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CLIL at the linguistic interfaces

This study explores the effect of CLIL on the acquisition of nominal morphology (syntax-morphology interface) and article use (syntax-semantics-discourse-interface), areas that have been scarcely investigated in CLIL settings. Here we compare article omission and overuse errors in an oral production task performed by L1 Basque-Spanish learners of L3 English in two CLIL and non-CLIL groups matching in age at testing and amount of exposure. Results indicate that as regards nominal morphology, both groups are equal in the omission of the definite and indefinite articles, but CLIL learners learn to solve article overuse more quickly than non-CLIL learners. Taking together these results and the findings from our previous study (Martínez-Adrián & Gutierrez-Mangado, 2015a) that revealed the non-existence of CLIL benefits regarding the acquisition of verbal morphology, we conclude that while the syntax-morphology interface

seems to be unaffected by CLIL, CLIL can aid in the acquisition of features from the syntax-semantics-discourse interface.

Basque/Spanish abstract at end.

Este estudio explora el efecto de AICLE en la adquisición de la morfología nominal (la interfaz sintáctico-morfológica) y el uso de artículos (la interfaz sintáctico-semántica), áreas lingüísticas que han recibido escasa atención en contextos AICLE. En este trabajo comparamos los errores de omisión y sobreuso de los artículos definido e indefinido del inglés como tercera lengua (L3) en una tarea de producción oral en dos grupos de bilingües de euskara y español. Ambos grupos tienen la misma edad y la misma cantidad de horas de exposición al inglés, pero difieren en tipo de instrucción (el primero se encuentra inmerso en un programa AICLE y el segundo no). Los resultados indican que con respecto a la morfología nominal, los aprendices AICLE y los NO-AICLE omiten el artículo definido y el indefinido de forma similar. Sin embargo, los aprendices AICLE parecen superar con más rapidez los errores de sobreuso en comparación con los aprendices NO-AICLE. Estos resultados, junto a los obtenidos en un estudio anterior (Martínez-Adrián & Gutierrez-Mangado, 2015a) donde se encontró que AICLE no beneficia especialmente la adquisición de la morfología verbal, nos llevan a la conclusión de que a pesar de que AICLE no parece redundar en una mejoría de los aspectos relacionados con la interfaz sintáctico-morfológica, supone una ayuda en la adquisición de características relacionadas con la interfaz sintáctico-semántico-discursiva.

1. Introduction

Research carried out in content and language integrated learning (CLIL) contexts has emphasized its benefits on students' overall proficiency in the four skills (listening, speaking, writing and reading) in the foreign language (Lasagabaster, 2008; Martínez-Adrián & Gutierrez-Mangado, 2015a; Ruiz de Zarobe, 2008). These general benefits could be related to the more natural and intense input received by CLIL learners (Coyle, 2007; Lázaro Ibarrola & García Mayo, 2012; Marsh, 2002; Muñoz, 2007). The type of input provided in CLIL lessons is communicatively more meaningful than the input provided in non-CLIL programmes. Apart from that, learners in CLIL tend to use the target language for interaction as they consider this language an instrument of communication rather than an object of study (Martínez-Adrián & Gutierrez-Mangado, 2015b). However, the advantages of CLIL are not so clear on language specific areas such as phonetics or morphosyntax and more fine-grained studies are needed so as to detect potential areas in which the purported benefits of CLIL could be identified (Gallardo del Puerto, Gómez Lacabex, & García Lecumberri, 2009; García Mayo & Villarreal Olaizola, 2010; Martínez-Adrián & Gutierrez-Mangado, 2009; Martínez-Adrián & Gutierrez-Mangado, 2015a, 2015b; Ruiz de Zarobe, 2010). Moreover, in comparative studies on the linguistic outcomes of CLIL and non-CLIL students, instructional setting and amount of exposure are often conflated, so that the effect of instructional setting cannot be confirmed.

This study addresses the shortcomings of previous research described above by focusing on the acquisition of linguistic interfaces, an area that has lately sparked a lot of interest in the field of language acquisition in formal linguistics (Rothman & Slabakova, 2011). The investigation of linguistic interfaces focuses on how different modules of interlanguage grammar relate to each other. Grammar consists of a lexicon and a collection of computational systems for syntax, semantics, and phonology that interface with each other, called grammar-internal interfaces. At the same time, grammar interfaces with grammar-external domains, such as the

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articulatory-perceptual system at phonetic form (PF) and the conceptual-intentional system at logical form (LF) (White, 2009). Some linguistic interfaces have been claimed to be more vulnerable for learners than others (e.g., Montrul, 2011; Sorace 2011). While the syntax-semantics interface seems unproblematic, both the syntax-morphology interface (Montrul, 2011; Slabakova, 2008; White, 2009) and the syntax-semantics-discourse interface pose special difficulties for second language (L2) learners (Montrul, 2011), as evinced by results on the acquisition of verbal and nominal morphology and the knowledge of articles in discourse (Gutierrez-Mangado & Martínez-Adrián, 2013, 2015; Ionin, Zubizarreta, & Philippov, 2009; Martínez-Adrián & Gutierrez-Mangado, 2015a; White, 2003a). Even if the acquisition of interface phenomena has been widely investigated, there is a lack of studies examining the acquisition of these areas in CLIL settings. The present study aims to fill the aforementioned gaps by examining whether CLIL instruction has a positive effect on those linguistic interfaces that have been shown to pose difficulties in the acquisition of L2 English. More specifically, we will compare the use of the article system (article omission and overuse) during oral production by first language (L1) Basque-Spanish learners of third language (L3)[1] English in two CLIL and non-CLIL groups matched for age at testing time and amount of exposure, and we will relate the findings obtained in the present study to those found in our previous investigation on the acquisition of verbal morphology by the same learners (Martínez-Adrián & Gutierrez-Mangado, 2015a).

