conceptual system and language processing in bilingual children: findings from literacy assessment in Spanish and Náhuatl. *Applied Linguistics*, 21(2), 170-204. doi: 10.1093/applin/21.2.170.
- Huguet, A. (2008). Interdependencia lingüística y práctica educativa. Un estudio con escolares de origen inmigrante. *Infancia y Aprendizaje*, 31(3), 283-301. doi: 10.1174/021037008785702901
- Huguet, A. (2014). Latin American students and language learning in Catalonia: What does the Linguistic Interdependence Hypothesis show us? *Spanish Journal of Psychology*, 17(1), 1-13. doi: 10.1017/sjp.2014.11
- Huguet, A., & Janés, J. (2013). Escuela e inmigración. Una revisión de estudios sobre el desarrollo de habilidades lingüísticas y procesos de interdependencia entre lenguas. *Anales de Psicología*, 29(2), 393-403. doi: 10.6018/analesps.29.2.130572
- Huguet, A., Vila, I., & Llurda, E. (2000). Minority language education in unbalanced bilingual situations: A case for the Linguistic Interdependence Hypothesis. *Journal of Psycholinguistic Research*, 29(3), 313-333. doi: 10.1023/A:1005152305793
- Huguet, A., Navarro, J. L., Chireac, S., & Sansó, C. (2013). The acquisition of Catalan by immigrant children. The effect of length of stay and family language. In J. Arnau (Ed), *Reviving Catalan at school. Challenges and instructional approaches* (pp. 29-48). Bristol: Multilingual Matters.
- Instituto Nacional de Estadística (2014). Avance de la estadística del padrón continuo a 1 de enero de 2014. *Datos provisionales*. Recovered from <http://www.ine.es>
- Lapresta C., Huguet Á., & Janés J. (2010). Análisis discursivo de las actitudes lingüísticas de los escolares de origen inmigrante en Cataluña. *Revista de Educación*, 353, 521-547. doi: 10.4438/1988-592X-0034-8082-RE
- Ministerio de Educación, Cultura y Deporte (2014). *Estadística de las enseñanzas no universitarias. Datos avance 2013-2014*. Recovered from <http://www.mecd.gob.es>
- Navarro, J. L., & Huguet, A. (2010). Conocimiento del catalán y caste-

- llano por parte del alumnado inmigrante. *Revista de Educación*, 352, 245-265. doi: 10.4438/1988-592X-0034-8082-RE
- Navarro, J. L., Hugueta, A., & Sansó, C. (2014). Competencias lingüísticas y alumnado inmigrante en Cataluña. El caso del colectivo de origen hispanohablante. *Educación XXI*, 17(2), 361-382. doi: 10.5944/educxx1.17.2.11495
- Oller, J. (2008). *El coneixement de llengua catalana i llengua castellana per part de l'alumnat estranger escolaritzat a l'educació primària de Catalunya: factors explicatius i relacions d'interdependència lingüística*. Universidad de Girona, Departamento de Psicología.
- Oller, J., & Vila, I. (2011). Interdependencia entre conocimiento de catalán y castellano y efectos de la lengua familiar en la adquisición de las lenguas escolares. *Cultura y Educación*, 23(1), 3-22. doi: 10.1174/113564011794728588
- Reljić, G., Ferring, D., & Martin, R. (2014). A meta-analysis on the effectiveness of bilingual programs in Europe. *Review of Educational Research*. Published online before print September 5, 2014. doi: 10.3102/0034654314548514
- Vila, I. (2006). Lengua, escuela e inmigración. *Cultura y Educación*, 18(2), 127-142. doi: 10.1174/113564006777973888

José Luis Navarro is a Professor in the Department of Pedagogy and Psychology at the University of Lleida. His research interests are centered on the development of language competence and on the schooling conditions of the pupils of immigrant origin.

Ángel Hugueta is a Full Professor in the Department of Pedagogy and Psychology at the University of Lleida. His research interests include bilingual education, the acquisition of second languages, psycholinguistics and sociolinguistics.

Clara Sansó is an Assistant Professor in the Department of Pedagogy and Psychology at the University of Lleida. Her research interests include bilingual and multilingual education, specifically analyzing the linguistic knowledge of students of immigrant origin.

Received date: 21-01-2015

Review date: 26-10-2015

Accepted date: 21-12-2015

