

How do differences in exposure affect English language learning? A comparison of teenagers in two learning environments

Carmen Muñoz

University of Barcelona, Spain

<https://orcid.org/0000-0002-7001-4155>

munoz@ub.edu

Teresa Cadierno

University of Southern Denmark, Odense, Denmark

<https://orcid.org/0000-0002-8305-1027>

cadierno@sdu.dk

Abstract

This study investigates whether potential differences in the weight of out-of-school and in-school learning environments affect the acquisition of L2 English by teenagers in two geographical contexts, more and less English-rich, and with less and more linguistic distance to English, respectively. Participants were two groups of 14-15-year-olds, from Denmark and Spain. Language measures included a listening comprehension test, a metalinguistic knowledge test, and a grammaticality judgment test. Data about out-of-classroom exposure was elicited via a questionnaire. The study showed that (a) the Danish group attained a significantly higher level in all language tests except for the metalinguistic knowledge test; (b) the Danish group engaged longer in out-of-school activities although the preference for some activities over others was similar in the two groups; and (c) the types of associations between out-of-school activities and language measures were different between the two groups. These results suggest that the potential influence of out-of-school activities on different language aspects is related to the particular context in which the L2 is learned and to the language proficiency of the learner.

Keywords: out-of-school input; in-school input; linguistic distance; adolescents; subtitles

1. Introduction

In the last decade, second language acquisition (SLA) research has turned its attention to the role of out-of-school exposure in the acquisition of foreign languages (FLs). The increased exposure to FLs via internet, audiovisual and social media allows for the possibility of learning languages, and especially English, outside the classroom context. Given its status as a lingua franca and the widespread lowering of the starting age in primary education across Europe and around the world, more people are learning English from a younger age and are in daily contact with this language (e.g., Muñoz, 2014; Sun et al., 2016; Unsworth et al., 2015).

Despite this common trend, there are notable differences in English proficiency levels across geographical contexts. These differences are related to a number of factors, such as the linguistic distance between the learners' first language (L1) and second language (L2), the amount of English instruction that learners are exposed to in school and the degree of contact with the FL outside school. Some learning environments are more English-rich than others – for example, those in which English TV programs are subtitled rather than dubbed. Given the large presence of English in the media and in the linguistic landscape, the status of English has been argued to be changing from a foreign to a second language in some European countries like Holland or the Nordic countries (de Bot, 2014), that is, in contexts where the linguistic distance from English is also relatively short.

The important role of out-of-school exposure in L2 learning can be explained by usage-based approaches, which assume language learning to be input-dependent and experientially-based (Ellis & Cadierno, 2009; Tomasello, 2003). A key aspect of usage is frequency, as language users are sensitive to the input frequency of specific language patterns at all levels of language representation (e.g., Ellis, 2002). Both token frequency (the number of times a given item appears in the input) and type frequency (the frequency with which different lexical items can be applied to a specific pattern or construction) play an important role in language learning (Bybee, 1995). Token frequency promotes the entrenchment of given linguistic expressions as a whole (e.g., *I dunno*), whereas type frequency determines the abstractness or schematicity of the resulting construction (Tomasello, 2003).

The present study is based on the assumption that usage-based differences in the amount of contact with English inside and outside school have implications for L2 English learning. As usage-based models emphasize the notion that language use in specific usage events is the basis for language learning (Langacker, 1987; Tomasello, 2003), it may be expected, for example, that learners in input-rich environments with more frequent exposure to L2 input outside the classroom will reach higher levels of English proficiency in language skills such as listening comprehension

when compared to learners in input poorer environments. Therefore, the study investigates whether these differences, together with the dissimilarity in linguistic distance, lead to differences in the acquisition of different L2 English dimensions by teenagers from two geographical contexts: Denmark and Spain.

2. Literature review

This section first presents research that has been conducted on school language learning. Then the second part addresses studies on language learning from out-of-school exposure. In the majority of studies, English was the target language (TL).

2.1. School language learning

Learners in FL contexts have traditionally had very limited access to the target language with classroom instruction being the main, and sometimes the only, source of input. In addition to age-related factors, input limitations in both quality and quantity have been seen as determinants of the slow learning rate observed in typical classroom settings (Muñoz, 2006). These limitations may also explain that the resulting knowledge is predominantly explicit (i.e., conscious) rather than implicit (e.g., DeKeyser, 2012) and declarative (e.g., language rules). Additionally, when the use of language in the classroom is not contextualized, instruction may mainly lead to metalinguistic knowledge about language (Doughty, 2003).

A few studies have examined the effects of extensive FL instruction in order to identify the language dimensions that are more enhanced in young adults' classrooms. For instance, two studies with Spanish-Catalan college students found that years of formal instruction were more significantly associated with their receptive knowledge of vocabulary and global proficiency (as measured by the Oxford Placement Test) in English than with measures of phonetic identification and oral performance, with the exception of measures of syntactic complexity (Muñoz, 2011, 2014). On the other hand, the pronunciation abilities of Japanese L1 students were observed to be enhanced with greater amounts of extra FL activities inside and outside school (Saito & Hanzawa, 2018). The students' pronunciation was examined in spontaneous speech as measured by means of a timed picture description task.

The effect of the amount of instruction has also been investigated in research with children and adolescents. In a study where very young Chinese EFL learners (aged 3-8) were followed for one and a half years, Sun et al. (2016) found that the total amount of school input significantly predicted English L2 outcomes in relation to productive and receptive vocabulary and receptive grammar skills, especially in the latter. Similarly, in a study with young learners

in the Netherlands starting English lessons at age 4, Unsworth et al. (2015) found that after two years of instruction, amount of classroom exposure (more than 60 minutes of weekly classroom exposure versus 60 minutes or less) was a significant predictor of children's outcomes in receptive vocabulary and grammar skills. However, in a study with Danish children (ages 7-8 and 9-10) who attended schools that differed in hours of instruction, ranging from 68.25 to 141, Cadierno et al. (2020) found that the total number of lessons was not a significant predictor of English proficiency in relation to receptive vocabulary, receptive grammar and phonetic discrimination skills. In fact, the relatively limited role of years of instruction in English FL proficiency has been evidenced in studies conducted in other geographical contexts. For example, De Wilde et al. (2021) found that even though the amount of English instruction significantly impacted overall proficiency, speaking skills, and receptive vocabulary in a group of Dutch-speaking children in Flanders (aged 10-12 at the first time of measurement), this effect disappeared when the effect of the English knowledge acquired outside school before classroom instruction was introduced into the analysis. Further support for the superior role of out-of-school activities vis-à-vis classroom instruction was found by Peters et al. (2019) in a study with Flemish secondary school learners. This study demonstrated that although years of instruction were positively related to vocabulary size in French and English, the effects of out-of-school activities in the latter was the most determinant factor of learners' vocabulary knowledge in English, which was consistently larger than in French in spite of fewer years of English instruction. Similarly, in a study with a group of 11th graders (ages 16-17) in Taiwan, Huang et al. (2020) found that even though the amount of formal English instruction in kindergarten was significantly associated to listening comprehension and measures of fluency and accuracy from an oral narrative (but not measures of complexity), the strongest influence on their language outcomes was a measure of current contact with English outside school. Finally, in a recent study of a representative sample of adolescents in 14 EU member states, Azzolini et al. (2020) found that although school factors were positively associated with the development of various English skills, especially in countries with native languages that are more distant from English, factors related to out-of-school exposure played an even more important role in the development of English skills in countries with both high and low linguistic distances from English. This finding underlies the strong influence that the informal language learning opportunities available to adolescents through different types of media have on their language proficiency (European Commission, 2012).