This paper is structured as follows. In section 2 we provide an overview of empirical findings in CLIL settings. Section 3 is devoted to the research on the acquisition of interface properties. Research questions are addressed in section 4, while the study is described next in section 5. Results are shown in section 6. Section 7 discusses the main findings and conclusions.

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[1] In this paper the term L3 is used to refer to the third language acquired by the learners. In the case of the participants from the present study, this means that these learners speak Spanish, which counts as one language and Basque, which counts as a second language, regardless of whether these languages were learnt simultaneously or sequentially.

2. CLIL and research findings

Dalton-Puffer (2011a) defines CLIL as an educational approach where curricular content is taught through the medium of a foreign language, typically to students in some form of mainstream education at the primary, secondary, or tertiary level. CLIL programmes in Europe are characterized by the use of a foreign language (English usually) as the language of instruction for content subjects. Less than 50% of the overall curriculum is usually taught in the target language. Apart from content instruction through the target language, English is also taught as a typical language subject (Dalton-Puffer, 2011a; Lasgabaster & Sierra, 2009). Teachers are usually non-native speakers of the target language and most of the time they are content specialists rather than language specialists.

However, as Marsh (2009) and Smit (2007) point out, CLIL is implemented differently not only in different countries but also within the same country and even in different schools in a particular city. The unsatisfactory results of other instructional programmes aimed at the introduction of English at an early age in school settings in Spain have led to a proliferation of CLIL programmes all over the country with a common goal: to improve foreign language competence and to reinforce foreign language teaching through the intensified exposure and the more natural methodology in CLIL. In fact, among the European countries that implement CLIL, Spain together with Estonia are the only countries where national and/or regional governments have taken the lead in creating and financially supporting coherent policies for its implementation (Dalton-Puffer, 2011b).

As for research on CLIL, even though a good number of studies have been undertaken to date, most studies have focused on the general proficiency attained by L3 learners in the foreign language (Jiménez Catalán, Ruiz de Zarobe, & Cenoz, 2006; Lasagabaster, 2008; Navés & Victori, 2010; Ruiz de Zarobe, 2008), and few studies have dealt with the acquisition of specific

linguistic features. In particular, more fine-grained studies are needed to explore which features are more easily acquired through exposure to CLIL.

In the studies regarding general proficiency in the target-language, CLIL learners have been found to outperform same grade non-CLIL learners (Admiraal, Westhoff, & De Bot, 2006; Jiménez Catalán, Ruiz de Zarobe, & Cenoz, 2006) and to perform as well as older non-CLIL learners or even better (Lasagabaster, 2008; Navés & Victori, 2010; Ruiz de Zarobe, 2008). These positive outcomes have been ascribed to the more intense and natural input provided in CLIL lessons. Nevertheless, these positive results could be due to the learners' greater exposure to the target language rather than CLIL per se, because besides regular English classes, CLIL learners have extra hours of exposure to English through content-based instruction.

More limited research has been conducted on specific areas of language, and the vast majority of these studies, as in the case of studies on general language proficiency, have not controlled for hours of exposure either, a variable that we control for in the present study. As a result of the use of the target language for meaningful interaction, vocabulary knowledge is one of those areas enhanced by content-based instruction (Dalton-Puffer, 2008). Several investigations have reported benefits in receptive vocabulary knowledge (Agustín Llach & Canga Alonso, 2016; Canga Alonso, 2013; Iglesias-Diéguez & Martínez-Adrián, in press; Jiménez Catalán et al., 2006; Jiménez Catalán & Ruiz de Zarobe, 2009; Xanthou, 2011) and productive vocabulary knowledge (Canga Alonso & Arribas García, 2015). Nevertheless, the benefits of CLIL do not seem to extend to other language-related areas such as phonetics (Gallardo del Puerto et al., 2009) or morphosyntax (García Mayo & Villareal Olaizola, 2010; Lázaro Ibarrola, 2012; Martínez-Adrián & Gutierrez-Mangado, 2009, 2015a, 2015b). Taking into account the results obtained in these investigations, several researchers have made a call for more focus-on-form in CLIL classrooms (Basterrechea Lozano & García Mayo, 2013; García

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Mayo, 2009, 2012; Martínez-Adrián, Gallardo del Puerto, & Gutierrez-Mangado, 2013; Ruiz de

Zarobe & Lasagabaster 2010) in order to promote greater accuracy of specific linguistic aspects.

In fact, research conducted in Canadian French immersion programmes (the precursors of

CLIL programmes) has revealed that many target features do not necessarily require any

instructional emphasis at all because they can be easily acquired through exposure to content-

based instruction (i.e. phonologically salient and high-frequency lexical items with syntactic

patterns congruent with a learner's first language (see Harley, 1994). However, other features

require specific treatment. Harley (1993) identified the following classes of target language

features as problem areas that require explicit attention in content-based classrooms: (i) features

that differ in non-obvious or unexpected ways from the first language; (ii) features that are

irregular, infrequent or otherwise lacking in perceptual salience in the L2 input; and (iii) features

that do not carry a heavy communicative load. Similarly, other researchers from different

theoretical backgrounds also conclude that systematic practice can contribute to the L2

development of linguistic features that entail special difficulties (DeKeyeser, 2010; García

Mayo, 2007; Gass & Mackey, 2007; Lyster, 2015; Slabakova, 2013).

3. The acquisition of interface properties

As Montrul (2011) describes, the concept of interfaces stems from the view of

grammar/language that assumes that the language faculty is organized in different modules

(syntax, semantics, phonology) which interact (interface) with each other (Burkhardt, 2005;

Jackendoff, 2002; Ramchand & Reiss, 2007). Research has shown that interface properties,

namely, properties that link two domains such as the syntax-semantics interface, are more

difficult to acquire than non-interface properties, that is, properties that are internal, for example,

to the syntax domain (Dekydspotter & Sprouse, 1997; Dekydstpotter et al, 2001; Montrul, 2011;

Slabakova, 2008; Sorace & Serratrice, 2009; Tsimpli & Sorace, 2006). Moreover, not all

linguistic interfaces are equally problematic (Slabakova, 2008; White, 2011). While syntax-semantics interface properties, such as the interpretation of adjectives (Rothman, Judy, Guijarro-Fuentes, & Pires, 2010), have been observed not to be so hard to acquire for L2 learners, knowledge of articles in discourse (Ionin et al., 2009; Snape, 2005) (syntax-semantics-discourse interface) and production of verbal and nominal morphology (syntax-morphology interface) (Prévost &White, 2000) have been found to be more difficult.

