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TRABAJO DE FIN DE GRADO

"*pro* need a little bit more":
AN ANALYSIS ON SUBJECT
PRODUCTION BY HEARING
IMPAIRED CHILDREN.

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ABSTRACT

This dissertation analyses the subject production of Spanish and English Hearing Impaired (HI) children as compared to that of Typically Developed (TD) children. The data analysed are spontaneous and have been extracted from CHILDES. The analysis focuses on two properties of the null subject parameter, namely, subject overtness and subject-verb agreement, and the objective is to analyse how these two properties are instantiated in the production of Spanish and English monolingual HI children. The results indicate that similar problems appear when comparing Spanish and English HI children, and that these problems are not frequent in their corresponding age-matched TD peers.

KEYWORDS: Hearing impairment, English, Spanish, acquisition, sentential subjects, null subject parameter.

RESUMEN

Este trabajo analiza la producción de sujetos de niños con pérdida auditiva, tanto ingleses como españoles, comparada con la de niños que se desarrollan de forma normal. Los datos que se han utilizado son espontáneos y se han extraído del proyecto CHILDES. El análisis se centra en dos propiedades del parámetro del sujeto nulo, en concreto, en la naturaleza del sujeto y en la concordancia sujeto-verbo. El objetivo es analizar cómo aparecen estas propiedades en la producción de niños con pérdida auditiva con español e inglés como primera lengua. Los resultados muestran que existen problemas similares en la comparación de niños con pérdida auditiva ingleses y españoles, y que estos problemas no son frecuentes en niños de su misma edad con desarrollo normal.

PALABRAS CLAVE: Pérdida auditiva, inglés, español, adquisición, sujetos referenciales, parámetro del sujeto nulo.

CONTENTS

UNIVERSIDAD DE VALLADOLID-LAURA FERNÁNDEZ MERINO

FOREWORD: CONTEXTUALIZATION OF THE DISSERTATION

The present undergraduate dissertation is the final formal requirement to conclude the degree in English Studies at the University of Valladolid. The topic of this dissertation belongs to the contents in the A2 subject "Scientific description of the English Language", as presented in the teaching guide of the academic year 2017-2018. Therefore, it falls within a category in which the following subjects of the degree are encompassed: English descriptive grammar (I, II and III), phonetics and phonology (Instrumental English I and English Phonetics and Phonology), the origins of the English language and English/Spanish comparative grammar.

This dissertation analyses the subject production of English and Spanish native speakers, more specifically of children with a hearing impairment. Therefore, this area of research has helped me broaden my knowledge on the acquisition of subjects, and thus, on language acquisition. Moreover, the fact that the children have a specific language impairment introduces me in the research of language disorders, a topic I am very interested in.

Apart from this, deciding on my own research questions, creating my own database and working with data and their analysis has helped me better understand how to codify and interpret data. This dissertation has also offered me the opportunity to carry out my own research, and thus, to guide my future professional career, as I have realized that there is a need for research on this topic. Moreover, during the development of this dissertation, I had made use of the knowledge acquired about bibliographical search during the degree. The general and specific competences I have used during the elaboration of this dissertation, which are also reflected in the official description of this degree, are the following:

- Ability to manage technological means and resources.

- Ability to identify, manage and synthesis bibliography.

- Skills on managing information.

- Research skills: investigation techniques and documentation.

- Autonomous learning.

- Ethic, critic and constructive spirit.

Moreover, as my research deals with English, but also with Spanish which is my mother tongue, this dissertation also covers specific competences like the following:

- Capacity to write and speak in the English language.

- Capacity to understand and produce in the English language texts related to the main professional possibilities of the degree.

- Capacity to relate linguistic knowledge with other areas and disciplines.

- Capacity to understand the English grammar and its description.

- Capacity to make use of my L1 language and to compare it with other languages.

- Capacity to understand the Spanish grammar and its description.

1. INTRODUCTION

Language acquisition is a developmental process in which a variety of factors are intertwined. Some of these include the following: the period of time children go through in order to acquire the main properties of the language they are exposed to, the role played by the type of input they receive, the education programs they attend and the different challenges they may encounter when acquiring their mother tongue. When there are extra factors that may influence the acquisition process, a change in the developmental process can arise. This undergraduate dissertation considers one of these factors, in this case, hearing impairment. Hearing impairment is a condition that affects 12.000 babies each year in the U.S. (Centers for Disease Control and Prevention, 2015), and almost 2.000 in Spain (Encuesta INE, 2000). This condition affects children's acquisition process as well as their education and learning paths. Therefore, this type of impaired acquisition must be studied in depth.

This dissertation is based on the analysis of sentential subjects as they appear in the data from Spanish and English hearing impaired (HI) children along their language developmental path, and thus, it contributes to provide more information about their linguistic delay. Therefore, this dissertation takes previous studies on children with specific language impairment (SLI) and HI children as a reference, as HI is considered a case of SLI. Moreover, the objectives of this study are to analyse the subject production of HI children, taking typically developed (TD) children as a control group, and to compare the differences and similarities that may appear between HI children from both languages.

This study is divided into eight sections, the introduction being the first one. The second section considers the theoretical approach that is at the bases of this work and, in particular, the principles and parameters theory on sentential subjects, that constitutes the formal background for this study. Then, the third section provides a general overview of the previous studies about the acquisition of subjects by HI, SLI and TD children. The fourth and the fifth sections state the objectives of the study and the methodology followed in the analysis. The sixth section shows the results obtained from the analysis of the data, and the discussion of these results. The conclusions reached after having analysed the data are gathered in the seventh section, and finally, the last section provides the bibliography that has been consulted for this dissertation. Moreover, the CD attached to this dissertation contains the Access database created to codify and analyse the children's production.

2. THEORETICAL FRAMEWORK

This section deals with sentential subjects and their defining properties according to some scholars. Moreover, a brief explanation of the principles surrounding this grammatical category will be provided, and thus, the differences that appear when analysing subjects in two different languages, in this case, English and Spanish, will be focalised. Furthermore, the different instances in which the null subject parameter, which is the formal framework of this dissertation, takes place in both languages will be explained.

