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Different starting points for early language learning: A comparative study of Danish and Spanish young learners of English

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Introduction

Research on young learners has shown clear differences in their use of and attainment in English as a foreign language (EFL). Differences can be due to a myriad of factors, both internal and external to the language learner (e.g., Sun, Steinkrauss, Tendeiro, & de Bot, 2016; Unsworth, Hulk & Marinis, 2011). An important factor that has not received enough attention in second language[1] (L2) learning research is the linguistic distance between the learners' first language (L1) and their L2, despite the common acknowledgment that different amounts of instruction hours are needed to learn less or more distant languages. Even though Danish, and Spanish and Catalan are ranked at the same level of difficulty (US Foreign Service Institute, http://web.archive.org/web/20071014005901/http://www.nvtc.gov/lotw/months/november/learningExpectations.html), they differ in their genealogical classification with respect to English, that is, in terms of their degree of diachronic relatedness. Whereas Spanish and Catalan are Romance languages, Danish is part of the North Germanic languages and thus genetically closer to English (i.e., Greenberg, 2001; Ruhlen, 1991).

An external factor that is receiving increased attention is the amount and quality of contact with the target language (TL), not only inside the classroom but also beyond the school context. This change in focus is largely motivated by the status of English as a global language and the informal access to social media (Kusyk & Sockett, 2012). Although the majority of Europeans use the Internet on a regular basis (72% in 2014 and 75% in 2014) and they are eager to access audiovisual content online (most of it in English) (http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard), variation across European countries is observed. Denmark ranks 1st among the 28 EU member States with Danish citizens being the most advanced in the use of Internet whereas Spain occupies the 15th position in the rank. In addition to variation in digital performance, European countries also differ with respect to the language in which films and programs are shown in television media. In many countries (e.g., Denmark and Portugal) foreign (mostly English speaking) television programs and movies are seen in the original language with subtitles provided in the home language. In contrast, in other countries (e.g., Spain and Germany), there is a long tradition of dubbing television films and programs into the country's home language, thus reducing the opportunities to be exposed to English (and other languages) outside the academic context.

The present study compares the development of English receptive skills (specifically, grammar) by two age groups (7 vs. 9) of primary school learners in two different contexts, Denmark and Spain. In explaining possible differences in English receptive skills development, the study focused on the influence of two language-related factors, receptive vocabulary skills and cognate linguistic distance, and two context-related factors, amount of formal instruction and frequency of contact with English outside the school.

Theoretical Background

Linguistic distance

An influential factor in L2 learning is the linguistic distance between the previously learned language/s and the TL. According to the "facilitation hypothesis", the L1 can facilitate the acquisition of an L2 provided that the two languages are linguistically alike (Gundel & Tarone, 1992). Similarly, it has been argued that the larger the linguistic distance between the L1 and the L2, the lower the L2 learnability, defined as the degree to which the L1 facilitates or impedes the learning of an L2 (Schepens, Van der Slik, & Van Hout, 2016). Cognate linguistic distance, a measure of linguistic distance that relies on the lexical similarity between words in different languages (e.g., Dyen, Kruskal, & Black, 1992), has been found to be a very strong predictor of L2 learning success (Van der Slik, 2010). Cognates or crosslinguistic cognates are defined as word pairs in two different languages that share both meaning (translation equivalents) and form (phonological or orthographic similarity) (Kohnert, Windsor, & Miller, 2004). This simple definition implies three types of cognates: words that are phonologically similar and orthographically identical; words that are phonologically similar but orthographically different, and false cognates in which words are phonologically and orthographically similar but not related in meaning (Rodriguez, 2001).

In studies of language processing by bilinguals it has been found that cognate words are easier and faster to recognize than non-cognate words (the "cognate facilitation effect", e.g., Kroll & Dijstra, 2002). Cognates are also easier to learn and integrate in the lexicon because the lexico-semantic representations of new L2 words are better established when they overlap with the native language at form-based linguistic levels (orthography and phonology) (De Groot & van Hell, 2005; Ellis & Beaton, 1993). From the perspective of crosslinguistic distance (CLI) in SLA, cognates

have been approached as a particular case of resemblance between languages and they have been shown to have a facilitative effect, especially in receptive tasks (Ringbom, 2007). On the other hand, false cognates are an example of how lexical closeness may mislead learners and, more generally, of the learning difficulties that may be caused by CLI (see Otwinowska, 2016). Other studies have focused on the lexical transparency of cognates observing that this is one of the strongest factors that aid perception and repetition of the TL speech stream after minimal exposure (Rast, 2010).

Of special interest for the present study is research that focuses on the spontaneous recognition of cognates by young learners who have not been instructed to recognize them. Most of this research has been conducted with bilingual Spanish-English children and the evidence produced about these children's ability to use cognates as a vocabulary learning strategy or their ability to recognize cognates is mixed. Differences may have been caused by the type of test and, in particular, whether the test was written or oral, and if the latter, whether phonological cognates have been selected out of the larger group of linguistic cognates. In fact, there is empirical evidence, at least with adult L1-Spanish participants, that different results are obtained according to whether Spanish-English linguistic or phonological cognates are used in the analysis (Stadhagen-González, Mueller Gathercole, Pérez-Tattam, & Yavas, 2013). Mixed results have also been obtained in relation to an increase in cognate recognition by children with age or grade level. Malabonga, Kenyon, Carlo, August, and Louguit, (2008) found that the recognition of cognates increased with age in their first, third, and fifth graders, but the better performance of older children may have been related to their higher levels of orthography and literacy since the study used a written test (Cognate Awareness Test (CAT); August et al., 2001). Kelley and Kohnert (2012) investigated cognate recognition in a group of 8- to 13-year-olds and found that age predicted

significant amounts of variance in cognate performance on the receptive Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 1997). In contrast, and using an auditory test (the picture vocabulary subtest of the TOLD-P:3: Test of Language Development Primary; Newcomer & Hammill, 1997), Méndez Pérez, Peña, and Bedore (2010) failed to find differences in cognate recognition between kindergarten and first graders, though they found differences due to amount of language exposure.

In the present study with English as the TL and L1-Danish and L1-Spanish/Catalan learners, the amount and characteristics of cognates shared between L1 and L2 are of great importance. According to Dyen, Kruskal, and Black (1992), Danish and English share 59.3 percent of cognates, whereas Spanish and English share 24.0 percent and Catalan and English 23.6 percent. This means that the cognate linguistic distance between Spanish/Catalan and English doubles the cognate linguistic distance between Danish and English. In addition, the shared Germanic cognates between Danish and English are frequent words used in the daily lives of children (e.g., *bold* vs. *ball*; *kop* vs. *cup*) whereas Romance cognates shared between Spanish/Catalan and English tend to be less frequently used words in children's English (e.g., *córnea/còrnia* vs. *cornea*; *felino/felí* vs. *feline*) (Minkova & Stockwell, 2006). When looking at the possible influence of cognates in this study, the choice of type of cognates for the analysis is especially relevant because although Spanish/Catalan-English cognate words may be recognizable orthographically, most of them are not transparent phonologically. In contrast, Danish-English cognates are much closer in pronunciation and cognate recognition is easier. This study will use a measure of cognate recognition computed from the PPVT as an indicator of linguistic distance.

