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ANAPHORS IN BINDING THEORY: IS THE PRODUCTION OF ANAPHORS SIMILAR IN AMERICAN AND BRITISH ENGLISH CHILD SPEECH?

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ABSTRACT

This undergraduate dissertation deals with the production of anaphors (reflexives and reciprocals) in North American and British English child speech within the ages of 2 to 4. By carrying out an empirical analysis of data from the CHILDES project, the purpose of this study is to determine whether the production of anaphors is parallel in the L1 acquisition of both British and American English. The data are analyzed in terms of anaphor form, anaphor function, and adulthood. The analysis suggests that the production of anaphors is quite similar in North American and in British English child speech in the case of the non-developmental analysis concerning anaphor form and function but it differs in the case of the developmental analysis considering adulthood.

KEYWORDS: Binding theory, principle A, anaphor production, North American English, British English, CHILDES.

RESUMEN

Este trabajo trata sobre la producción de anáforas (pronombres reflexivos y recíprocos) tanto en niños norteamericanos como británicos de entre 2 y 4 años con inglés como lengua materna. El objetivo del trabajo es demostrar mediante un análisis empírico de datos procedentes de CHILDES si en ambos casos el proceso de adquisición de anáforas es paralelo. Estos datos son analizados de acuerdo a las diferentes formas y funciones de las anáforas, así como a su adecuación a la gramática adulta. El análisis indica que el uso de las anáforas es similar en el discurso de los niños británicos y en el de los norteamericanos con respecto a su forma y su función mientras que éste difiere si consideramos la adecuación a la gramática adulta en su desarrollo.

PALABRAS CLAVE: teoría del ligamiento, principio A, producción de anáforas, inglés norteamericano, inglés británico, CHILDES

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1. Introduction

The acquisition of the different principles of Binding Theory has been a subject of interest since Chomsky exposed his Binding Theory. Many comparisons between the acquisition of the different principles as well as among different languages have been done, but few studies compare the production of the Principle A in North American and in British English child speech. Because of this, the present dissertation tries to make a deeper exploration in this respect through a comparison between the production of anaphors in both groups of children.

Therefore, this undergraduate dissertation provides an empirical study on the production of anaphors in North American and in British English child speech between the ages of 2 and 4 years old with the aim of answering some questions about their acquisition. The data analyzed offer information on the following issues:

- The form and function of the anaphors used by both child groups.

- The complexity of the usage of the anaphors in terms of the rate of correctness in the production of both child groups.

- The relationship that exists between the complexity of the anaphors and the linguistic development, as measured by the MLU rate (Mean Length of Utterance), in the case of both child groups.

This dissertation is divided in six differentiated sections which are the following: section 2 corresponds to a theoretical overview of binding theory and especially of the principle A as it is the one that includes anaphors. In this section an account of the process of anaphor acquisition is also included by referring to previous empirical studies on anaphors in which data from North American and British English L1 speakers are analyzed.

The section 3 includes the objectives and research questions, as well as the hypotheses derived from these questions and that guide the empirical analysis in this dissertation.

In section 4 the empirical analysis is exposed including the information about the different corpora and participants selected, the CLAN programs used in order to analyze the data, a classification of the data, and a detailed examination of them.

The section 5 includes the main conclusions reached through the analysis of the data considering the previous research questions and the initial hypotheses. The bibliography appears in the final section.

2. Theoretical and empirical background

2.1. Binding theory: anaphors and other NP types

Reflexives and reciprocals are also known as anaphors and they are two different subtypes of nouns phrases (NPs), as exposed in Haegeman and Guéron (1999). Anaphors have some common features with other NPs but they also have their own defining properties. Chomsky's (1981) binding theory offers a classification of NPs in terms of the referential properties they have and so NPs could be of three types: anaphors (reflexives and reciprocals), pronouns and referential expressions. Each of the three principles in binding theory deals with each of these three NP types: principle A (anaphors), principle B (pronouns), and principle C (referential expressions).