1. **The Grammatical Properties of Subjects**

According to Crystal (2008:461), a subject could be defined as "a term used in the analysis of grammatical functions to refer to a major constituent of sentence or clause structure, traditionally associated with the 'doer' of an action", which means that the subject is the element that performs the action of a verb. There are some scholars that have stated some further properties to broaden the definition of this universal category. Following Andrews (1985), there are five properties usually shared by all subjects. Firstly, one of the most common properties is that subjects usually adopt the form of a DP (1a), although they can also adopt the form of a PP (1b) or a clause (1c).

1)   a.   *The house* is red.

        b.   *Between 6 and 9* will suit me.

        c.   *Going to the cinema* is funny.

Moreover, subjects are the external argument of a verb, and they typically receive nominative case via verbal inflection. The IP (inflectional phrase) is the clause selected by the complementizer, and thus, the one that gives the information about tense and agreement (Haegeman, 1999).

Thirdly, subjects agree with verbs in number and person, which in English is overtly marked in the -s for the third person singular in present tense (2a). Verbal agreement is overtly realized in all verbs in Spanish, as verbal inflection indicates specifically which person is doing the action (2b).

2)   a.   She eat*s* chocolate.

      b.   Yo com*o* chocolate, mientras que mis padres come*n* bizcocho.

The fourth property is that subjects are normally the leftmost constituent within a sentence (3a), but there are some instances in which we can find another element in that position (3b) due to emphatic or pragmatic reasons.

3)   a.   *George* wants to go to the cinema.

      b.   *Yesterday,* all my problems seemed so far away.

The final property to consider is the fact that subjects determine the number, gender, and person of the reflexive pronoun that appears in the sentence when they are co-referential. Thus, in the example (4), the pronoun *he* is the one that provides gender, number and person features to the reflexive pronoun *himself* (i.e. masculine, singular and third person).

4)   *He* cuts *himself*.

2. Principles and parameters: subjects across languages

The properties outlined above characterize subjects across languages. This leads us to discuss more in depth how subjects are captured in Universal Grammar. Universal Grammar, as proposed by Chomsky (1965), states that all human languages share a series of systems and categories while they differ in some others, and thus, Universal Grammar is formed by a number of principles (the common properties) and parameters (that capture differences across languages). As the category analyzed in this dissertation is the subject, the principle that will be focused on is the Extended Projection Principle (EPP) and the corresponding parameter the Null Subject Parameter (NSP).

2.1 The Extended Projection Principle (EPP)

The EPP is an extended version of the Projection Principle, formulated in 1986, which stated that "a lexical structure must be represented categorically at every syntactic level" (Chomsky, 1982:8), i.e., every verb needs a certain number of arguments. Beyond this, the principle was developed into an extended version (EPP), which stated that every sentence must contain a subject. Principles are universal, which means that they must occur in every language. However, even if all sentences in all languages must have a subject (the necessity for the subject), the nature of the subject may change from one language to the next. This variability across languages in the case of the nature of the subject is capture in the Null Subject Parameter.

2.2 The Null Subject Parameter (NSP)

Together with the EPP, the Null Subject Parameter (NSP) is at the basis of this dissertation. The NSP determines if a language can drop the subject or not and, therefore, within this parameter, there exist two types of languages, [+null subject] languages, and [-null subject] languages. Although there are many properties that can define whether a language is [+/- null subject], the salient property deals with whether the subject of inflected verbs can be null or whether it cannot be null; and whether this affects both referential and non-referential subjects. These are the two properties that will be discussed below and, as this dissertation is focused on the analysis of two languages, English and Spanish, the following explanation of the NSP will differentiate between both languages.

The drop of the subject is directly related to the nature of verbal inflection. Spanish has a rich verbal inflection, which permits to know who is doing the action without necessarily having an explicit subject. As explained before, the verbal morpheme expresses the person and number of the subject, and thus, it allows Spanish to have both null and overt subjects. As in example (5a), the pronominal marker *mos* indicates a first-person plural subject and, therefore, the explicit pronominal subject could be null (as indicated by the presence of the null category *pro*). On the contrary, English has poor verbal inflection and so it cannot identify the subject and the subject needs to be overtly expressed. In example (5b), it is the pronominal subject that expresses who is doing the action.

5)   a.   *pro* Va*mos*.

          b.   *We* go.

Examples (5a) and (5b) illustrate how Spanish is a [+null subject] language while English is a [-null subject] language.

Regarding the referential properties of the subjects, we can distinguish between referential and non-referential subjects. Referential subjects deal with subjects that have a referent, and these can have 3 different forms in Spanish: 2 overt (pronouns and DPs) and 1 null. Therefore, regarding referential subjects, in Spanish we can find null referential subjects, as in (5a) above or (6a), and overt referential pronouns and DPs, as in (6b) and (6c) respectively.

6)   a.   *pro* me llamó ayer.

       b.   *Ella* me llamó ayer.

       c.   *Sus padres* vienen mañana.

Non-referential subjects are subjects that do not have a referent. In Spanish non-referential subjects are null, as in example (7).

7)   *pro* está lloviendo.

Considering English, as it is a [-null subject] language, both referential and non-referential subjects need to be overt. In the case of referential subjects, these can be pronouns (8a) and DPs (8b).

8)   a.   *She* is eating chocolate.

       b.   *My parents* are worried about me.

Regarding non-referential subjects, overt expletives need to be used, which, according to Haegeman (1999, 1.6.2.1), are "a non-referential element (...) which seems to function as a mere filler for the subject position and which fails to contribute to the semantics of the sentence", i.e., they are inserted because of syntactic reasons, but they do not have lexical meaning. Therefore, in English we can find overt expletives in sentences such as (9).

9)   *It* is raining.

To sum up, table 1 gathers the different referential and non-referential subject forms that are available both in English and Spanish.

Table 1. English and Spanish null and overt subject types					
	NULL		OVERT		
LANGUAGE	REFERENTIAL	EXPLETIVE	REFERENTIAL		EXPLETIVE
			DP	Pronoun	
SPANISH	*pro* salió	*pro*expl está lloviendo	Mis padres están preocupados	Ella salió	*Ello está lloviendo
ENGLISH	*pro* went out	*proexpl is raining	My parents are worried about me	She went out	It is raining

As can be seen in table 1, in the case of Spanish, expletive subjects cannot be overt as in *"*ello está lloviendo",* and, in the case of English, it is not possible to find a null referential subject or a null expletive subject as in *"*pro went out"* and *"*pro*expl *is raining".*

However, there are instances in which we can find null subjects in English, as it is the case of imperatives (10a) and non-inflected or non-finite verbs (10b).

