



## Acquisition of reading comprehension in L1 in bilingual programmes of Primary Education. A comparative study

### Adquisición de la lectura en L1 en programas bilingües de Educación Primaria. Un estudio comparativo

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#### Abstract

In this paper, the effect of CLIL (Content and Language Integrated Learning) on the development of reading competence in the mother tongue of 9-year-olds (4<sup>th</sup> year of primary school) is analysed. For this purpose, a reading comprehension test was used and the scores obtained by bilingual students (CLIL group, n = 18,541) and their non-bilingual peers (non-CLIL group, n = 1,998) were compared. The overall results indicate that the bilingual programme evaluated in this study, despite use of the mother tongue being limited to around 25 % of the academic curriculum, was not detrimental to the acquisition of reading competence in the L1, possibly due to there being transfer strategies processes between languages. There also were not any differences detected between the two groups in the acquisition of literal and inferential reading levels, although there were significant differences in favour of the CLIL group in the comprehension of lexical items and significant differences favourable to the non-CLIL group in the critical reading level.

#### Resumen

En este trabajo se analiza el efecto de las enseñanzas bilingües tipo AICLE (Aprendizaje Integrado de Contenidos y Lenguas Extranjeras) en el desarrollo de la competencia lectora en lengua materna en estudiantes de 4.º de Educación Primaria (9-10 años). Para ello se aplicó un test de comprensión lectora y se compararon las puntuaciones obtenidas por los estudiantes que recibieron enseñanzas bilingües (grupo CLIL, n=18,541) y los que cursaron enseñanzas ordinarias (grupo no-CLIL, n=1998). Los resultados globales indican que las enseñanzas bilingües evaluadas en este estudio, a pesar de conllevar una limitación académica de la lengua materna de en torno al 25 % del currículo, no ocasionaron ningún perjuicio a la adquisición de la competencia lectora en la L1, posiblemente debido a la existencia de procesos de transferencia de estrategias entre lenguas. Tampoco se detectaron diferencias entre los dos grupos en la adquisición de los niveles de lectura literal e inferencial, aunque sí que se encontraron diferencias significativas a favor del grupo CLIL en la comprensión de elementos léxicos y a favor del grupo no-CLIL en el nivel de lectura crítica.

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## Introduction

The low results of Spain in the mastery in foreign languages recorded in various international and European studies have questioned the methodologies used in language teaching (Fernández-Fontecha, 2009).

In this context, bilingual education type CLIL (Content and Language Integrated Learning) offers a hopeful horizon, considering the good results of bilingual students in acquiring the target language in these programs (Moya-Guijarro and Ruiz-Cordero, in press; Nieto-Moreno-de-Diezmas, 2016a; Pérez-Cañado and Lancaster, 2017; Ruiz-de-Zarobe, 2011).

In addition, several studies indicate that bilingual education does not harm the assimilation of content (Bergroth, 2006; Madrid, 2011; Stohler, 2006), since, as the researchers explain, the double cognitive effort that students must perform to learn new knowledge conveyed through a foreign language stimulates their cognitive flexibility (Coyle, Hood and Marsh, 2010) and the development of their learning strategies and cognitive abilities (Nieto-Moreno-de-Diezmas, 2016b), thereby enhancing the learning of content (Dalton-Puffer, 2008; Halbach, 2009), instead of being a hindrance, since bilingual students become more effective learners (De-Jabrun, 1997).

However, there are still many aspects of bilingual education that need to be investigated, since CLIL is a multifaceted and complex phenomenon. One of the issues that deserves further consideration is the impact of bilingual education in the development of different skills in the mother tongue (Sierra, Gallardo-del-Puerto and Ruiz-de-Zarobe, 2011) including reading comprehension. Literacy in the mother tongue is acquired at school, not only in the language classroom, but also in the rest of the school subjects, since written comprehension is a fundamental instrument for accessing the

knowledge of the different content subjects. Therefore, either directly or indirectly, explicitly or implicitly, consciously or not, all subjects contribute to the development of reading competence. Since bilingual education is based on delivering part of the curriculum through a foreign language, there is a decrease in the time of exposure to the mother tongue in these contexts, and because of that, the acquisition of skills such as reading comprehension in the first language (L1) could be compromised, especially during Primary Education, since the development of literacy is still in the process of acquisition.