Principle A deals with reflexives and reciprocals (anaphors) and it is the focus of this dissertation. According to principle A, these NP types need an antecedent that can provide meaning (that is, reference) to the reflexive or reciprocal. The domain in which the anaphor must be bound by an antecedent is the binding domain, which could be defined as the clause in which the NP appears. An anaphor must be bound in its binding domain, that is, the antecedent of the anaphor has to appear in the same clause as the anaphor. In (1) examples of anaphors and their antecedents are shown and co-referentiality is illustrated by means of sub-indexes:

(1)

    a. $[_{CP} [_{NP1}$ **I**$]_i$ laughed at $[_{NP2}$ **myself**$]_i]$

    b. $[_{CP} [_{NP1}$ **the girl**$]_i$ laughed at $[_{NP2}$ **herself**$]_i]$

    c. $[_{CP} [_{NP1}$ **the boy and the girl**$]_i$ laughed at $[_{NP2}$ **each other**$]_i]$

In (1a) the reflexive *myself* does not have a reference of its own. It needs to be linked to an antecedent that would provide its content. This antecedent is the NP1 *I*. In (1b) the reflexive *herself* is referentially dependent on *the girl*. In this case the antecedent of *herself* is the

NP1 *the girl.* In (1c) instead of a reflexive we have the reciprocal *each other* that needs to be linked to an antecedent that provides meaning. In this case the antecedent of *each other* is *the boy and the girl.*

As in the examples in (1), two main properties of anaphors can be stated. On the one hand, every antecedent matches the reflexive, or the reciprocal, in terms of its grammatical features, especially in terms of person, gender, and number. In (1a) the antecedent *I* as well as the reflexive *myself* are first person singular. In (1b) both the antecedent *her* and the reflexive *herself* are feminine, third person, and singular. In the case of reciprocals, gender is not taken into account as it is always the same for masculine as well as for feminine. In (1c) the antecedent *the boy and the girl* and the reciprocal *each other* are third person plural in that they involve more than one person. On the other hand, the relationship between the antecedent and the reflexive, or the reciprocal, is constrained by position and so the antecedent must always precede the anaphor in order for the anaphor to be interpreted. This is also seen in examples in (1) where the antecedents (NP1) always precede the anaphors (NP2).

Principle B deals with pronouns. These NPs are referentially dependent on another NP that could be in the linguistic discourse or in the extralinguistic situation. All pronouns must have an antecedent. In the case of having the antecedent in the linguistic discourse, the antecedent must be outside the pronoun's binding domain, as illustrated in (2):
(2)

  a. $[_{CP}\,[_{NP1}$**the boy**$]_i$ laughed at $[_{NP2}$ **her**$]_j]$

  b. $[_{CP}\,[_{NP1}$**the girl**$]_i$ laughed at $[_{NP2}$ **her**$]_j]$

  c. $[_{CP1}\,[_{NP1}$ **the boy**$]_i$ ask **me**$_i$ $[_{CP2}$ to help $[_{NP2}$ **him**$]_i]]$

In (2a) and (2b) the pronoun *her* refers to an external referent which is either in the extralinguistic situation or in the previous linguistic context, and not to an NP included in the same sentence of the pronoun. The same happens with the pronoun *me* in (2c) that is referentially dependent on a referent which is in the extralinguistic situation and it refers to the person who is uttering the sentence. That is, the NP1s in the sentences in (2a) and (2b), *the boy* and *the girl,* cannot serve as an antecedent to the pronoun *her* and, in (2c), *the boy,* cannot serve as an antecedent to the pronoun *me.* In (2c) there are two clauses (CP1 and

CP2) and the antecedent of *him* in CP2 is *the boy* in CP1. The pronoun is still free within the sentence in which it appears (CP2), its binding domain, but it has an antecedent NP that is out of its binding domain. This is what the square brackets in (2c) indicate: *him* is located in CP2 and it is bound by the referent *the boy* which appears in CP1, that is, outside of the sentence in which *him* is located.

Principle C deals with referential expressions (R-expressions). These NP types must be free as they take their reference from the universe of discourse which is the real world. This is seen in the examples in (3):

(3)

    a.   [CP[NP1 **John**] plays the guitar]

    b.   [CP[NP1 **John**] is a great footballer]

In (3a) and (3b) the R-expression *John* does not need an antecedent. We just know who John is because it exists in the real world.

In this dissertation we are going to focus on anaphors which include reflexives as well as reciprocals, that is, on principle A of binding theory. In order to analyze anaphors we are going to focus on some defining properties of both reflexives and reciprocals. First of all, we are going to discuss the types of reflexives and reciprocals. Secondly, we are going to see the functions that reflexives and reciprocals can play in the sentence. Thirdly, we are going to identify the specific constraints they have to obey and that dictate the position they can occupy with respect to their antecedent (i.e. c-command and binding, A-binding, and locality conditions on binding).

2.2. Defining properties of anaphors

2.2.1. Form

According to the grammatical feature of number, there are singular and plural reflexives. In the singular form the reflexives ends in –*self* meanwhile the plural form of reflexives ends in –*selves.* In accordance with gender grammatical features, there are masculine and feminine reflexives. Every reflexive could be either masculine of feminine except for the

reflexive *himself* that is always masculine and the reflexive *herself* that is always feminine. Taking into account person grammatical features, there are three different types of reflexives: first, second, and third person.