10)   a.   _ come here!

      b.   I want _ to go to the cinema.

These null subjects in English, however, are very much restricted syntactically speaking and, therefore, do not make English a [+null subject] language.

3. EMPIRICAL FRAMEWORK

Given that the participants in this dissertation are SLI children, specifically HI children, in this section, previous works regarding language acquisition by SLI[1] children are reviewed. First, the previous works regarding SLI children including their defining properties and the way language acquisition proceeds in these cases will be analysed. Then, both English and Spanish works on the acquisition of language in HI and SLI children will be highlighted. Finally, a summary with some of the most relevant studies about subjects and their acquisition by both TD and SLI children will be provided.

1. **Language acquisition in children with specific language impairment**

The term SLI has been used since 1980, and it refers to a condition in which children experience significant language learning difficulties (Leonard, 1998). However, not all difficulties are included in this nomenclature, as some scholars have defined children with SLI using some exclusionary and inclusionary criteria, which will be explained in the following paragraphs.

Regarding the inclusionary criteria, there are two factors to be considered when identifying children with SLI. The first one is non-verbal intelligence, IQ: some investigators propose that, in order to be considered as a significant intellectual disability, the IQ needs to be lower than 75 (Plante, 1998). The second factor to be considered is verbal intelligence, that is the language production and the difficulties regarding language. Within this categorisation,

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[1] The term SLI will be used from now on with those works in which children's impairment is not specified, although this dissertation analyzes exclusively HI children.

children must have cognitive, hearing, oral-motor, among other deficits to be considered language impaired. Besides this, the receptive language age of the children must be at least 6 months below their chronological age, and their expressive language age must be 12 months below their chronological age.

Regarding the exclusionary criteria, there are some controversies as to which children should be excluded, as some of the typically excluded children are those with mental deficiency, hearing loss, severe emotional disturbance, and frank neurological deficits (Gillan and Kamhi, 2010).

Therefore, as there is some discrepancy among scholars regarding which language disorders or difficulties should be framed within the term SLI, in this dissertation HI children have been considered SLI children because of the following three reasons: Their delay in linguistic development, their problems with morphosyntax and their linguistic age as opposed to their chronological age. These will be explained in the subsequent paragraphs.

According to Leonard (1998), SLI children experience environmental deficits, either at home or within the educational framework. HI children are deprived of linguistic stimuli as spoken language (Meier, 1991), which is the typical language-learning environment, and this is a real disadvantage for them when attending lessons, together with the lack of sign language education. Therefore, linguistic input and language development are closely related, and both are clearly deficient in HI children.

Moreover, morphosyntactic markers (i.e. the use of morphemes that mark tense and agreement) are some of the properties that are specifically problematic for SLI children (Bedore and Leonard, 1998), and which they also share with HI children. According to Le Normand (2004) in his longitudinal study about fifty French HI and deaf children, there are ten common grammatical mistakes in their language production. Their auditory condition

affects them in their use of gender and number inflection, as well as in their use of verbal inflection, agreement, omission, confusion or inversion of grammatical words, including verbs and functional words.

Finally, as it has been stated before, according to Stark and Tallal (1981), receptive language and expressive language must be 6 and 12 months below the chronological age of TD children, respectively. González et al. (2014) evaluated 32 children with pre-speech deafness and hearing loss. During their study, the *Reynell Developmental Language Scales III* was administered to each child, in which the child, supported by images and objects, was asked to produce certain grammatical structures. The authors concluded that 53,1% of the children presented a great imbalance between their linguistic age and their chronological age. In fact, 22% of the children presented a gap of more than three years. The participants, who were between the ages of 3 and 7, had a linguistic age of 2 to 4 years. Hence, the linguistic age of HI children is also affected, as it is the case of SLI children.

2. **Language acquisition in Hearing Impaired children**

The acquisition of language is one of the most recurrent research topics nowadays when dealing with the analysis of language and its evolution. However, there is not a large amount of data in the field of hearing impairment. Most of the works that have been conducted, and most of the studies that have been carried out, have dealt with the benefits or the consequences of cochlear implants and the support of sign language. But few studies are actually concerned with the linguistic development of HI children.

González et al. (2014) studied the language development of Spanish children with digital hearing aids and cochlear implants. They concluded that an early cochlear implant can

suppose a significant change in the education of deaf and hearing-impaired children. Moreover, they analysed some of the common linguistic problems these children have, and they found that they had problems with the production of third person singular, past tense, passive, and subject-verb agreement. In their discussion, they highlighted the lack of research in this field, and hence, the need to comprehend their linguistic evolution and their linguistic delay to intervene and facilitate their education.

Gregory and Mogford (1981) carried out a longitudinal study in which they measured the number of words produced by English deaf and TD children. They concluded that the production time of words was belated in deaf children when compared to hearing children, which involved a delay in the appearance of oral production. Moreover, they showed how vocabulary was poorer in the case of deaf children, which also led to a delay in their linguistic abilities.

Moreover, it has also be found that, together with the lack of vocabulary these children present, they have problems with the production of simple structures, as well as with everyday words (Quintana Alonso, 2004). In fact, this is probably a consequence of their lack of oral exposure, and the lack of sign language support.

Regarding sign language, the importance of a signal exposure for a better language development has also been discussed (Meier, 1991). The typical language-learning environment includes an auditory input, which in HI children is limited, and therefore, their linguistic input is visual rather than auditory.

3. **Subjects in the production of SLI and TD children**

In this section the literature regarding subjects in the production of English SLI and TD children, as well as in that of Spanish SLI and TD children will be reviewed. To the best of our knowledge, no works on HI children's ability in this grammatical area have been carried out.

