

Learning to Read an L2 from an Oral L1: The Case of Moroccan Students who Learn
Spanish

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Abstract

The aim of this study is to assess the variables concerning L1 and L2 that influence word reading and reading comprehension acquisition of students of Moroccan origin in the South of Spain and to compare their reading performance with their non-immigrant Spanish classmates'. Participants were 38 students of Moroccan origin and 37 non-immigrant students from the same classes. We used an oral vocabulary test and a reading comprehension test, which taps lexical, semantic, and syntactic reading processes, in addition to reading fluency. The results indicated that immigrant students differed from non-immigrant students in word reading, reading fluency, and the use of punctuation marks, but there were no significant differences in reading comprehension. In non-immigrant students, reading comprehension correlated significantly with oral vocabulary and the other reading processes, but in the students of Moroccan origin, only receptive oral vocabulary in L2 correlated with the use of punctuation marks. However, being in schools with educational resources specifically aimed at helping the Moroccan pupils was associated with a higher level of word reading in immigrant students.

Keywords: reading comprehension, second language learners, Moroccan speakers, oral vocabulary.

Learning to Read an L2 from an Oral L1: The Case of Moroccan Students who Learn Spanish

Educational systems all over the World are increasingly faced with the challenge of teaching children from cultural and ethnic groups different from those they have traditionally dealt with. These children, very often of families of immigrant status, have a different background from the pupils of the traditionally majority groups in many ways. Language is probably one of the factors related to this background that is most relevant to academic and educational achievement. Many minority children find that teaching takes place in a language different from the one they speak at home and were brought up in. Other children are relatively bilingual, although perhaps not always as fluent as the other pupils in the mainstream language.

Reading in L2-Speaking Pupils

There are many potential disadvantages of acquiring the majority language as a second language (L2) for academic achievement in general and reading in particular (Verhoeven, 2006). Reading comprehension is likely to be limited depending on oral language abilities in L2, since it relies heavily on many discourse-level, semantic and syntactic processes common to listening comprehension. Phonological processes and representations may also be affected, leading to difficulties in word decoding (see Geva & Yaghoub Zadeh, 2006; Gottardo & Mueller, 2009; Koda, 2007).

The literature on L2 word reading and text comprehension in minority children is relatively scarce when compared to reading literature in L1. Research carried out up to the moment has aimed, on the one hand, at evaluating whether potential limitations in this population are actually causing any sort of real difficulties in minority readers, and on the other, if processes involved in reading in an L2 are somehow different from those present in L1 reading and how they may be influenced by reading in L1.

Research into word reading has provided some surprising results about the similarity of word reading levels and processes in minority and majority populations (see Verhoeven, 1999 for an early exception). In a study with 74 Canadian children, 36 of which spoke Punjabi, Chinese or Hindi at home, a small effect size of language on performance on word reading tasks was found in first grade (Chiappe & Siegel, 2006). However, this difference had completely disappeared by the time the children had reached second grade. In the Netherlands, Droop and Verhoeven (2003) found no differences between 143 Dutch, 62 Turkish, 60 Moroccan-speaking children fourth grade children on a reading decoding task. In a longitudinal study following 135 minority children of 33 different languages and 689 native English speakers from Kindergarten through to fourth grade, Lesaux, Rupp, and Siegel (2007) also found no differences on word reading at this level. Lipka and Siegel (2007) similarly found no differences in grade 3 for 128 minority students when compared to 703 L1 students.

A certain number of pupils of minority groups do, in any case, have problems in achieving adequate word reading. But the processes that explain these difficulties do not appear to be very different from those found for L1 readers. As with these, one of the main predictors of word reading ability is adequate phonological processing in the language in which reading is to be carried out (L2 for the minority readers) (Chiappe & Siegel, 2006; Chiappe, Siegel, & Gottardo, 2002; Hutchinson, Whiteley, Smith, & Connors, 2004; Jongejan, Verhoeven, & Siegel, 2007; Lindsey, Manis, & Bailey, 2003; Orly Lipka & Siegel, 2007). Overall, no differences on phonological awareness in the majority language were found between L1 and L2 readers. In other words, it would seem that difficulties with word reading in some L2 children arise more from individual differences than from their minority language status (August, Shanahan, & Shanahan, 2006).