Table 1 shows a classification of the different forms of reflexives in terms of number (as in the feature pair [+/- SINGULAR]), gender (i.e. [+/- MASCULINE]), and person (i.e. first, second or third).

Table 1. Reflexive forms			
Reflexives	**Number**	**Gender**	**Person**
Myself	[+ SINGULAR]	[+/- MASCULINE]	1st
Yourself	[+ SINGULAR]	[+/- MASCULINE]	2nd
Himself	[+ SINGULAR]	[+ MASCULINE]	3rd
Herself	[+ SINGULAR]	[- MASCULINE]	3rd
Itself	[+ SINGULAR]	[+/- MASCULINE]	3rd
Ourselves	[- SINGULAR]	[+/- MASCULINE]	1st
Yourselves	[- SINGULAR]	[+/- MASCULINE]	2nd
Themselves	[- SINGULAR]	[+/- MASCULINE]	3rd

As seen in table 1, there are, therefore, a total of 8 reflexive forms in English.

In English there are two reciprocal pronouns which are *each other* and *one another*. Traditionally, *each other* was used to refer to two people meanwhile *one another* was used to refer to more than two people. Nowadays, as Garner (2009) noted, "careful writers will doubtless continue to observe the distinction, but no one else notice" (287). Reciprocals are always plural because they are used to express a mutual action or relationship which includes more than one person. There is no distinction in terms of gender or person grammatical features in the case of reciprocals.

2.2.2. Function

Reflexives as well as reciprocals can have several functions in the sentence. They are used as objects of verbs (such as direct object, indirect object, and object of a preposition), and subject, as in Frajzyngier and Walker (2000). These functions can vary according to the reference between the subject and the place in which the reflexive is located because both,

the reflexive and the reciprocal, would generally refer to the subject of the sentence. There are also some anaphors that do not function as subjects or objects; these anaphors are used in order to give emphasis. The different functions are explained below.

As anaphors refer to the subject of the sentence, an anaphor functions as a **direct object** when the object and the subject have the same referent, as illustrated in (4):
(4)
    a. $[_{CP} [_{NP1}$ **He**$]_i$ found $[_{NP2}$ **<u>himself</u>**$]_i$ on the ground$]$
    b. $[_{CP} [_{NP1}$ **They**$]_i$ meet $[_{NP2}$ **<u>each other</u>**$]_i$ in China$]$

In (4) the direct object is NP2 which corresponds to a reflexive in (4a) and to a reciprocal in (4b). Both in (4a) and (4b) the referent of NP1 is the same of the referent of NP2, that is, NP1 is the binder of NP2. In (4a) *himself* is the direct object which refers to the subject *he*. In (4b) *each other* is the direct object which refers to the subject *they*.

An anaphor can function as an **indirect object** when the indirect object is co-referential with the subject, as illustrated in (5):
(5)
    a. $[_{CP} [_{NP1}$ **They**$]_i$ have given$[_{NP2}$ **<u>themselves</u>**$]_i$ $[_{NP3}$ some drinks$]]$
    b. $[_{CP} [_{NP1}$ **They**$]_i$ have given $[_{NP2}$ **<u>each other</u>**$]_i$ $[_{NP3}$ some presents$]]$

In (5a) the indirect object is the NP2 *themselves* and it refers to the subject of the sentence, *they*. The direct object of the sentence is the NP3 *some drinks*. In (5b) the indirect object is the NP2 *each other* which refers to the subject of the sentence, *they*. The direct object of the sentence is the NP3 *some presents*.

An anaphor can function as the **complement of a preposition** when the complement of the preposition refers to the subject of the clause, as shown in (6):
(6)
    a. $[_{CP} [_{NP1}$ **She**$]_i$ cooks for $[_{NP2}$ **<u>herself</u>**$]_i]$
    b. $[_{CP} [_{NP1}$ **Mary and John**$]_i$ cook for $[_{NP2}$ **<u>each other</u>**$]_i]$

In (6) NP2 functions as the object of the preposition *for* and it refers to the subject of the sentence which is NP1. In (6a) the reflexive *herself* refers to the subject *she* which is the binder of the anaphor. In (6b) the reciprocal *each other* refers back to the subject *Mary and John.*

When an anaphor appears in **subject** position three situations arise: anaphors as subjects of finite clauses, anaphors as subjects of non-finite clauses and small clauses, and anaphors contained within subjects.