Young learners' contact with the TL

Research has shown the importance of time and intensity in foreign language (FL) learning, and it has been largely acknowledged that typical FL instruction, characterized as input-limited, may not be conducive to high proficiency levels (e.g., DeKeyser, 2007; Muñoz, 2012; Nunan, 1991; Rifkin, 2005). Research has also shown that input-limited FL instructed settings cannot provide young learners with the amount and quality of exposure to the TL needed for these learners to use implicit learning mechanisms to their advantage (DeKeyser, 2000; Muñoz, 2006b). At a time when Internet is providing unlimited exposure to and interaction possibilities in the TL, language learning is increasingly observed to happen outside the classroom.

Indeed, the role of out-of-school contact[2] with the TL is a relatively unexplored area that has attracted increased attention of second language acquisition (SLA) researchers in the last decade (see Sundqvist & Sylvén, 2016 for a recent volume on this topic). In contrast to the closely related area of out-of-school learning, where the focus is on intentional learning (e.g., Benson & Reinders, 2011), the focus on out-of-school contact is mainly on the opportunities for incidental learning that such contact with the TL provides. Incidental learning has been defined as the process of learning something without the intention of doing so. For example, incidental vocabulary learning is the "learning of vocabulary as the by-product of any activity not explicitly geared to vocabulary learning" (Hulstijn, 2001: 271). Following Rieder (2013), incidental learning can involve implicit learning processes (which take place without awareness) and/or explicit learning processes (which take place without learning intention but involve awareness).

Studies focusing on out-of-school contact have targeted university students (e.g., Sockett, 2014) and teenagers (e.g., Sundqvist & Wikström, 2015) but recently attention has been paid to how children benefit from activities they engage in out of the classroom, usually for entertainment, such as television and gaming. In the following we focus on studies conducted with primary school children. The findings from these studies generally show that out-of-school contact with an L2 through media and movies is beneficial for developing young learners' L2 proficiency.

Koolstra and Beentjes (1999) in an experiment with fourth and sixth graders found that children who had watched a Dutch-subtitled English language documentary performed significantly better in a vocabulary test than children who had seen the same English documentary but without subtitles and a control group who had watched a Dutch television program without subtitles. In addition, sixth graders performed better than fourth graders, and children who indicated frequently watching subtitled English TV programs outperformed those who indicated watching them with a low or mid frequency. Another experiment by d'Ydewalle and Van de Poel (1999) showed that short-term exposure to a non-familiar FL through watching subtitled television also had a positive effect on children's acquisition. Children were in grades 3, 4, 5 and 6. The tests involved vocabulary, morphology and syntax. The participants' L1 was Dutch and the target FLs were Danish and French, the former being more similar to Dutch than the latter. Dutch-subtitled short movies with soundtracks in the TLs were used after which the participants filled in a multiple-choice vocabulary questionnaire. When the TL was Danish and the L1 Dutch, there was a positive effect on vocabulary, which disappeared when the TL was French. This effect was stronger than the effect of instruction, since fifth and sixth graders had had French instruction from grade 5. No gains were observed in syntax for either TL and only modest gains in French morphology. These results

were largely confirmed in a later study by Van Lommel, Laenen, and d'Ydewalle (2006).

Kuppens (2010) investigated the extent to which long term consumption of media and, more specifically, subtitled television programs and movies, computer games and music affected the English proficiency of 11-year-old Flemish (Dutch-speaking) children as measured by oral English-to-Dutch and Dutch-to-English translations. The results of the study showed children who frequently watched English-subtitled television and movies performed significantly better on both types of translations, with the effect being stronger for girls than for boys. In addition, playing English computer games significantly influenced the English-to Dutch translation skills, but the effect was limited, which may be due to the fact that the survey did not distinguish between different types of games, Kuppens speculated.

As part of the Early Language Learning in Europe (ELLiE) project, Lindgren and Muñoz (2013) examined the impact of out-of-school factors on the listening and reading skills of 4th graders (10-11 years old) in seven European countries: Croatia, England, Italy, the Netherlands, Poland, Spain and Sweden. The results of the study showed that linguistic distance and out-of-school contact (e.g., watching films, playing games, and listening to music) were the strongest predictors of the students' listening and reading skills. The seven country contexts differed greatly in contact with the FL; a high level of contact was found in the Netherlands and Sweden, the two countries that are most closely related, linguistically, to the TL (English), but also in Croatia where the linguistic distance between the two languages (Croatian and English) is much larger. In addition, it was found that watching subtitled films was the most powerful type of exposure for both listening and reading.

Sundqvist and Sylvén (2014) investigated the degree to which 4th grade Swedish children (aged 10-11) engaged in English language-related activities outside of school, and the relationship between playing digital games and a number of factors, including children's gender, L1, motivation for learning English, self-assessed English ability and self-reported strategies for speaking English. Results from a questionnaire and a one-week language diary showed that the children engaged extensively in English activities out of class (M=7.2 hours/week), with boys spending significantly more time than girls in digital gaming and watching films.

In a qualitative study involving observations and semi-structured interviews, Turgut and Irgin (2009) examined Turkish children's experiences of language learning while playing digital games in English at Internet cafés. The results of this study suggest that children's involvement in online gaming has potential benefits for vocabulary learning. Children reported that in order to learn unknown words, they developed strategies such as guessing from the context, looking them up in an online dictionary, and asking friends sitting close by about meaning of unknown words.

In a study of direct relevance to the present investigation, Hannibal Jensen (2017) examined the extent to which Danish children aged 8 and 10 engaged in extramural English activities of different kinds, and focusing on gaming activities examined the extent to which there was a correlation between these and English receptive vocabulary. Following the methodology used by Sundqvist and colleagues, data on extramural habits were collected with a one-week language diary. The results of the study showed that children spent most time on gaming, listening to music and watching television. A gender difference was found in relation to gaming, with boys gaming significantly more than girls. In addition, gaming with both oral and written English input was significantly correlated with receptive vocabulary scores for all

groups except for younger girls who hardly gamed at all. In contrast, gaming with English written input was significantly correlated with vocabulary performance for older boys only, presumably because these children tended to pay more attention to the language of the games and combined their gaming with walkthroughs of gameplay on YouTube in order to get to higher levels in the games.

The merits of digital gaming for language learning were also shown in several studies in a special issue of *ReCALL* published in 2012. For example, Sylvén and Sundqvist (2012) examined whether L2 English reading and listening comprehension and vocabulary correlated with the frequency of gaming and the types of games played by Swedish young learners aged 11-12. Children who were frequent gamers (more than 5 hours/week) outperformed moderate gamers who, in turn, outperformed non-gamers. In addition, boys outperformed girls regarding L2 vocabulary, presumably because of the type of game favored among boys and girls, respectively, and the total amount of time invested in game play. Girls tended to prefer single-player simulation games whereas boys chose first-person shooter or multiplayer games which are considered more beneficial for L2 learning as they provide learners with opportunities for engagement with rich L2 input and scaffolded interaction.