## Studies on the impact of bilingual education in the acquisition of reading comprehension in the mother tongue

As pointed out by Dalton-Puffer, Nikula and Smit (2010), under the rubric of bilingual education, a great variety of practices are included. Therefore, it is necessary to distinguish different models of bilingual education, since each context requires specific research (Pérez-Cañado, 2011). Thus, research literature on acquisition of the mother tongue in bilingual education environments can be classified in four different contexts: Canadian immersion, European CLIL with a percentage of between 50 and 75% taught in the foreign language and CLIL in Spain in Spanish bilingual autonomous communities and in monolingual autonomous communities.

To start off, research on results in the mother tongue in immersion programmes, such as the Canadian model will be reviewed. In the Canadian Primary Education immersion programmes, since a high percentage of the curriculum -close to 100%- is taught through a second language (French), the academic presence of the mother tongue (English) is considerably restricted. Consequently, in these contexts, the acquisition of academic skills in the mother tongue has been a concern for

teachers and families and has consequently received considerable attention from linguists.

However, research shows that in the short term, there are no negative effects for the development of the mother tongue of students in immersion programmes (Genesee, 1994). In the evaluations carried out in the first grades of Primary Education, the students in programmes of early total immersion showed a certain delay with respect to the rest of the students in the acquisition of the mother tongue (Genesee, 1994; Swain and Lapkin, 1982), but since the mother language (the subject of English) was introduced in the curriculum, they quickly caught up (Genesee, 2007; Lapkin, Hart and Turnbull, 2003). The hypothesis of the transfer of skills from one language to another (Cummins, 1998; Genesee and Jared, 2008) explains the rapidity with which students who have not received academic exposure to the mother tongue manage to reach their monolingual classmates: "Early total immersion students' ability to catch up to students educated entirely in English within one or two years suggest that skills acquired in French can be, and are, transferred to English, and possibly vice versa" (Genesee and Jared, 2008, p.140).

Secondly, I will review the studies that have investigated the impact of bilingual education in the acquisition of the mother tongue in European programmes, in which the second language (L2) conveys between 50 and 75% of the curriculum. In these settings the academic limitation of the mother tongue is not as drastic as in the Canadian immersion programmes, although it is still considerable. This is the case of several bilingual programmes implemented in Belgium and Finland.

In Belgium, the fact that the provision of 75% of the curriculum in Dutch in bilingual centers could compromise the acquisition of the mother tongue (French) has been studied sufficiently, especially in Primary Education,

and no evidence has been found that this modality of CLIL could undermine the acquisition of students' first language (Lecocq et al., 2004; Van-de-Craen, Mondt, Allain and Gao, 2007), so that, if any difference is observed it is in favor of students in bilingual programmes (De-Samblanc, 2006; De-Vriese, 2007).

In turn, Van-de-Craen, Mondt, Ceelers and Migom (2010) explain the success of bilingual students in mastering their reading skills because the acquisition of literacy is done first in the target language, Dutch, which is considered an "easy language" due to its high correspondence between spellings and sounds, and later, in French, considered to be a "difficult language". That way, when students have to face the acquisition of literacy in French, they have already learned the meta-linguistic strategies of association between spellings and sounds and are ready to apply it to French, thus using knowledge acquired in one language to learn another. This explanation is closely connected to the transference hypothesis enunciated in Canadian immersion settings. However, in the context of this study, literacy is first acquired in the mother tongue, Spanish, but since Spanish is an "easy language" reading strategies might also transfer from the L1 to the second language, English, which would be "the difficult language" (L2), as described in the Belgian bilingual programmes.

In keeping with the aforementioned investigations, no negative effects of bilingual education in the acquisition of the mother tongue have been detected in Finland. For example, Bergroth (2006) compares the results of the students who followed bilingual education with those of mainstream students in the university entrance test in L1 and finds that the CLIL programmes do not harm the acquisition of the mother tongue. Furthermore, Seikkula-Leino (2007) uses a test to determine the capacities of Secondary students in bilingual and non-bilingual programmes and then compares these capacities with their academic results. The con-

clusions of the research indicated that the fact of having received bilingual education did not influence the students to acquire the mother tongue according to their capabilities, above or below them.