Studies on these interfaces thus far have mainly tackled non-CLIL learners, and further research in CLIL contexts is needed to gain more insight into these phenomena. This is especially pertinent because one of the strengths of CLIL is precisely its emphasis on communicative skills, which have been found to have a direct impact on the general proficiency of English and on the knowledge of vocabulary.

Previous studies dealing with the acquisition of L2 English verbal inflection (syntax-morphology interface) in non-CLIL settings have compared the production of tense and agreement morphology in L2 English to the production of syntactic properties, implicating the functional category "inflection" (Haznedar, 2001; Haznedar & Schwartz, 1997; Ionin & Wexler, 2002; Lardiere, 1998; White, 2003a, among others). These investigations have reported that learners of English at different ages and at different stages of development are not target-like in their production of inflectional morphology, while showing evidence of abstract syntactic knowledge associated with inflection in that: (i) subjects are hardly omitted; (ii) subject pronouns are almost invariably nominative, (iii) agreement is usually accurate when it is present, (iv) suppletive forms of auxiliaries and the copula are supplied to a much greater extent than inflectional morphology on lexical verbs, and (v) there is no variability in verb placement, namely, verbs are positioned appropriately with respect to adverbs and negation, all of which suggest that feature strength is present (White, 2003b). These results support the Missing Surface Inflection Hypothesis (Prévost and White, 2000), according to which mapping problems exist

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from abstract syntactic categories to their particular surface morphological manifestations rather than absence of syntactic knowledge (White, 2003a, b). In other words, learners have problems at the syntax-morphology interface (Slabakova, 2013).

As for nominal inflection, studies comparing article choice among L2 adult learners with different L1s in non-CLIL settings generally agree that speakers of [- article] L1s omit English articles in obligatory contexts to a greater extent than speakers whose L1s do have articles (such as Spanish) (e.g., Larsen-Freeman, 1975; Murphy, 1997; Parodi, Schwartz, & Clahsen 1997; Thomas, 1989). In other words, learners from [-article] languages seem to have more problems at the syntax-morphology interface. Similarly, adult learners from [- article] L1s have been found to overuse the definite article in production and elicitation tasks to a higher extent than learners whose L1s have articles (e.g., García Mayo, 2009; Ionin, Zubizarreta & Maldonado, 2008; Ionin et al., 2009; Snape, 2005), suggesting that the syntax-semantics-discourse interface is more difficult for [-article] L1 learners. Previous studies carried out with non-CLIL Basque-Spanish bilingual learners of L3 English have revealed high article overuse and omission errors in production tasks (Gutierrez-Mangado & Martínez-Adrián, 2009, 2013, 2014). More recent investigations comparing Basque-Spanish bilinguals to Spanish monolingual learners of L2 English have found a higher degree of omission and overuse errors in the bilingual group (Gutierrez-Mangado & Martínez-Adrián, 2015, in press). Thus, the syntax-morphology interface and the syntax-semantics-discourse interface pose problems for these bilingual learners. In fact, it has been argued that the use of articles by the Basque/Spanish bilingual group resembles the pattern of overuse and omission reported for [–article] L1 learners more than for [+article] L1 learners, which lends support to the suggestion that the Basque definite article is not a true article, but a noun marker (see Manterola 2012, 2015). These studies lead to the conclusion that Basque-Spanish bilingual learners of L3 English do not transfer from Spanish (like the L1 Spanish matching group) but from Basque. In other words, these learners seem to transfer from

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the language they use on a daily basis rather than Spanish, which is typologically closer to English (see Cenoz, 2001 for a discussion of factors affecting transfer in the context of the Basque Country).

Previous studies conducted in CLIL focusing on the acquisition of verbal morphology (syntax-morphology interface) have concluded that this feature is equally problematic both for CLIL and non-CLIL learners (García Mayo & Villareal Olaizola, 2010; Lázaro Ibarrola, 2012; Martínez-Adrián & Gutierrez Mangado, 2015a). However, further research is needed in CLIL with other properties that also belong to this interface (i.e. nominal inflection) and to the other aforementioned problematic interfaces (i.e. syntax-semantics-discourse interface).

Taking into account the studies that have compared CLIL to non-CLIL learners in terms of verbal inflection and investigations in immersion contexts in Canada, the main aim of this study will be to examine whether CLIL has a positive effect on two linguistic interfaces that have been shown to pose difficulties for L2 learners: nominal morphology (syntax-morphology interface) and article overuse (syntax-semantics-discourse interface). Thus, we will investigate which linguistic features are more easily acquired through exposure to content-based instruction and which ones are more difficult and require special intervention and treatment in the classroom through systematic practice (e.g., DeKeyeser, 2010; Lyster, 2015; Slabakova, 2013).

4. Research questions

Based on previous findings on the acquisition of interface properties and on the findings reported in studies which have compared CLIL to non-CLIL learners as regards formal aspects of language (Gallardo del Puerto et al., 2009; García Mayo & Villareal Olaizola, 2010; Lázaro Ibarrola, 2012; Martínez-Adrián & Gutierrez-Mangado, 2009, 2015a, 2015b), this study addresses the following research questions (RQ) and hypotheses (H):

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RQ #1: Do CLIL and non-CLIL learners show target-like performance in the production of articles?

H #1: If properties related to the syntax-morphology interface are acquired, no omission errors will arise. If properties related to the syntax-semantics-discourse interface are acquired, no overuse errors will emerge.