In sum, the results of these studies highlight the important role of out-of-school contact in children's FL learning, while also indicating that there may be gender-related differences. Children can and do learn language through their engagement with out-of-classroom activities such as watching films and playing computer games. These findings support usage-based claims of language learning being experientially-based, and being largely implicit, that is, taking place without learners being conscious of it (Ellis & Wulff, 2008). This approach to language learning is reviewed in the following section.

Usage-based approach to language learning

Usage-based theories of language cover a whole family of approaches that share a particular view of language and language learning (for applications of usage-based models to L2 learning see Cadierno & Eskildsen, 2015; Ellis & Cadierno, 2009a; Robinson & Ellis, 2008). Language is seen as intrinsically linked to human cognition and as symbolic, that is, constituted by a structured inventory of constructions that are conventionalized form-meaning pairings used for communicative purposes (Langacker, 1987). Language knowledge thus consists of a continuum of linguistic constructions of different levels of complexity and abstraction, ranging from concrete and particular items (e.g., words or formulae as in *Once upon a time*) to more abstract classes of items (e.g., word classes and abstract constructions such as the passive construction) as well as complex combinations of concrete and abstract pieces of language (mixed constructions) (e.g., *Where's the X*? or *As soon as X*). This means that no rigid separation is posited between lexis and grammar (Langacker, 1987; Tomasello, 2003). In fact, and in line with this conception of language, research into early L1 acquisition has found a strong relationship between vocabulary and grammar. For example, in a study examining the development of vocabulary and grammar in German-speaking children aged between 1;6 and 2;6, Szagun, Steinbrink, Franik, and Stumper (2006) found that the different language skills (vocabulary, inflectional morphology and sentence complexity) were strongly related, with grammatical development increasing non-linearly in dependence on vocabulary. This confirms earlier findings that when language first emerges, the development of lexicon and grammar are strongly interdependent (Bates, Bretherton, & Snyder, 1988; Bates & Goodman, 1999; Marchman & Bates, 1994).

In addition, and directly relevant for the present study, language structure is considered to emerge ontogenetically from repeated usage in particular contexts (Tomasello, 2000). Usage-based models assume that language learning is input-dependent and experientially-based. Input-based, because the process of language learning is crucially shaped by the particular language patterns that learners are exposed to, and experientially-based, because conventional units or constructions are abstracted from the specific usage events that speakers participate in. Development is slow and gradual, moving from an initial reliance on concrete items to more abstract linguistic schema, thus following what is known as the item-based path of learning (Ellis, 2002; Ellis & Cadierno, 2009b).

A key aspect of usage is frequency. Following Ellis (2002: 144), frequency is a "key determinant of acquisition because 'rules' of language, at all levels of analysis (from phonology, through syntax, to discourse), are structural regularities that emerge from learners' lifetime analysis of the distributional characteristics of the language input." Psycholinguistic research shows that language users are sensitive to the input frequency of specific language patterns at all levels of language representation, including phonology, lexis, syntax and sentence processing (e.g., Ellis, 2002). Bybee (1995) distinguishes between two types of frequencies in relation to vocabulary acquisition: token frequency, which refers to the number of times a particular item (i.e., a particular word or a specific phrase) appears in the input, and type frequency, which refers to the frequency with which different lexical items can be applied to a specific pattern or construction, that is, the number of distinct lexical items that can occur in a given slot in a construction (e.g., different verbs in a given type of construction). For example, the regular English past tense morpheme *–ed* has a very high type frequency

as it applies to many different types of verbs, whereas the vowel change exemplified in verbs like *swam* and *rang* has much lower type frequency (Ellis, 2002).

The distinction between token and type frequency is crucial because of the different roles that they play in language acquisition. 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 productivity of phonological, morphological and syntactic patterns is thus a function of type frequency.

The crucial role of input frequency in language processing has important implications for language learning. Under this perspective, acquiring a language is considered an intuitive statistical learning process, one that involves the associative learning of representations that reflect the probabilities of occurrence of form-function mappings (Ellis, 2002). Frequency of exposure and contact with the TL thus promotes the acquisition of all aspects of language (see Ellis, 2002 for a review). In L1 and naturalistic second language acquisition, the bulk of language acquisition is implicit learning from usage insofar as both involve interaction with authentic target language for real-world purposes. L2 learning in instructed FL settings, on the other hand, is less likely to promote implicit learning as the amount of input that the learner is exposed to and the amount of interactional opportunities that are afforded are limited (Muñoz, 2008). In other words, classroom instruction cannot provide the massive amount of exposure that is required for implicit learning to take place (DeKeyser, 2000; Ellis, 2002) but classroom learners who are in contact with the TL beyond the school context can potentially benefit from the implicit learning mechanisms that are characteristic of L1 and naturalistic L2 acquisition.

In short, usage-based models emphasize the impact of frequency on language processing and language learning, and may therefore explain the important role of out-of-school contact when learning a FL, but research under this perspective on early FL learning is scant. Neither has research focused sufficiently on the role of linguistic distance and, in particular, on cognate linguistic distance in a comparative study and in relation to early FL learning inside and outside the school. The present study aims at filling these important gaps in the area of early FL learning.

The current study

The current investigation contributes to research on early language learning by comparing the receptive skills (specifically, grammar) of two populations of English young learners, with Danish and with Spanish/Catalan as L1s, respectively, and at two different ages, 7 and 9. It provides a closer look at differences between languages where the L1-L2 pairs differ in cognate linguistic distance. The present study also examines the role of contact with the TL inside and outside the classroom context, and attempts to explain the latter on the basis of usage-based models to language and language learning. Finally, the study examines the variable gender to look for possible differences between boys and girls.

The study addressed the following research questions:

1) How do English receptive skills (and more specifically, grammar skills) of Spanish-Catalan children (aged 7 and 9) with an average of 400 and 700 hours of school English instruction, respectively, compare with the skills of same age Danish children at the beginning of instruction?

2) What is the role of language-related factors (measures of receptive vocabulary knowledge and of linguistic distance between learners' L1 and L2) and context-related factors (formal and informal contact with English), as well as gender, in 7- and 9-year-old children's performance on English receptive skills?

Method

Participants

The participants in this study were 260 learners of English, 132 from Danish schools and 128 from Spanish schools (in Catalonia). In both settings the participants were distributed into two age groups: 7- and 9-year-olds. There were 71 learners (36 females) in the group of Danish 7-year-olds (1st grade) and 61 (30 females) in the group of Danish 9-year-olds (3rd grade). They came from 9 different schools. In the Spanish group, there were 69 learners (32 females) in the 7-year-old group (2nd grade) and 59 (34 females) in the 9-year-old group (4th grade). They came from four different schools. In all cases, consent forms from the parents were collected through the schools.

