Crosslinguistic influence and morphological awareness in English (third language) writing

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Abstract
Aims: The aim of the present paper is twofold. Firstly, we look into the effects of a number of factors on crosslinguistic influence (study 1). Secondly, we analyse the role played by morphological awareness in the production of crosslinguistic instances (study 2). In this way, we contribute to the understanding of how crosslinguistic and metalinguistic dimensions of third language acquisition are intertwined.

Methodology: We investigate lexical adaptations of the first language and second language in third language English (i.e. adapted loan words) and combine quantitative and qualitative research methods. A quantitative analysis explores the impact of the first language, the L2 factor, typology and proficiency in the target and the source languages (study 1). A qualitative analysis then proposes a categorization of the strategies used by participants to adapt their first language and second language to the target language (study 2).

Data and Analysis: Language proficiency was evaluated in 222 compositions, 74 written in each language (Basque, Spanish and English). The adapted loan words found in English compositions were classified according to their source language, word category, word class and type/token categories (study 1). In addition, the strategies used by participants were identified and analysed (study 2).

Findings: The results indicate that language typology is the main predictor of the source language of crosslinguistic influence, and a variety of strategies point at morphological awareness as a key factor in the strategic use of participants' first language and second language.

Originality: By mixing quantitative and qualitative methods, this paper provides additional support to the claim that crosslinguistic influence and morphological awareness are intertwined in third language writing.

Significance: The overall results show that students who are morphologically aware make crosslinguistic and morphological associations and use them strategically in their third language.

Introduction

The Basque Autonomous Community (BAC) offers an immersive context in which to study the phenomenon of language contact and acquisition. According to the most recent sociolinguistic survey, 33.9% of the population in the BAC is bilingual in Basque and Spanish and, of the Basque-speaking population, 50% have Basque as a first language (L1), 13.2% are simultaneous bilinguals with both Basque and Spanish as their L1s and 36.8% speak Basque as a second language (L2) or additional language (Basque Government, 2016).

In the BAC education system, due to institutional support, Basque is the main language of instruction in primary and secondary education and students with Basque and Spanish as home languages are instructed in Basque (EUSTAT, 2017). Globalization has had an important influence on language instruction and English is taught in kindergarten. Thus, all students in the BAC have at least three languages in their school curriculum. In this particular context, the fact that Basque is a non-Indo-European language, typologically distant from the Romance language it has contact with (i.e. Spanish), adds additional value to the study of crosslinguistic influence (CLI) and morphological awareness (MA) in third language (L3/foreign language) writing.

This article reports the main findings of two related studies in CLI. In study 1, CLI is analysed in English (L3) writing by 74 secondary school students. All these students were bilingual in Basque and Spanish, in the sense they could speak both languages. In terms of language background, 32.4% reported that Basque was their mother tongue; 35.1% said that Spanish was their mother tongue; 32.4% reported both languages as their mother tongue (i.e. being simultaneous bilinguals) (Genesee, Paradis, & Grago, 2004). In addition, all participants were primarily instructed in Basque and studied Spanish and English as school subjects. In study 2, the crosslinguistic instances (i.e. adapted loan words) were re-analysed, identifying and categorizing the strategies used by participants in order to produce them. Due to their extended linguistic repertoire, these multilingual learners had two source languages at their disposal. Several publications have investigated the influence of native and non-native languages in the acquisition process (Cenoz, Hufeisen, & Jessner, 2001; De Angelis, 2007). Yet, the questions of whether multilingual learners are aware of CLI phenomena and whether they are able to use crosslinguistic and MA strategically in the learning process require further investigation. In this way, this article contributes to the understanding of how crosslinguistic and metalinguistic dimensions of third language acquisition (TLA) are intertwined.

Crosslinguistic influence in third language writing

The target of study 1 was to analyse the impact of the L1, the L2-factor, typology and proficiency in the target and the source languages. The existing literature on CLI agrees that all language knowledge in the mind interacts and affects the learning processes as well as the cognitive development of learners (Jarvis & Pavlenko, 2008). While CLI occurs at different linguistic levels (e.g. syntax, phonology, etc.), little research has been done on the positive effect of CLI, presumably due to the difficulty of determining exactly the extent of a positive effect when the most obvious and tangible signs of CLI are negative (i.e. errors).

However, the learning of each additional language increases the levels of metalinguistic awareness and leads to a greater reliance on crosslinguistic similarities between prior languages and the one that is being acquired (Jarvis, 2015). As Ringbom (1987, p.109) points out, 'CLI based on perceived similarities is overwhelmingly "positive transfer"'. In such cases, CLI occurs as a learning strategy by which the learner uses her or his knowledge of one language for the formulation of hypotheses about the language that is being acquired (e.g. Ellis, 1994, p.314). In this sense, several

publications argue for the need to account for both positive and negative transfer (e.g. Jarvis & Odlin, 2000, p.539). According to Ringbom (1992), the advantages of crosslinguistic transfer could frequently involve morphology. Thus, we considered that the analysis of adapted loan words offered an excellent option for investigating the use of participants' MA and crosslinguistic associations as L3 learning strategies. In addition, the effect of the factors shown to trigger native and non-native CLI in previous research studies were measured in order to understand how they could also affect the type of morphological strategies used by these students, namely language typology, the L2-factor and language proficiency in the source and the target languages. With regard to the effect of these factors, the following can be said.