RQ #2: Does instructional setting (CLIL vs. non-CLIL) impact the acquisition of different interface systems?

- RQ # 2a: Are CLIL learners' omission rates similar to those of non-CLIL learners?

  H #2a: If CLIL students omit articles to a lesser degree, this would constitute evidence in favour of benefits at the level of the syntax-morphology interface. Based on previous findings on verbal infection (Martínez-Adrián & Gutierrez-Mangado, 2015a), we do not expect an advantage on the part of CLIL learners when compared with non-CLIL learners.

- RQ #2b: Are CLIL learners' overuse rates similar to those of non-CLIL learners?

  H #2b: If CLIL students overuse articles to a lesser degree, this would constitute evidence in favour of benefits at the level of the syntax-semantics-discourse interface. We predict that given the focus on meaning promoted by CLIL, CLIL learners may be better than non-CLIL learners when tested on features which are related to discourse properties, such as the correct use of articles in discourse.

5. Methodology

5.1. Participants

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The participants were 35 Basque/Spanish bilingual students learning L3 English in two different schools in the Basque Country. In both schools students were instructed in Basque (the minority language), and Spanish (the majority language) was a school subject to which four hours a week were devoted. English was taught as a foreign language. The context in which the subjects are immersed has been defined as additive trilingualism (Cenoz & Valencia, 1994). The participants are middle-class students with a very similar sociolinguistic backgrounds and socioeconomic status and come from either Basque-speaking or Spanish-speaking families. In all cases, the additive context in which these learners live leads to balanced bilingualism.

As can be observed in Table 1, there were two participant groups (CLIL and non-CLIL) matching in age at testing (14–15). The CLIL group and non-CLIL group attended a different school. However, both groups have very similar hours of exposure to English (the CLIL group had received seven hours of instruction more than the non-CLIL group), allowing us to avoid the limitations found in previous research where CLIL and non-CLIL groups had different amount of exposure to the target language. By keeping constant the variable 'hours of exposure' in this study, we are able to attest whether the potential advantages that might emerge in the case of CLIL learners could be attributed to the more intense and meaningful input provided in the CLIL classes. However, note that the non-CLIL group started learning English at age 4 and the CLIL group at age 8. The reason to include these two groups with a difference in onset age lies in the finding that earlier exposure is not an advantage in formal settings, as older learners are usually found to be better with respect to younger learners when amount of exposure is constant (García Mayo, 2003; Muñoz, 2006).

The CLIL group ($n = 16$) was made up of 7 females and 9 males in their 4th year of secondary education who were enrolled in a CLIL programme at age 12, where they were taught content through English for 4 hours in their social sciences course; they also received EFL lessons for 3 hours a week like their non-CLIL counterparts. At the moment of testing, they had

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received 1,155 hours of instruction in English. The non-CLIL group ($n = 19$) was composed of 8 females and 11 males in their 4th year of secondary education and the total number of hours of exposure to English was 1,148. The English classes they received involved traditional EFL classes and at the time of data collection this particular school did not offer a CLIL alternative.

Table 1. Participants

	Age at testing	Age of 1st exposure	Length of exposure in years	Total hours of exposure
CLIL Group ($n =16$)	14–15	8	6	1,155
non-CLIL ($n =19$)	14–15	4	10	1,148

CLIL teachers in these contexts are non-native with at least a B2 level in English (Common European Framework of Reference for Languages – CEFR)[2]. Teachers of subject matter in English in these schools are either content teachers or English language teachers while the person in charge of the English language course is an English language teacher, also non-native. Before teaching CLIL, teachers follow a teacher-training programme that encompasses both theoretical and pedagogical information relevant for CLIL practice. As regards the materials used in these content classes, teachers follow a set of materials translated and adapted from those employed in the same course taught in Basque.

The EFL classes were not the same for the two groups. In CLIL programmes such as the one in this study, the EFL class is geared towards reinforcing the CLIL class, especially the vocabulary needed for the topics covered in the social sciences course (Muñoa, 2011). However, in the non-CLIL group, the EFL class was characterized by decontextualized grammar

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2 The CEFR offers 6 language proficiency levels, from A1 to C2 representing different language levels, from Basic user to Proficient user. http://www.coe. int/t/dg4/linguistic/Source/Framework_en.pdf)

instruction in which attention was drawn to isolated language forms without a meaningful context.

5.2. Instruments and data collection and analysis

This paper reports the results of a subset of data from a project where a wide battery of tests (general proficiency and oral and written tests and various questionnaires) was used to collect data from different schools. The empirical data reported here were gathered through two different instruments: the standardized Oxford Placement Test (OPT) (Allan, 1992) to measure English proficiency and an oral narration task to examine the use of English articles. The OPT, which has been used in numerous studies to establish students' level of English, was completed by all students in their classrooms and consisted of listening and grammar sections in the form of multiple choice questions and fill-in the blanks (Martínez-Adrián & Gutierrez-Mangado, 2015b; Agathopoulou, 2003; Lasagabaster, 2008; Villarreal Olaizola & García Mayo, 2010).

For the oral narration task, students were asked to individually narrate the well-known story "Frog, where are you?" (Mayer, 1969) with visual support provided by a series of drawings. This story has been widely used in different studies investigating the acquisition of formal aspects (e.g., García Mayo & Villareal Olaizola, 2010; Martínez-Adrián & Gutierrez-Mangado, 2015a, 2015b; Ruiz de Zarobe, 2008). The oral production was orthographically transcribed and codified in CHILDES format[3] (McWhinney, 2000).

Following previous research (Gutierrez-Mangado & Martínez-Adrián, in press), the narratives were first analysed for the production of articles in singular and count noun contexts, since these provide obligatory contexts for articles. Mass nouns and plurals were eliminated from the main analysis as were singular count nouns, which do not require an article (e.g., *he went to*

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3 The Child Data Exchange System (CHILDES), is a widely use tool which facilitates the analysis of language acquisition data by offering tools for codifying and analyzing oral and written language samples.

bed). Self-corrections and exact repetitions of the experimenter's utterances were also excluded. Productions of other determiners in place of articles have also been omitted from the analysis.