2.2. Language learning from out-of-school exposure

In the last two decades, research has increasingly focused on the characteristics of learners' out-of-school exposure and its influence on language learning (see Sundqvist

& Sylvén, 2016). Some studies have been concerned with the types of English-related activities that learners of different age and gender most frequently engage with (e.g., Hannibal Jensen, 2017; Muñoz, 2020). For example, in a study that examined contact with English outside of school by means of a questionnaire and a one-week language diary, Sundqvist and Sylvén (2014) found that Swedish children (aged 10-11) engaged extensively in English activities, with boys spending significantly more time than girls in digital gaming and watching films, and girls spending more time on pastime language-related activities such as Facebook. Furthermore, in a series of studies conducted with French university students, Sockett and colleagues (e.g., Sockett & Toffoli, 2012) showed that the majority of students watched films and television series in English, while a minority also corresponded regularly with other English users on social networking tools like Facebook, Twitter and Myspace.

Other studies have focused on the association between amount and types of exposure and objective measures of language proficiency, mostly in school learners. Two studies including adolescents and children from different European countries (Azzolini et al., 2020; Lindgren & Muñoz, 2013) found that linguistic distance and out-of-school exposure were among the strongest predictors of learners' English proficiency. Likewise, studies conducted in single geographical contexts (e.g., Hannibal Jensen, 2017 in Denmark; Johannsdóttir, 2018 in Iceland; Sun et al., 2016 in China; Verspoor et al., 2011 in the Netherlands) have supported the important role of out-of-school activities in school learners' English proficiency.

The positive effect of engaging in English activities has also been documented in studies conducted in Flanders with learners before the start of formal instruction. To illustrate, De Wilde et al. (2020b) observed that young Dutch-speaking learners in Flanders made very large gains in overall language proficiency (measured by tests of receptive vocabulary, listening comprehension, reading comprehension and writing, and speaking) by means of their contact with English mainly through gaming, using social media and speaking English. Also, in Flanders, Puimège and Peters (2019) investigated a very large group of 10-, 11- and 12-year-olds and found age differences both in the amount of exposure to English and in vocabulary knowledge. Their results also highlight the positive effects of gaming and video streaming, among the English activities, and of cognateness, among the word-related variables studied. The joint positive effects of context exposure and linguistic distance have also been evidenced in a comparative study by Muñoz et al. (2018) who investigated two groups of Danish learners (7- and 9-year-old, respectively) at the start of English instruction and two groups of Spanish/Catalan learners after several years of instruction (3 and 5, respectively). The L1-Danish children, with more frequent exposure to English media and an advantage at cognate recognition, showed a level of receptive knowledge of vocabulary very similar to the level shown by the L1-Spanish/Catalan children. The

higher amount of instruction of the Spanish learners only had a noticeable influence on the performance in the grammar recognition test of the 7-year-olds.

Finally, a fruitful recent line of research is concerned with the positive effects on L2 learning of audiovisual input, where on-screen text can be added to audio and imagery. The learning potential of such multimodal input is explained by several cognitive theories. According to Paivio's dual coding theory (1986), the verbal and visual memory paths are activated simultaneously, facilitating input retention and information storage in long-term memory. Partly based on this, Mayer's cognitive theory of multimedia learning (2014) assumes that the presentation of words with pictures allows learners to make connections between them. It also assumes that processing is more efficient when input is received through several channels because this enhances individuals' limited attentional capacity. From the perspective of SLA, Long (2020) has argued that bi-modal and tri-modal input may improve enhanced incidental learning, an internal process in the mind of the learner that increases unconscious detection, without necessarily raising learning to the level of conscious awareness at all. Indeed, research on learning from audiovisual input has consistently shown that watching audiovisual material, especially with captions (subtitles in the L2), is beneficial for comprehension (e.g., Gass et al., 2019), vocabulary items and formulaic sequences (e.g., Peters & Webb, 2018; Pujadas & Muñoz, 2019), grammar learning (e.g., Lee & Révész, 2020; Pattemore & Muñoz, 2020), and pronunciation (Wisnieska & Mora, 2020). On the other hand, watching non-captioned video has been shown to especially benefit aural recognition of word forms (Sydorenko, 2010).

In sum, recent research has provided a great deal of evidence regarding the positive effects of out-of-school exposure on L2 learning, supporting usage-based claims that language learning emerges from human experience with language (e.g., Cadierno & Eskildsen, 2015; Muñoz et al., 2018). The token and type frequency with which constructions are encountered by L2 learners in informal exposure to English outside the classroom can be expected to facilitate the statistical associative learning of form-function relations involved in all aspects of language (Ellis, 2002). The present study contributes to this line of research by jointly addressing the role of in-school and out-of-school factors in the development of different English language dimensions in environments that differ in terms of the degree of social penetration of English. Moreover, this study focuses on two learner populations with first languages that vary with respect to their linguistic distance from this language, an issue that has so far received scant attention (but see Azzolini et al., 2020). Thus, the present study fills these gaps by exploring whether divergences in the weight of in-school and out-of-school factors in these two learner populations are related to language dimensions that are more likely to be developed via classroom instruction, via exposure to English outside school, or through both.

3. The present study

3.1. Comparing two learning environments: Linguistic and societal circumstances

The two learning environments investigated in the current study, Denmark and Spain, are representative of a group of European countries with Germanic and Romance languages respectively. Danish belongs to the group of North Germanic languages and is thus genetically closer to English than Spanish and Catalan (the two languages of Catalonia) which belong to the group of Romance languages (Greenberg, 2001). The shared Germanic origin also explains the similarity between Danish and English phonotactics (Grønnum, 2001). In terms of cognate linguistic distance, a measure of linguistic distance that relies on the lexical similarity between words in different languages, Danish and English share 59.3 per cent of cognates, whereas Spanish and English share 24.0 per cent and Catalan and English 23.6 per cent (Dyen et al., 1992). Additionally, the shared Germanic cognates between Danish and English are mostly words with higher frequency and more phonological transparency than the Romance cognates.

The two learning environments also differ in relation to the social penetration of English. For example, in Denmark, English television programs and films are seen in the original language with L1 subtitles, whereas in Spain, English audiovisuals are dubbed into the country's home languages. Moreover, the joint influence of exposure to media and linguistic distance can be observed in that 85% of the words in TV programs are in the first frequency band (Webb & Rodgers, 2009), and among them many words are cognates with Germanic languages.

As in previous studies in Flanders (e.g., De Wilde et al., 2020b) or in Sweden (e.g., Sundqvist & Wikström, 2015), a joint effect of amount of exposure and linguistic distance may be observed: Denmark is an English-richer environment than Spain, and the linguistic distance between English and Danish is smaller than that between English and Spanish or Catalan.