Language typology defines how relatively far or near languages are from each other based on their similarities and differences, and research shows that this is a key factor in native (i.e. L1 > L3) and non-native CLI (i.e. L2 > L3) (e.g. Cenoz, 2001, 2003; De Angelis, 2005; Ecke, 2001; Fouser, 2001). Several studies in TLA have reported that learners tend to use their L2 as the source language for CLI more often than their L1, due to a closer cognitive similarity between their L2 and L3 (Bardel & Falk, 2012). These results have been related to a 'foreign language effect' (De Angelis & Selinker, 2001) or 'L2 status' (Hammarberg, 2001) (e.g. Bardel & Falk, 2007; Williams & Hammarberg, 1998). Furthermore, a low proficiency in the target language has generally been associated with a greater CLI (Navés, Miralpeix, & Celaya, 2005; Williams & Hammarberg, 1998), whereas learners at higher levels of a L3 are reported to produce fewer instances of CLI due to their better command of the L3. Yet, some studies counter this commonly accepted view and reported CLI both in the initial stages of TLA and also at higher proficiency levels (Angelovska & Hahn, 2012). In addition, several studies have reported that high proficiency in the source languages leads to greater CLI from those languages (Lindqvist, 2010; Ringbom 1987, 2001). Yet, evidences have been also found that CLI in the L3 does not exclusively occur in cases where proficiency in the L2 (i.e. source language) is also high (De Angelis & Selinker, 2001).

Studies on morphological awareness

The target of study 2 was to investigate the use of participants' MA and crosslinguistic associations as L3 writing (and learning) strategies. The qualitative analysis presented in this second study is subordinate to and explicatory of the first quantitative analysis in which a set of factors appeared to influence CLI. Thus, the findings of this qualitative analysis were then interpreted in relation to the findings of the quantitative analysis.

MA entails a 'conscious awareness of the morphemic structure of words and ability to reflect on and manipulate that structure' (Carlisle, 1995, p.194) and, in contrast to syntactic and lexical CLI, it has been less investigated in L3 studies. Overall, significant progress has been made towards an understanding of the factors that influence CLI. However, analysing the extent to which learners are able to consciously manipulate and exploit these crosslinguistic and morphological associations in the L3 learning process requires further research.

Morphology-based linguistic transfer plays a central role in literacy development (Li & Kirby, 2014). Studies on MA have investigated whether the teaching of the skills associated with this type of awareness was a worthwhile classroom endeavour. White, Power, and White (1989) found that MA improved with age and experience and, based on their findings, supported the practice of direct morphological instruction in Grades 4 and above. Freyd and Baron (1982) found that students who analysed derived words as multiple morphemes rather than as a monomorphemic words were indeed better learners of vocabulary. Similarly, Bowers and Kirby (2010) proposed approaching vocabulary instruction by teaching morphology and found that such instruction significantly improved vocabulary knowledge.

Among other studies, there is evidence that morphological instruction improves reading comprehension (Carlisle, 2000; Kuo & Anderson, 2006) and develops vocabulary beyond the words targeted (Bowers & Kirby, 2010). Therefore, there is convincing evidence that morphological instruction is indeed beneficial, and thus we suggest that the teaching of the skills associated with MA may enhance the potential of the strategies that bilingual learners use more or less consciously in their L3 writing.

With regard to the transferability of morphology, although scarce, we find that examples of morphological transfer from native and non-native languages have been reported in inflectional and derivational morphology (e.g. Bouvy, 2000; Hammarberg, 2001; Jarvis & Odlin, 2000). Concerning adapted loan words, various researchers working in L2 and TLA have encountered these non-target lexemes, which are referred to here as adapted loan words.

Haugen (1950) distinguished 'loanwords' (without morphemic substitution), 'loanblends' (with partial morphemic substitution) and 'loanshifts' (with total morphemic substitution). Ringbom (1986, p.117) categorized them as 'hybrids, blends and relexifications', Singleton (1987, p.334) called them 'formal lexical innovations', Poulisse and Bongaerts (1994, p.41) 'blends', Williams and Hammarberg (1998, p.298) called them 'TL-adapted language switches' and Dewaele (1998, p.471) also investigated adapted loan words, which he called 'lexical inventions'.

Analysing the role of proficiency and typological proximity in CLI, Lindqvist and Bardel found that there was interplay between these factors when students produced 'word construction attempts' (2014, p.253) or adapted loan words. Similar results were found by Bardel and Lindqvist (2007) and Lindqvist (2009). This led us to ask whether learners' strategies based on both crosslinguistic comparison and MA may be determined by the factors analysed in the quantitative analysis of this study.

The present study

This study addresses two research questions.

Research Question 1: How are the L1, the L2, language typology and proficiency in the three languages of our participants related to CLI in English (L3) writing?