Next, all obligatory contexts for definite and indefinite articles were quantified. Obligatory contexts for indefinite articles were those where a new character was introduced for the first time. Subsequent mentioning of previously introduced characters was considered an obligatory context for a definite article.

Articles were coded according to their appropriateness in the contexts as correct 'a' (1), correct 'the' (2), 'a overuse' (3), and 'the overuse' (4) in cases where one was used for the other. Omissions in indefinite (5) and definite (6) contexts were also coded. See examples below.

(1) 'Correct a': *once upon a time there was a boy who had a a frog and a dog*.(non-CLIL 01)

(2) 'Correct the': *the, the boy went to bed*. (non-CLIL 04)

(3) 'A overuse': *the child goes to see a dog*. (CLIL 93)

(4) 'The overuse': *and she look over the trunk*. (CLIL 99)

(5) 'Null indefinite': *the dog throw to the floor ____ beehive*. (non-CLIL 12)

(6) 'Null definite': *when he arrive to____ cliff the children se cae*. (CLIL 67)

Note that examples (3) and (4) are correct without a context. However, in (3) both 'the child' and 'a dog' have already been mentioned, so the indefinite article 'a dog' is not appropriate. Similarly, in (4), the context describes the first mentioning of the object 'trunk'; therefore, the sentence is coded as incorrect since 'a trunk' would be the expected appropriate answer. In order to establish the first and subsequent mention contexts as such, we collected data from native speakers of English matching the participants in the study in age, using exactly the same methodology followed with the participants.[4] We then examined the natives' article choice

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[4] A reviewer rightly points out that example (4) might not be a good example of overuse of 'the' and could be an artifact of the stories' shared knowledge between the participant and the researcher. However, the data collected by the natives was gathered following exactly the same methodology. The results did not reveal any omissions

for each context. Thus, we established that the contexts in (3) and (4) were a context for the definite article and an indefinite article respectively, based on the consistent use of the definite article in this context by the natives. Examples (7) and (8) show one of the native's description in the contexts exemplified in (3) and (4):

(7) the little boy put his shoes on and quickly climbed through the window and helped <u>the dog</u> not to step on any glass.

(8) They made their way over to <u>a hollow log</u>.

Statistical analysis was conducted using SPSS. Both descriptive and inferential statistical analyses were carried out. In the case of the OPT, the Kolmogrow-Smirnov tests to verify the normality of distribution of the sample showed a normal distribution (Z=0.096, p=0.200). Therefore, a T-test was computed to compare the CLIL and the NON-CLIL group. In the case of the oral production task, first, the percent correct was calculated for each student in each group. Then, the mean percent correct and standard deviations were calculated in both groups. As for the latter, Kolmogrov-Smirnow tests were run to verify the normality of distribution of the samples, which were not found to be normal (correct 'the' (Z=2.604, p=0.000), correct 'a' (Z=1.892, p=0.002), incorrect 'the' (Z=1.989, p=0.001), incorrect 'a' (Z=3.173, p=0.000), null indefinite (Z=3.452, p=0.000), and null definite (Z=2.954, p=0.000)). Consequently, we used the Mann-Whitney U test for the comparison of both groups and Wilcoxon-rank for within group comparisons.

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or overuse (see Gutierrez-Mangado & Martínez-Adrián (in press) for a sample of the descriptions provided by the natives). The reviewer also adds that if 'the' overuse was a task artifact the same participant should be using 'the' consistently throughout the story; if on the other hand 'the' overuse truly reflects the participant's grammar, then, s/he would be expected to interchangeably use 'the' and 'a'. The results reported below show no consistent 'the' overuse in any of the learners. Finally, after narrating the story in English, the participants were asked to narrate it in Spanish and also in Basque. The narrations in Spanish and Basque did not show any overuse of the definite articles in Spanish or Basque. If shared knowledge between the participants and the researcher had been influencing 'the' overuse in the English narrations, more overuse would be expected in the narrations in Spanish and Basque, which was not the case.

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6. Results

6.1 Oxford Proficiency Test

The T-test run to compare the results obtained on the OPT in both samples indicated that

the CLIL group had a higher level of proficiency than their non-CLIL counterparts. The listening

section took 20 minutes to complete, and participants were allowed 50 minutes for completing

the grammar section. The maximum score for both tasks was 200 (Table 2). The scores

correspond to CEFR level B1 for the CLIL group and A2 for the non-CLIL group.

Table 2. Oxford placement test mean scores and standard deviations

Group	Mean (SD)	T-test	p-value
CLIL	60.7 (6.1)	-3.358	0.002*
non-CLIL	52.0 (7.84)		

$p < .05$ (*)

6.2 Obligatory occasion analysis

In this section we first present the results on accuracy in the use of the definite and

indefinite article and the distribution of omission and overuse errors.

6.2.1 *Accuracy in the use of definite and indefinite articles*

In order to answer the first research question as regards accuracy rates in the production

of articles, we calculated accuracy in indefinite contexts as a percentage of all obligatory

contexts in which 'a' should appear (first mention singular nouns excluding proper nouns).

Accuracy in definite contexts was calculated in the same way. Examples of accurate production

of indefinite and definite articles are shown in (9) and (10) respectively:

(9) once upon a time a little boy had a frog in a bottle. (non-CLIL 05)

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(10) and <u>the boy</u> eeh go out to take <u>the dog</u>. (CLIL 58)

As can be observed in Tables 3 and 4, neither group showed target-like performance (complete accuracy) in the use of the definite and indefinite articles. The proportions of correct definite articles were 391/339 for the CLIL group and 330/349 for the non-CLIL group, while for the indefinite article the proportions of correct responses were 122/158 for the CLIL group and 123/183 for the non-CLIL group. However, both learner groups were more accurate in the use of the definite article (Table 3).