3.1**. Previous works in SLI and TD English**

Regarding previous works on English SLI children, in Schaeffer's (2002) longitudinal study, 17 English speaking children with SLI were studied during 4 consecutive years. The purpose of this study was to compare SLI children with TD children in terms of subject production, and he discovered that they made similar morpho-syntactic errors. His findings showed that SLI children produced a large number of bare stems constructions in contexts of verbal agreement. Thus, they produced sentences as in (11), in which there is no subject-verb agreement.

    11)   *She drink my milkshake.

Moreover, he also found that a considerable number of examples did not have nominative case subjects, as in (12).

    12)   *Me want a chocolate bar.

These types of errors were found in younger SLI children, between 1-3 years, while the older ones produced adult-like subjects. Besides this, he concluded that the SLI children did not have problems with null subjects, as they produced overt subjects in the same way as the TD children.

In addition to this, subjects have also been studied in comparison to objects, as in the case of Hyams and Wexler (1993), whose study about null subjects in child language reviewed the possible omissions that SLI children tend to do. For instance, they calculated the rate of subject and object drop of two children with the purpose of seeing if the drop of the subject was a grammatical option for the children. They found that in 55% of the cases the children dropped the subjects, whilst objects were dropped only 7% of the time in obligatory contexts.

In Bloom's (1990) study about subjectless sentences in TD child language, the interaction or influence of the VP length was considered when producing null subjects. This possibility was also studied by Hyams and Wexler (1993) in SLI children, and both studies found that the presence and length of subjects is closely related to the VP length, as subjectless sentences tended to occur in longer VPs, whilst sentences with shorter VPs had overt subjects.

To sum up, previous works about subject production in both SLI and TD English children show that they produce similar morpho-syntactic errors and that neither of them have problems with subject omission once the subject omission stage is overcome.

3.2. <u>Previous works in SLI and TD Spanish</u>

Most of the Spanish works regarding subjects deal with bilingual children or with Spanish children acquiring English as a Second Language (ESL). Therefore, there is a lack of research in terms of SLI children's production of subjects in this language in a monolingual L1 context.

One of the issues that has been studied is the order of the subject within a sentence, since Spanish has more word-order freedom than languages like English (Bel, 2005). In Bel´s (2005) study, the author analysed 3 L1 Catalan children and 3 L1 Spanish children, and she

came to the conclusion that children exposed to a [+null subject] language acquired earlier the syntactic rules that govern the sentence. Thus, these children were able to produce sentences as (13) where the subject appears post-verbally, and this could be related to the pragmatic purposes entailed by the children, rather than the possibility of dropping or changing the position of the subject.

13)   Vino *la mama.*

Added to this, Perales and Portillo (2007) studied the referential properties of subjects. In their study, they analysed the differences and the relationship between subjects and their antecedents. They concluded that null subjects have a subject as antecedent in 80% of the cases, i.e., in a sentence as that in (14), "Juan" in the first sentence is interpreted as being the antecedent of the null subject *pro* in the second sentence.

14)   Juan pegó a Pedro. *pro* Está enfadado.   (Perales and Portillo, 2007:891)

In conclusion, studies about subject problems in Spanish SLI and TD children show that they do not have problems with the order of a subject within a sentence nor with subjects and their antecedents. However, there is still a lack on the study of subject production in SLI children.

4. OBJECTIVES OF THE STUDY AND RESEARCH QUESTIONS

As it has been mentioned in the previous section, there is a lack of, and therefore a need for, studies on language acquisition by SLI children in general, and particularly by those with hearing impairment. Henceforth, the principal aim of this dissertation is to contribute to broaden this area of research, and thus, to add on further investigations.

This section presents the research questions that guide the study. Three question sets will be presented. Since this dissertation analyzes two languages, English and Spanish, each question set contains the corresponding research questions for each language. Given that the focus of this study is placed on HI children, the last question set deals with a crosslinguistic comparison between HI children from both languages.

1. Question set 1: English HI and TD children

With respect to the production of subjects by English HI when compared to TD children, two issues will be focused: subject overtness and subject-verb agreement. The following two research questions deal with each of these issues.

1.1. Research question 1: Overtness in English

As English is a [-null subject] language, do the HI children show a lower null subject rate when compared to that of overt subjects? Does this rate differ from the one produced by TD children?

1.2.   Research question 2: S-V agreement in English

Following the longitudinal study carried out by Schaeffer (2002), are there any problems with S-V agreement in the HI production? Are those problems similar to the ones produced by TD children? Moreover, problems with S-V agreement appear in SLI children between 1-3 years (Schaeffer 2002), and so, does this error type also appear in HI children between the ages of 4-5?

2.   Question set 2: Spanish HI and TD children

Within this section, the research questions dealing with the production of subjects by Spanish HI when compared to TD children will be stated. Therefore, the following two research questions focus on subject overtness and subject-verb agreement.

2.1.   Research question 1: Overtness in Spanish

As Spanish is a [+null subject] language, do the HI children produce a higher rate of null subjects when compared to overt subjects? Is this percentage similar to the one produced by TD children?

2.2.   Research question 2: S-V agreement in Spanish

Following the longitudinal study carried out by Schaeffer (2002), do HI children also have problems with S-V agreement? And do TD children have similar problems in this respect?

Besides, as in Schaeffer (2002), these problems with S-V agreement appear in SLI children between 1-3 years, and so, do these errors also appear in HI children between the ages of 4-5?

3. Question set 3: Spanish and English HI children

This question set includes the research questions regarding the differences that could be obtained by comparing the production of subjects in English and in Spanish as they appear in HI children's data.

3.1. Research question 1: Subject properties across languages

As it can be seen in the different studies about SLI children (Bedore and Leonard, (1998); Le Normand (2004)), they usually have the same problems regarding verbal agreement and morpho-syntax. Are these problems shared by the HI children from the two different languages in the case of subject production?

3.2. Research question 2: VP length and subject presence-omission across languages

According to Bloom's (1990) study about subjectless sentences, the VP length can interact in the production of null subjects. Taking language economy as a referent, and considering that Spanish allows the drop of the subject while English requires the overt presence of a subject, do Spanish HI children have less problems than English HI children in the production of subjects?

5. METHODOLOGY

This section deals with the methodology followed in this dissertation, and it will be divided into two subsections: Data selection and data classification. In the first subsection, the corpora and the participants selected for the analysis will be presented, and, in the last one, the classification of the data and the database created for this dissertation will be explained.