The Danish learners in the two age groups had all just begun formal English instruction, which controls for the possible influence of the respective English teaching methodologies used in the two contexts; the 7-year-old group had had an average of 12 hours of instruction and the 9-year old group, 10 hours. The 7-year-old Spanish learners had had an average of 287 hours of English instruction, and the 9-year-old Spanish learners had had an average of 520 hours of English instruction; most of them had begun English instruction in pre-school (age 3-5).[3] The Spanish learners were all

bilingual in Spanish and Catalan. Although Catalan is the language of school in Catalonia, Spanish is the majority language and its presence in the media is strong. These children may have had Spanish or Catalan or both as the family language/s and their type of bilingualism may be considered balanced in most cases.

The Danish and Spanish schools were selected from a convenient sample representing average levels of achievement in both contexts. They were also similar in terms of representing a variety of working and middle-class families in both social contexts, and for this reason both public and semi-private schools were included. Among the 9 Danish schools, 4 were public and 2 were semi-private. The Spanish sub-sample included 3 semi-private schools and 1 public school.

Instruments and procedure

A standardized test was used to measure children's English receptive skills, the Test for Reception of Grammar, TROG-2 (Bishop, 2003). This test measures receptive knowledge of 20 English phenomena (e.g., negation, reversible *i*n and *o*n, and the 'not only X but Y' construction). TROG-2 was originally designed to test grammar knowledge in L1 populations. However, when used with L2 learners, the test arguably measures more than the knowledge of certain English grammatical phenomena. This is because in order to successfully complete the test, the testee does not only need to comprehend the meaning of the various types of grammatical phenomena that he/she is presented with (e.g., negation, reversible *i*n and *o*n) but also the specific lexical items (e.g., the nouns and verbs) that appear in the sentence stimuli. From a usage-based perspective, the test contains what could be considered mixed constructions (e.g., *the neither nor* construction, or *the X but not Y* construction) as well as more abstract types

of constructions such as negation or relative clauses. In addition to knowledge acquired in the English classroom, the TROG-2 test may reflect exposure to large stretches of language found in e.g., films, games instructions, and song lyrics, that is, in the types of usage events that the child commonly participates in (e.g., Tomasello, 2000).

The TROG-2 test consists of a picture selection task where children are asked to select one picture out of four which best corresponds to a sentence that they hear. For example, for the reversible *in* and *on* type of construction, the child sees four pictures depicting four spatial configurations (one with a box next to a cup, another one with a cup inside a box, a third one with a box inside a cup and a last one with a cup on top of a box), and hears the sentence '*The cup is in the box'*. The test consists of 80 four-choice items arranged in 20 blocks, each of them containing a given grammatical contrast (e.g., negation, reversible SVO, singular/plural inflection). The test was individually given to children in the same session and following a receptive vocabulary test. The administration procedures followed the manual indications. The administration of the test was discontinued when five consecutive blocks of items had been failed. A block was failed if the testee did not answer the four items correctly. Regarding the scoring procedures, we computed the total amount of correct items (as in Unsworth, Persson, Prins, and de Bot, 2015), which provided more variability among students than a score based on the total number of blocks passed, and could be treated as a continuous variable in the regression analysis. The maximum score was 80.

To assess children's recognition of vocabulary, and of cognates in particular, this study used the Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4) (Dunn & Dunn, 2007). This test is also a picture-selection test consisting of 228 items organized in 19 sets. Each set contains 12 items. For example, the child sees a picture of a flower, a pumpkin, a ball and a bird, and hears the word '*ball*'. The administration of

the test followed the manual indications. The only exception was that the PPVT was given from the beginning to every child, independent of their age (as in other studies in early L2 learning; see Unsworth et al., 2015). For each student the test administration stops when the student does not answer more than eight questions correctly in the same set. Scoring procedures followed the test manual. Raw scores for each child were calculated. The maximum score on this test was 228.

In the case of the Danish learners, the oral stimuli for the two tests (i.e., the TROG-2 and the PPVT) were previously recorded. This was done in order to ensure homogeneity in administration as several researchers were involved in data collection. In the case of the Spanish/Catalan learners, the stimuli were not previously recorded as the same research assistant administered the tests to all children. The tests were pilot-tested with several children of the same two ages as those included in the present study.

Data were collected from children's out-of-school contact by means of a take-home questionnaire that parents completed in the two settings. The questionnaires were collected a few weeks after the proficiency tests were administered to the children. The questionnaire included questions about out-of-school contact and background questions about language use at home. In this study we look at three frequent types of out-of-school contact: watching films/TV programs, playing videogames, and listening to music. Specifically, parents were asked questions concerning (a) the frequency with which children watched English-spoken audiovisual material from Internet, television, and cinema with or without subtitles in L1 or L2; (b) the frequency with which children played English-spoken videogames (with or without subtitles in L1 or L2); (c) the frequency with which children listened to English music.

Data analysis

Cognate Recognition Index: CRI

First of all, items in the PPVT were categorized as cognates or non-cognates based on etymology. Because etymological or linguistic cognates may not be recognized when heard given that despite orthographic similarities pronunciation often differs, especially in the case of Spanish-Catalan and English, phonological cognates were selected from the larger set of linguistic cognates. This selection eliminated linguistic cognates that have different phonological forms although they could be recognized in written form or through training or instruction. Following Méndez Pérez, Peña and Bedore (2010) the criterion used was that the English word shared three phonemes with the corresponding word in the learners' respective L1 (Danish in one case and Spanish/Catalan in the other; no discrepancies were found between these two). Only for very short words such as 'bus' two equal phonemes were considered sufficient to determine cognate status. Table 1 displays the number of cognates for each L1-L2 combination up to the highest set reached by the Danish and the Spanish children, set 13 and set 11, respectively (See Appendices S1 and S2 in the Supporting Information online for the lists of cognates). As can be seen in Table 1, the Danish-English cognates were most frequent in the first sets while the Spanish/Catalan-English cognates were found in the more advanced sets, which were reached by only a handful of participants. Using the responses of each participant to PPVT items, the following calculations were made:

- Total number of words heard (individual ceiling).
- Total number of correct responses on cognates and non-cognate words.
- A Cognate Recognition Index (CRI) (*total number of cognates correctly identified/total number of cognates heard*) which measures the degree of recognition for cognate items.

Table 1 Number of cognates per set

PPVT Set	Danish-English cognates	Spanish/Catalan-English cognates
Set 1	5	2
Set 2	6	1
Set 3	2	3
Set 4	6	2
Set 5	5	4
Set 6	4	5
Set 7	6	7
Set 8	6	2
Set 9	6	5
Set 10	5	9
Set 11	3	8
Set 12	7	n.a.
Set 13	5	n.a.
Total	66	48

Note. n.a.= Not applicable

Measures of out-of-school contact with English

The responses to the questions about frequency of contact with different English-language media and games in the parental questionnaire were largely spread, which made it convenient to re-code values into three bands with similar number of

observations in each: low frequency, mid frequency, and high frequency. Also all audiovisual material from Internet, television and cinema (with or without L1 or L2 subtitles) was gathered together under the label “films”. It can be seen in Table 2 that the corresponding bands are not identical because they are based on the responses from the questionnaires. As expected, contact with English through music was more frequent than through videogames and films.