When an anaphor is the **subject of a finite clause**, the resulting clause is ungrammatical. An anaphor cannot be the subject of a finite clause in English because in that position the anaphor will lack a binder, as examples in (7) illustrate:

(7)

    a.   *[$_{CP1}$ [$_{NP1}$ **Mary**]$_i$ expects [$_{CP2}$ that [$_{NP2}$ **herself**]$_i$ should be invited]]

    b.   *[$_{CP1}$ [$_{NP1}$ **Mary and John**]$_i$ expect [$_{CP2}$ that [$_{NP2}$ **each other**]$_i$ will do the homework]]

Examples (7a) and (7b) are ungrammatical because the reflexive *herself,* as well as the reciprocal *each other,* are the subjects of the corresponding subordinate finite clauses (CP2) and so, they lack an antecedent in their own clause and, therefore, they violate principle A of binding theory (as presented in section 2.1 above).

When an anaphor is the **subject of another clausal constituent,** a non-finite clause, or a small clause, the binding domain is extended to the next higher-up clause; that is, the binding domain is extended to the domain containing the first c-commanding subject, as (8) illustrates:

(8)

    a.   [$_{CP1}$ **John**$_i$ considers [$_{CP2}$ **himself**$_i$ to be clever]]

    b.   [$_{CP1}$ **John**$_i$ considers [$_{CP2}$ **himself**$_i$ clever]]

    c.   [$_{CP1}$ [$_{NP1}$ Paul and Bill] think [$_{CP2}$ that [$_{NP2}$ **Mary and John**]$_i$ expect [$_{CP3}$ [$_{NP3}$ **each other**]$_i$ to write an essay]]]

    d.   [$_{CP1}$ [$_{NP1}$ Paul and Bill] think [$_{CP2}$ that [$_{NP2}$ **Mary and John**] consider [$_{CP3}$ [$_{NP3}$ **each other**]$_i$ the best friend]]]

In (8a) *John* is the antecedent of *himself* and, therefore, the binding domain of the reflexive has extended from CP2, the non-finite clause where the reflexive appears, to CP1. In (8a) the reflexive *himself* is the subject of the non-finite clause where it is bound by the subject of the main clause, *John.* In (8b) a binding relation is established between the reflexive subject of the small clause, *himself,* and the subject of the higher clause, *John.* Therefore, the binding domain of *himself,* which is the subject of a non-finite clause in (8a) and the subject of a small clause in (8b), is extended beyond the immediately containing clause. Example (8c) illustrates a sentence in which the reciprocal is the subject of a non-finite clause, and (8d) illustrates a reciprocal which is the subject of a small clause. Both of them are grammatical sentences. In (8c) as well as in (8d) the reciprocal *each other* in CP3 is bound in the domain delimited by the next c-commanding subject that is *Mary and John* in CP2. In both cases, the sentence would be ungrammatical if the antecedent of the reciprocal were the NP *Paul and Bill* in CP1 instead of *Mary and John* in CP2, as the binder is the closest element to the anaphor, that is, the NP in CP2, in this case.

If an anaphor is **contained within the subject** of either a finite cause or a non-finite clause, the binding domain is extended to the first clause up. The binding domains of those anaphors are delimited by the higher subject. This is parallel to (8) and it is illustrated in the examples in (9).

(9)

    a.   [$_{CP1}$ Paul expects [$_{CP2}$ **John$_i$** to agree [$_{CP3}$ that pictures of **himself$_i$** will be shown next week]]]

    b.   *[$_{CP1}$ **Paul$_i$** expects [$_{CP2}$ John to agree [$_{CP3}$ that pictures of **himself$_i$** will be shown next week]]]

    c.   [$_{CP2}$ Paul believes [$_{CP2}$ **John$_i$** to expect [$_{CP3}$ pictures of **himself$_i$** to be on sale next week]]]

    d.   *[$_{CP1}$ **Paul$_i$** believes [$_{CP2}$ John to expect [$_{CP3}$ pictures of **himself$_i$** to be on sale next week]]]

    e.   [$_{CP1}$ **Mary and John$_i$** expect [$_{CP2}$ recent friends of **each other$_i$**] to be playing the guitar in London]

In (9) we can see that the reflexive *himself* is contained within the subject of a finite clause (*pictures of himself* in 9a-b) as well as within the subject of a non-finite clause (*pictures of himself* in 9c-d). On the one hand, in the examples (9a) and (9c) the binding domain is

extended to the next clause up and delimited by the higher subject (*John)* in the second CP. On the other hand, we can see that in (9b) and (9d) the binding of *himself* by *Paul* in the main CP (CP1), which is still a higher subject, is ungrammatical. This is so because the closest antecedent for *himself* is *John* in CP2. In (9e) we can see the reciprocal *each other* is contained in the subject of a non-finite clause. The binding domain is extended to the next clause up and delimited by the higher subject (*Mary and John)* in CP1.