3.2. Aim and research questions

The aim of the study was to explore whether potential differences in the weight of in-school and out-of-school learning environments together with a dissimilarity in linguistic distance led to differences in the acquisition of L2 English by teenagers from the two learning contexts. Specifically, the study addressed the following research questions:

1. Are there differences in the levels of English proficiency attained in different language measures (i.e., listening comprehension, grammaticality judgment, metalinguistic knowledge) by same-age teenagers in the two

- learning environments (more and less English-rich and less and more linguistically distant, respectively)?
2. Are there differences in the frequency with which same-age teenagers engage with the different types of out-of-school activities in the two learning environments?
 3. Which types of out-of-classroom activities (i.e., viewing videos, listening to songs, writing, reading, speaking, gaming) have the strongest associations with each English language measure in the two learning environments?

In relation to the first research question, it was predicted that the Danish participants would show advantages in listening comprehension skills, because their environment is English-richer and the similarities between Danish and English offer a useful crutch for comprehension (De Wilde & Eyckmans, 2017; Muñoz et al., 2018). It was also predicted that the Spanish participants would show advantages in metalinguistic explanations, because of their longer period of English instruction, that will have facilitated the acquisition of declarative knowledge. In relation to the third research question, a higher association was predicted between listening scores and leisure activities (e.g., viewing, gaming), and between metalinguistic knowledge scores and literacy-oriented activities (reading, writing).

4. Method

4.1. Participants

The participants comprised two groups of 14-15-year-olds, one from a school in Denmark and one from a school in Spain. The Danish group consisted of 56 learners (31 female and 25 male) who were finishing the 8th grade of their primary school studies. The Spanish group consisted of 80 learners at the end of 9th grade¹ (39 female and 41 male); they were bilingual Catalan-Spanish. Both schools were semi-private and were similar in terms of socio-economic background, so as to control as much as possible for the financial circumstances that allow access to English outside of school. Informed consent was obtained from the parents through the school.

The Danish students had started English instruction at the average age of 9-10 and had had six years of formal English instruction (360 hours); none had participated in extracurricular classes in English. The English proficiency level expected by Danish students at the end of compulsory education (i.e., in 9th grade) is equivalent to B1 (CEFR). The Spanish students had started learning English at age 4-5 on average and had had 10 years of English instruction (on average

¹ Children in Denmark start primary school one year later than in Spain: Denmark at age 7-8; Spain at 6-7.

over 750 hours), and 77.5% of them had had extracurricular classes in English. The expected English proficiency level by the Spanish students at the end of compulsory education (i.e., in 10th grade) is equivalent to A2.

In both schools, English was typically used as the vehicle of instruction in class and teachers had the required national degree in education and possessed a high level of English proficiency. Although both schools applied a communicative approach to teaching English, including a focus on form, there were some differences between them. In the Danish school, the textbook used a topic-based syllabus that presented topics through a variety of texts. The themes were typically discussed in class orally and summarized in writing; grammar was practiced mainly through web exercises at home and later discussed in class. In the Spanish school, the textbook used followed a structural syllabus. Target structures were practiced in writing through focus on form exercises, essay writing and oral communicative activities.

4.2. Instruments and procedure

4.2.1. Questionnaires

The participants completed a background questionnaire including questions about their history of English learning (e.g., extracurricular tuition, number of weekly classes, age of onset) and an out-of-school exposure questionnaire in their L1, Danish or Catalan. The latter was built on the basis of a questionnaire that had been used in previous research (e.g., Muñoz, 2020) and had undergone a two-part validation process. First, colleagues' suggestions and critiques helped ensure that its questions were appropriate. Then, a group of students in a Master's program in applied linguistics completed the questionnaire in order to give feedback and identify potential areas of confusion. After making the suggested changes, the questionnaire was piloted with learners in the same-age range and changes were implemented in order to improve its clarity and suitability.

The questionnaire consisted of nine main questions asking about the weekly frequency of common activities in English on a scale of 1-7 (see Appendix A). (1 = *never*; 2 = *less than one hour*; 3 = *between two and three hours*; 4 = *between three and four hours*; 5 = *between four and five hours*; 6 = *between five and six hours*; 7 = *more than six hours*); an open-ended question followed asking learners to specify how many hours (if more than six). The nine activities were: watching audiovisual material with L1 subtitles, with English subtitles, without subtitles; listening to songs; reading for leisure online or on paper; speaking online or face-to-face; writing; single-player gaming; and multiplayer gaming.

4.2.2. Language tests

Three tests were selected on the assumption that they would yield measures of the language knowledge that was more likely to be developed through incidental exposure outside school, through classroom instruction, or through both. A listening comprehension test was used as a measure of a skill that can be enhanced through incidental exposure to English media; a metalinguistic knowledge test was used as a measure of explicit and declarative knowledge that is most frequently developed in a classroom, and a grammaticality judgment test was chosen on the grounds that the grammatical and ungrammatical sentences may yield measures of different types of knowledge developed through either incidental or classroom experience.²

To measure the participants' listening comprehension in English, the Listening Section of the Oxford Placement Test (OPT) was used (ListT). The grammaticality judgement test (GJT) was adapted from previous studies (see Ellis et al., 2009). The grammatical constructions were balanced to include syntactic and morphological rules of early, intermediate and late acquisition (Ellis, 2009). After piloting with a small group of same-age learners, the original set of grammatical constructions was shortened slightly to make it less tiring for this age group. Each grammatical structure was represented by two grammatical and two ungrammatical sentences, with a total of 52 sentences (see Appendix B). The metalinguistic knowledge test (MKT) contained a selection of 10 ungrammatical sentences from the GJT (see Appendix C). The participants were informed that the sentences were ungrammatical and that the ungrammaticality was italicized in each sentence, but that they did not have to correct the error; instead, they had to explain why each sentence was ungrammatical using their own words in their L1 (see Gutiérrez, 2012).

The reliability of the two language tests adapted for this study was calculated using Cronbach's alpha. The GJT and the MKT had acceptable values of reliability: GJT (Cronbach alpha = .946 in the Danish sample and .796 in the Spanish sample) and MKT (Cronbach alpha = .779 in the Danish sample and .721 in the Spanish sample).

² Researchers have long discussed the nature of the knowledge measured by GJTs. It has been claimed that timed GJTs measure implicit knowledge and untimed GJTs measure explicit knowledge (Ellis, 2005). On the other hand, it has also been claimed that grammatical and ungrammatical sentences in GJTs measure two different types of knowledge representations, i.e., implicit knowledge and explicit knowledge respectively, in both timed and untimed conditions (e.g., Gutiérrez, 2012). Recently, however, it has been argued that the alleged implicit knowledge accessed by GJTs in some studies may actually have been automatized explicit knowledge (see the discussion in Maie & DeKeyser, 2020). The present study using untimed GJTs was not designed to address such fundamental issue, though some intriguing differences in the results of the grammatical and ungrammatical sets are observed and discussed.