Finally, research on the impact of bilingual programmes on the acquisition of the mother tongue in the Spanish context will be explored. As it is well known, in Spain there are two different linguistic contexts: monolingual autonomous communities -with Spanish as the only official language- and bilingual autonomous communities, with two co-official languages: Spanish and a heritage language: Catalan, Basque or Galician. In the autonomous communities with two co-official languages, CLIL introduces a third language as a means of instruction, which increases the linguistic pressure in the curriculum. Although more evidence of the impact of CLIL in the co-official languages would be needed, a couple of studies have been carried out in the Basque Country. The unpublished research of Eiguren (2006) cited by Ruiz-de-Zarobe and Lasagabaster (2010, p.22) concludes that the introduction of English as a third language of instruction does not harm the acquisition of either Spanish or Basque in students with 10 years of age in Primary Education. Subsequently, Merino and Lasagabaster (2015) conducted a longitudinal study set in Secondary Education and did not detect any impairment in the development of Basque and Spanish, in spite of the fact that some curricular subjects were taught in English.

In the Spanish monolingual autonomous communities, some studies can be mentioned. Thus, Ramos, Ortega and Madrid (2011) and Pérez-Cañado (2017) did not find any detrimental effects of CLIL in the development of the mother tongue, and Nieto-Moreno-de-Diezmas (2017) looked into the acquisition of reading literacy in the L1 of secondary students in bilingual programmes and concluded that the integrated curriculum even contributed significantly to

the acquisition of literal and inferential reading, while it did not have any effect, nor negative or positive, in the development of critical reading.

In this context, the general objective of this work is to look into the impact of bilingual education on the different processes and skills connected with the acquisition of reading comprehension in the mother tongue, and provide new evidence to help us understand how primary students, who are in the process of acquiring the comprehensive reading, deals with the incursion of a foreign language as a means of instruction in that process. This general objective is divided into the following:

- 1) Determine the influence of the bilingual methodology on the development of global reading competence in students in the 4<sup>th</sup> grade of Primary Education (9-10 years of age).
- 2) Study the possible differentiation in the acquisition of the different types of reading: literal, inferential and critical reading, depending on the type of instruction, bilingual/non-bilingual.
- 3) Check if bilingual education impacts positively or negatively on the mastery of the different learning standards used to evaluate the reading competence.

In relation to the proposed objectives and drawing on the studies reviewed, the hypothesis of this study is that bilingual education has no detrimental effect for the acquisition of reading skills in the mother tongue and maybe some benefits in certain skills and learning standards could be detected (De-Samblanc 2006; De-Vriese 2007).

## Method

### *Participants*

The data analyzed in this study belong to students in the 4<sup>th</sup> year of Primary Education (9-10 years of age) enrolled in public schools of the Autonomous Community of Castilla-La

Mancha and were collected in a process of diagnostic evaluation addressed to the census of students that included a set of 20,539 participants. This study compares two groups: the experimental group or “CLIL group” composed of 1,998 students in bilingual programmes, and the control group or “non-CLIL group”, made up of mainstream students comprised of 18,541.

The experimental group or “CLIL group” was made up of students enrolled in European Sections. The programme of the European Sections of Castilla-La Mancha was created in 2005, by Order 07/02/2005 (DOCM 24/02/2005) and has been amended by Decree 7/2014 of 01/22/2014, which regulates multilingualism in non-university education in Castilla-La Mancha, and then, by Decree 47/2017 of July 25. The CLIL group received bilingual education from at least 1<sup>st</sup> grade of Primary Education, which implies that from 1<sup>st</sup> to 4<sup>th</sup> grades of Primary Education part of two content subjects was taught in English.

In the bilingual programme designed by the Autonomous Community of Castilla-La Mancha, the centers are responsible for selecting bilingual subjects, depending on the provision of accredited teachers with a level B2 of the Common European Framework of Reference for Languages (CEFR) in the target language, so there is some variability in the subjects taught

in the bilingual modality. The most common bilingual subjects are: Social Sciences, Natural Sciences and Art and Crafts. In this way, the students of the experimental group received around 25% of the curriculum in English, which means, both an increase in exposure to the foreign language, and a limitation of academic contact with the mother tongue

It is important to mention that students’ access to the European Sections was made following the general rules of the admission process (proximity of home, siblings enrolled in the center, limited income ...) applicable to all schools. It is explicitly prohibit to base the access of students on the realization of academic or linguistic tests. In addition, all students from schools with a European Section receive bilingual education, regardless of their academic or linguistic level, which gives the programme an inclusive, comprehensive and non-selective character (Nieto-Moreno-de-Diezmas and Ruiz-Cordero, in press).