An anaphor functions as an **emphasizer** when it is used to stress who performs the action. Reflexives can function as emphasizers meanwhile reciprocals cannot, as shown in (10):

(10)

    a.   [$_{CP}$ [$_{NP1}$ **You**]$_i$ go [$_{NP2}$ **<u>yourself</u>**]$_i$]

    b.   *[$_{CP}$ [$_{NP1}$ **Peter and Mary**]$_i$ go [$_{NP2}$ **<u>each other</u>**]$_i$]

    c.   [$_{CP}$ [$_{NP1}$ **Peter and Mary**]$_i$ hate [$_{NP2}$ **<u>each other</u>**]$_i$]

In (10a) NP2 *yourself* emphasizes NP1 *you* which is the subject of the sentence. The reflexive *yourself* is an emphasizer because it does not provide new information but rather stresses the information conveyed by the subject, it does not have an independent grammatical function as it is a copy of the element it emphasizes and, as a result, it can be removed without making the sentence ungrammatical. In (10b) NP2 *each other* is meant as emphatic but it renders the sentence ungrammatical because the reciprocal *each other* does not have a syntactic function. In (10c) NP2 does not emphasize *Peter and Mary.* The reciprocal *each other* cannot be removed because, if so, the sentence is ungrammatical as it is the direct object of the sentence.

2.2.3. Constraints

Reflexives, as reciprocals, must obey some specific constraints that dictate the position they are able to occupy with respect to their antecedent. These constrains are going to be dealt with next. Firstly, we are going to focus on the relation between the antecedent and the reflexive. Then, we are going to discuss some other constraints which are c-command binding and A-binding. And finally we are going to deal with the locality conditions on binding.

First of all, we are going to take into account the importance of the antecedent and its relation with the reflexive. Every reflexive element is referentially dependent on another NP which is called antecedent, as we have already discussed above with regards to principle A of binding theory, and as the examples in (11) illustrate.

(11)

    a.   [$_{CP}$ [$_{NP1}$ **Mary**]$_i$ hurt [$_{NP2}$ <u>**herself**</u>]$_i$]

    b.   [$_{CP}$ [$_{NP1}$ **John and Mary**]$_i$ hurt [$_{NP2}$ <u>**each other**</u>]$_i$]

    c.   *[$_{CP}$ [$_{NP1}$ <u>**Herself**</u>] arrived on time]

    d.   *[$_{CP}$ [$_{NP1}$ **John**] hurt [$_{NP2}$ <u>**herself**</u>]]

In (11a) the antecedent *Mary* matches the reflexive *herself* in terms of its grammatical features and, in particular, in terms of person (3rd person), gender ([-masculine]) and number ([+singular]). In (11b) the antecedent *Mary and John* matches the reciprocal *each other* in terms of its grammatical features, particularly, in terms of person (3rd person), and number ([-singular]), which are always fixed for reciprocals. By analyzing the ungrammatical examples (11c) and (11d), we realize that the distribution of reflexives is not completely free. The example (11c) is ungrammatical because there is no antecedent and every reflexive needs another NP in the sentence for being interpreted. In (11d) *John* cannot serve as the antecedent of *herself* because *John* is masculine meanwhile *herself* is feminine. This means that the relationship between a reflexive and its antecedent is constrained by feature matching as well as by position.

There are some additional constrains on the relation between the anaphor and its antecedent. Not every NP that precedes the anaphor can serve as its antecedent. The branching node of the antecedent must dominate the branching node of the reflexive: the NP must c-command the reflexive in order to function as an antecedent. This is illustrated in example (12).

(12)

    a.   [$_{CP}$ [$_{NP1}$ **Mary's brother**]$_i$ enjoyed [$_{NP2}$ <u>**himself**</u>]$_i$]

    b.   [$_{CP}$ [$_{NP1}$ **Mary's brothers**]$_i$ hurt [$_{NP2}$ <u>**each other**</u>]$_i$]

In (12a) the NP1 *Mary's brother* c-commands the reflexive: the first branching node dominating *Mary's brother* is CP and CP *also* dominates *himself*. The antecedent of the reflexive *himself* is, hence, *brother* as the head of NP1, because it also matches the anaphor in gender, number, and person features. The same happens in (12b): the first branching node dominating *Mary's brothers* is CP and CP also dominates *each other*. The antecedent of the reciprocal *each other* is *brothers* because they match in number and person features.