Present data are much less clear for text comprehension. Lesaux et al. (2007) found no differences on comprehension measures in their study. In a study controlling for socioeconomic status (SES), Droop and Verhoeven (2003) did find that their Moroccan and Turkish-speaking children had lower comprehension scores than low SES Dutch native speakers. These results were confirmed in a later study with a sample representative of the Dutch school population of grades 3 to 6 (Verhoeven, 2006).

Text comprehension is very closely related to cognitive and linguistic processes that are more closely related to language proficiency (August et al., 2006). Proctor, Carlo, August, and Snow et al. (2005) and Droop and Verhoeven (2003) found that oral comprehension and vocabulary in L2 were related to differences in performance on text comprehension. Vocabulary size is, of course, a variable related to text comprehension in studies on L1 text comprehension (Alonso Tapia, 2005). Another variable that is also related to L1 reading that appears to influence L2 reading is syntactic awareness. Results are very consistent in that there seems to be a general lag in syntactic awareness in L2 readers with respect to native-speakers (e.g. see Chiappe & Siegel, 2006, 1999; Chiappe et al., 2002; Lesaux, Lipka, & Siegel, 2006).

Reading in Children of Immigrant Families in Spain

Although cultural diversity has been a reality for many countries for some time now, Spain has undergone a profound demographic transition over the past years. For example, the number of immigrants in 2005 was four times higher than the figure in the year 2000 (Huguet & Navarro, 2006). These changes have inevitably reached the educational system, which in the 2008-2009 academic year had a total of seven percent of minority pupils from ages three to sixteen (Ministerio de Educación de España, 2009). The largest communities found in schools are those of Latin American, specifically from Ecuador, and Moroccan origin. Due to

native-language differences, it is Moroccan children that present the greatest interest for the present study and the greatest challenge initially for the educational system.

Moroccan-minority students have been extensively studied over the past years. Roa Venegas (2006) studied 126 children from three schools in Ceuta, a Spanish town on the North of Africa. Moroccan-speaking pupils had poorer scores on visual memory, basic concepts and language. Navarro and Huguet (2007) included 28 non-Spanish pupils in a study in the bilingual region of Catalonia (4 Arabic speakers), and found lower scores on Spanish and Catalan. Some of the research has specifically looked at reading in this population. For example, Navarro and Huguet compared the reading of 44 Spanish-speaking secondary-school pupils and nine African, 20 Latin-American, and 20 European non-Spanish native speakers. They found poorer performance in the L2 group. The same happened in a larger study by Vila (2008), with 177 Arabic-minority students.

These studies seem to be in conflict with the general tendency found in the studies carried out in other countries, namely the United States, Canada and the Netherlands. However, some of the Spanish studies control poorly for important mediating variables such as socioeconomic status (see Kieffer, 2008 for a study highlighting its relevance). Reading, on the other hand, has been measured through global non-standardized measures that do not provide an accurate view of relevant individual dimensions and processes in reading.

The lack of systematic and controlled studies on this group of children is unfortunate. Moroccan-minority children represent a group culturally and linguistically different from Spanish majority pupils. Moroccan Maghrebi Arabic or *Darija* is the Arabic dialect spoken in most of Morocco and it is relatively distant from Modern Standard Arabic. The greatest part of written communication in Morocco takes place in Modern Standard Arabic, whereas *Darija* is rarely written. Standard Arabic, on the other hand, is taught at school and only spoken in formal contexts. Children brought up in a Moroccan-speaking family in Spain will

probably be facing reading in an L2 (Spanish) without practice in the written script for their L1 (Darija). This could possibly contribute to difficulties arising in mastering the written code in L2.

In addition, although the number of studies looking at L2 Spanish readers is comparatively high, very little research has been carried out looking at L2 minority pupils of other languages reading in Spanish. Since Spanish is a relatively transparent language, this could be a facilitating factor for reading acquisition in minority readers, considering previous research that points to easier word reading and spelling acquisition in transparent writing systems (Seymour, 2005).