Table 3. Mean percent correct, standard deviations, and Mann Whitney U test results for use of definite articles by learner group

Group	Mean % correct (SD)	Mann-Whitney U	p-value
CLIL	98.00 (7.00)	1.260	0.208
non-CLIL	96.89 (6.05)		

p < .05 (*)

Table 4. Mean percent correct, standard deviations, and Mann-Whitney U test results for use of indefinite articles by learner group

Group	Mean % correct (SD)	Mann-Whitney U	p-value
CLIL	77.69 (28.75)	0.880	0.379
non-CLIL	68.31) (28.82)		

p < .05 (*)

Within-group comparisons showed that in both groups, learners were more accurate with the definite than with the indefinite article (non-CLIL Z=-3.110; p-value=0.02; CLIL Z=-2.547;

p-value=0.011). Note that the standard deviations in both groups showed less homogenity than in the accuracy rates obtained with the definite article, which could be due to the variability observed in the overuse of the definite article in both groups, as will be explained below. Between-group comparisons did not yield statistically significant differences in the correct use of the definite article or the indefinite article.

6.2.2 *Article omission*

To answer RQ #2a, we calculated omission rates for both groups. Both CLIL and non-CLIL learners omitted the definite article (example 12) but only the non-CLIL group omitted the indefinite article (example 13) (Table 5–6). The proportions of omissions for the definite article were 2/399 in the CLIL group and 14/349 in the non-CLIL group, while proportions of omission for the indefinite article were 0/158 in the CLIL group and 5/183 in the non-CLIL group. The standard derivations in the non-CLIL group were higher for omissions of both the definite as well as the indefinite articles.

(12) *and the reindeer eeeh carry to___ boy running.* (non-CLIL 01)

(13) *when he arrive to ___ cliff eh the children eeeh the children se cae.* (non-CLIL 67)

Table 5. Mean percent of definite article omissions, standard deviations, and Mann-Whitney U test results by learner group

Group	Mean % omissions (SD)	Mann-Whitney U	p-value
CLIL	0.49 (1.34)	-0.756	0.449
non-CLIL	2.00 (5.29)		

p < .05 (*)

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Table 6. Mean percent of indefinite article omissions, standard deviations, and Mann-Whitney U test results by learner group

Group	Mean % omissions (SD)	Mann-Whitney U	p-value
CLIL	0 (0.0)	-1.918	0.055
non-CLIL	2.78 (6.07)		

p < .05 (*)

Within group comparisons revealed no differences between the omission rates in either group (non-CLIL Z=-0.674; p-value=0.500, and CLIL Z=1.342; p-value=0.180). The Mann-Whitney U test revealed no statistically significant differences between the groups.

A qualitative inspection of the results showed that in the non-CLIL group, four learners out of 19 omitted the indefinite and the definite article, with omission rates ranging from 7.14% to 20% for the indefinite and from 3.3% to 22% for the definite. In the CLIL group, none of the participants omitted the indefinite article, and just two participants omitted the definite article with omission rates ranging from 3.8 to 4%.

6.2.3 *Article overuse*

To answer RQ #2b, overuse rates were computed for the definite and indefinite articles in both groups. These were instances when participants used the definite article instead of the indefinite article or vice versa (Tables 7-8). More specifically, the proportion of overuse for the definite article was 8/158 in the CLIL group and 30/183 in the non-CLIL group, while for the indefinite article the proportion of overuse was 6/399 in the CLIL group and 5/349 in the non-CLIL group.

Table 7. Mean percent of definite article overuse, standard deviations, and Mann-Whitney U test results by learner group

Group	Mean % overuse (SD)	Mann-Whitney U	p-value
CLIL	1.65 (4.08)	-2.074	0.038*
non-CLIL	8.55 (10.71)		

$p < .05$ (*)

Table 8. Mean percent of indefinite article overuse, standard deviations, and Mann-Whiteney U test results by learner group

Group	Mean % overuse (SD)	Mann-Whitney U	p-value
CLIL	1.5 (6.0)	-1.412	0.158
non-CLIL	1.10 (2.11)		

$p < .05$ (*)

Results revealed that both CLIL and non-CLIL learners overuse the definite article (examples 14–15) to a higher extent than the indefinite article (examples 16–17):

(14) *and they look after <u>the</u> bueno (well) enborra (trunk) edo (or) <u>trunk.</u>* (non-CLIL 05)

(15) *and and she look over <u>the trunk</u>.* (CLIL 99)

(16) *ejem the boy and the dog is coming to to escape eeh <u>a frog</u>.* (non-CLIL 01)

(17) *bueno (well) the child goes to # to see <u>a dog</u>.* (CLIL 93)

In (14) and (15), the participants mention the word 'trunk' for the first time but both of them use the definite article instead of the indefinite article. This can be compared with the natives' use of the indefinite article in (7) above. On the other hand, in examples (16) and (17) the participants have already introduced the characters 'frog' and 'dog' and instead of using the definite article to mention them, they use the indefinite article.

The finding that both groups overused the definite article to a higher degree than the indefinite article is in line with the trend observed both in children and adult learners of L2 English in production tasks and seems to reflect the developmental pattern in the acquisition of English articles (Huebner, 1983, 1985; Thomas, 1989; Zdorenko & Paradis, 2008, 2012). The within-group statistical analysis indicated that the non-CLIL group significantly overused 'the' to a higher extent than 'a' (Z=2.403; p-value=0.016), while no such differences emerged in the CLIL group (Z=0.365; p-value=0.715). Between-group comparisons revealed that the CLIL group overused 'the' less than the non-CLIL group (Table 7), and this result was statistically significant. No statistically significant differences were found between the groups in overuse of the indefinite article (Table 8).

A qualitative inspection of individual results revealed the existence of high variability in both groups. In the non-CLIL group, five participants out of 19 overused the indefinite article, with errors ranging from 3.33% to 7.14%. Nine of them overused the definite article, with errors ranging from 3.33% to 28.57%. Just one CLIL participant out of 16 overused the indefinite article 24% of the time, while three overused the definite article, with rates ranging from 5.5% to 15.15%.