The ListT was scored following the OPT test instructions. For the GJT, the learners' accuracy scores were calculated for all the test items (out of a possible 52 points), as well as separately for the grammatical (G-GJT) and ungrammatical (U-GJT) sentences (26 points each). Answers in the MKT were scored as correct and incorrect (1/0 points). The criteria were agreed after several cycles of discussion of all the answers obtained for each sentence by two raters. Correct answers consisted of age-adequate explanations of the errors that showed recognition of the relevant grammatical rule. Incorrect answers consisted of corrections without explanations, or wrong or irrelevant explanations (see example below).

Example:

Prompt: Did Martin *lived* in Africa?

Correct: es live porque ya has puesto did

Transl.: it's "live" because you already put "did"

Incorrect: tendría que haber el past perfect

Transl.: there should be the past perfect

Data collection took place in two separate sessions one week apart. Each session lasted about 40 minutes. In the first session, the participants completed the background questionnaire, the ListT and the out-of-school exposure questionnaire. In the second session, they took the GJT and the MKT.

4.2.3. Data analysis

To address the comparison in the first research question between the two participant groups, independent-sample *t*-tests were performed. Additionally, the association between the different language measures was explored by means of Spearman-rank correlations. To address the comparison in the second research question between percentage frequency of engagement in different English-related activities by the two participant groups, Mann-Whitney *U* tests were calculated. Finally, to address the third research question and explore the strength of the association between the different out-of-classroom activities and the different language measures of the two participant groups, Spearman-rank correlations were performed.

5. Results

5.1. Language measures

To answer the first research question inquiring about differences in the levels attained in a set of tests, descriptive statistics were calculated first (see Table 1). The average score of the Danish group in the ListT corresponds to a level of C1

in the Common European Framework of Reference for Languages (CEFR) and the score of the Spanish group to a level of B2.³

Table 1 Descriptive statistics for the language tests

	Danish sample			Spanish sample		
	Mean % (SD)	Max. %	Min. %	Mean % (SD)	Max. %	Min. %
ListT	80.73 (5.98)	94	62	70.03 (7.42)	86	45
MKT	25.50 (2.39)	80	0	56.90 (2.09)	100	20
GJT	80.94 (4.74)	96.15	51.92	71.42 (6.38)	92.31	34.61
G-GJT	86.96 (2.60)	100	57.69	82.07 (3.63)	100	30.77
U-GJT	74.92 (2.95)	96.15	46.15	60.77 (3.90)	88.46	23.07

Note. LisT = Listening comprehension test; MKT = Metalinguistic knowledge test; GJT = Grammaticality judgment test; G-GJT = Grammatical sentences in GJT; U-GJT = Ungrammatical sentences in GJT

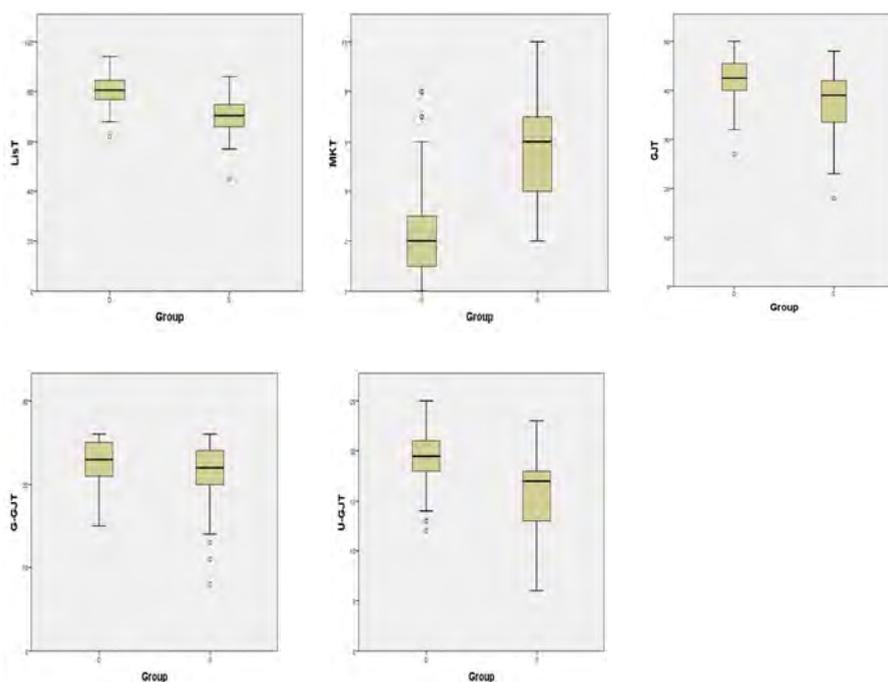


Figure 1 Boxplots depicting test scores of the Danish (D) and the Spanish (S) samples (LisT = Listening comprehension test; MKT = Metalinguistic knowledge test; GJT = Grammaticality judgment test; G-GJT = Grammatical sentences in GJT; U-GJT = Ungrammatical sentences in GJT)

³ The OPT reports scores aligned to the CEFR for the whole test: the grammar and the listening comprehension sections (max.: 100 points each); only a rough equivalence can be estimated for one of the sections.

The boxplots in Figure 1 show a few acceptable outliers, and a negatively skewed distribution in the Spanish group's GJT and U-GJT scores. To determine whether these differences were significant, independent-sample *t*-tests were computed to compare the scores in each test; as the Levene test showed that variances of the GJT and the U-GJT were unequal, the *t*-values for unequal variances were used. The results showed that all the scores were significantly different (Bonferroni adjusted alpha level: .01) except for the difference between scores in the G-GJT: ListT: $t = 8.952, p < .001, d = 1.54$; MKT: $t = 8.098; p < .001, d = 1.40$; GJT: $t = 5.188, p < .001, d = .77$; U-GJT: $t = 6.261, p < .001, d = .94$. Thus, the Spanish group outperformed the Danish group on the MKT, the Danish group outperformed the Spanish group on the ListT, the (total) GJT, the U-GJT, and the G-GJT, but in this last case the difference was not significant after Bonferroni correction ($t = 2.244; p = .026, d = .35$). The effect sizes are large, except for the comparison of the GJT (medium), and of the G-GJT (small). Non-parametric tests (Mann-Whitney *U*) were also run on these data and the results confirmed significant differences in all comparisons ($p < .001$), except for G-GJT ($p = .052$).

Table 2 Correlations for scores on the language tests

		ListT	MKT
LisT	D		
	S		
MKT	D	.307*	
	S	.222*	
GJT	D	.608**	.415**
	S	.337**	.646**
G-GJT	D	.511**	.122
	S	.246*	.604**
U-GJT	D	.441**	.538**
	S	.286*	.537**

Note. ** $p \leq .01$, * $p \leq .05$. D = Danish sample; S = Spanish sample. LisT = Listening comprehension test; MKT = Metalinguistic knowledge test; GJT = Grammaticality judgement test; G-GJT = Grammatical sentences in GJT; U-GJT = Ungrammatical sentences in GJT

Spearman rank correlations were computed to examine the relationship between the various measures for the two samples. As shown in Table 2, most correlations were medium in size. The correlations of LisT with the other measures were stronger for the Danish sample than for the Spanish sample.