There are also some locality conditions on binding that are important as they also affect reflexives and reciprocals. The binding domain is the domain in which the anaphor must be bound by an antecedent. Both, the antecedent and the anaphor must be clause-mates, that is, they must both appear in the same clause, so binding relations between them are subject to a locality condition. The subject of a small clause, as is (13a-c), as well as the subject of a non-finite clause, as in (13b-d) are first potential binders for the anaphor. The binding domain of an anaphor is delimited by the first c-commanding subject.

(13)

    a.   [$_{CP1}$ [$_{NP1}$ Mary] considers [$_{CP2}$ [$_{NP2}$ **John$_i$**] too proud of [$_{NP3}$ **<u>herself</u>$_i$**]

    b.   [$_{CP1}$ [$_{NP1}$ Mary] considers [$_{CP2}$ [$_{NP2}$ **John$_i$**] to be too proud of [$_{NP3}$ **<u>himself</u>$_i$**]]

    c.   [$_{CP1}$ [$_{NP1}$ Mary] considers [$_{CP2}$ [$_{NP2}$ **John and Mary$_i$**] too proud of [$_{NP3}$ **<u>each other</u>$_i$**]]

    d.   [$_{CP1}$ [$_{NP1}$ Mary] considers [$_{CP2}$ [$_{NP2}$ **John and Mary$_i$**] to be too proud of [$_{NP3}$ **<u>each other</u>$_i$**]]

In (13a) and (13b) *John* is the subject of a small clause and the subject of a non-finite clause respectively. In both cases *John* is the first potential binder for the reflexives as both *John* and the reflexives are contained in the same clause (CP2). In (13c) and (13d) *John and Mary* is the subject of a small clause and the subject of a non-finite clause respectively. In both cases *John and Mary* is the first potential binder for the reciprocals as both *John and Mary* and the reciprocals are contained in the same clause (CP2).

The antecedent of an anaphor must occupy an argumental position (A-position), as shown in example (14):

(14)

    a.   [$_{CP1}$ Mary says [$_{CP2}$ that **John$_i$** contradicted **<u>himself$_i$</u>**]]

    b.   [$_{CP1}$ Mary says [$_{CP2}$ that **John and Paul$_i$** hurt **<u>each other$_i$</u>**]]

    c.   [$_{CP1}$ [$_{TopP}$ **John$_i$**, Mary says, [$_{CP2}$ t$_i$ **t$_i$** will never contradict **<u>himself$_i$</u>**]]]

    d.   [$_{CP1}$ [$_{TopP}$ **John and Paul$_i$**, Mary says, [$_{CP2}$ t$_i$ **t$_i$** will never contradict **<u>himself$_i$</u>**]]]

    e.   *[$_{CP1}$ [$_{TopP}$ **John$_i$, <u>himself$_i$</u>** says, [$_{CP2}$ he$_i$ will never contradict **Mary**]]]

In (14) we are dealing with subordination, thus there are two sentences (the main clause, CP1, and the subordinate clause, CP2). In (14a) the reflexive is bound by *John* which is the subject of the subordinate clause that occupies an A-position. In (14b) the reciprocal *each other* is bound by *John and Paul* which is the subject of the subordinate clause that occupies an A-position. In (14c) *John* is topicalized because it has moved from the subject position of the subordinate clause (an A-position) to the CP level (a non-argumental position, A'-position). In (14d) *John and Paul* is topicalized as it has moved from an A- position to an A'-position. The antecedent when moving leaves a co-indexed trace in CP2 (A-position), as well as another trace in CP2 (A'-position), thus the two traces in (14c-d). This means that the antecedent binds the reflexive before moving, that is, in an A-position. The sentence illustrated in (14e) is ungrammatical, even if the antecedent *John* is topicalized, because the antecedent of the reflexive does not occupy an A-position but an A'-position and there is no other candidate before *himself* that can function as its antecedent. Therefore, the reflexive lacks an antecedent and so it violates principle A of binding theory.

2.3. Anaphors and acquisition works

Extensive work on language acquisition have been carried out among linguists within the generative tradition. According to Yule (2014:171-180), the language acquisition process is divided in 5 different stages: babbling (from 6 until 11 months of age); one-word stage (from 12 to 18 months); two-word stage (from 18 until 20 months); telegraphic speech (from 21 until 24 months) in which the child starts to create sentences with a series of words (e.g. this dog black); and multiple-word stage (from 2 or 3 years old until 5 years of

age or when the child finally reaches the adult grammar) in which further syntactic, semantic, and morphological developments take place.

With respect to the topic of this dissertation, the acquisition of anaphors in American and British English child speech, few works have been carried. Meanwhile it is easy to find numerous studies that have to do with the acquisition of reflexives in a later age (e.g. Love, Walenski & Swinney (2009)) as well as many works that deal with the acquisition of L2 reflexives (e.g. Hirakawa (1990)) or with the acquisition of personal pronouns (e.g. Van Rij, Van Rijn & Hendriks (2010)).