1. Data selection

1.1 Corpora

In order to select the data of this study, the corpora available in the CHILDES project (MacWhinney, 2000) were used. CHILDES is a compilation of corpora on the spontaneous linguistic production of children and their parents. The corpora comprise the transcriptions of the oral production and in some cases the original audio/video recordings. An explanation of the linguistic environment of the children is also provided in each case.

As the target of this dissertation is the analysis of HI children, the corpora selected were from the Clinical/Language Disorders folder. One of the corpora selected was the Nicholas Corpus. This corpus was created to study the verbal and nonverbal communication of both TD and HI English children (some with cochlear implants). Thus, the transcriptions are classified in two sections: Normal hearing (TD) and HI. These children were given toys during the recording sessions, and they had to play with their parents.

Besides, to analyse HI Spanish children, the MOC Corpus was selected. This corpus was created to analyse the linguistic development of a deaf child with a cochlear implant, and

thus, it provides 156 files of recording transcriptions including coding of gestures. In the recording sessions, the child played with her mother.

For the analysis of TD Spanish children, the BecaCesNo Corpus was selected. It contains 81 transcriptions of free conversations between children and adults. In this case, the children were not recorded with their parents, but with the investigators.

1.2 Participants

For this dissertation, 4 participants were selected from the previously mentioned corpora. As the main objective of the dissertation was to see the linguistic delay of the HI participants, they were selected according to their age. Following the age-matching selection criterion, the files selected for the analysis contained transcriptions of 4;4-4;7[2] year old children.

In the case of English children, two children were selected from the Nicholas Corpus. As it is not specified which children have a cochlear implant, the criterion for the selection has been the closer age-matching. The HI child selected is Paloma (4;5) and the corresponding transcription file is "hi54f-paloma". From the TD section, Elodie (4;7) and the transcription file is "nh54f-elodie" were selected.

Regarding the HI Spanish children, Berta (4;5) from the MOC Corpus was selected, and from all her recordings the chosen file was "040500", in which she had the required age. As a TD child, Rocío (4;4) and her "04f09" file were selected from the BecaCesNo Corpus.

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[2] This is the format used in CHILDES to express age: year;month. This dissertation will follow this same format.

As it can be seen, all the participants are female. Although biological gender is not targeted in this study and the criterion for participant selection is age-matching closeness, only girls have been included to ensure that children's biological gender did not influence the results.

Once the participants were selected, their MLU was automatically calculated by using the CLAN program called MLU. The MLU value shows the linguistic development of the children.

To sum up, table 2 shows an overview of the participants and their corresponding MLU values in the data selected.

Table 2. Participants selection					
Child Name	**Language**	**Group**	**File selected**	**MLU average**	**Age**
Paloma	English	HI	"hi54f-paloma"	2.4	4;5
Elodie	English	TD	"nh54f-elodie"	3.5	4;7
Berta	Spanish	HI	"040500"	2.2	4;5
Rocío	Spanish	TD	"04f09"	5.6	4;4

Moreover, all the data used for this study with respect to the target structure were extracted manually from the corpora and classified as explained in the next section.

2. Data classification

This section deals with the classification of the data obtained, which have been codified in an Access database attached to this dissertation in an electronic format. The variables considered in this study and the discarded cases will be described below.

2.1 Variables

The document attached to this dissertation contains 4 sheets, one per child. Each sheet was arranged according to two general properties: child group and language group. Thus, whether a child was a TD or an HI has been considered, as well as whether their L1 was English or Spanish. The name of each sheet shows this classification. Table 3 gathers the name of each sheet following this classification.

Table 3. Sheet classification			
Child Name	**Language**	**Group**	**Sheet Name**
Paloma	English	HI	PALOMA HI EN CHILD
Elodie	English	TD	ELODIE TD EN CHILD
Berta	Spanish	HI	BERTA HI SP CHILD
Rocío	Spanish	TD	Rocío TD SP CHILD

In each sheet, three variables were considered: Grammatical correctness, subject overtness and grammatical person.

1. Variable 1: Grammatical correctness

In this variable, the data were classified according to the correctness of the nature of subjects and subject-verb agreement. First, whether a null subject was correct or incorrect was considered. Thus, sentences as (14a) and (14b) in the case of Elodie, and (15) in the case of Rocío were classified as table 4 shows.

14)   a.   *pro* gave her a kiss   (line 130)

b.   _ put it on the table.   (line 806)

15)   porque *pro* me cai (.) en el suelo .   (line 15)

Table 4. Variable 1.1: Nature of Subjects			
Example	**Line**	***Null SU**	**Null SU**
**pro* gave her a kiss	130	1	0
_ put it on the table .	806	0	1
porque *pro* me cai (.) en el suelo .	15	0	1

*Null SU = incorrect null subject
Null SU = correct null subject (i.e. imperatives)

Besides this, whether there was subject-verb agreement or not was also considered. Thus, sentences as (16a) and (16b) in the case of Paloma, and (17a) and (17b) in the case of Berta were classified as table 5 shows.

16)   a.   * he want to climb up.   (line 130)

        b.   is Jaime playing now ?   (line 528)

17)   a.   yo quería coserlo .   (line 429)

        b.   *pro* te va (=voy) a matar.   (line 295)

Table 5. Variable 1.2: Subject-Verb Agreement			
Example	**Line**	**S-V agreement**	**No S-V agreement**
* he want to climb up.	130	0	1
is Jaime playing now ?	528	1	0
yo quería coserlo	429	1	0
pro te va (=voy) a matar.	295	0	1

2. Variable 2: Subject overtness

In this variable, whether a subject was null or overt was considered. Thus, if a subject fell into the category of null it was classified in terms of correctness (see variable 1). Moreover, if this null subject appeared in a non-finite sentence (18a), it was classified as such. All the null subjects in non-finite clauses were correct, so there is only one category for these subjects. Overt subjects as (18b) and (18c) in the case of Berta, and (19a) and (19b) in the case of Paloma were classified according to their corresponding subtype (DP vs pronoun). Table 6 gathers some examples of this variable.