5.2. Frequency of exposure to English

The second research question addressed the frequency with which the two groups engaged in different types of out-of-school exposure. As shown in Table 3, the Danish group generally reported a higher frequency of exposure than the

Spanish group. A series of Mann-Whitney U tests showed that differences were small in terms of the frequency with which the two groups listened to songs, engaged in single player gaming and viewed audiovisual input with English subtitles. Significant differences were found in relation to viewing with L1 subtitles ($U = 2836.50$, $p = .008$), viewing without subtitles ($U = 3368.50$, $p = .000$), speaking in English ($U = 2936.50$, $p = .001$), writing in English ($U = 2997$, $p = .000$), and multi-player gaming ($U = 2658$, $p = .023$). After Bonferroni correction for multiple comparisons (adjusted alpha value .0055), significant differences were still found for viewing without subtitles, speaking and writing.

Table 3 Percentage frequency for weekly exposure to English

		Never	< 1h	1h-2h	2h-3h	3h-4h	4h-5h	5h-6h	> 6 hours
Viewing	D	17.9	12.5	10.7	14.3	8.9	8.9	8.9	17.9
L1 subtitles	S	27.5	15	23.8	7.5	10	7.5	3.8	5.1
Viewing	D	26.8	26.8	26.8	7.1	5.4	3.6	1.8	1.8
English subtitles	S	36.3	28.8	23.8	6.3	2.5	--	2.5	--
Viewing	D	5.4	19.6	19.6	8.9	8.9	12.5	12.5	12.5
no subtitles	S	38.8	21.3	22.5	5	2.5	2.5	--	6.4
Listening to songs	D	--	7.1	19.6	17.9	7.1	14.3	14.3	19.7
	S	1.3	8.8	21.3	8.8	12.5	11.3	18.8	16.3
Reading	D	10.7	42.9	26.8	16.1	--	1.8	--	1.8
	S	27.5	33.8	20	10	1.3	2.5	1.3	1.3
Speaking	D	14.3	33.9	23.2	8.9	7.1	1.8	1.8	9.0
	S	41.3	26.3	16.3	3.8	8.8	2.5	--	1.3
Writing	D	10.7	39.3	25.0	14.3	1.8	5.4	1.8	1.8
	S	27.5	50	13.8	2.5	3.8	1.3	--	--
Single-player	D	48.2	14.3	12.5	7.1	5.4	--	5.4	7.1
Gaming	S	55	20	7.5	3.8	1.3	1.3	5	5.1
Multiplayer	D	51.8	14.3	3.6	1.8	5.4	7.1	8.9	7.2
Gaming	S	66.3	15	6.3	3.8	2.5	1.3	--	3.8

Note. D = Danish sample; S = Spanish sample

5.3. Influence on language dimensions

To address the third research question that inquired about the association between the frequency of the different types of out-of-school exposure and the level attained in the different tests, Spearman rank correlations were computed (see Table 4). The first noticeable difference between the two samples concerned the significant correlations with viewing with L2 subtitles and without subtitles: numerous and positive for the Spanish sample, whereas the only significant one for the Danish sample, with GJT, was negative. Another interesting difference concerns the significant correlations with reading only for the Spanish group, and with speaking only for the Danish group. With regard to the similarities, the negative direction of almost all correlations with viewing with L1 subtitles in both groups

and the absence of significant correlations with listening to songs and writing in both groups are interesting findings. Also noticeable are the significant negative correlations with gaming, especially for the Spanish group.

Table 4 Summary of correlations of language test scores and exposure frequencies

		ListT	MKT	GJT	G-GJT	U-GJT
Viewing	D	-.161	.121	-.084	-.073	-.070
L1 subtitles	S	-.039	-.198	-.101	-.064	-.147
Viewing	D	-.169	-.120	-.289*	-.179	-.259
English subtitles	S	.320**	.250*	.250*	.244*	.160
Viewing	D	.237	-.041	.232	.210	.190
no subtitles	S	.176	.057	.337**	.282*	.299**
Listening to	D	-.060	-.048	.027	.175	-.112
songs	S	.184	.019	.070	.142	-.015
Writing	D	.039	-.205	.156	.183	.089
	S	-.046	-.096	-.014	-.051	.021
Reading	D	-.013	-.184	.192	.173	.165
	S	.158	.231*	.231*	.172	.219
Speaking	D	.137	-.159	.289*	.318*	.220
	S	-.011	.027	.089	.108	.042
Single-player	D	.047	-.273*	-.023	.021	-.029
Gaming	S	.033	-.190	-.171	-.222*	-.116
Multiplayer	D	.235	-.188	.128	.213	.043
Gaming	S	-.048	-.350**	-.340**	-.317**	-.328**

Note. ** $p \leq .01$, * $p \leq .05$. D = Danish sample; S = Spanish sample

6. Discussion

This study investigated the performance on different language measures of two groups of learners in environments that differ in the amount of context exposure and linguistic distance from English. It compared the frequency of their out-of-school exposure by means of different activities and related these frequencies to language test scores.

The first research question compared the levels of attainment of the two learner groups in three different tests. The comparison showed that the Danish group, in an English-rich environment and with a shorter linguistic distance from English, attained significantly higher levels on all the tests except for the MKT. This result generally concurs with the results by Azzolini et al. (2020), showing that the shorter the distance between English and the national language, the higher the average English competence. In line with the usage-based assumption of language learning being rooted in concrete usage events, the Danish learners' superior listening comprehension was predicted because of their exposure to spoken English through a variety of media, as found in studies in similar environments such as Flanders (De Wilde & Eyckmans, 2017) and because of the language proximity

and shared cognates, as also shown in studies with Dutch (De Wilde et al., 2020a; Puimège & Peters, 2019) and Danish children (Muñoz et al., 2018). Similarly, the Spanish learners' superior performance in the metalinguistic task was predicted given their longer period of English instruction, and thus, a longer exposure to usage events that are more form-focused and conducive to the development of declarative knowledge on the part of the learner. No prediction was made concerning the GJT, on which the Danish group also showed an advantage.

The correlations of the GJT with the other measures differed in the two groups in an interesting way. In the Danish group, the correlation between the GJT and the ListT was large, and larger than that with the MKT. Moreover, the correlation between the G-GJT and the MKT was not significant, while that between the U-GJT and the MKT was medium to high. This finding echoes previous research using a Principal Factor Analysis which found that grammatical and ungrammatical sentences loaded in different components deemed to represent implicit and explicit knowledge respectively (Ellis, 2009; Gutiérrez, 2012), or automatized explicit and explicit knowledge (see Note 2). Conversely, in the Spanish group these correlations with the MKT were all medium to high, suggesting that the learners may have mainly resorted to explicit knowledge. A tentative explanation for these findings is that the Danish learners may have learned the target constructions mostly incidentally through their cumulative higher exposure to the correct versions of those constructions in out-of-school English-related activities (though learners may have been made aware of underlying rules through classroom instruction). In fact, the Danish learners may have resorted to both implicit and explicit knowledge in their performance (Ellis, 2005). In contrast, the most important source of knowledge of the Spanish learners when performing both the MKT and GJT may have been classroom instruction.