According to Lee (2005), studies on the acquisition of reflexives show that, at least, North American children acquire the locality condition of reflexives relatively early. Read and Chou Hare (1979) demonstrate that the participants identified the reflexive with its local antecedent before the age of 6 years old in agreement with a study on the reflexive's comprehension in finite clauses of 230 North American children aged between 6;8 and 12;3 years old. Solan's (1987) toy-manipulation study with 37 North American children between
4 and 7 years old provides similar results. Jakubowicz's (1984) also realized a toy-manipulation study with 3 year old North American children and they choose the local antecedent 95% of the time. The methodological problem of those studies is that the children only show a preference for the local antecedent as they have to choose between two different ones.

The study carried out by Chien and Wexler (1990) with 157 North American children aged between 2;6 and 6;6 years old includes three different tasks. The first as well as the second task are preference tasks: they are a Simon-says game and a party game. Meanwhile, the third task is a yes/no judgment in which a local biding as well as a long distance binding is possible. Children were given an image and a stimulus sentence and they have to interpret what they see. The local interpretation is tested thanks to a match picture and the long distance interpretation is tested through a non-matched picture.

The latest study demonstrates that children older than 5 years old have a clear knowledge of Principle A with more than 90% of the cases accepting a local binding interpretation and rejecting the mismatching of long distance binding interpretations. However, there is no

predictable behavior on principle A by children under the age of 5 years as many children between 2;6 and 4 years old accepted 79.51% of the local interpretation, meanwhile, they only accepted 30.56% of the long distance interpretation. Therefore, this study demonstrates that principle A knowledge happens between the age of 5 and 6 years old.

It is assumed by Chien and Wexler (1990) that the responses of the children under 5 years old are so because of a response bias toward the long distance antecedent due to pragmatic factors, not because of a lack of principle A knowledge. The Simon-says task demonstrates that the percentage of non-adult-like long distance antecedent decreases as the age of the participants increases. The party game experiment reveals that local binding is favored over long distance binding, and it shows that the percentage of the usage of the long distance antecedents is completely random at the different ages.

The yes/no judgment task reveals that the youngest children allow long distance binding (69.44%) as well as a local binding (79.5%). Although reflexives can take any NP as an antecedent, the subject NP is preferred by both, children and adults.

3. Research questions and hypotheses

The present study compares the production of anaphors in American and in British English child speech through the analysis of the spontaneous data obtained from children that have been recorded in a natural setting.

Taking into account previous studies on the acquisition of anaphors (section 2.3) as well as the grammatical properties that characterize anaphors (section 2.2), this analysis seeks to give an answer to the following research questions:

1. Is there any kind of preference among the acquisition of the different forms of anaphors? Are all of them acquired at the same age and with the same adulthood rate in both geographic places?

2. Does an acquisition order exist in the grammatical functions of the anaphors? If so, is it the same order in both groups of children? And which functions are the ones that are easier to acquire?

3. According to the different types of mistakes that children could make, is there any kind of relationship between the ones made by the British children and the ones made by the North American children? Could we establish an age from which the whole production of anaphors is adult-like?

4. Does any relation exist between the use of anaphors and the development of the acquisition process as measured by the mean length of the utterances (MLU)? Is the same relationship found in North American and in British English child speech?

As no previous research has been carried out on anaphors comparing North American and British English, the present study seeks to contribute to fill in this gap by analyzing whether anaphors are acquired in the same proportion and around the same age in North American and in British English. In this respect and considering the research questions above, two hypotheses can be provided.

A first initial working hypothesis would be that no different results will appear in terms of anaphor form and function according to a non-developmental analysis comparing North American and British English child speech. This is expected to be so given that North American and British English do not differ from each other in this grammatical aspect.

A second hypothesis concerns development and adulthood. Based on previous works on MLU and development (Brown 1973), it could be hypothesized that there is a relation between the MLU rate and the rate of correctness; that is, that the older the child is the lower error rate his production will have. And again, this will be so for both North American and British children's production alike.

4. Empirical study on anaphors

In order to determine whether the production of anaphors is similar in American and in British English child speech and to be able to answer the four research questions and confirm the two hypotheses presented above, an empirical analysis have been carried out. This analysis includes three different steps: firstly, data selection: corpora and participants that includes a description of the criteria used to select data, as well as information about corpora and the participants who produced these data; secondly, data classification criteria;

and finally, data analysis in terms of anaphor production. These three steps are dealt with in the subsequent sections.