18) a. *pro* te voy a _ dar un mordisco   (line 205)

   b. y *yo* enseño una cosita.   (line 95)

   c. *ese de ahí* está buer@p   (line 56)

19) a. *I* will go first   (line 121)

   b. *both of us* spill the beans   (line 134)

Table 6. Variable 2: Subject overtness						
		Null subjects			Overt Subjects	
Example	**Line**	***Null SU**	**Null SU**	**Non-finite**	**Pron**	**DP**
pro te voy a _ dar un mordisco	205	0	1	0	0	0
pro te voy a ▯ dar un mordisco	205	0	0	1	0	0
y **yo** enseño una cosita .	95	0	0	0	1	0
ese de ahí está buer@p	56	0	0	0	0	1
I will go first .	121	0	0	0	1	0
both of us spill the beans	134	0	0	0	0	1

3. <u>Variable 3: Grammatical person</u>

The third variable deals with the grammatical person of each instance. Thus, subjects as in (20a), (20b) and (20c) in the case of Rocío, and (21a) and (21b) in the case of Elodie were classified according to their number and person, together with the previously mentioned variables. Therefore, once a subject was classified in terms of overtness, it was categorized according to its number and person. Table 7 shows some instances of this variable in combination with the other variables.

20)   a.   Y *Mari Carmen* me ha da(d)o carbo(n).   (line 115)

        b.   pues (.) *yo* no se   (line 161)

        c.   *pro* nos iremos de vacaciones   (line 185)

21)   a.   *I* only have this much left   (line 30)

       b.   *it* look*s* like Lassie   (line   431)

Table 7. Variable 3: Grammatical person											
			Overt Subjects			Grammatical person					
Example	Line	Null	Pron	DP	1p sg	2p sg	3p sg	1p pl	2p pl	3p pl
Y **Mari Carmen** me ha da(d)o carbo(n) .	115	0	0	1	0	0	1	0	0	0
pues (.) **yo** no se	161	0	1	0	1	0	0	0	0	0
pro nos iremos de vacaciones .	185	1	0	0	0	0	0	1	0	0
I only have this much left	30	0	1	0	1	0	0	0	0	0
it look**s** like Lassie	431	0	1	0	0	0	1	0	0	0

These three variables were used to classify all the data of the study.

2.2 Discarded cases

In this section the decisions taken during the processes of data extraction and data classification will be explained. There were cases of imitation, fixed expressions and unclear instances that were not included in the database. These discarded cases were the following.

Regarding imitation, the children's recording took place usually when children interacted with their mothers, so some of the instances found in the corpora were produced as a repetition of what the mother said. This is the case of (22).

22)   *MOT: que el tiempo pasa .

        *CHI: que el tiempo pasa , papi .   (line 118)

This example shows the child, Berta, repeating what her mother has said, and therefore, this utterance was not taken into account as Berta is not the one producing the original sentence. All the imitation cases that appeared in the corpora were, therefore, discarded.

Moreover, fixed expressions were not taken into account, as they were not clauses or did not reflect productive language and, therefore, did not have relevance for this dissertation. Examples (23a) and (23b) are some of these instances in the case of Rocío.

23)   a.   Vale!   (line 21)

        b.   otra vez ?   (line 306)

There were other problematic instances in which it was unclear what the child was trying to say. In these cases, if the researchers that carried out the data transcription clarified the words, they were classified. On the other hand, if words were not clarified, and it was nearly impossible to figure out what the child was trying to say, or the symbols " xxx" appeared in the utterance, they were not classified. There were some "xxx" cases in which the appearance of these symbols did not affect the classification, as in the case of (24a), and others in which they did affect, as in (24b). Examples like those in (24a) were included in the corpus while those like the one in (24b) were removed from the corpus.

24)   a.   *pro* voy a echar xxx la cena.   (line 738)

b.   yo xxx cumple.   (line   547)

6. ANALYSIS

In this section, the results obtained from this study will be explained. Moreover, as these results address and provide the answer to the research questions stated in the fourth section of this dissertation, this section will be organized following the same schema as in the research questions. Thus, the HI children's results dealing with subject overtness and subject-verb agreement in English (question set 1) will be presented first. Then, the ones dealing with subject overtness and subject-verb agreement in Spanish (question set 2) will be discussed. And finally, the ones dealing with the comparison of the subject production across both languages (question set 3) will be explained.

1.   **Data analysis and question set 1: English HI and TD children**

This question set deals with the production of subjects by English HI when compared to TD children focusing on subject overtness and subject-verb agreement.

1.1.   **Research question 1: Overtness in English**

Table 8 gathers the classification of the results for this research question.

Table 8. Question set 1: Research question 1 (Overtness in English)								
	Null SUs				**Overt SUs**			**Total subjects**
Child	***Null SU**	**Null SU**	**Non-finite**	**Total**	**Pron**	**DP**	**Total**	
TD CHILD (Elodie)	5 (2.89%)	11 (6.35%)	23 (13.29%)	39 (23%)	82 (47.4%)	52 (30%)	134 (77%)	**173 (100%)**
HI CHILD (Paloma)	11 (6.5%)	6 (3.5%)	0	17 (10.11%)	116 (69%)	35 (20.83%)	151 (89.9%)	**168 (100%)**

Table 8 shows the subject production in the case of the English children, organized in terms of overtness. Moreover, null subjects have also been classified according to whether they were correct or not (variable 1). In the case of Elodie, out of the 173 subjects that she produces, 23% are null subjects, whilst 77% are overt subjects. Moreover, within her production of null subjects, 2.89% of them are incorrect (*Null SU). In the case of Paloma, she produces 168 subjects, from which 10.11% are null subjects, and 89.9% overt subjects. Besides, 6.5% null subjects are incorrect.

These results show that in the case of Paloma, the HI child, her rate of null subjects (10.11%) is lower than that of overt subjects (89.9%), and this answers the first research question in that she shows a lower rate of null subjects when compared to that of overt subjects. Moreover, when comparing these results to the ones of Elodie, it can be seen that Elodie produces a higher rate of null subjects (23%) than Paloma, who in fact, does not produce instances of subjects in non-finite sentences. This happens partly because Paloma's sentences are shorter than the ones produced by Elodie. Hence, the rate of null subjects produced by both children in English (a [-null subject] language) is lower than the rate of overt subjects which points to both children's production complying with the adult requirement (i.e.

sentences in English typically have an over subject, while null subject use is grammatically restricted).