Research Question 2: What morphological strategies do bilingual writers use when they adapt their previous languages in English (L3) writing?

Participants

This study includes 74 bilingual learners of English as a L3 from the fourth grade of secondary education in the BAC, Spain. The mean age of the participants was 15.27 (SD = 0.53) and all participants had Basque and/or Spanish as their L1, attended a school with Basque as the language of instruction and studied Spanish and English as school subjects.

According to the questionnaire, 35.1% of the participants had Spanish as their mother tongue (N = 26), 32.4% had Basque (N = 24) and 32.4% indicated that both Spanish and Basque were their mother tongues (N = 24) (i.e. they were simultaneous bilinguals) (Genesee et al., 2004).

Data collection

Firstly, the 74 participants completed a background questionnaire designed to obtain demographic, academic and linguistic data.

Table 1. Proficiency scores (maximum = 100).

	English	Basque	Spanish
Low proficiency	22–42	12–52	44–66
Intermediate proficiency	42–51	52–59	66–72
High proficiency	51–66	59–86	72–96

Then, all the participants wrote one composition in each language (English, Basque and Spanish). Three pictures that included people and animals doing different actions were used for the composition writing, a different picture for each language. Participants were asked to look at the given picture and to describe or tell a story about the people and actions they observed. All the students had the same picture for each language and the compositions were scheduled at least six weeks apart. In total, 222 compositions were gathered.

Data analysis

In order to investigate the impact of the L1 and the L2 (i.e. L2-factor), we considered the information gathered with the background questionnaire and divided the sample into three L1 groups. In total, 24 Basque L1 speakers, 26 Spanish L1 speakers and 24 simultaneous bilinguals were distinguished. In the case of the simultaneous bilinguals, the effects of the L1 and the L2-factor could not be evaluated, as these participants reported having both languages as their mother tongues. In addition, in the case of the Basque L1 speakers, the effects of typology and the L2-factor were also difficult to tease apart, as the influence of the L2 could be related to both factors. Yet, no statistical differences were found between the three L1 groups.

Following the findings of previous studies on assessment in writing, we evaluated language proficiency in the three languages using the revised rubric proposed by Polio (2013) as it appears in Connor-Linton and Polio (2014) (see the Appendix). The 222 compositions were transcribed literally in Word documents, and three evaluators analysed them. The essays were evaluated in order to obtain scores for content (maximum = 20), organization (maximum = 20), language use (maximum = 20), vocabulary (maximum = 20) and mechanics (maximum = 20) (i.e. appropriate layout, spelling and punctuation). The scores were based on a number of descriptors for each of the dimensions and no specific score was designed to any descriptor. The proficiency scores obtained for each of the languages were used to answer RQ1, and the proficiency groups were as shown in Table 1.

In addition, quantitative and qualitative analyses were conducted in order to measure the impact of typology in CLI (the quantitative analysis) and the morphological strategies used by the participants (the qualitative analysis).

Quantitative analysis

In order to investigate the impact of language typology in CLI we categorized three possible sources of influence (Basque, Spanish and Ambiguous). The Ambiguous category referred to a source that reflected the influence of more than one language. For instance, '*plats*' (1). In this case, '*plats*' may be based on the Spanish word '**plat**os' or on the Basque word '**plat**errak', which mean 'dishes'.

In addition, we specified 48 original subcategories in which CLI could be expected. These categories were designed as follows.

Table 2. Morphological strategies in English (third language) writing.

Morphological strategy	
Adaptation of lexical morphology	
Adaptation of derivative morphology	
Adaptation of flexive morphology	The comparative formula
	Deletion and neutralization of Spanish grammatical gender
	The plural inflection

Firstly, we divided the CLI instances into word categories (content and function words), and sub-divided each category into the word class they were based on. Specifically, we classified nouns, verbs, adjectives and adverbs as *content* words and prepositions, pronouns, conjunctions and articles as *function* words. Each instance was counted for the total number of times it occurred (tokens) and the variety of distinct manners (types) in which it was present in the composition. Therefore, CLI instances were classified considering the following information: origin (e.g. Basque), word category (e.g. content word), word class (e.g. noun) and type or token (e.g. type). Two examples of these categories are as follows:

Ex: '*disfrutated*' (2)
[Origin: Spanish; Word category: Content word; Word class: Verb; Type-Token: Token]
(*disfrutated* is based on the Spanish word *disfrutar*, which means "to enjoy")

Ex: '*komune*' (3)
[Origin: Basque; Word category: Content word; Word class: Noun; Type-Token: Type]
(*komune* is based on the Basque word *komuna*, which means 'bathroom')

It is important to bear in mind that the section devoted to the presentation of the results is exclusively focused on the adapted loan words we found in 18 subcategories of CLI. The results of the quantitative analysis were later processed using the program SPSS Statistics.

Qualitative analysis

The qualitative analysis was focused on identifying and describing the way in which participants strategically adapted their previous linguistic knowledge in order to produce L3-like vocabulary or adapted loans. For that purpose, the 74 compositions written in English (L3) were re-evaluated and the steps followed by students were described according to the type of morphology they entailed: lexical, derivational or flexive. The categories found were classified as shown in Table 2.