7. Discussion and conclusion

The aim of this paper was to test the effect of CLIL on the acquisition of features from the syntax-morphology (article omission) and the syntax-semantics-discourse interfaces (article overuse) in order to contribute to the existing debate on which features are positively affected by CLIL and which ones require special instructional intervention. With respect to the first research question (*Do CLIL and non-CLIL learners show target-like performance in the production of articles?*), even if the CLIL group had attained a higher proficiency level, both CLIL and non-

CLIL learners still exhibited problems with the use of articles. Therefore, it could be argued that properties related to the syntax-morphology interface and the syntax-semantics-discourse interface were still being acquired at testing time, regardless of the type of instruction. In addition, both types of learners showed an asymmetry in accuracy rates, being more accurate in the production of the definite than the indefinite article. These results corroborate previous research on the acquisition of articles by L2/L3 English learners (e.g., Gutierrez-Mangado & Martínez-Adrián, 2015, in press; Robertson, 2000; Snape, 2005).In this respect, the high standard deviations in the accuracy rates of the indefinite article are also worth mentioning. They may stem, above all, from the individual variability observed in the production of article misuse. Note that in previous research with Basque-Spanish bilinguals (Gutiérrez-Mangado & Martínez-Adrián, in press) individual differences have been claimed to be the focus of attention in future research on the acquisition of determiners..

As for the second research question (*Does instructional setting (CLIL vs. non-CLIL) impact the acquisition of different interface systems?*), first of all we tested whether CLIL learners' omission rates were similar to those of non-CLIL learners so as to analyse the impact of CLIL on the syntax-morphology interface. The results showed that CLIL and non-CLIL learners did not differ with respect to article omission, supporting our hypothesis. At this stage of development, where both groups of learners have received a similar amount of hours of exposure and have different general proficiency level (irrespective of the accumulated exposure through content classes in the CLIL group), the learners' omission rates do not exceed 9% for the definite article and 3% for the indefinite article.

The low omission rates reported lead us to make two observations: (i) the omission rates of articles in these learners is lower than the omission rates reported in Gutierrez-Mangado & Martínez-Adrián (in press), where a group of 14–15 year old non-CLIL Basque/Spanish bilinguals with fewer hours of exposure (792 hours) produced omission rates over 20% for the

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definite article and 18% for the definite article in the same oral narration task. Although

tentative, this difference in omission rates, given the hours of exposure of the learners reported in

the present article and those in Gutierrez-Mangado & Martínez-Adrián (in press), might indicate

that CLIL and non-CLIL learners alike are able to reduce the number of omission errors by a

mere increase in hours of exposure. In other words, with respect to article omission, it seems to

be the case that errors decrease as the learners are exposed to sufficient input without the need of

special intervention.[5] (ii) In Martínez-Adrián & Gutierrez-Mangado (2015a) we examined the

same learners as in the present study with respect to omission of verbal inflection. In Martínez-

Adrián & Gutiérrez-Mangado (2015a) verbal inflection was found to be particularly problematic

for the same CLIL and non-CLIL participants at this particular stage of development (see the

results reported in Martínez-Adrián & Gutierrez-Mangado, 2015a, for the same CLIL and non-

CLIL learners). More specifically, omission of the third person singular –*s*, appears not to be

positively affected by accumulated hours of exposure, as both CLIL and non-CLIL learners still

have problems with it and omit the –s with equal frequency. It seems to be the case that the focus

on meaning that CLIL promotes, and which leads to a better performance in the OPT, does not

affect the acquisition of grammatical features like the third person singular –s, which has been

described as a less salient feature encoding grammatical information (Goldschneider &

Dekeyser, 2001). This type of feature has been suggested to require special intervention in the

classroom (Harley, 1993). Thus, the shortcomings observed in the case of the third person

singular –s could be solved by both proactive (i.e. pre-planned noticing and awareness tasks) and

reactive approaches (i.e. corrective feedback) to form-focused instruction as already claimed in

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[5] Further investigation will shed light as to whether differences between CLIL and non-CLIL learners
emerge in previous stages of acquisition. In previous studies (Gutierrez-Mangado & Martínez-Adrián,
2015; Gutierrez-Mangado & Martínez Adrián, in press), non-CLIL learners at earlier stages of
development have been reported to produce a higher number of omission errors. Comparing CLIL
and non-CLIL at such earlier stage of development, when they make more errors, would allow us to
investigate whether CLIL learners show benefits when compared to non-CLIL learners.

previous research (Basterrechea Lozano & García Mayo, 2013; Lyster, 2007; Martínez-Adrián &

Gutierrez-Mangado, 2015a), or by the improvement of teacher-training programmes, the

promotion of the collaboration between researchers and teachers, and the existence of greater

connections between content teachers and language teachers. Thus, if we take into consideration

the results reported here for article omission together with the omission of verbal inflection in

our previous study, we can conclude that participation in a CLIL programme per se does not

affect the acquisition of features related to the syntax-morphology interface (verbal and nominal

inflectional morphology) as positively as it does general language proficiency or vocabulary.

Omission errors in the domain of nominal inflection decrease as exposure to the language

increases and omission errors in the domain of verbal inflection do not improve despite the

accumulated hours of exposure in CLIL.

Apart from investigating the impact of CLIL on the syntax-morphology interface, we also

examined the impact of CLIL on the syntax-semantics-discourse interface. To this aim, we

explored whether CLIL learners' overuse rates were similar to those of non-CLIL learners. The

analysis of the data revealed that CLIL learners overused 'the' to a lesser degree than their non-

CLIL counterparts, which indicates that the more meaningful input provided in CLIL lessons

may have a positive impact on features pertaining to the syntax-semantics-discourse interface.