### Instruments

The participants took an *ad hoc* reading comprehension test that consisted of a 324 word adapted journal text and nine reading comprehension tasks connected with nine learning standards that served to evaluate three levels of reading (Jenkinson 1976; Smith 1989): literal

LEVEL OF READING COMPREHENSION	LEARNING STANDARD	QUESTION FORMAT	SCORE
<b>LITERAL READING COMPREHENSION</b>	Global comprehension	Short answer	2 points
	Identification of details	Multiple choice	1 point
	Receptive vocabulary	Short answer	2 point
	Spatial and temporal relationships	Short answer	2 points
	Identification of cohesive references	Short answer	2 points
	Extracting main ideas	Multiple choice	1 point
<b>INFERENTIAL READING</b>	Difference between fantasy and reality	Multiple choice	1 point
	Inference of causal references	Short answer	2 points
<b>CRITICAL READING</b>	Critical assessment of relevance and interest	Long answer	3 points

Figure 1. Levels of reading comprehension, learning standards, question format and score.

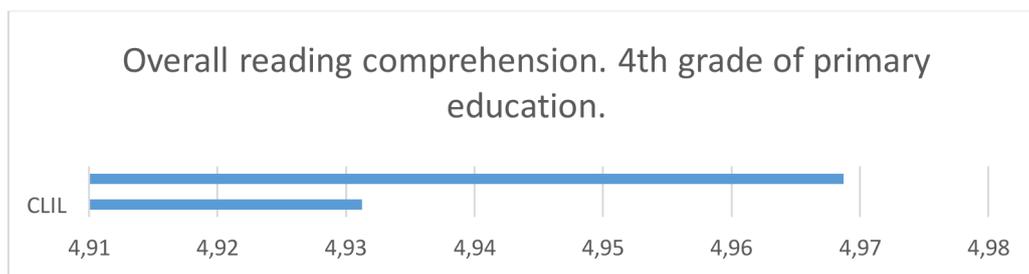


Figure 2. Overall results in reading comprehension

reading (understanding of ideas and explicit information); inferential reading (ability to deduce the implicit) and critical reading (ability to critically evaluate what was read). The journalistic article was adapted from real news and was preceded by a small text in which it was connected with the usual activities of the classroom. In this text, presented in bold, the students are asked to imagine that their tutor takes an article to class so they can read it. After this short introductory text, it appears the journalistic extract that accounts for an accident that occurred in Formigal. Then, the tasks that students have to solve are presented in three question formats: multiple choice (1 point), questions with open short answer, (2 points) and questions with long answer (3 points). Figure 1 shows the correspondence between learning standards, reading levels, question formats and score.

#### **Analysis and presentation of data**

Statistical analysis of the data was carried out using the SPSS (Statistical Package for Social Science). The Cronbach's alpha is 0.567, so the internal consistency and reliability of the test is moderate. The Kolmogorov-Smirnov Test (KS test) indicated that the sample had a normal distribution, so the T-student test of independent samples was performed comparing the scores of the experimental group (CLIL) and the control group (non-CLIL). The overall results in reading comprehension were calculated from the average score of the learning standards

evaluated. The overall results and the results by reading levels (literal, inferential and critical) are presented using a scale of 0 to 10.

## **Results**

### **Overall results in reading comprehension**

The overall results in reading comprehension of the two groups analyzed are below 5 points out of 10, which in a school context would mean that both groups would be close to pass. As can be seen in Figure 2, mainstream students scored slightly above, but the differences are not significant, so it can be concluded that there is no impact, neither negative nor positive, of the bilingual programmes in the acquisition of reading comprehension, although, incidentally, these low results warn about the need to encourage reading in Primary schools.