Results

Quantitative findings

In order to answer the first research question, five analyses were conducted. A frequency analysis showed that language typology had a main effect on the selection of the source language of CLI.

As Table 3 shows, Spanish was the predominant source language for CLI, followed by Ambiguous, and then instances that had Basque as the source language. These results point towards language typology as a determinant factor to explain both native (i.e. L1 > L3) and non-native

Table 3. Distribution of adapted loan words according to the source of influence.

No. of students ($n = 74$)	Spanish		Basque		Ambiguous	
	Type	Token	Type	Token	Type	Token
Nouns	38	54	2	2	8	9
Verbs	25	27	–	–	8	10
Adjectives	23	26	2	2	1	1
Adverbs	3	3	–	–	–	–
TOTAL	89	110	4	4	17	20

Table 4. Differences in crosslinguistic influence (CLI) according to the first language (L1).

	Basque L1 speakers ($n = 24$)		Spanish L1 speakers ($n = 26$)		Bilingual speakers ($n = 24$)		F	Sig.
	M	SD	M	SD	M	SD		
1	.12	.33	.03	.19	.00	.00	1.95	.14
2	.12	.33	.03	.19	.00	.00	1.95	.14
3	1.04	.62	1.15	.73	1.41	.77	1.75	.18
4	1.25	.79	1.65	1.44	1.54	.93	.88	.41
5	.16	.38	.30	.54	.20	.50	.55	.57
6	.25	.60	.30	.54	.25	.60	.08	.92

Note 1: Basque CLI types; 2: Basque CLI tokens; 3: Spanish CLI types; 4: Spanish CLI tokens; 5: Ambiguous CLI types; 6: Ambiguous CLI tokens.

(i.e. L2 > L3) CLI in L3 writing, considering the relative typological distance between the two pairs of languages (Basque-English and Spanish-English).

In order to explore the impact of the L1 on the levels of CLI, as measured by the three CLI categories (Basque, Spanish and Ambiguous), we conducted a one-way between-groups analysis of variance (ANOVA). This analysis was conducted considering CLI types and tokens. In Table 4 we show the results.

The results of the ANOVA indicated that there was no statistically significant difference between the levels of CLI in the three L1 speakers' groups. The differences between the three groups of L1 speakers for Basque CLI types, $F(2.71) = 1.95$, $p < 0.14$ and tokens $F(2.71) = 1.95$, $p < 0.14$, were not statistically significant. The differences between the three groups of participants for Spanish CLI types, $F(2.71) = 1.75$, $p < 0.18$ and tokens $F(2.71) = 0.88$, $p < 0.41$, were not statistically significant either. Finally, the differences between the three groups of participants for Ambiguous CLI types, $F(2.71) = 0.55$, $p < 0.57$ and tokens $F(2.71) = 0.08$, $p < 0.92$, were not statistically significant. These results indicate that participants used both the L1 and the L2 as the source languages for CLI, and proved that the L1 and the L2-factor do not have any determinant effect on bilinguals' CLI in L3 writing per se.

Thirdly, we tested the impact of proficiency in the target and the source languages on CLI. For that purpose, we divided our sample using the 33rd percentile in SPSS Statistic based on the scores obtained in the proficiency evaluation in each of the languages (see the Appendix), and thereby obtained three proficiency groups (i.e. low, intermediate and high).

Table 5. Differences between English proficiency groups in crosslinguistic influence (CLI).

	Low proficiency (n = 23)		Intermediate proficiency (n = 28)		High proficiency (n = 23)		F	Sig.
	M	SD	M	SD	M	SD		
1	.04	.20	.10	.31	.00	.00	1.45	.24
2	.04	.20	.10	.31	.00	.00	1.45	.24
3	1.56	.66	1.03	.79	1.04	.56	4.63	**.01**
4	1.91	1.08	1.28	1.27	1.30	.76	2.61	.08
5	.08	.28	.32	.54	.26	.54	1.57	.21
6	.08	.28	.42	.74	.26	.54	2.26	.11

Note 1: Basque CLI types; 2: Basque CLI tokens; 3: Spanish CLI types; 4: Spanish CLI tokens; 5: Ambiguous CLI types; 6: Ambiguous CLI tokens.

In English, a one-way between-groups ANOVA was conducted to explore the impact of different English proficiency levels on levels of CLI, as measured by the three proficiency groups. In Table 5 we show the results.

As shown in Table 5, the differences between the three English proficiency groups on Basque CLI regarding types, $F(2.71) = 1.452$, $p < 0.241$, and tokens, $F(2.71) = 1.452$, $p < 0.241$, were not statistically significant. In contrast, the differences between the three English proficiency groups in Spanish CLI types were shown to be significant, $F(2.71) = 4.638$, $p < 0.013$, while the differences between the three English proficiency groups in Spanish CLI tokens, $F(2.71) = 2.618$, $p < 0.080$, again were not statistically significant. Finally, the differences between the three proficiency groups of English on Ambiguous CLI types, $F(2.71) = 1.576$, $p < 0.214$, and tokens, $F(2.71) = 2.267$, $p < 0.111$, were not statistically significant.