Table 2 Frequency bands for Films, Videogames and Music

	Films	Videogames	Music
Low frequency	0-3 hours/month	0-3 hours/month	0-10 hours/month
Mid frequency	4-13 hours/month	4-12 hours/month	11-23 hours/month
High frequency	14+ hours/month	13+ hours/month	24+ hours/month

Results

This section first presents the PPVT scores and the CRI values derived from the students’ cognate recognition in this vocabulary test (0 = no recognition; 1 = recognition). This is followed by the analysis of the out-of-school contact measures. These factors – vocabulary recognition, cognate recognition, and out-of-school contact – together with hours of English instruction will be used as predictor variables in a Poisson regression with the TROG scores as dependent variable.

Table 3 displays the descriptive statistics of the PPVT scores, the number of sets students reached in the PPVT test, the CRI values, and the number of hours of English instruction for each age and L1 group.

Table 3 Descriptive statistics of the PPVT test and CRI

	PPVT score				Sets				CRI			
	Da7	Sp7	Da9	Sp9	Da7	Sp7	Da9	Sp9	Da7	Sp7	Da9	Sp9
N	71	69	61	59	71	69	61	59	71	69	61	59
Min.	4.00	3.00	13.00	9.00	1.00	1.00	2.00	2.00	0.47	0.00	0.62	0.12
Median	24.00	23.00	42.00	46.00	4.00	4.00	6.00	6.00	0.75	0.67	0.79	0.76
Mean	30.13	29.56	46.69	49.01	4.80	4.59	9.75	6.90	0.74	0.63	0.80	0.72
Max.	87.00	73.00	111.00	107.00	11.00	11.00	13.00	15.00	1.00	1.00	1.00	1.00
SD	18.22	17.82	24.52	22.95	2.55	2.37	3.19	2.92	0.12	0.19	0.09	0.17

Note: Da = L1-Danish; Sp = L1-Spanish/Catalan; 7 = 7-year olds; 9 = 9-year olds

It may be seen that the distribution of the PPVT score is very similar for Spanish and Danish students of the same age. That is, differences in means are negligible despite the huge differences in instruction hours before the test. On the other hand, Danish students, and especially the 9-year-olds, reach a higher number of sets on average, probably because the first sets presented to the children contained more English-Danish

cognate words (up to set number 9; see Table 1). A Kruskal-Wallis test revealed a significant effect of group on the PPVT score ($\chi 2(3) = 41.3$, $p < 0.001$).). A post-hoc test using Wilcoxon signed-ranks tests with Bonferroni correction showed that there is no difference between the PPVT score of Danish and Spanish students of the same age, but there is a statistical difference between groups of different ages. The following pairwise p-values and effect sizes (r) were obtained: Da7-Sp7 (*p*-value = 0.91, *Z* = -0.12 , r = -0.007); Da7-Da9 (*p*-value < 0.01, *Z* = -3.97, r = -0.25); Da7-Sp9 (*p*-value < 0.001, *Z* = -5.15, r = -0.32); Da9-Sp7 (*p*-value < 0.001, *Z* = 3.84, r = 0.24); Sp7-Sp9 (*p*-value < 0.001, *Z* = -4.94, r = -0.31); and Da9-Sp9 (*p*-value = 0.28, *Z* = -1.09, r = -0.07).

As can be seen in Table 3, L1-Spanish/Catalan learners have lower values of CRI than L1-Danish learners of the same age. A Kruskal-Wallis rank sum test was employed to compare the CRI mean values in the four groups because the groups did not have equal variance. The Kruskal-Wallis test revealed a significant effect of group on the CRI value ($\chi 2(3)= 41.7$, $p < 0.001$). A post-hoc test using Wilcoxon signed-ranks tests with Bonferroni correction showed that the CRI values of the Danish groups were significantly higher than those of the Spanish groups of the same age, that the older Danish group had a significantly higher value than the younger Danish group, and that the younger Danish group and the Spanish older group had similar values. The following pairwise p-values and effect sizes (r) were obtained: Da7-Sp7 (*p*-value < 0.001, *Z* = -3.76 , r = -0.31); Da9-Sp9 (*p*-value < 0.01, *Z* = -3.16, r = -0.27); Sp7-Sp9 (*p*-value < 0.001, *Z* = -3.39, r = -0.28); Da7-Da9 (*p*-value < 0.001, *Z* = -2.93, r = -0.25); Da9-Sp7 (*p*-value < 0.001, *Z* = -6.24, r = -0.53); Da7-Sp9 (*p*-value = 0.82, *Z* = -0.22, r = -0.02). As we can see there are medium effect sizes for pairs Da7-Sp7, Sp7-Sp9, Da7-Da9, and Da9-Sp9 and a large effect size for pair Da9- Sp7.

As regards contact with English-language media and games, the variables examined (films, videogames, and music) had three levels: low (L), mid (M), and high frequency (H). Table 4 shows that Danish students were more frequently exposed to out-of-school English than Spanish students. This is particularly salient for exposure to films, where most students in the two Danish groups watched English-spoken films (or audiovisual material) with very high frequency. In contrast, most students in the younger Spanish group never or rarely watched English-spoken audiovisual material, and the majority of students in the older group were exposed to them only with low or mid frequency.

Table 4 Frequency of out-of-school contact with English in percentages

	Films			Games			Music		
	L	M	H	L	M	H	L	M	H
				7-years-old					
Da	12.86	34.29	52.86	15.71	44.29	40.00	10.00	70.00	20.00
n = 71									
Sp	64.71	32.35	2.94	51.47	42.65	5.88	57.35	39.71	2.94
n = 69									
				9-years-old					
Da	6.67	36.67	56.67	15.00	45.00	40.00	6.67	50.00	43.33

n = 61									
Sp	50.00	46.55	3.45	48.28	44.83	6.90	34.48	48.28	17.24
n = 59									

Note: Da = L1-Danish; Sp = L1-Spanish/Catalan; L = Low frequency; M = Mid frequency; H = High frequency

A series of Pearson's chi-square tests were calculated comparing the frequency of contact with English outside the school of Spanish and Danish students of the same age. The null hypothesis of equal distribution was rejected by all the tests. Beginning with the two 7-year-old groups, the Danish students are more likely to watch films in English than the Spanish students ($\chi^2(2) = 54.593$, $p < .001$). They are also more likely to play videogames in English ($\chi^2(2) = 30.566$, $p < .001$), and to listen to English music ($\chi^2(2) = 37.608$, $p < .001$). Differences are very large for high and low frequencies. A similar pattern is observed for the 9-year-old groups: for films ($\chi^2(2) = 47.874$, $p < .001$), videogames ($\chi^2(2) = 24.034$, $p < .001$), and music ($\chi^2(2) = 17.818$, $p < .001$).