### **Results in levels of reading comprehension**

If we consider the scores in reading levels, bilingual students (CLIL) score slightly above mainstream students when their literal reading comprehension skills are assessed, although the differences are not significant. On the other hand, their results are significantly lower in critical reading ( $p < .05$ ), and they also score lower in inferential reading, although in this case, the differences are not significant (figure 3).

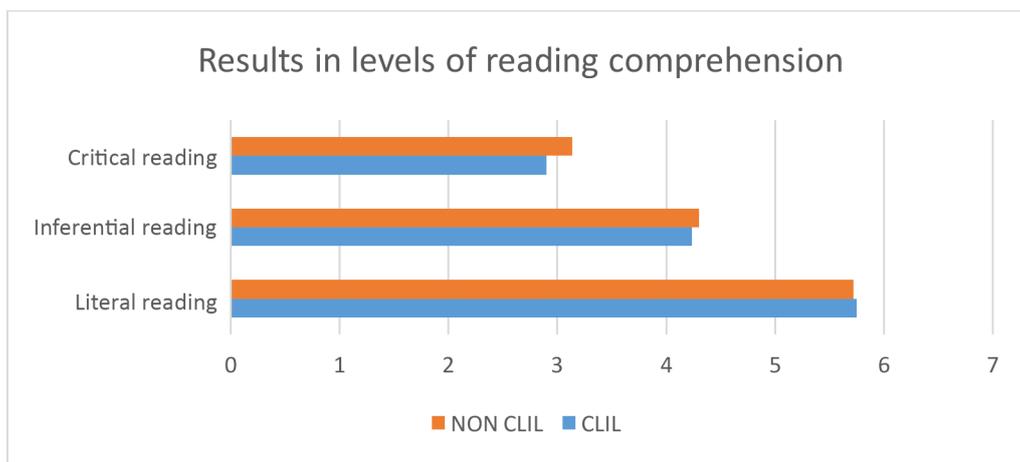


Figure 3. Results in levels of reading comprehension

**Results in literal reading comprehension**

Although there are no significant differences in the level of literal reading, and there is even a tie between the two groups, when it comes to extracting the main idea from a text, and identifying spatial and temporal relationships, bilingual students recorded higher scores in three of the six learning standards evaluated: identification of cohesive references, global comprehension and comprehension of lexical items (receptive vocabulary), and the differences are significant in this last standard ( $p < .05$ ). However, mainstream students achieved a higher score in

one learning standard: identification of details, but the difference is not significant (figure 4).

**Results in inferential reading comprehension**

There are no significant differences between the CLIL and non-CLIL groups in their inferential reading skills; there is a tie in their ability to infer causal references in a text and although bilingual students obtained a lower score than their counterparts when it comes to distinguishing between fantasy and reality, the difference is not significant (figure 5).