Thus, our second hypothesis was also corroborated. Interestingly, the overuse errors in the non-

CLIL group in the present study were not as high as those reported in our previous investigations

where non-CLIL learners had less exposure to English (see Gutierrez-Mangado & Martínez-

Adrián, 2009, 2013, 2014, 2015, in press). Nevertheless, participation in a CLIL programme may

speed up the process of overcoming this type of error, as the CLIL learners oversused 'the' less

than the non-CLIL group.[6] Thus, we could argue that the benefits of CLIL observed in general

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[6] Note that even if the non-CLIL learners starting learning English at an earlier age, this was not
advantageous for them. This result supports previous research conducted with early learners in a formal
setting. Several investigations conducted to date have concluded that the introduction of a foreign language

proficiency do extend to a feature pertaining to the syntax-semantics-discourse interface. The

picture that emerges from this finding is that article overuse may not require special intervention

because it might be more positively affected by content-based instruction. A tentative

explanation for the difference between the acquisition of nominal and verbal morphology may lie

in the nature of the features involved: articles, unlike the –s morpheme, have been suggested to

encode a semantic feature (definiteness) (Ionin, Ko, & Wexler, 2004), which also interfaces with

discourse.

> The finding in the present study that discourse related features are not so hard to acquire
>
> is in line with previous analyses (Iverson, Kempchinsky & Rothman, 2008; Rodríguez-
>
> Ordóñez & Sainzmaza-Lecanda, in press). However, research by Sorace (2011), Sorace
>
> and Filiaci (2006) and Tsimpli and Sorace (2006), among others, has revealed that the
>
> acquisition of features at the interface with discourse present difficulties for L2 learners
>
> and is affected by L1 attrition. In this respect, Montrul (2011) points out that such
>
> conflicting results may stem from the difficulty of assigning certain features to a specific
>
> interface. Thus,grammatical phenomena that may be originally conceived by the
>
> researcher as representing one internal interface or the other (e.g., morphology-syntax or
>
> syntax-semantics), can, in fact, involve discourse as well, because perhaps the word
>
> 'discourse' and processing multiple sources of 'knowledge' involve a multitude of
>
> factors: some of them relate to the grammar, others to the input, and yet others to the type
>
> of tasks used in our experiments. (Montrul 2011, p. 602)

In the present case, we have examined the production (and omission) of nominal

morphology, a phenomenon which has been classified as involving the syntax-morphology

interface (Prévost &White, 2000) as well as knowledge of articles in discourse which involves

the syntax-semantics-discourse interface (Ionin et al., 2009; Snape, 2005). The finding that CLIL

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in a formal setting at a younger age should be combined with more intense exposure so as to obtain the
benefits of early exposure (García Mayo & García Lecumberri, 2003; Muñoz, 2006).

and non-CLIL learners do not differ in their omission rates suggests that teaching modality (where there is not sufficient focus on form) seems not to affect the acquisition of the syntax-morphology interface. However, note that there is a difference in the acquisition of verbal and nominal inflection in that: (i) the omission rates related to nominal morphology are very low, which may indicate that the learners in the present study have already acquired the D category[7] (Prévost & White, 2000) related to nominal inflection; (ii) the high omission rates in verbal morphology show that the learners are not yet able to map the syntactic category I to the surface morphological manifestation (-s) (Prévost & White, 2000; White 2003a, 2003b). This difference may indicate that not all features related to the same interface, in this case the syntax-morphology interface, are acquired uniformly. Further research is needed in order to investigate the cause of this difference.

On the other hand, the different rates of article overuse, where non-CLIL learners showed significantly higher rates of definite article overuse than CLIL learners given similar amount exposure to the target language, seems to highlight the benefits of CLIL in the acquisition of a feature related to the syntax-semantics-discourse interface, 'the' overuse. In this respect, CLIL is characterized by a focus on meaning and the use of the target language for interactional purposes in the classroom, which could be argued to be related more to discourse than syntax. Previous research has already highlighted that the benefits of CLIL extend to areas of language related to semantics and discourse such as vocabulary (Diéguez-Iglesias & Martínez-Adrián, in press; Agustín Llach & Canga Alonso, 2016; Canga Alonso, 2013; Xanthou, 2011; Jiménez Catalán et al., 2006; Jiménez Catalán & Ruiz de Zarobe, 2009; Jiménez Catalán & Agustín Llach, 2017). The finding that 'the' overuse is positively affected by CLIL also supports the finding that CLIL

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7 In the acquisition literature, omission of obligatory morphemes has often been attributed to the absence of the category related to the specific morpheme in the learners' L1. When the learners' L1 lacks a given syntactic category (and the corresponding phrase) one of the tasks of the L2 learners is to acquire the given category and related phrase. Category D refers to the syntactic category determiner, which in languages like English is realized as a determiner phrase and category I refers to the syntactic category inflection which is realized as an inflectional phrase.

benefits the acquisition of certain features related to discourse.

In conclusion, the analysis of the oral narration task suggests that while the syntax-morphology interface does not benefit from CLIL and aligns with previous research on the acquisition of formal aspects of language by CLIL learners, overuse of the definite article, a feature pertaining to the syntax-semantics-discourse interface may be enhanced by content-based instruction programmes. So, even if research on the acquisition of specific linguistic properties conducted to the present date has attested a similar performance in CLIL and non-CLIL learners, this study has shown that not all specific linguistic properties are equally affected by CLIL. The results have shown that CLIL can benefit the acquisition of some specific linguistic features (in this case a feature related to semantics or discourse such as overuse of the definite article), while at the same time not directly affecting others (in this case a feature pertaining to the syntax-morphology interface such as article omission). Future research should shed more light on the areas that can fully benefit from CLIL and on those areas that require a special intervention as well as on the individual factors that may cause higher variability among the learners in the acquisition of some of these features.

All in all, ventures such as more solid collaborations between the different stakeholders and a more effective training of prospective CLIL teachers may lead to a better implementation of CLIL programmes in the upcoming years.

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