The different association patterns between the Danish and Spanish performance in the MKT and the GJT seem to provide support for the role of token and type frequency in usage-based accounts of L2 learning. Repeated exposure to English language samples over the years has presumably provided Danish learners (and less so their Spanish counterparts) with many opportunities to experience high token frequencies of particular linguistic items and high type frequencies of various linguistic material in given constructions, and thus facilitated the emergence of more abstract linguistic schemata (see Muñoz et al., 2018 for a similar argument). This finding, though still preliminary given the correlational nature of the data in the current study, suggests that, in line with usage-based approaches to L2 learning, implicit and/or incidental L2 learning is possible when learners have the chance to interact with large amounts of language samples in informal contexts (see Sockett & Toffoli, 2012).

In response to the second research question, the out-of-school questionnaires revealed that the contact with English outside school was higher for the

Danish group, as expected, particularly so in activities such as viewing audiovisual material without subtitles, with L1 subtitles, and speaking, writing and multiplayer gaming. These results are in line with previous studies conducted in Flanders with adolescents (Peters, 2018) and slightly younger participants (De Wilde et al., 2020b) as well as in a study with 10-year-olds from seven different European countries (Lindgren & Muñoz, 2013). The most frequent types of exposure in these studies included listening to songs, watching films or TV and gaming. This coincidence suggests a general age-related pattern for the young in this geographical region (see also Muñoz, 2020).

The third research question addressed the association of the English-related activities with the language measures in the two learning environments. The correlations found were small and small-to-medium and so, even though they suggest interesting tendencies, these findings should be considered preliminary. First, in relation to the LisT scores, it was predicted that they would be associated especially with leisure activities. The results did not support the prediction since there was only a significant positive correlation with viewing with English subtitles in the Spanish group. Interestingly, though the correlations with audiovisual input for the Danish group were not significant, they were negative for viewing with English and Danish subtitles. The direction of the relationship, surprising at first sight, may be related to Danish teenagers' practice of watching TV in English with Danish subtitles from a very early age (Muñoz et al., 2018). As they grow older and their comprehension improves, they may become used to accessing the easily available digital contents without subtitles, and only those with lower proficiency level may choose Danish or English subtitles. This tentative explanation may also apply to the negative relationship, not significant but consistent in the Spanish group, between the LisT scores and viewing L1-subtitled audiovisual material. As for the correlations of LisT scores with viewing audiovisual input without captions, they were positive for both groups and approaching significance for the Danish learners, who watch audiovisual input without on-screen text much more often. The possibility that this frequent practice benefited their listening skills is supported by research indicating that viewing non-captioned video is especially beneficial for the aural recognition of word forms (Sydorenko, 2010).

Second, regarding MKT scores, it was predicted that they would be particularly associated with reading and writing, the most literacy-related activities. The results only confirmed a positive significant correlation with reading in the Spanish group, which is in line with the findings by Muñoz (2020), showing that reading had the strongest link with class grades in a large sample of Spanish learners.

With regard to GJT scores, no prediction was made but two interesting significant correlations of G-GJT (the sub-set allegedly associated with implicit or automatized explicit learning) were found: with viewing with English subtitles

for the Spanish group and with speaking for the Danish group, two activities associated with out-of-school learning.

Finally, focusing on the out-of-school activities, it is interesting that viewing English-spoken videos was more strongly associated with linguistic measures for the Spanish learners, probably because of the lack of variability in the Danish group. As seen above, and though we can only talk of a tendency because the correlations are not significant, the direction of the relationship was negative for viewing videos with English subtitles for the Danish group and for viewing with L1 subtitles for both groups except for MKT scores in the Danish group. De Wilde et al. (2021) found a significant negative association between viewing with L1 subtitles and measures of receptive vocabulary, speaking skills, and overall language proficiency in a study with Dutch-speaking Flemish school learners. According to these authors, this result may indicate that lower proficiency learners prefer input supported by L1 subtitles, whereas more proficient learners prefer 'English-only' input. However, this does not rule out the possibility that language learning takes place for less proficient learners while watching television with L1 subtitles, as observed for listening and reading skills by Lindgren and Muñoz (2013) and for class grades by Muñoz (2020).

The associations of gaming with language scores are also worthy of consideration because of the predominantly negative relationship, especially in the Spanish group. Spanish learners presented significant negative associations with the MKT and the GJT, and their scores seemed to be more dependent on school instruction for this group. Studies in Flanders (e.g., De Wilde & Eyckmans, 2017; De Wilde et al., 2020b; Puimège & Peters, 2019), Denmark (Hannibal Jensen, 2017) and Sweden (e.g., Sundqvist & Wikström, 2015; Sylvén & Sundqvist, 2012) have found the amount of gaming in English to be positively related to different language measures, including receptive vocabulary size, speaking, reading, and writing skills. However, no significant association was found in other studies with similar learner samples (Muñoz et al., 2018 for Denmark; Peters, 2018 for Flanders), while a significant negative association for Spanish learners was observed in one large survey (Muñoz, 2020). Muñoz (2020) reflected that participants with lower grades (possibly less academically oriented) may have engaged in gaming more often. Additionally, perhaps gaming takes away time from other activities that are more effective and adequate for lower-level learners. All in all, these mixed results may reflect differences in the types of games that are chosen in the different contexts (Kuppens, 2010; Sylvén & Sundqvist, 2012), their lexical profiles (Rodgers & Heidt, 2021), learners' proficiency level and even what learners do when playing games (Hannibal Jensen, 2017).

7. Conclusion

The present study has shed some new light on the unexplored issue of differences in English learning arising from divergences in the weight of in-school and out-of-school learning and in the degree of social penetration of English and linguistic distance from this language. Despite the exploratory nature of the study, its findings make several relevant contributions. It has shed light on the ways in which English language learning may be affected by different combinations of classroom instruction and out-of-the classroom exposure and, hereby, it has provided support for the experientialist view of language acquisition in usage-based accounts of L2 learning, that is, the fact that language knowledge is viewed as emerging ontogenetically from participation in particular usage events (Tomasello, 2003). The study has also provided a comparison of the amount and types of out-of-school exposure in which same-age teenagers in a more or less English-rich environment engage. By contrasting the association between these different types of input with learners' performance on the different tests, the study has indicated that this association may show different directions and be dependent on learners' cultural habits (i.e., dubbed or undubbed TV) and, probably, on their proficiency.

The results have several pedagogical implications for teachers. First of all, teachers need to recognize the singularities of present-day English learners as learners of a global language that is increasingly present in their daily lives. It is important that they are aware of the types of activities in which learners engage with English in their free time and the effect that this contact with English may have on their proficiency level. Likewise, it is important that teachers train students to exploit the advantages of informal input and that they recommend proficiency-appropriate activities. Last, by recognizing the characteristics of the English knowledge that is acquired beyond the classroom (i.e., vocabulary pertaining to topics not addressed in the classroom, colloquial expressions), teachers can integrate it into the classroom setting (e.g., in the development of learning tasks and the content of language tests).