As can be observed, both children produce incorrect null subjects, as illustrated in examples (25a), in the case of Paloma (HI), and (25b), in the case of Elodie (TD).

25) a. *pro* will play with the beans.   (line 103)

   b. *pro* play with toys.   (line 507)

Most of their incorrect null subjects refer to first person singular, as in examples (25a) and (25b). Therefore, the rate of null subjects in Paloma (HI) is lower than that of overt subjects. Besides, the rate of null subjects in Elodie (TD) differs from that of Paloma in that she produces more null subjects than Paloma.

1.2. <u>Research question 2: S-V agreement in English</u>

Table 9 shows the results regarding research question 2.

Table 9. Question set 1: Research question 2 (S-V agreement in English)					
	S-V AGREEMENT	**NON S-V AGREEMENT**			**Total subjects**
Child		**3rd s.**	**3rd pl.**	**Total**	
TD CHILD (Elodie)	173 (100%)	0	0	0	**173 (100%)**
HI CHILD (Paloma)	152 (90.47%)	15 (8.9%)	1 (0.59%)	16 (9.52%)	**168 (100%)**

As can be seen in these results, Paloma (HI) has problems with S-V agreement in 9.52% of cases. Moreover, from the total of non S-V agreement cases, 8.9% of the cases have to do with the third person, as she produces sentences as (26a) and (26b) where the -s marker is missing. On the contrary, Elodie (TD) does not have problems as 100% of her structures obey English S-V agreement rules.

26) a. she want go the house   (line 830)

    b. he want to climb up .   (line 528)

Therefore, these results answer this research question in that, as in Schaeffer (2002), this HI child has problems with S-V agreement, whereas the TD child does not. These problems with S-V agreement, as the -*s* in the third person singular, also appear in SLI children between the ages of 4 and 5, in this case in those with hearing impairment. However, the percentage of these ungrammatical cases is very low as it is below 10% of the HI child's overall subject production.

2. Data analysis and question set 2: Spanish HI and TD children

This section deals with the production of subjects by the Spanish HI child when compared to the TD child focusing on subject overtness and subject-verb agreement.

2.1. Research question 1: Overtness

Table 10 gathers the corresponding results necessary to provide an answer to this research question.

	Null subjects				Overt Subjects			
Table 10. Question set 2: Research question 1 (Overtness in Spanish)								
Child	***Null SU**	**Null SU**	**Non-finite**	**Total**	**Pron**	**DP**	**Total**	**Total subjects**
TD CHILD (Rocío)	0	245 (67.49%)	26 (7.16%)	271 (74%)	13 (3.58%)	79 (21.76%)	92 (25.34%)	**363 (100%)**
HI CHILD (Berta)	0	94 (78%)	16 (13.44%)	110 (92.43%)	3 (2.52%)	6 (5.04%)	9 (7.56%)	**119 (100%)**

Table 10 shows the subject production of the Spanish children organized in terms of overtness. Moreover, these results have been classified according to whether they were correct or not (see variable 1). In the case of Berta (HI), she produces 119 subjects out of which 92.43% are null and 7.56% are overt. Moreover, within her production of null subjects, all of them are correct. Regarding Rocío (TD), she produces a total of 363 subjects, from which 74% are null and 25.34% are overt. Besides, all her null subjects are correct, too.

When comparing both children, the rate of null subjects in Berta (92.43%) is higher than that of Rocío (74%). In any case, both rates are higher than the ones of overt subjects, which is in line with the fact that Spanish is a [+null subject] language. These results provide an answer to research question 1 in question set 2: Berta, the HI child, produces a higher rate of null subjects given that Spanish is a [+null subject] language, and this percentage is significantly higher than that of Rocío, the TD child.

2.2.   Research question 2: S-V agreement

Table 11 gathers the results related to this research question, which deals with S-V agreement.

Table 11. Question set 2: Research question 2 (S-V agreement in Spanish)			
	S-V AGREEMENT	**NON S-V AGREEMENT**	
Child	**Total S-V agreement**	**Total non S-V agreement**	**Total subjects**
TD CHILD (Rocío)	358 (98.62%)	5 (1.37%)	363 (100%)
HI CHILD (Berta)	115 (96.63%)	4 (3.36%)	119 (100%)

As table 11 shows, there are few cases in which the children's sentences lack S-V agreement. In the case of Berta (HI), from a total of 119 instances, only 3.36% are classified as non S-V agreement. She produces 4 sentences, all of them in first person singular, in which the subject and the verb do not agree, as in (27a) and (27b). In the case of Rocío, only 1.67% of their sentences have non S-V agreement, but there is no person that stands out from the others, although these examples appear in sentences with DPs as subjects, as in (28).

27)   a.   *pro* te <u>va</u> (= voy) a matar   (line 295)

        b.   ataque fantasma y *pro* te <u>va</u> (=voy) a matar   (line 252)

28)   que estos ya se ha (=han) ido todos   (line 294)

As can be seen in the case of Berta, there are just a few exceptions in which there is non S-V agreement, hence, this answers this research question in that this Spanish HI child does not have problems with S-V agreement. This is different from Schaeffer's (2002) findings but

age difference is a factor here: the problems do not appear in Spanish SLI children with hearing impairment between the ages of 4-5 as they did in children between 1-3 years. Moreover, when comparing these results to the ones of Rocío, the rate is very similar, so neither the TD nor the HI child has problems with S-V agreement.

3. Data analysis and question set 3: Spanish and English HI children

This question set deals with the comparison of the production of subjects in English and Spanish HI children.

3.1 Research question 1: Subject properties across languages

Table 12 shows the results from Paloma and Berta, both hearing-impaired children.