Consequently, English proficiency was shown to be a significant factor in the case of Spanish CLI types; low proficiency learners of English appeared to use their Spanish knowledge in a more varied manner (types) (M = 1.56) than intermediate (M = 1.03) or high proficiency (M = 1.04) learners. Yet, these results should be understood with caution, as the proficiency groups were determined according to the scores obtained within the sample, and they showed as quite balanced.

Finally, we tested the effect of proficiency in the source languages on CLI. In the first stage we conducted a one-way between-groups ANOVA to explore the impact of different Spanish proficiency levels on levels of CLI, as measured by the three proficiency groups. Table 6 shows these results.

As Table 6 shows, the differences between the groups were not statistically significant at the $p < 0.05$ level. The differences between the three Spanish proficiency groups on Basque CLI types, $F(2.71) = 1.100$, $p < 0.371$, and tokens, $F(2.71) = 1.006$, $p < 0.371$, were not statistically significant. In addition, the differences between the three Spanish proficiency groups on Spanish CLI types, $F(2.71) = 1.423$, $p < 0.248$, and tokens, $F(2.71) = 2.133$, $p < 0.126$, were not statistically significant. Finally, the differences between the three Spanish proficiency groups on Ambiguous CLI types, $F(2.71) = 0.918$, $p < 0.404$, and tokens, $F(2.71) = 1.203$, $p < 0.306$, were not statistically significant either. Consequently, proficiency in Spanish was not a significant factor on levels of CLI.

In the second stage, we conducted a one-way between-groups ANOVA to explore the impact of different Basque proficiency levels on levels of CLI, as measured by the three proficiency groups (i.e. low, intermediate and high).

Table 6. Differences between Spanish proficiency groups in crosslinguistic influence (CLI).

	Low proficiency (n = 26)		Intermediate proficiency (n = 24)		High proficiency (n = 24)		F	Sig.
	M	SD	M	SD	M	SD		
1	.07	.27	.00	.00	.08	.28	1.00	.37
2	.07	.27	.00	.00	.08	.28	1.00	.37
3	1.30	.78	1.29	.62	1.00	.72	1.42	.24
4	1.57	1.17	1.75	1.18	1.12	.85	2.13	.12
5	.30	.61	.12	.33	.25	.44	.91	.40
6	.30	.61	.12	.33	.37	.71	1.20	.30

Note 1: Basque CLI types; 2: Basque CLI tokens; 3: Spanish CLI types; 4: Spanish CLI tokens; 5: Ambiguous CLI types; 6: Ambiguous CLI tokens.

Table 7. Differences between Basque proficiency groups in crosslinguistic influence (CLI).

	Low proficiency (n = 26)		Intermediate proficiency (n = 25)		High proficiency (n = 23)		F	Sig.
	M	SD	M	SD	M	SD		
1	.11	.32	.00	.00	.04	.20	1.70	.18
2	.11	.32	.00	.00	.04	.20	1.70	.18
3	1.11	.76	1.24	.72	1.26	.68	.29	.74
4	1.57	1.44	1.44	.91	1.43	.84	.13	.87
5	.34	.62	.16	.37	.17	.38	1.17	.31
6	.34	.62	.20	.50	.27	.58	.40	.67

Note 1: Basque CLI types; 2: Basque CLI tokens; 3: Spanish CLI types; 4: Spanish CLI tokens; 5: Ambiguous CLI types; 6: Ambiguous CLI tokens.

As shown in Table 7, the differences between the groups were not statistically significant at the $p < 0.05$ level. The differences between the three Basque proficiency groups on Basque CLI types, $F_{(2.71)} = 1.705$, $p < 0.189$, and tokens, $F_{(2.71)} = 1.705$, $p < 0.189$, were not statistically significant. In addition, the differences between the three Basque proficiency groups on Spanish CLI types, $F_{(2.71)} = 0.293$, $p < 0.747$, and tokens, $F_{(2.71)} = 0.132$, $p < 0.876$, were not statistically significant. Finally, the differences between the three Basque proficiency groups on Ambiguous CLI types, $F_{(2.71)} = 1.170$, $p < 0.316$, and tokens, $F_{(2.71)} = .402$, $p < 0.671$, were not statistically significant either. Consequently, these outcomes indicate that Basque proficiency is not a significant factor on levels of CLI.

Qualitative findings

While the quantitative analysis measured the impact of various factors on CLI, in order to describe the processes entailed in these CLI instances or adapted loan words a qualitative analysis was required. Thus, this second study (and analysis) presents the morphosemantic problem-solving steps bilingual students took in order to create adapted loans in their English (L3) writing. Presumably, the strategies described throughout this section help students to succeed on many occasions. Yet, in this study we only analyse the instances that appeared as failures or errors.
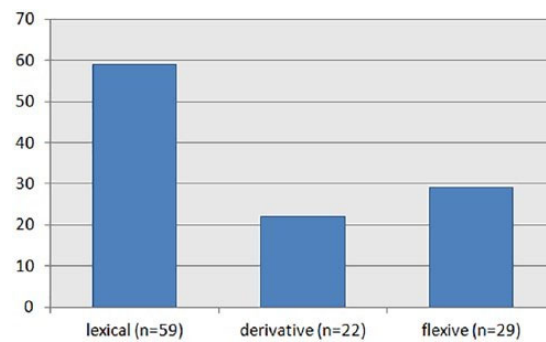
Figure 1. Distribution of the morphological strategies.