Table 5 displays the descriptive statistics of the TROG test scores (the values of instruction hours are repeated here for convenience). It can be observed that whereas the scores of the 7-year-old Spanish students are much higher than the scores of the Danish students of the same age group, the difference in means is much lower when the 9-year-olds are compared. On the other hand, the difference in the average of English instruction hours is even higher for the older than for the younger groups: 286.50 vs. 11.83, and 519.80 vs. 10.13, respectively.

Table 5 Descriptive statistics of the TROG test and instruction hours

	TROG score				Instruction hours			
	Da7	Sp7	Da9	Sp9	Da7	Sp7	Da9	Sp9
N	71	69	61	59	71	69	61	59
Min.	1.00	2.00	1.00	2.00	3.45	131.00	4.50	207.50
Median	7.00	12.00	15.00	18.00	6.75	274.50	10.50	634.50
Mean	8.99	13.51	16.64	18.15	11.83	286.50	10.30	519.80
Max.	63.00	32.00	69.00	52.00	28.00	434.30	13.50	634.50
SD	17.95	7.00	9.88	8.74	8.67	124.84	2.94	154.06

Note: Da = L1-Danish; Sp = L1-Spanish/Catalan

A generalized linear regression analysis was ran to answer the second research question of this study, concerning the role of language-related factors and context-related factors, as well as gender, in these students' performance on receptive grammar skills. Our model had the TROG score as the dependent variable and the variables Danish, Gender, PPVT score, CRI value, Instruction Hours, and the three frequency bands for each type of out-of-school contact (Films L, Films M, Films H, Videogames L, Videogames M, Videogames H, and Music L, Music M, Music H) as the regressors. Interactions between variables were considered when significant or when their inclusion improved the model fit to the dataset. Robust standard errors clustered by school were used to account for differences in student performance due to school.

Table 6 displays the coefficients of the linear model fitted for the 7-year-olds, explaining 43% of the variance (Adj R^2 = .426) in the TROG scores. In this model three variables show a significant association: being Danish, the score on the receptive vocabulary test, and the value representing cognate recognition. On the other hand, the amount of hours of English instruction is not significantly associated to the TROG score, though there is a significant interaction between the hours of English instruction and being Danish, indicating that having more hours of English instruction benefits L1-Danish students especially[4]. Neither gender nor none of the variables indicating contact with English outside the school showed a significant association.

Table 6 Results of regression on TROG scores. 7-year-olds

	Estimate	*se*	*p*-value
(Intercept)	13.109	0.898	0.000
Instruction hours	0.007	0.004	0.123
Danish	16.694	6.462	0.011
PPVT	0.193	0.048	0.000
CRI	11.865	4.065	0.004
Instruction hours:Danish	0.151	0.049	0.002

The results of the regression model for the 9-year olds are displayed in Table 7. In this model the predictors explain almost 39% of the variance (Adj R^2 = .386) of the TROG scores. In this age group the strongest associations with the TROG scores appear to be the values of cognate recognition and of receptive vocabulary. Being Danish or Spanish is not significantly associated with the receptive grammar scores but the

interaction of Danish and the cognate recognition scores is marginally significant indicating that recognizing cognates benefits Danish-L1 students especially. The variable of hours of English instruction does not show a significant association this time either. While the variable gender is not significant, the interaction with the results of the receptive vocabulary test is, indicating that Danish boys are more likely to get higher scores in vocabulary. Finally, one of the media regressors, watching English-spoken films (audiovisual material) with high frequency shows a marginally significant association with the TROG scores.

Table 7 Results of regression on TROG scores. 9-year-olds

	Estimate	*se*	*p* value
(Intercept)	16.739	1.693	0.000
Instruction hours	0.005	0.004	0.246
Danish	-3.724	2.702	0.171
PPVT	0.129	0.049	0.009
CRI	12.007	2.939	0.000
Male	-0.263	0.735	0.721
Films M	1.313	1.117	0.242
Films H	4.882	2.637	0.067
CRI:Danish	15.719	8.192	0.058
Male:PPVT	0.144	0.065	0.029

Discussion

This study was concerned with the comparison of the receptive skills of two groups of young L1-Danish at the beginning of English language instruction and two groups of L1-Spanish/Catalan students of the same ages after several years of English language instruction. By looking at the English skills of the Danish children before any substantial school instruction took place we could suppress the possible influence of the teaching systems on the results in the two contexts. The study examined the role of two language-related factors, receptive vocabulary skills and cognate linguistic distance, and two context-related factors, amount of formal instruction in English and frequency of contact with English through media and games. In addition, the study examined the variable gender to look for possible differences between boys and girls.

The first research question aimed at examining the receptive skills of the students in the two different contexts. To that end, the study compared the scores obtained in the TROG test by the two groups of Danish students and the two groups of Spanish students. Descriptive statistics showed that the Spanish students always had a higher mean score than the same-age Danish students, but the difference was larger for the younger groups than for the older groups. The Spanish students' advantage over the Danish students was to be expected due to the longer period of English instruction the former had. However, the difference in score average was higher for the two younger groups than for the two older groups, whereas the difference in instruction hours was larger for the former than for the latter (287 hours vs 12 and 520 vs. 10, respectively). This indicates that the amount of instruction did not play a determinant role and raises the question of what factor or factors have compensated the Danish students for the instruction received by the Spanish students.

In fact, the analyses performed to address the second research question showed that hours of instruction was not a significant predictor of scores for the two groups of

7-year-old students. Instead, a significant interaction was found indicating that having more hours of English instruction benefits L1-Danish students over Spanish/Catalan-L1 students (but see note 4). In the same line, being Danish is shown to benefit the receptive skills of the 7-year-olds. The results also indicate that recognizing vocabulary items benefits Spanish and Danish learners' grammar recognition. This result in in line with a basic assumption of usage-based approaches to language, namely, the assumption that a strict separation between lexis and grammar is unattainable (Langacker, 1987), and with the findings of research on L1 acquisition showing the interdependence of lexicon and grammar in early language development (e.g., Bates et al., 1988; Bates & Goodman, 1999; Marchman & Bates, 1994; Szagun et al., 2006).

As seen in the previous analysis, no differences were found between the average scores of the Spanish and Danish children of the same age on the vocabulary recognition test. In other words, when Danish students start English instruction at age 7 they are able to recognize as many English words as the 7-year-old Spanish students after 3 years of English instruction. Language distance, measured by these children's cognate recognition, is shown to be a significant predictor of their ability to recognize grammatical structures and, more generally, their listening comprehension ability and general proficiency. Although no interaction is observed here, the results of the Kruskall-Wallis test comparing the CRI values of the four groups of students showed that the 7-year-old Danish children's CRI values were significantly higher than those of the Spanish children of the same age, which may seem to explain the Danish advantage. Furthermore, although the measures of out-of-school contact with English did not appear to have a statistically significant effect (yet), it may be suggested that Danish children's more frequent exposure to English-spoken television programmes at home is familiarizing them with English vocabulary and structures to a higher extent.