Several limitations in this study should be addressed in future research. First, the tests used here addressed only certain dimensions of language proficiency and did not include measures of production and interaction. In addition, the reliability of the MKT was acceptable but low, probably due to the small number of items. Another limitation is the fact that the teaching approaches in the two environments may have differed over the years for different students, which is something that could not be controlled. This study used cross-sectional correlational data, which do not warrant the directionality of causality, and future studies could investigate the relative effect of different activities on learning gains in relation to specific populations. Additionally, further research with other language

pairs could disentangle the relative impact of the amount of out-of-classroom exposure and linguistic distance. For now, the present study has contributed to highlighting this joint effect that characterizes most previous studies in this line of research, suggesting that the influence of different activities on different language outcomes is context-dependent. This finding, which is also highlighted by Azzolini et al. (2020), provides a more nuanced perspective than previous work conducted in single geographical contexts, and especially in those with a joint effect of high amount of exposure and short linguistic distance.

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References

- Azzolini, D., Campregher, S., & Madia, J. E. (2020). Formal instruction vs informal exposure: What matters more for teenagers' acquisition of English as a second language? *Research Papers in Education*, 1-29. <https://doi.org/10.1080/02671522.2020.1789718>
- Bybee, J. (1995). Regular morphology and the lexicon. *Language and Cognitive Processes*, 10, 425-455.
- Cadierno, T., & Eskildsen, S. W. (Eds.). (2015). *Usage-based perspectives on second language learning*. Mouton de Gruyter.
- Cadierno, T., Hansen, M., Lauridsen, J. T., Eskildsen, S. W., Fenyvesi, K., Hannibal Jensen, S., & aus der Wieschen, M. V. (2020). Does younger mean better? Age of onset, learning rate and short-term L2 proficiency in young Danish learners of English. *VIAL*, 17, 57-86.
- de Bot, K. (2014). The effectiveness of early foreign language learning in the Netherlands. *Studies in Second Language Learning and Teaching*, 4(3), 409-418. <https://doi.org/10.14746/sslIt.2014.4.3.2>
- DeKeyser, R. M. (2012). Age effects in second language learning. In S. Gass & A. Mackey (Eds.), *Handbook of second language acquisition* (pp. 442-460). Routledge.
- De Wilde, V., & Eyckmans, J. (2017). Game on! Young learners' incidental language learning of English prior to instruction. *Studies in Second Language Learning and Teaching*, 7(4), 673-694. <https://doi.org/10.14746/sslIt.1017.7.4.6>
- De Wilde, V., Brysbaert, M., & Eyckmans, J. (2020a). Learning English through out-of school exposure: How do word-related variables and proficiency influence receptive vocabulary learning? *Language Learning*, 70(2), 349-381.
- De Wilde, V., Brysbaert, M., & Eyckmans, J. (2020b). Learning English through out-of school exposure. Which levels of language proficiency are attained and which types of input are important? *Bilingualism: Language and Cognition*, 23(1), 171-185.
- De Wilde, V., Brysbaert, M., & Eyckmans, J. (2021). Young learners' L2 English after the onset of instruction: Longitudinal development of L2 proficiency and the role of individual differences. *Bilingualism: Language and Cognition*, 24(3), 1-15. <https://doi.org/10.1017/S1366728920000747>
- Doughty, C. (2003). Instructed SLA: Constraints, compensation, and enhancement. In M. Long & C. Doughty (Eds.), *Handbook of Second Language Acquisition* (pp. 257-310). Blackwell.
- Dyen, I., Kruskal, J. B., & Black, P. (1992). An Indoeuropean classification: A lexicostatistical experiment. *Transactions of the American Philosophical Society*, 82(5), iii-132.

- Ellis, N. C. (2002). Frequency effects in language processing: A review with implications for theories of implicit and explicit language acquisition. *Studies in Second Language Acquisition*, 24, 143-188. <https://doi.org/10.1017/S0272263102002024>
- Ellis, N. C. (2005). At the interface: Dynamic interactions of explicit and implicit language knowledge. *Studies in Second Language Acquisition*, 27, 305-352.
- Ellis, N. C., & Cadierno, T. (2009). Constructing a second language: Introduction to the special section. *Annual Review of Cognitive Linguistics*, 7, 111-139.
- Ellis, R. (2009). Measuring implicit and explicit knowledge of a second language. In R. Ellis, S. Loewen, C. Elder, R. Erlam, J. Philip, & H. Reinders (Eds.), *Implicit and explicit knowledge in second language learning, testing and teaching* (pp. 31-64). Multilingual Matters.
- Ellis, R., Loewen, S., Elder, C., Erlam, R., Philip, J., & Reinders, H. (Eds.). (2009). *Implicit and explicit knowledge in second language learning, testing and teaching*. Multilingual Matters.
- European Commission. (2012). *First European survey on language competences: Education and training*. Publications Office of the European Union.
- Gass, S., Winke, P., Isbell, D., & Ahn, J. (2019). How captions help people learn languages: A working-memory, eye-tracking study. *Language Learning & Technology*, 23(2), 84-104.
- Greenberg, J. H. (2001). The methods and purposes of linguistic genetic classification. *Language and Linguistics*, 2, 111-135.
- Grønnum, N. (2001). *Fonetik og fonologi: Almen og dansk*. Akademisk Forlag.
- Gutiérrez, X. (2012). Implicit knowledge, explicit knowledge, and achievement in second language (L2) Spanish. *The Canadian Journal of Applied Linguistics*, 15(1), 20-41
- Hannibal Jensen, S. (2017). Gaming as an English language learning resource among young children in Denmark. *CALICO Journal*, 34(1), 1-19. <https://doi.org/10.1558/cj.29519>
- Huang, B. H., Shawn Chang, Y-H., Zhi, M., & Niu, L. (2020). The effect of input on bilingual adolescents' long-term language outcomes in a foreign language instruction context. *International Journal of Bilingualism*, 24(1), 8-25.
- Johannsdóttir, Á. (2018). English exposure and vocabulary proficiency at the onset of English instruction. In B. Arnbjörnsdóttir & H. Ingvarsdóttir (Eds.), *Language development across the life-span: The impact of English on education and work in Iceland* (pp. 57-78). Springer International Publishing.
- Kuppens, A. H. (2010). Incidental foreign language acquisition from media exposure. *Learning, Media and Technology*, 35(1), 65-85.
- Langacker, R. W. (1987). *Foundations of cognitive grammar, vol. 1: Theoretical prerequisites*. Stanford University Press.