Overall, students analysed the possibilities offered by the linguistic context of their English sentences and adapted morphemes from the source languages to create L3-like words or adapted loans. In the ways they adapted this morphological knowledge to fit the requirements of the target language, students showed 'conscious awareness of the morphemic structure of words and the ability to manipulate that structure' (Carlisle, 1995, p.194), or MA.

In order to properly describe the manner in which students used MA, we demonstrate the intermediate steps involved in each instance. As far as these steps can be shown to be consciously made, we define them as strategic (Dahm, 2015). These strategies will be explained as related to the adaptation of the three types of morphology: lexical, derivative and flexive morphology.

As shown in Figure 1, the predominant strategy was adapting lexical morphology, followed by adapting flexive and derivative morphology. In the case of adapting flexive morphology, participants adapted the comparative formula four times, deleted or neutralized the Spanish grammatical gender 14 times and inflected the plural 11 times.

Strategy 1: Adapting lexical morphology

The first strategy we found in order to produce adapted loans was that of adapting the source languages' lexical morphology to fit L3 morphosyntactic rules. In order to do so, students deduced what was acceptable in the target language. O'Malley and Chamot (1990, p.119) defined deduction as 'applying rules to understand or produce the L2 or making up rules based on language analysis'. This strategy was shown to be more suitable for three word classes, and thus we will discuss this strategy accordingly.

In nouns, the strategy was shown to be as follows. Firstly, students selected (in most cases) a Spanish noun, due to a closer typological relationship. Then, they adapted its lexeme to English grammatical rules. Examples such as '*plant*' (4) illustrate how students used Spanish '*planta*' (floor) and deleted the final '-a' in order to adapt this Spanish word to English grammar. This example was found, for instance, in the compositions of student no. 27, no. 45, no. 113 and no. 152.

In verbs, we found the strategy to be different in finite and non-finite verb forms. In regard to non-finite forms (i.e. infinitive, gerunds and participles) we noticed that students used verbs that had a similar formal equivalent in English and used them in the same linguistic context as they would use the Spanish verbs. For instance, we found that they used verbs such 'install' in order to mean 'settle'. In these cases, we think that the formal relatedness between the Spanish and English verbs 'instalar' (Sp.) and 'install' (Eng.) influenced the election of the source language verb. Yet,

the use that students made of these verbs often showed a lack of knowledge of the correct English use, derived from a specific linguistic context. In finite verb forms, we found that students adapted Spanish or ambiguous lexemes to the English conjugation. In this manner, we found instances such as '*alquil-ed*' (5) (student no. 77) or '*disfruta-ted*' (6) (student no. 20). In these cases, the source language of the verbal lexeme was the equivalent of the English verbs students intended to use. However, no formal similarity existed between the verb form they chose and the English verb they required: '*alquiled*'/'to rent' and '*disfrutated*'/'to enjoy'.

Interestingly enough, we also found that in some cases students used a main English verb while translating the preposition that this verb would have in Basque or Spanish. For instance, 'talking <u>with</u>' (7) from the Basque form 'norbaitekin hitz egin' *(-ekin = with*) or from the Spanish form 'hablar con' *(con = with*) instead of 'talking <u>to</u>' (Eng.) (students no. 20, no. 103 and no. 109). Or, 'talking <u>between</u>' (8) from the Basque 'elkarren artean hitz egin' (*artean = between*) or from the Spanish form 'hablar entre' (*entre = between*) instead of 'talking <u>to</u>' (Eng.) (student no. 28). While these instances show an influence from students' L1 and L2, this CLI could not be considered formal (see also Ringbom, 1987), and thus it was not included in the quantitative analysis.

Regarding the adaptation of lexical morphology in adjectives, we found that the lexical morphemes participants mostly implied were lexemes with an ambiguous or a Spanish origin. In this manner, students added English derivative morphemes to these ambiguous or Spanish lexemes. For instance, when writing '*constitut-ed*' (9) instead of 'based' (student no. 18).

In addition, we found that students related some of the target language derivative morphemes with others from the source languages erroneously, for instance, when they made the wrong correspondence between the English morpheme '-ed' with the Spanish morpheme '-ante'. In those instances, students wrote 'relaxed' (10) (=*relaj-ado*, Sp.) instead of 'relaxing', which would be the correct word for the context (=*relaj-ante*, Sp.) (student no. 32), or when they made the wrong correspondence between the English morpheme '-ing' and the Spanish morpheme '-ado' in examples such as 'exciting' (11) (=*excit-ante*, Sp.) instead of writing 'excited' (=*excit-ado*, Sp.) (student no. 123).