Table 12. Question set 3: Research question 1 (Subject properties across languages)			
	S-V AGREEMENT	**NON S-V AGREEMENT**	
Child	**Total S-V agreement**	**Total non S-V agreement**	**Total SUs**
EN HI CHILD (Paloma)	152 (90.47%)	16 (9.52%)	168 (100%)
SP HI CHILD (Berta)	115 (96.63%)	4 (3.36%)	119 (100%)

As it could be seen in different studies about SLI children (Bedore and Leonard, (1998); Le Normand, (2004)), they usually have problems regarding verbal agreement and morpho-syntax. Table 12 shows that, in the case of Paloma, the English child, the rate of non S-V agreement (9.52%) is higher than that in Berta (3.36%). Moreover, in the case of Paloma, she has specific problems with third person singular -*s* (see examples 26a and 26b), as she omits

it in 8.9% of the cases (see table 9). These problems do not appear in Berta's production. Berta, the Spanish child, shows few problems with S-V agreement in the case of DPs, but all of them happen when it is first person singular, as in (29a) and (29b).

29)   a.   *pro* te **mata** (= mato) con la cola   (line 205)

        b.   *pro* te **va** (=voy) a matar   (line   295)

Therefore, both children have different mistakes regarding S-V agreement even if each of them has different specific problems: the *-s* in the third person in the case of Paloma, and the non S-V agreement in cases with first person singular in the case of Berta. That is, they share the presence of non S-V agreement cases but not the specific problems these HI children have across languages, such as omission, confusion or inversion of grammatical words, among others. This is expected as S-V agreement exhibit differences across the two languages as it is morphological rich and overtly marked in Spanish but not so in English.

3.2.   <u>Research question 2: VP length and subject presence-omission across languages</u>

Table 13 shows the corresponding results about the production of subjects from HI children in both languages.

Table 13. Question set 3: Research question 2 (VP length and subject presence-omission across languages)					
Child	***Null SU**	**Null SU**	**Non-finite**	**Total null SUs**	**Total SUs**
EN HI CHILD (Paloma)	11 (6.5%)	6 (3.5%)	0	17 (10.11%)	**168 (100%)**
SP HI CHILD (Berta)	0	94 (78%)	16 (13.44%)	110 (92.43%)	**119 (100%)**

As table 13 reflects, the rate of incorrect null subjects in the case of Paloma (6.5%) is higher than that in Berta (0%). Moreover, Paloma does not produce any non-finite sentence subjects, but on the contrary, Berta produces them in 13.44% of the cases. Therefore, in this case the Spanish HI child has less problems than the English HI one in the production of ungrammatical null subjects, given that Spanish is a [+null subject] language. These results answer the second research question in question set 3 in that the Spanish HI child, Berta, has less problems in the production of subjects than the English HI child. Moreover, it is necessary to consider the VP length, as it may also interact with the production of null subjects, as in Bloom's (1990). Since Spanish is a [+null subject] language and it allows the drop of the subject, sentences are shorter than those in English, which is a [-null subject language], so in this case VP length is an influencing factor.

7. CONCLUSIONS

This section gathers the final conclusions of this dissertation. This dissertation has presented a study on the production of sentential subjects in HI children and TD children from two different languages, in this case, English and Spanish. After explaining the formal differences between both languages in terms of subjects, addressing in particular the EPP and the NPP (section 2), this dissertation has shown some of the most relevant studies done on the acquisition process of HI and SLI children (section 3). The lack of information and research about these children was highlighted, and although this dissertation may contribute to expand our knowledge on HI children's linguistic production, there is still a need for further research. Moreover, section 4 presented the objectives of this study. These objectives dealt with the analysis of subject production by English HI and TD children, Spanish HI and TD children, and the comparison between the HI children from both languages. In order to analyse the subject production, a database was created by extracting data from CHILDES and by extracting subject data and classifying these data according to different linguistic variables (section 5).

The analysis of these data, explained in section 6, reflected some of the common problems HI children have with respect to two of the grammatical properties of subjects: S-V agreement and subject omission-production. Both agreement as well as omission problems have been detected in English; while only agreement problems appear in the case of Spanish given that Spanish is a [-null subject] language. These results are in line with what previous studies have stated: HI children show a linguistic delay in comparison to TD children.

However, this dissertation covers a small portion of the possible research topics that could be addressed in this area, and it also deals with the analysis of the linguistic production of four children. This suggests that a broader study based on a larger number of children could provide more details about the problems these children have, and thus, suggest possible solutions as to their education and linguistic environment at home. Besides, this analysis followed an age-matching criterion, and therefore, an analysis on their production in terms of MLU-matching could point out different findings. Moreover, a longitudinal study of HI children could also provide further light as to the actual developmental path they follow; as the children under investigation in this dissertation are 4-5 years old, the analysis of their production throughout the years would reflect their linguistic development in more detail as compared to TD children. Together with the previous ideas, this analysis focused on HI children within the SLI category, so an analysis on SLI children with cognitive problems, mental deficiency and so on could also highlight some problems they might share, thus pointing to common properties SLI children have.

Finally, this dissertation analyses subject production, although some other errors did appear in the data, such as verb omission, auxiliary omission in questions and article omission. Hence, further research on these syntactic areas would also contribute and facilitate a possible intervention in HI children's education with a view to improve their linguistic knowledge.

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AFTERWORD: OBJECTIVES REACHED IN THE UNDERGRADUATE DISSERTATION

After carrying out the present study, I think I have reached two of the most important objectives as in the official description of the English degree (Universidad de Valladolid 2009: 14) which are the following:

- To provide a complete acquisition process in linguistics, culture and literature of the English language (in this particular case, in linguistics).

- To achieve a solid instrumental competence in English in a general environment but also in a professional one.

Regarding the first objective, with this study I have put in practice several aspects that I have learned throughout my four-year degree, which are the following:

- Grammatical background and data compilation and analysis: English grammar I and II (1st year), English grammar III (2nd year), and General Linguistics (2nd year)

- Comparative grammatical background and data compilation and analysis: English/Spanish comparative grammar (3rd year).

- English language and data compilation: Applied Linguistics III and Information and Communication Technologies Applied to English studies (4th year).

Regarding the second objective, these aspects have been combined, and they could be applied to the two principal professional fields in our degree: teaching and research. As I have suggested along my dissertation, this study has given me the occasion broader my knowledge of the field of linguistics, in particular, the study of acquisition in HI children. The study of the needs of these children could have consequences for language teaching. Moreover, given that my study is based on the analysis of empirical data, it is also related to a specific

research methodology used in the fields of acquisition and language learning, and I have been able to apply the knowledge on codification and interpretation of data acquired through this degree.