Our study is therefore aimed at determining: a) the level of word reading and text comprehension of Moroccan-minority children in Southern Spain compared to non-immigrant Spanish readers, b) the influence of L1 and L2 variables on word and text reading in these pupils compared to non-immigrant readers.

Method

Participants

Participants were 75 Spanish fifth and sixth year Primary school pupils (aged 11 to 13), 38 children of Moroccan families and 37 of Spanish non-immigrant families. Both Moroccan and non-immigrant pupils were selected from the same 19 state schools of the provinces of Seville and Cadiz (Southern Spain). For each immigrant included in the study, the next non-immigrant student on the class list was chosen for the control group, with the exception of one case (in which the non-immigrant participant had to be excluded from the sample after completing the field work because of not meeting the inclusion requirements).

Gender distribution in the two groups was equivalent (21 boys in both groups and 16 and 17 girls among the non-immigrant and immigrant students, respectively, $\chi^2 = .017$, $p = .896$). However, the groups differed in age, with Moroccan students somewhat older ($M =$

11.7, $SD = .67$) than the non-immigrant students ($M = 11.4$, $SD = .73$), $t(73) = -2.25$, $p = .025$, $d = .42$.

Non-verbal IQ on the Raven's Progressive Matrices was within normality for both Moroccan and non-immigrant children.

The following inclusion requirements were established for all participants:

- Absence of cognitive, sensory, or any other kind of evident limitation to reading.
- A prior history of having attended a school regularly for at least the past three years in any language or country. This requirement was intended to guarantee a minimum level of instruction in reading and to eliminate the possible effects of late schooling.
- A minimum continuous residence in Spain for at least one year prior to data collection, in order to guarantee a minimum of knowledge of Spanish.

Instruments and Procedure

The following instruments were used:

- Spanish Peabody's Picture Vocabulary Test (SPPV: Dunn, Dunn, & Arribas, 2006), for the assessment of oral language and vocabulary in Spanish.
- A Moroccan adaptation of Peabody's Picture Vocabulary Test (MPPV). A translation and adaptation of the instrument in Moroccan Maghrebi Arabic or Darija was specifically developed for this study. The Spanish version of this test was translated into Moroccan by a native speaker. Another native speaker independently carried out an additional translation. Both translations were compared and a 90 % agreement found. A third native Moroccan college graduate revised the translation,

and resolved discrepancies with the second translator through consensus, reaching 100 % agreement.

- Reading Processes Test – Secondary Education Version (PROLEC-SE: Ramos & Cuetos, 1999), for the level of reading in Spanish. This is a reading test standardized in Spain for children aged 10 to 16. It includes three subscales: a) lexical processing (PL), b) syntactic processing (PS) and c) semantic processing or text comprehension. The PL scale includes word (Pale) and a non-word (Ppse) reading tasks. The PS scale is composed of a task requiring picture-sentence matching of different grammatical structures (Edoe) and a punctuation mark reading task (Spe). The semantic or text comprehension scale is composed of two reading comprehension tasks. In the first one (Cte), participants must read two expository texts, each followed by 10 questions, half of them on details or literal information from the text, and the other half requiring inferences. In the other task, children are asked to read an expository text and fill-in a corresponding outline (Ete). Reading fluency is also registered in these tasks (Vle). The authors of the test report good reliability (Cronbach's alpha = .85) and highly significant correlations of all the subscales with teacher reports of student reading ability ($p < .0001$) (Ramos & Cuetos, 1999: pp.24 -25).
- Personal history, academic and family questionnaire (accessible at <http://bscw.rediris.es/pub/bscw.cgi/3932122>). The teachers were interviewed, and asked to provide information about the children's biography, family, daily-life routines, and living context, their origin and prior schooling, their attitude and their families' towards the school, and current school context and practices. This information was complemented with interviews of the students and consultation of file records in the schools.