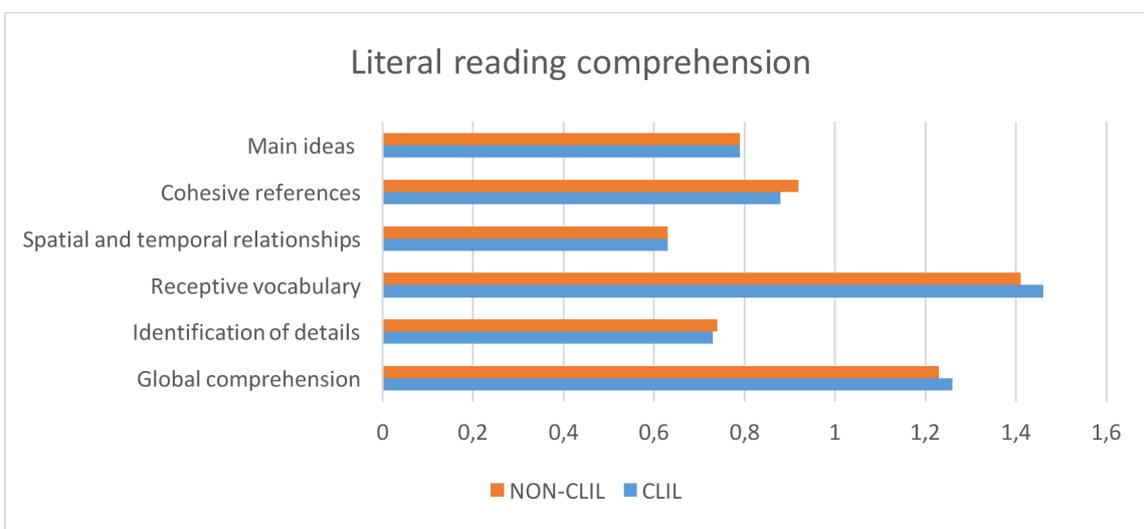


Figure 4. Literal reading comprehension: Learning standards

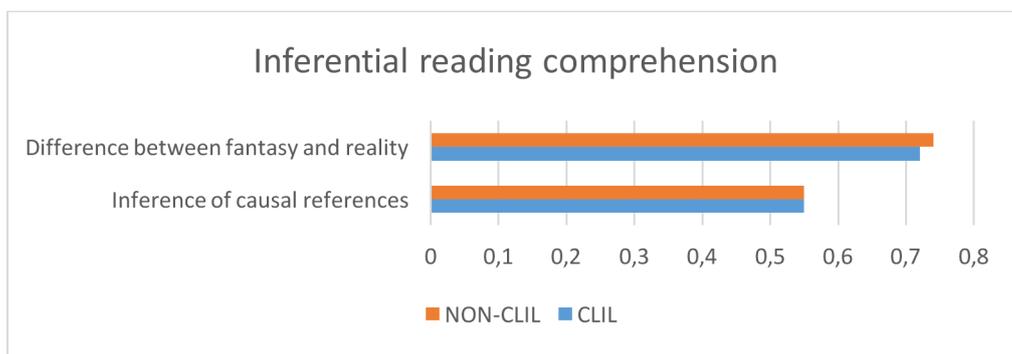


Figure 5. Inferential reading comprehension: Learning standards

### Results in critical reading comprehension

Bilingual education does not contribute to the development of critical reading skills in the same way as regular education, since there are significant differences ( $p < .05$ ) between the two groups when assessing the interest and relevance of the content of the text (figure 6).

### Discussion and conclusions

From the analysis of the data from this study, it can be inferred that bilingual education (CLIL) does not harm the acquisition of reading competence in the mother tongue, since there are no significant overall differences between the CLIL experimental group and mainstream students. In addition, the results seem to indicate that bilingual education enhances certain skills connected with the level of literal reading, such as the acquisition of receptive vocabulary, in contrast to the development of skills related to the level of critical reading in which bilingual students got significantly lower outcomes. CLIL students scored higher when it came to identify-

ing cohesive references, understanding lexical elements, and understanding a text globally, -all these skills related to the level of literal reading-, but the differences were only significant in lexical comprehension. In contrast, the non-bilingual students outperformed their peers in the identification of details, differentiation of facts and opinions and assessment of the interest and relevance of the content, but the differences were significant only in the last standard mentioned. The two groups recorded exactly the same score when identifying spatial and temporal relationships, main ideas and causal relationships.

Therefore, three main conclusions can be drawn from these data, which will be discussed below. First, bilingual education does not negatively impact on the overall results for reading comprehension in the mother tongue nor on the acquisition of literal and inferential reading levels. Second, bilingual students show significant deficiencies compared to mainstream students in the critical reading level,

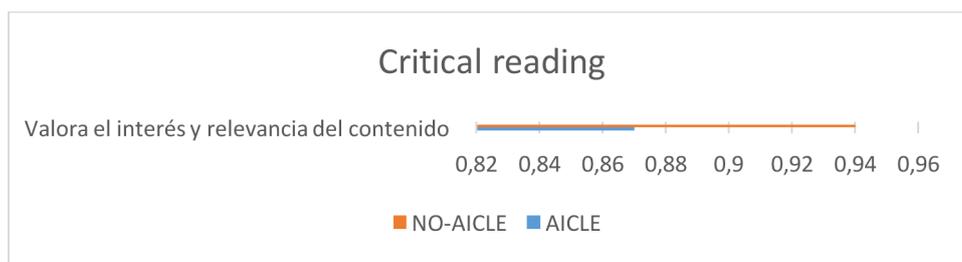


Figure 6. Critical reading comprehension: Learning standards

and thirdly, bilingual education has a positive impact on the acquisition of written receptive vocabulary in the mother tongue.