The regression analysis performed on the data from the two 9-year-old groups confirmed the significant role played by cognate linguistic distance and receptive vocabulary knowledge as well as the lack of significance of the amount of English instruction on these results. As was the case with the younger groups, we observed that when Danish students start English instruction at age 9 they are able to recognize as many English words as the 9-year-old Spanish students after 5 years of English instruction. Now the analysis also appears to confirm the benefits that cognate recognition confers to Danish children in particular, as seen in the marginally significant interaction of these two variables. Being Danish seems beneficial not in itself now but through the interaction with the values of cognate recognition of these 9-year olds. This superior cognate recognition ability is also seen in that at the age of 9 Danish children can reach higher sets in the PPVT test than Spanish children of the same age (9.75 vs. 6.90), a result that is likely due to the fact that the first sets contain more Danish-English cognates than Spanish/Catalan-English cognates (as seen in Table 1).

A significant interaction is also observed between gender and vocabulary recognition scores: boys are likely to have a higher score on that test. Although a clear explanation cannot be drawn from this study, this result is in line with the finding by Hannibal Jensen (2016) with a partially similar sample of Danish children, that a higher performance on the vocabulary test of the 9-year-old boys was associated to their higher frequency of gaming. Gender differences were also observed in the study by Sylvén and Sundqvist (2012) with boys outperforming girls regarding L2 vocabulary presumably because of the type of game and the time spent gaming (see also Sylvén & Sundqvist, 2014).

However, in the present study an effect of playing videogames is not observed and only the frequency with which students watch audiovisual material approaches

significance. This suggests that children who watched audiovisual material with high frequency are more likely to obtain higher scores on the grammar receptive test than those who did not engage in this out-of-school activity or did it with low or mid frequency. Because Danish children's frequency of contact with English through media and games was significantly higher than that of Spanish children, as shown in the comparative analyses of frequencies of the different types of out-of-school contact, it may be argued that they had had more opportunities for implicit learning of English constructions. This explanation is in line with usage-based models which emphasize the input-dependent and experientially-based nature of language learning. Arguably, frequent contact with English media and games provided Danish children with ample 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 implicit learning of the L2 (Ellis, 2002). In fact, Kusyk and Sockett (2012) showed positive effects of frequent viewing of television series in English on the acquisition of the meaning of frequently occurring chunks of language in these series. Specifically, French university students who were frequent viewers of online American television series self-evaluated their comprehension of the 30 most frequently 4-grams in the series (e.g., *What are you doing?, I want you to?*) to a higher degree than non-regular watchers. Similarly, in a diary study in which six French students were asked to keep a log of their online activities in English for a period of 60 days, Sockett and Toffoli (2012) found that students were able to produce words or expressions that they had encountered during their informal online activities (e.g., *awesome, what's up, wait a minute, hope that you are well*), with one of the participants also reporting having paid attention to syntactic structure when viewing the series over and over again. The results of these studies indicate that implicit (learning without awareness) and / or incidental

learning (learning without intention but with or without awareness) is indeed possible during encounters with the TL in informal contexts.

The findings in the present study are also in line with the results from previous research with child learners, such as the study by Kuppens (2010) with Flemish-speaking children with extensive exposure to English-spoken films and programs. They also accord with the results of the study by Koolstra and Beentjes (1999), in which they found that Dutch-speaking children who frequently watched subtitled English TV programs outperformed those who indicated watching them with a low or mid frequency. Both Dutch and Danish are close to English, which will have facilitated children's initial understanding and serve as a crutch in the process of acquiring receptive skills in English. The positive benefits of exposure to audiovisual material on the scores of the TROG test also accords with the results of the ELLiE project, where exposure to films had a significant effect on the scores in a listening comprehension and a reading comprehension test of a sample of 9-year-old children from seven European countries (Lindgren & Muñoz, 2013). With respect to grammar specifically, previous studies had not shown significant benefits when grammar phenomena were tested. In a short experiment, d'Ydewalle and Van de Poel (1999) found that acquisition through watching films was largely restricted to vocabulary, and no substantial gains were observed in syntax and morphology in the participants (age 8-12). Similar results were obtained by Van Lommel and colleagues (2006), and the authors concluded that grammar, contrary to vocabulary, may be too complicated to acquire from a rather short movie presentation. From a usage-based perspective, learning grammatical meanings, which are generally more abstract than lexical meanings, will arguable require a higher degree of cumulative contact over the years rather than a one-off short-term experiment involving grammar phenomena in an unknown language, as in their investigation.

As regards the other types of out-of-school contact examined in this study, it has been found that contact with English music did not play any role in the results. This finding accords with previous findings (e.g., Lindgren & Muñoz, 2013) and suggests that children do not tend to focus on the song lyrics while listening to music for pleasure. Moreover, films and TV programs (and to a lesser extent games) may provide both voice and text, and thus children may be reaping the benefits of multimodal input (e.g., Mayer, 2009) that only listening to songs does not provide. As seen above, playing videogames did not appear to have a significant influence on these children's performance on the TROG test either. Several considerations appear relevant. First, a common finding of studies that have looked at different types of contact is that games have a more limited effect on FL acquisition than watching movies (Kuppens, 2010; Lindgren & Muñoz, 2013). Second, previous studies have shown benefits on vocabulary learning (Hannibal Jensen, 2017; Sylvén & Sundqvist, 2012; Turgut & Irgin, 2009) while potential benefits for grammar learning have not been investigated to any great extent. The results of our study suggest that the amount of contact with the TL via videogames may not have been high enough to facilitate children's recognition of grammatical patterns. Given the item-based path of learning documented in L1 and L2 acquisition (e.g., Dabrowska, 2000; Eskildsen, 2009), it can be hypothesized that a higher degree of repeated contact with the TL may be necessary for the recognition of more abstract and schematic type of constructions.

Third, as suggested by several authors (Kuppens, 2010; Sylvén & Sundqvist, 2012), when examining the possible influence of gaming on English language learning a more finely focused analysis may be needed that looks at the different types of games that children play because not all of them may offer the same learning affordances. An in-depth analysis should also look at what children do when playing games (Hannibal

Jensen, 2017), and even the personal and motivational characteristics of gamers at this early age. Fourth, proficiency may also play a role here in that young children may not yet possess the level of English comprehension needed to benefit from exposure to English text (or voice) in the games and, as a result, may not make an effort to understand and hence benefit from that exposure.

In this study, linguistic proximity is shown to be a determinant factor contributing to Danish children's matching Spanish children's scores in spite of the huge differences in hours of English formal instruction. As noted above, English-Danish cognates are words from Germanic origin and very frequent in their daily life as opposed to English-Spanish/Catalan cognates, less frequent in children's linguistic environment. Danish children' statistically significant superior recognition of cognates takes them to a final average score on the receptive vocabulary test that is very similar to the average score obtained by the Spanish children, a score that results mostly from their formal learning and to which cognate words do not contribute as much. In answer to the quest for the factors that compensate for the instruction that the Spanish students have had, it may be claimed that linguistic proximity also gives Danish learners a head start in vocabulary comprehension that is a very effective crutch for English language learning. Because attention needs to be focused on fewer linguistic elements, cognitive load in working memory and processing is lessened and language development may be speeded up for young Danish learners of English.