All the field work was carried out by Moroccan bilingual Spanish-Moroccan staff visiting the schools. The Moroccan students were allowed to respond to the questions in their language of choice. The order of administration of the instruments was counterbalanced.

Results

Due to non-normality of the data, non-parametric tests were used in all comparisons, with a significance level of .05. Analyses were carried out using the SPSS15 package.

Reading in Spanish and in Arabic

We obtained separate raw scores for each task of the PROLEC-SE and, to facilitate the interpretation of the results, we also used the lexical scale (word and non-word reading), the syntactic scale (pairing drawing-sentence and punctuation marks), and the semantic scale scores (text comprehension and text structure) following the test manual's recommendations. Only three immigrant participants were able to read Arabic. These children had learned Arabic in the *Temporary Linguistic Adaptation Class* (support classes for non-Spanish speaking children of immigrant families, see below). In these cases, Arabic should be considered a written L3, since their oral L1 was Moroccan Maghrebi Arabic and their written L2 was Spanish. For this reason, although they were administered an Arabic version of the PROLEC-SE adapted by our research team, their responses to this test were excluded from the analyses.

Table 1 shows that Moroccan students scored lower than the non-immigrant students on all three scales. However, the differences were only significant in the case of the syntactic scale, $U(N = 75) = 484.00, p = .013, r = .29$.

(INSERT TABLE 1 HERE)

In contrast, analysis of the individual scales revealed some additional group differences. No differences were found in the raw accuracy scores of non-word reading. However, the non-immigrant children had a higher mean accuracy score in word reading and

a clearly higher reading fluency, $U(N = 75) = 491.50, p = .024, r = .26$, and $U(N = 75) = 361.00, p < .001, r = .40$. With regard to the syntactic processes, although the Moroccan students did not seem to present significant differences with the non-immigrant children in sentence-to-picture matching, there were differences in the use of punctuation marks, $U(N = 75) = 440.50, p = .005, r = .32$. None of the semantic scale tasks, directly related to text comprehension, revealed significant differences between immigrant and non-immigrant students.

Standardized scores replicate similar performance of both groups on the different tasks. They reflect the extent to which the immigrant children's performance in various tasks was similar to the non-immigrant children and illustrates the reading level of the non-immigrant participants in these schools with respect to the general population. The centile score of the Moroccan children was low both for word reading and non-word reading ($Mdn = 25$, range 5 - 95, in both cases). This also occurred with non-immigrant children in the case of non-words ($Mdn = 38, 5 - 90$), although not with word reading ($Mdn = 50, 5 - 90$). Moroccan students' standardized scores were lower than expected from the test norms ($Mdn = 20, 5 - 75$), whereas the non-immigrant group's scores spanned the test distribution ($Mdn = 60, 5 - 95$).

The centile scores in the syntactic and semantic tasks, however, were lower than expected. For example, the median of the non-immigrant pupils in the sentence-to-picture matching task was slightly lower than expected ($Mdn = 44, 5 - 75$), and the immigrant children had even lower scores ($Mdn = 25, 5 - 95$). However, there seems to be a floor effect for both groups in the test of punctuation marks ($Mdn = 10, 5 - 50$ and $Mdn = 10, 5 - 75$, for immigrants and non-immigrant students, respectively), although with a lower range for the Moroccan children.

The semantic tasks were difficult for both groups. The median centile scores for the tasks of text comprehension were 38 (5 - 93) for the non-immigrant group and 25 (5 - 83) for the Moroccan group, and 18 (5 - 90) and 8 (5 - 75) respectively on the text structure task.

Oral comprehension in Spanish and Moroccan

The results of SPPV test indicated a lower level of oral comprehension in Spanish among the Moroccan students. Their mean raw score was 108.5 ($SD = 20.3$) versus 119.6 ($SD = 19.4$) in the non-immigrant group, $t(73) = 2.32$, $p = .023$, $d = .55$.

Surprisingly, the immigrants' scores on the Moroccan version of this test were not significantly different from their Spanish vocabulary scores ($M = 103.4$, $SD = 24.9$).

School and family history and context

Academic profile of the Moroccan students.