### ***Absence of significant differences in literal and inferential reading comprehension between CLIL and non-CLIL groups***

This result is consistent with the research literature reviewed and supports the initial hypotheses. It is logical that in the bilingual programme evaluated in this study a negative effect on the acquisition of global reading comprehension has not been detected, since the academic limitation of the mother tongue was much lower than in other bilingual and immersion contexts in which, although a percentage between 75% and 100% of the curriculum was taught in an L2, the acquisition of L1 was not impaired.

However, the fact that several subjects of the curriculum are not taught in the mother tongue and that this situation does not hinder the acquisition of reading comprehension, deserves further reflection. According to Cummins (1998) and Genesee and Jared (2008) this finding can be explained by means of the transference hypothesis, according to which the skills and strategies acquired in the second language are extrapolated to the learning of the mother tongue and vice versa. In the same sense, Van-de-Craen et al. (2010) explain that although there is a drastic reduction in the curricular presence of the mother tongue in the Walloon bilingual programmes, the results in reading in the L1 are so good due to the psycholinguistic principle, according to which, the students apply the linguistic knowledge acquired when learning a second language to learning the mother tongue. In addition, according to Wolf (2005) in the CLIL classroom, most acquisitive processes are related to written comprehension, so that learning reading strategies plays a fundamental role in these settings. These pedagogical practices undoubtedly have an impact on the fact that reading in L2 is one of the skills in which CLIL impacts most positively (Dalton-

Puffer, 2008; Nieto-Moreno-de-Diezmas, 2016a; Ruiz-de-Zarobe, 2011). In addition, the results of this study seem to indicate that those strategies and the specific reading skills that bilingual students acquire in the foreign language are transferred to their comprehensive written abilities in the mother tongue, and therefore, the curricular limitation of Spanish in the curriculum did not imply a negative effect on reading literacy in L1.

### ***Detriment of bilingual education for the acquisition of critical reading comprehension***

Contrary to the expected results, there is an area harmed by bilingual education: critical reading. These results may be explained because in bilingual subjects, the double difficulty of understanding academic texts in a foreign language entails the need to use a pedagogy more based on literal understanding to the detriment of the acquisition of critical reading.

This finding may be related to the results obtained in the Canadian immersion research. In the first years of Primary Education, the students in immersion had some deficiencies in the mastery of the mother tongue when compared to their monolingual classmates (Genesee, 1994; Lapkin et al., 2003; Swain and Lapkin, 1982), although in the short term the differences between both groups dissipated (Genesee 2007). The students in the CLIL programme analyzed in this study seem to evolve in parallel, since the deficiencies in the level of critical reading that have been detected in 4<sup>th</sup> grade of Primary Education are diluted in Secondary Education, as suggested by the data collected in a study that evaluated this same bilingual programme of Castilla-La Mancha (Nieto-Moreno-de-Diezmas, 2017). The results of this study indicated that there were no significant differences in the acquisition of critical reading skills among students in bilingual programmes and mainstream students in the 2<sup>nd</sup> grade of Compulsory Secondary Education (13-14 years of age).

However, pedagogical implications derive from the results of this study, since they show negative effects of CLIL on the acquisition of the critical reading level in Primary Education. Once this lack is detected, it is important to mitigate its effects, for example, through coordination between the teachers who teach their subject in L1 and those who teach in L2, a strategy suggested by Halbach (2009), to solve the issue of gaps in the acquisition of content and vocabulary in CLIL Primary students. In this case, it would be important for teachers in bilingual schools to become aware of the need to promote and support the acquisition of critical reading skills, both in subjects taught in a foreign language and in those taught in Spanish, and especially in the latter, in order to compensate for the difficulty of working with this level of reading in the bilingual classroom.

### **Significantly positive contribution of bilingual education to acquiring vocabulary in the L1**

Bilingual students recorded significantly higher scores on the understanding of lexical elements. In this sense, it is interesting to collate this result with the fact that the research literature has revealed that the acquisition of receptive vocabulary in the target language constitutes one of the most evident gains of bilingual education (Agustín-Llach and Canga Alonso, 2014; Canga-Alonso, 2015; Merikivi and Pietilä, 2014; Nieto-Moreno-de Diezmas, 2016a). This finding could be interpreted as a new evidence of the theory of the transfer of skills, strategies and competences between the second language and the mother tongue.

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