Strategy 2: Adapting derivative morphology

Derivative morphology was mostly used in two combinations that were independent from the word class they implied. Specifically, the instances we found showed (a) a source language base and target language derivation and (b) an ambiguous base and an ambiguous derivation.

Derivative morphemes have a clear semantic content as they add meaning to the base of the words. Furthermore, adding derivative morphemes (prefixing and suffixing) alters a word's grammatical category and this second strategy proved resourceful when creating L3-like vocabulary.

In the first combination, students selected a Spanish lexeme and added English derivational morphemes. An example is the word '*anunc-ment*' (12) (student no. 78). In this case, the Spanish lexeme '*anunc-*' was apparently selected from '*anuncio*' (=commercial), to which the English suffix and derivative morpheme '-ment' (=*the result of)* was added in order to convey both meanings.

In the second combination we recognized, students used an ambiguous base and derivation. We realized that the sharing of some derivational morphemes from Latin and Greek, and some vocabulary between Spanish and English, complicated the endeavour of differentiating the source language of each of the forms (i.e. lexical and derivational morphemes). The students used prefixes and suffixes common to both languages most frequently, and thus we suggest that formal similarities at a morphological level also triggered CLI. Thus, drawing the line between the influence of one language and another proved a difficult (or even impossible) task in bilinguals' CLI at a morphological level. Examples such as '*unifamiliar*' (13) (student no. 97) or '*solarium*' (14) (student

no. 34) are illustrative of this, and in them we see that the source language of the instances and the Latin origin of the prefixes and suffixes make it difficult to discern whether the instances have a single source language or the influence was combined.

Strategy 3: Adapting flexive morphology

The adaptation of flexive morphology proved to be the strategy most closely related to the source languages' characteristics. Thus, we found three language-specific contexts in which students used and adapted flexive morphemes: in the English comparative formula, to delete and to neutralize Spanish grammatical genders and to inflect the plural in nouns.

The comparative formula. CLI in the English comparative formulas occurred in two specific ways. On the one hand, CLI was reflected by the double marking of the comparison, for instance, in 'more higher' (15) (student no. 51). On the other hand, CLI was reflected in the incorrect use of the comparative formula in the case of short adjectives with examples, such as 'more hot' (16) (student no. 149).

In the two cases, we consider that Basque ('*baino ... gehiago*' or '*-goa*') and Spanish ('*más ... que*') comparative formulas could have influenced these errors. However, as the number of crosslinguistic instances in the comparative formulas was low, we consider that this strategy could be effective in many cases. In other words, we estimate that students could have benefited from making associations between their previous languages' comparative formulas and the English comparative formula more often than not. However, some of these instances could be also considered intralingual errors, as they could reflect students' overgeneralization of English grammatical rules for the comparative formula. As they may reflect CLI, we decided to include them.

Deletion and neutralization of the Spanish grammatical genders. In regard to Spanish grammatical genders, we recognized two strategies to accommodate Spanish language characteristics to English language rules: deletion and neutralization.

Deletion of the Spanish grammatical genders. Firstly, we recognized that students systematically deleted Spanish grammatical genders ('-o' and '-a'). Illustrative examples of this first strategy were instances such as '*marionets*' (17) (=*marionetas*/puppets) (student no. 45), or 'electrodomestics' (18) (=*electrodomesticos/*appliances) (students no. 14 and no. 94).

Neutralization of the Spanish grammatical genders. Secondly, we recognized that in the cases in which deletion did not occur, students used neutralization as the alternative strategy to deal with the differences between Spanish and English grammatical genders. In those cases, students adapted the Spanish feminine ('-a') or masculine ('-o') to a more neutral form ('-e'). Illustrative examples of this strategy were words such as 'facture' (19) (=*factura/*invoice) (student no. 69) or 'pise' (20) (=*piso/*floor) (student no. 48).

Plural inflection. CLI on plural inflection was evident in the cases in which the plural inflection was added to nouns that were or had a plural noun in English. In some cases, those instances reflected CLI (i.e. interlingual errors); yet, in others, they could reflect a generalization of the target language rule (i.e. intralingual errors). Some illustrative examples are 'mans' (21) instead of 'men' (student no. 117), 'persons' (22) instead of 'people' (students no. 11, no. 25, no. 56 and no. 119) or 'familiars' (23) (students no. 25, no. 60 and no. 75) instead of 'family members'.

Discussion and conclusion

The main goal of this research study consisted of demonstrating how crosslinguistic and MA are intertwined in English (L3) writing. For that purpose, we measured the impact of various factors on CLI and related our results to the morphological strategies used by the participants.

We found that typology was a determinant factor to explain both native and non-native CLI in L3. Similarly, the qualitative analysis showed that participants used Spanish more often than Basque in adapted loan words, presumably due to the languages' typological proximity. This finding is in line with the results of studies that proved that CLI in multilinguals includes all languages belonging to their linguistic repertoire (see De Angelis, 2007) and also with studies that indicated typology is the most deterministic variable in the selection of the source language of CLI (e.g. Rothman, 2010, 2011).