Teachers had been asked whether the immigrant students scored above, below or at the average level of their class. Teacher reports of the academic achievement of the participating pupils rated 11 as having an academic development higher than the average of their class, 13 as being on average and 14 below average.

Most of them ($n = 27$) were considered to have acceptable social relations, similar to those of their classmates, although some ($n = 8$) were considered especially well adapted by their teachers. Only three were rated as below average. The attitude of the rest of the students towards them was classified as positive and above the average in 33 cases, and below in one case.

The data with regard to these students' behavior at school is more varied. Thus, in 10 of them, there were absenteeism problems, and a similar number of children did not seem particularly interested in learning. Seventeen of them regularly did not complete their homework.

The educational context.

Most of the schools received additional support for possible special educational needs of immigrant students. Only 2 out of the 38 immigrant students were in schools in which there was no support teacher for them, and 2 did not receive support from the district Educational Counseling unit. In the case of 30 of the children, schools reported that they adapted the curriculum to adjust to the needs of these students, and in 32, that they also had extracurricular supplementary classes.

All these are general curriculum enrichment and organizational strategies accessible to all schools in Southern Spain. The number of students who were in schools with resources *specifically* targeting immigrant students was somewhat lower, although still considerable. This was the case of 29 students who were in schools that collaborated with organizations providing support to immigrant populations, 12 students in schools with a cultural mediator, and 23 that had a Temporary Linguistic Adaptation Class (TLAC). The cultural mediator is a person from the same minority group as the immigrant students who acts as a linguistic and cultural bridge between the students and the school. TLACs are classes where these students receive academic support in order reach an adequate level of proficiency in the L2. Eleven of the students were in schools that had specific educational material in the immigrants' language of origin.

The relation between the families and the schools.

Teacher reports about family perception of schools and their attitude toward education was relatively positive. Most of the families ($n = 26$) would like their children to continue their schooling for as long as possible, even to a university level. Eight of them hoped their children would at least complete compulsory schooling, and only three were indifferent. Only one family seemed to contemplate the option of vocational education.

Parents seemed to be actively involved in their children's motivation to study. Their response to good grades was to reward the children with money or other presents as soon as

their reports came in (13 children) or at the end of the school-year ($n = 6$). Thirteen families provided social reinforcement. Of the remaining six families, only two did not reinforce their children's good performance.

The responses about the families' attitude towards the school were along these same lines. Twenty-five of them had a positive attitude and two were actively enthusiastic. There were, however, a substantial number of families that were indifferent ($n = 5$), an attitude of resignation and passive acceptance ($n = 5$), or even explicit rejection ($n = 1$). In 28 of the families, a stable and active collaboration with the school was reported, although in the remaining 10 there was no such contact.

Individual differences in reading

Raw scores on the scales of the PROLEC-SE correlated significantly with each other in the group of non-immigrant students (see Table 2). However, this was not the case with the group of Moroccan pupils, where the correlation among the semantic and lexical scales was non-significant. Raw scores on the semantic scale, however, correlated significantly with the raw score of the SPPV test. This was not the case for the Moroccan version of this test. There was also a clear correlation of the SPPV and the time of schooling in Spain among the Moroccan students.

(INSERT TABLE 2 HERE)

In both groups, reading fluency correlated with reading comprehension in Spanish ($r = .366, p = .024$ for the immigrant students and $r = .338, p = .038$ for the non-immigrant students).

We found significant differences between the children in schools that did and those did not have cultural mediators and/or a relation with immigrant organizations. Children in schools with these kinds of support had higher raw lexical scores. Median lexical raw scores of Moroccan children in schools with cultural mediators was 72.5 (66 - 79) versus 67.0 (41 -

79) in those who were in schools without them, $U(n = 38) = 76.5, p = .012, r = .29$. The Moroccan children in schools that collaborated with immigrants support groups also had higher lexical raw scores ($Mdn = 74.0, 54 - 79$) than those who were in schools where this was not the case ($Mdn = 65.0, 41 - 72$), $U(n = 38) = 43.5, p = .003, r = .35$. There were no differences in students from these schools in the time they had spent in Spanish schools or in their scores on the SPPV test.