To finish, the comparisons in this study have revealed age effects. The older Spanish students attained a higher mean score than the younger Spanish students, but they had had many more English classes. More interestingly, the Danish 9-year-olds also had a higher mean score than the 7-year-olds on the TROG test (and the receptive vocabulary test), and this result cannot be ascribed to a higher number of English

instruction hours. Rather, this head start appears to be an effect of their older age. Several factors seem to be at play here. First, the older students' advantage may be partly the effect of their superior cognate recognition skills: the 9-year-old Danish students showed a much higher recognition of cognates than the 7-year-olds, which is in agreement with the results by Kelley and Kohnert (2012), who found that age was a good predictor of variance in cognate performance on the PPVT. More generally, this advantage may be attributed to their superior crosslinguistic awareness, which has helped these Danish learners recognize constructions in a language that is close to their L1 (Otwinowska, 2015). Also the older children's superior cognitive skills may have allowed them to do better in a recognition test (Muñoz, 2008). For example, Landau and Lakusta (2006) argue that items in the TROG do not only require knowledge of target grammatical structures, but also proficiency in a number of other cognitive capacities such as (visual-spatial) processing and working memory. It may also be argued that the advantage comes from their superior literacy skills after two extra years of schooling (e.g., Cummins, 2000). Danish children start learning to read when they are 6-7 years old, so it may be assumed that the younger children have not been able to benefit as much as the older children from multimodal input (reading subtitles and listening to voice) when watching TV programs or playing videogames.

Moreover, the older students' advantage may also be partly the effect of the 2-year-longer accumulated contact with English media and games. In fact, the effect of contact with English media (i.e. frequency of watching audiovisual material) is observed in the comparison of the 9-year-old students but not yet in the analysis of the data from the 7-year-old groups. Neither did Unsworth and colleagues (2015) find that out-of-school exposure was a significant predictor of the English language skills of their Dutch learners of English at ages 4 and 5, a finding that they attributed to their young

age as well. This older learner advantage may seem to run counter the expectation that younger children would benefit further from implicit learning conditions (DeKeyser, 2000) and, therefore, from out-of-school contact. However, the finding is in consonance with the age advantage found by Koolstra and Beentjes (1999) in incidental acquisition of vocabulary from watching a subtitled documentary: the L1-Dutch sixth graders outperformed fourth graders in their experiment. Also Van Lommel et al. (2006), contrary to their initial expectation, found that younger learners (age 11) did not show higher incidental learning than older learners (age 17) from watching subtitled television programs (while the latter did show higher intentional learning with advance rule presentation than the former). These two studies report short-term experiments, for which older learners could be expected to do better because of their more efficient learning rate (e.g., Jaekel, Schurig, Florian, & Ritter, 2017; Muñoz, 2006a, b; Pfenninger & Singleton, 2017). The finding in the current study comes from an extensive contact with the target language, and a plausible explanation may be that the 9-year olds have benefited from the opportunities for incidental and implicit learning as much as the 7-year-olds, because of their relative young age too, and for a longer time (2 more years).

Conclusion

In this study L1-Danish children showed a level of receptive knowledge of English at the beginning of instruction that is not very different from the level L1-Spanish/Catalan children had after several years of English instruction. Performance on the receptive grammar test showed the effects of a number of factors: receptive vocabulary skills, cognate recognition, formal and informal contact with English. The

analysis indicated that test performance was particularly similar in vocabulary recognition and this appears related to the Danish children's superior recognition of cognate words. Formal contact with English through instruction did not give the Spanish children a sizeable advantage over Danish children. Seemingly, Danish children found opportunities for learning English in their more frequent contact with English through audiovisual material, which allowed them to catch up with Spanish formal learners of English. This finding is in consonance with claims made in usage-based models regarding the crucial role of input frequency and participation in specific usage events in language learning, and provide further evidence for the role of implicit and incidental learning in informal contact with the TL outside the school context (Sockett, 2014). An age advantage was also revealed in the comparison of the 7-year-old and 9-year-old Danish children, which is in agreement with the older learners' rate advantage found in other contexts and also consequential with a longer period of informal contact with the TL.

This study is not without limitations. The first is the use of a parental questionnaire to gather information about children's frequency of contact with English. In an ongoing study we are using closely-guided diaries that are completed by the children in an app format with positive results. Also small-scale studies where children are observed interacting with media and gaming outside school can complement the quantitative data with qualitative data on what children do while engaging in media and gaming. Further research should look also at the effects of gaming on different-age children, the type of games and the effects of gender. Another limitation of the study is that though efforts were made to find comparable students samples, we did not look at individual differences such as motivation, which could have moderator effects. Finally,

further research should look at different language dimensions including productive tasks.

The findings of the present study have several social and educational implications. International surveys are a valid tool for assessing the language competences of citizens in different geographical areas. Due to the role of English in the current globalized world, knowledge of English in such international comparisons is usually highlighted and conclusions hastily drawn concerning people's abilities and lack of abilities. Absent from those comparisons is the role of linguistic distance (i.e., proximity to English).[6] The findings of the current study provide evidence of the necessity of taking linguistic distance into account when interpreting the results of such crosslinguistic comparisons. This study has also highlighted the role played by contact with a language in society and through media, in particular Internet and television programs. Following from this, two educational implications of the study may be highlighted here. One is the convenience of enhancing students' cognate awareness as a shortcut to a larger vocabulary that helps them in proceeding faster in L2 learning. Relatedly, teachers may help students enhance their awareness of the opportunities for language learning outside school as well as integrate the product of such activities in the classroom.

Notes

1. In this paper the terms foreign language and second language are used interchangeably.

2. We use the term “out-of-school contact” rather than the frequently used term “out-of-school exposure” because the latter seems to exclude output and interaction which may be present in some activities, such as certain types of games. We thank an anonymous reviewer for this observation.

3. Both Spanish groups had also had school contact with English in CLIL (Content and Language Integrated Learning), amounting to an average of 133 extra hours for the younger group and 300 for the older group, though only the hours of English language instruction are considered in the analyses.

4. This result may also be an artefact of the high number of hours of the Spanish learners, as pointed out by an anonymous reviewer.

5. As mentioned by an anonymous reviewer, socioeconomic variables may have an effect on access to technology necessary for having contact with English outside of class. However, while this may very well be the case, it does not challenge the finding that contact with English out of school has a positive influence on learning.

6. Although the European Survey of Language Competence (2014) does not have data from Denmark, data from Sweden (arguably similar to Denmark in linguistic distance to English) shows that 91% of 14-year-old students achieve a B level in listening, while only 24% of Spanish students reach that level.

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