- Lee, M., & Révész, A. (2020). Promoting grammatical development through captions and textual enhancement in multimodal input-based tasks. *Studies in Second Language Acquisition*, 42(3), 577-598. <https://doi.org/10.1017/S0272263120000108>
- Lindgren, E., & Muñoz, C. (2013). The influence of exposure, parents, and linguistic distance on young European learners' foreign language comprehension. *International Journal of Multilingualism*, 10(1), 105-29. <https://doi.org/10.1080/14790718.2012.679275>
- Long, M. H. (2020). Optimal input for language learning: Genuine, simplified, elaborated, or modified elaborated? *Language Teaching*, 53(2), 169-182.
- Maie, R., & DeKeyser, R. (2020). Conflicting evidence of explicit and implicit knowledge from objective and subjective measures. *Studies in Second Language Acquisition*, 42(2), 359-382. <https://doi.org/10.1017/S027226319000615>
- Mayer, R. (Ed.). (2014). *The Cambridge handbook of multimedia learning*. Cambridge University Press.
- Muñoz, C. (2006). The effects of age on foreign language learning: The BAF project. In C. Muñoz (Ed.), *Age and the rate of foreign language learning* (pp. 1-40). Multilingual Matters.
- Muñoz, C. (2011). Is input more significant than starting age in foreign language acquisition? *International Review of Applied Linguistics in Language Teaching (IRAL)*, 49, 113-133.
- Muñoz, C. (2014). Contrasting effects of starting age and input on the oral performance of foreign language learners. *Applied Linguistics*, 35(4), 463-482.
- Muñoz, C. (2020). Boys like games and girls like movies: Age and gender differences in out-of-school contact with English. *Revista Española de Lingüística Aplicada*, 33(1), 171-201. <https://doi.org/10.1075/resla.18042.mun>
- Muñoz, C., Cadierno, T., & Casas, I. (2018). Different starting points for early English language learning: A comparative study of Danish and Spanish young learners. *Language Learning*, 68(4), 1076-1109.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.
- Pattemore, A., & Muñoz, C. (2020). Learning L2 constructions from captioned audio-visual exposure: The effect of learner-related factors. *System*, 93, 1-13.
- Peters, E. (2018). The effect of out-of-school exposure to English language media on learners' vocabulary knowledge. *ITL – International Journal of Applied Linguistics*, 169(1), 142-167.
- Peters, E., Noreillie, A., Heylen, K., Bulté, B., & Desmet, P. (2019). The impact of instruction and out-of-school exposure to foreign language input on learners' vocabulary knowledge in two languages. *Language Learning*, 69, 943-977.

- Peters, E., & Webb, S. (2018). Incidental vocabulary acquisition through viewing L2 television and factors that affect learning. *Studies in Second Language Acquisition, 40*(3), 551-77. <https://doi.org/10.1017/s0272263117000407>
- Puimège, E., & Peters, E. (2019). Learners' English vocabulary knowledge prior to formal instruction: The role of learner-related and word-related variables. *Language Learning, 69*(4), 943-977. <https://doi.org/10.1111/lang.12364>
- Pujadas, G., & Muñoz, C. (2019). Extensive viewing of captioned and subtitled TV series: A study of L2 vocabulary learning by adolescents. *The Language Learning Journal, 47*(4), 479-496.
- Rodgers, M. P. H., & Heidt, J. (2021). Levelling up comprehensible input and vocabulary learning: The lexical profile of videogames. In W. Valentin & R. Tegge (Eds.), *Pop culture in language education* (pp. 215-227). Routledge.
- Saito, K., & Hanzawa, K. (2018). The role of input in second language oral ability development in foreign language classrooms: A longitudinal study. *Language Teaching Research, 22*, 398-417. <https://doi.org/10.1177/1362168816679030>
- Sockett, G., & Toffoli, D. (2012). Beyond learner autonomy: A dynamic systems view of the informal learning of English in virtual online communities. *ReCALL, 24*, 138-151. <https://doi.org/10.1017/S0958344012000031>
- Sun, H., Steinkrauss, R., Tendeiro, J., & de Bot, K. (2016). Individual differences in very young children's English acquisition in China: Internal and external factors. *Bilingualism: Language and Cognition, 19*, 550-566. <https://doi.org/10.1080/13670050.2016.1178706>
- Sundqvist, P., & Sylvén, L. K. (2014). Language-related computer use: Focus on young L2 English learners in Sweden. *ReCALL, 26*, 3-20. <https://doi.org/10.1017/S0958344013000232>
- Sundqvist, P., & Sylvén, L. K. (2016). *Extramural English in teaching and learning: From theory and research to practice*. Palgrave Macmillan.
- Sundqvist, P., & Wikström, P. (2015). Out-of-school digital gameplay and in-school L2 English vocabulary outcomes. *System, 51*, 65-76. <https://doi.org/10.1016/j.system.2015.04.001>
- Sydorenko, T. (2010). Modality of input and vocabulary acquisition. *Language Learning & Technology, 14* (2), 50-73.
- Sylvén, L. K., & Sundqvist, P. (2012). Gaming as extramural English L2 learning and L2 proficiency among young learners. *ReCALL, 24*(3), 302-321. <https://doi.org/10.1017/S095834401200016X>.
- Tomasello, M. (2003). *Constructing a language: A usage-based theory of language acquisition*. Harvard University Press.
- Unsworth, S., Persson, L., Prins, T., & de Bot, K. (2015). An investigation of factors affecting early foreign language learning in the Netherlands. *Applied Linguistics, 36*, 527-548. <https://doi.org/10.1093/applin/amt052>

- Verspoor, M. H., de Bot, K., & van Rein, E. (2011). English as a foreign language: The role of out-of-school language input. In A. De Houwer & A. Wilton (Eds.), *English in Europe today: Sociocultural and educational perspectives* (pp. 148-166). John Benjamins.
- Webb, S., & Rodgers, M. P. H. (2009). The vocabulary demands of television programs. *Language Learning*, 59(2), 335-66.
- Wisnieska, N., & Mora, J. C. (2020). Can captioned video benefit second language pronunciation? *Studies in Second Language Acquisition*, 42(3), 599-624. <https://doi.org/10.1017/S0272263120000029>

APPENDIX A

Background questionnaire

Please tell us with which frequency you do the following activities IN A REGULAR WEEK.

Ex. 1. Per week, with which frequency do you see films, series, videos, videoclips, vblogs, etc. in English with English subtitles?

- | | | | |
|--|--|------------------------------------|--|
| <input type="checkbox"/> I don't do this | <input type="checkbox"/> Less than 1 h | <input type="checkbox"/> 1 h - 2 h | <input type="checkbox"/> 2 h - 3 h |
| <input type="checkbox"/> 3 h - 4 h | <input type="checkbox"/> 4 h - 5 h | <input type="checkbox"/> 5 h - 6 h | <input type="checkbox"/> More than 6 h |

If more than 6 hours, please specify how many:

Ex. 2. . . . read in English online (webpages, blogs, etc.) or in paper (books, magazines, comics, etc.)?

APPENDIX B

Grammatical structures in the GJT and examples of learner error

Ex. 1. Verb complementation

Louis says he wants *buying* a new car.

Ex. 2. Regular past tense

2. Martin *completed* his assignment yesterday.

APPENDIX C

Metalinguistic knowledge test

INSTRUCTIONS: The words that are italicized make these sentences ungrammatical. Say why using your own words. You don't need to correct them. Here is an example:

He likes going to *partyes*

Some words that finish in "y," like "party," make the plural adding "ies."

Ex. 1. Victoria *live* with her friend Helen.

Ex. 2. This building is *more smaller* than your house.