Since these educational factors can affect the whole of the school, it seemed appropriate to carry out additional analyses considering schools as units. In these analyses, a mean score for the immigrant and non-immigrant children in each school was calculated. We established three types of schools. First, those that had both types of resources (cultural mediators and relation with immigrant support groups), that could be considered schools with maximum support ($n = 2$ schools, 10 immigrant students). A second group ("medium support") included the schools with at least one of these supports ($n = 7$ schools, 15 immigrants), and a third "lower support" group included 9 schools (13 immigrants). There were significant differences among the raw lexical scores of the three kinds of schools, $\chi^2(2, n = 38) = 12.51, p = .002$ for the Kruskal-Wallis test. This did not occur in the case of syntactic or semantic scores, and there were no differences among the time the Moroccan students of each kind of school had spent in Spanish schools or on their SPPV test scores. The schools with lower support had also lower median raw lexical scores ($Mdn = 65.0, 41 - 74$) than the students from the schools with medium support ($Mdn = 73.0, 57 - 79$), $U(n = 25) = 37.5, p = .006$, and high support ($Mdn = 74.0, 61 - 79$), $U(n = 28) = 11.5, p < .001$. However, the differences between the students of these two kinds of schools were not significant. There were no differences among the three types of schools in the scores of the non-immigrant students.

Discussion

This study presents data on the reading performance of immigrant students of Moroccan families. These children access Spanish as an L2 from an oral language (the Moroccan Arabic dialect) that is rarely used in a written form. Despite this circumstance, these students did not present lower Spanish reading comprehension scores compared to non-immigrant students from a similar background, and they were only different from them in tests that assess word reading, reading fluency, and punctuation marks.

In contrast to other studies conducted with immigrant population in general (Chiappe & Siegel, 2006; Droop & Verhoeven, 2003; Lesaux et al., 2007; Lipka & Siegel, 2007), this group presents differences in word reading with regard to non-immigrant students. These difficulties could stem from individual differences in reading acquisition and be unrelated to the linguistic minority status of the Moroccan children (August et al., 2006). However, these students read non-words with the same ability as the non-immigrant participants, which seem to rule out this hypothesis. We feel that their poorer word reading performance is more likely due to a lower prior exposure to Spanish written texts.

Reading fluency is a variable that has received very little attention in the studies dedicated to reading comprehension in L2. In one of the few studies that does, Saiegh-Haddad (2003) found that reading fluency and reading comprehension were correlated in adult readers of an L2 (English), but not in L1 (Arabic and Hebrew). In our study, despite immigrant students' lower reading fluency compared to the non-immigrant pupils, reading fluency correlated in both groups with reading comprehension in Spanish.

The immigrant students also obtained lower scores on the syntactic scale of the PROLEC-SE, especially in the use of punctuation marks in reading. This result is consistent with studies that have observed lower scores on syntax tasks in L2 readers with regard to non-immigrant readers (Chiappe & Siegel, 2006, 1999; Chiappe et al., 2002; Lesaux et al.,

2006). However, in our case, the fact that the non-immigrant students also obtained lower than normal scores in the task of punctuation marks cannot be ignored. One could therefore consider a possible influence of contextual variables, shared by both groups, versus merely linguistic variables.

With regard to text comprehension, and coinciding with some other studies (Lesaux et al., 2007), the students of Moroccan origin were not different from their non-immigrant classmates of the same background. Their lower scores on word reading, reading fluency, and punctuation mark tasks, did not seem to compromise their performance in reading comprehension. In this sense, the results would be congruent with other studies (for example, Zinar, 2000), which propose that the deficits in word reading may be compensated with other strategies that favor reading comprehension.