Likewise, proficiency in the target language is a primary factor in the frequency with which bilinguals use knowledge of their previous languages. In this study, less proficient learners of English (L3) appeared to use CLI more often in their L3 writing than intermediate or high proficiency learners. However, these results should be understood cautiously, as proficiency groups were determined according to the scores obtained *within* the sample, and the scores were quite balanced (see Table 1). Similarly, the qualitative analysis showed that participants used their MA strategically, not only to solve vocabulary gaps, but also to create new vocabulary beyond the requirements of the writing task.

In addition, language proficiency in the source languages did not appear to be a main factor in CLI. We consider this finding related to the fact that all learners in the classes were almost equally proficient speakers of Basque and Spanish as all participants had Basque, Spanish or both as their L1 and began to study Basque, at the latest, at the age of 3 years old. Taking this into consideration, we suggest that the comparative levels of proficiency in the source and the target language may be better investigated where these proficiency levels are considerably different, for instance in the case of immigrant students whose proficiency in their L1 is measured according to the date of arrival (see Guion, Flege, Liu, & Yeni-Komshian, 2000).

With regard to the morphological strategies identified, our results show that learners who are morphologically aware understand the relationship between the base form of a word and its suffixes and prefixes, and thus we suggest that they can further understand the parallels to other words that contain the morphemes they already know (see also Jornlin, 2015). The strategies reported in this study allow us to argue that bilingual writers make morphological associations and use them strategically in order to produce new vocabulary. In this sense, we suggest that the teaching of the skills related to MA may be appropriate for the acquisition of languages overall.

The outcomes of the present study lead us argue that more flexible syllabi could offer the opportunity to actively recognize the associations that students already make between the languages they know. Using methodologies that differ from monolingual assumptions would encourage students to make more conscious connections among their languages and, in order to do so, 'translanguaging' pedagogies would be an excellent option (see Leonet, Cenoz, & Gorter, 2017).

Declaration of conflicting interest

Funding

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Appendix. English as a second language profile (revised) (from Polio, 2013 in Connor-Linton & Polio, 2014).

	Content		Organization		Vocabulary		Language use	Score /2	Mechanics
20 16	Thorough and logical development of thesis Substantive and detailed No irrelevant information Interesting A substantial number of words for amount of time given	20 16	Excellent overall organization Clear thesis statement Substantive introduction and conclusion Excellent use of transition word Excellent connections between paragraphs Unity within every paragraph	20 16	Very sophisticated vocabulary Excellent choice of words with no errors Excellent range of vocabulary Idiomatic and near native-like vocabulary Academic register	20 16	No major errors in word order or complex structures No errors that interfere with comprehension Only occasional errors in morphology Frequent use of complex sentences Excellent sentence variety	20 16	Appropriate layout with indented paragraphs No spelling errors No punctuation errors
15 11	Good and logical development of thesis Fairly substantive and detailed Almost no irrelevant information Somewhat interesting An adequate number of words for the amount of time given	15 11	Good overall organization Clear thesis statement Good introduction and conclusion Good use of transition words Good connections between paragraphs Unity within most paragraphs	15 11	Somewhat sophisticated vocabulary Attempts, even if not completely successful, at sophisticated vocabulary Good choice of words with some errors that do not obscure meaning Adequate range of vocabulary but some repetition Approaching academic register	15 11	Occasional errors in awkward order or complex structures Almost no errors that interfere with comprehension Attempts, even if not completely successful, at a variety of complex structures Some errors in morphology Frequent use of complex sentences Good sentence variety	15 11	Appropriate layout with indented paragraphs No more than a few spelling errors in less frequent vocabulary No more than a few punctuation errors

(continued)

Appendix. (continued)

	Content		Organization		Vocabulary		Language use		Score /2	Mechanics
10 6	Some development of thesis Not much substance or detail Some irrelevant information Somewhat uninteresting Limited number of words for the amount of time given	10 6	Some general coherent organization Minimal thesis statement or main idea Minimal introduction and conclusion Occasional use of transitions words Some disjointed connections between paragraphs Some paragraphs may lack unity	10 6	Unsophisticated vocabulary Limited word choice with some errors obscuring meaning Repetitive choice of words No resemblance to academic register	10 6	Errors in word order or complex structures Some errors that interfere with comprehension Frequent errors in morphology Minimal use of complex sentences Little sentence variety	10 6	Appropriate layout with most paragraphs indented Some spelling errors in less frequent and more frequent vocabulary Several punctuation errors
5 0	No development of thesis No substance or details Substantial amount of irrelevant information Completely uninteresting Very few words for the amount of time given	5 0	No coherent organization No thesis statement or main idea No introduction and conclusion No use of transition words Disjointed connections between paragraphs Paragraphs lack unity	5 0	Very simple vocabulary Severe errors in word choice that often obscure meaning No variety in word choice No resemblance to academic register	5 0	Serious errors in word order or complex structures Frequent errors that interfere with comprehension Many errors in morphology Almost no attempt at complex sentences No sentence variety	5 0	No attempt to arrange essay into paragraphs Several spelling errors even in frequent vocabulary Many punctuation errors