The vocabulary score in L2 of the Moroccan students is lower than non-immigrant students'. However, in contrast to the non-immigrant students, vocabulary knowledge of the Moroccan children correlated with reading comprehension scores. In other words, although the two groups do not differ in reading comprehension because in both cases it is low, the data point to possible differences in the causes of this poor performance in both groups. In the immigrant students, this low reading level is associated with a low level of vocabulary in L2, whereas this may not be the main variable in the case of the non-immigrant pupils. This would support the suggestion by Verhoeven (2000) and Gottardo and Mueller (2009), who argue for separate models to explain reading comprehension of native-speakers and learners of an L2.

Of the remaining contextual variables examined, only the provision of specific resources for immigrants has some influence on their reading level. The immigrant students in schools with cultural mediators and/or collaborating with associations of immigrants scored higher in lexical reading processes (word reading and non-word reading). This

advantage could be a result of the application of educational methods better adapted to the culture of origin of the immigrant students or that at least allow them to build bridges between the Moroccan and Spanish cultures. Future studies should examine this possible influence in greater detail. In any event, it should be noted that these resources have a specific impact on the Moroccan children: the differences in immigrant students' reading between these schools and those without any support did not extend to the scores of non-immigrant children.

The absence of a relation between the measures of mastery of L1 (Moroccan) and reading comprehension in L2 is not new (see Gottardo & Mueller, 2009 for similar results). It may be explained by the fact that these students had not had any prior literacy experience in their own language, i.e. Modern Standard Arabic, and they currently attended classes where instruction in reading comprehension was carried out in Spanish. Only the studies that assess initial reading comprehension in children educated in bilingual contexts find a significant connection between the variables of the L1 and reading in L2 (Gottardo & Mueller, 2009).

The immigrant students of our study presented fewer differences with the non-immigrant pupils in most of the processes involved in reading than has been found in previous studies in the literature. This may be due to the fact that our participants were from the same schools and thus from similar background, and to the specific characteristics of the L2 in this case—Spanish—, a language with transparent orthography that may be easier to acquire than other more opaque languages, like English (Seymour, 2005). In addition, this study has analyzed the differences in a variety of dimensions (lexical, semantic, and syntactic) involved in reading, which may help to draw a clearer profile that better matches reading performance in an L2.

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Table 1

Raw scores on the different Spanish reading tasks and scales

	Non-Immigrants			Immigrants		
	Median	Minimum	Maximum	Median	Minimum	Maximum
PL	73	60	79	72	41	79
Pale (*)	38	31	40	37	21	40
Ppse	35	27	39	35	20	40
PS (*)	35	19	46	29	12	43
Edoe	19	6	23	15	7	24
Spe (*)	17	6	24	14	2	23
Vle (**)	103	50	147	73	50	131
PSe	12	1	32	9	2	23
Cte	5	1	13	4	0	11
Ete	6	0	19	4	0	15

Note. PL = Lexical scale; Pale = Accuracy of word reading ; Ppse = Accuracy of nonword reading; PS = Syntactic scale; Edoe = Accuracy of sentence-to-picture matching; Spe = Accuracy of use of punctuation marks; Vle = Reading fluency (words per minute); PSe = Semantic scale; Cte = Accuracy on the reading comprehension task; Ete = Accuracy on the text structure task.

(*) $p > .05$; (**) $p < .001$

Table 2
Correlations among the different reading scales, vocabulary scores and time in the Spanish educational system

		PL	PS	PSe	Pbe	Pbm	TEE
Non-Immigrant	PL	1.000					
	PS	.442(**)	1.000				
	PSe	.441(**)	.630(**)	1.000			
	Pbe	.532(**)	.454(**)	.610(**)	1.000		
Immigrant	PL	1.000					
	PS	.495(**)	1.000				
	PSe	.143	.381(*)	1.000			
	Pbe	.181	.257	.462(**)	1.000		
	Pbm	.113	.053	.017	.075	1.000	
	TEE	-.175	.159	.264	.539(**)	.126	1.000

Note. PL = Lexical scale; PS = Syntactic scale; PSe = Semantic scale; Pbe = Raw score on the Spanish version of the Peabody Picture Vocabulary test; Pbm = Raw score on the Moroccan version of the Peabody Picture Vocabulary test; TEE = time spent in a Spanish school.

(*) $p > .05$; (**) $p < .01$