4.1. Data selection: corpora and participants

The resource used to extract the necessary data for this study is TalkBank, more precisely, CHILDES (Child Language Data Exchange System), the child component of TalkBank created by MacWhinney (2000). This online resource provides L1 and L2 browsable and downloadable databases for the analysis of communication studies, as well as for several research purposes. Two sets of monolingual corpora have been selected in an attempt to compare the production of anaphors in American and British English child speech. Those corpora are presented next: the British English Corpora and the North American English Corpora. The information regarding these corpora has been extracted from the British English and North American manuals available in CHILDES.

The two corpora sets are longitudinal studies which include the spontaneous production of monolingual English native children from Britain as well as from North America. The age range covered is from 2 years old to 4 years old approximately. In order to carry out the comparison, the data selected from the two different groups of participants must be balanced in that they have to include a similar amount of participants and they have to cover a similar age range. Due to the limited British material available in CHILDES, there are only two participants in this group meanwhile there are three participants in the North American group.

4.1.1. North American English Corpora

Two North American corpora have been chosen for this study. Both of them have been extracted from the Eng-NA-MOR section. These are the Brown corpus and the Sachs corpus.

The Brown corpus features data from North American children. The ages of the three participants studied by Brown and his collaborators, range from 1 year and 6 months to 5 years and 1 month. There are a total of 214 files. There are 55 files in the Adam folder and

he was studied from 2 years and 3 moths to 4 years and 10 months of age. There are 20 files in the Eve folder and she was studied from 1 year and 6 months to 2 years and 3 months of age. There are 139 files in the Sarah folder from 2 years and 3 months to 5 years and 1 month.

In this dissertation the data produced by Eve are not going to be analyzed as hers are not very large. The analysis is then focused on the production of Adam and Sarah in the age range from 2 to 4. This means that children's production before the age of 2 years old, as well as that after the age of 4 years old have been excluded from our research.

The Sachs corpus is a longitudinal study conducted by Sachs on her daughter called Naomi. The ages of the participant range from 1 year and 1 month to 5 years and 1 month. There are a total of 94 files.

4.1.2. British English Corpora

Two British corpora have been used in this study and they have all been extracted from the Eng-UK section. These corpora are the following: the Lara corpus and the Thomas corpus.

The Lara corpus is a longitudinal corpus that includes the transcripts from a child between the ages of 1 year and 9 months and 3 years and 3 months recorded in conversations with her caregivers over an 18 month period without the presence of any researcher. In total, nearly 49,000 child utterances were transcribed.

Lara (pseudonym) was the daughter of two white university graduates. Her mother and her maternal grandparents have south east regional dialects, her father has a local dialect and her paternal grandmother has a strong north east accent and many dialectal vocabulary. Lara developed a north Nottinghamshire accent without many regional dialectal items.

The Thomas corpus is a longitudinal naturalistic study of one child called Thomas during a period of 3 years. The data are divided in three different sections (A, B, and C). In section A (aged from 2 years to 3 years and 2 months), Thomas was recorded five hours every week. In section B (aged from 3 years and 3 months to 3 years and 11 months), Thomas was recorded five hours every month. In Section C (aged from 4 years to 4 years and 11 months), Thomas was recorded one hour every month.

In order to conclude this section, table 2 sums up the two data sets and the different corpora included in each set. The number of participants analyzed as well as the age range is also shown.

Table 2. Data selection				
	North American		**British**	
Corpus	Brown	Sachs	Lara	Thomas
# of children	2	1	1	1
Age range	2-4	2-4	2-3	2-4
Child	Adam	Sarah	Naomi	Lara	Thomas

Table 2 shows that the different corpora used are 4: the Brown corpus, the Sachs corpus, the Lara corpus, and the Thomas corpus. There is one child analyzed in each corpus, except in the Brown corpus where there are two children analyzed which means that data from 3 North American children and from 2 British children will be analyzed.

The present study is focused on the production of anaphors between the ages of 2 to 4 (as previous works have dealt with the production of anaphors from the age of 5; see section 2.3). That is why the child production that falls out of this age range has not been taken into account.

4.2. Data classification criteria

Data selection have been done considering different factors, as explained below, and compiled in an Excel document because of the great amount of data analyzed. This Excel database is contained in a CD alongside this undergraduate dissertation.

The current study focuses on the production of anaphors in American and British child speech, so the adult data included in the corpora have been omitted. Accordingly, only child data have been analyzed.

In order to classify the data from the 5 children, the following variables have been taken into account: anaphor form, anaphor function, and adulthood. The examples used below to illustrate these different variables are taken, when possible, from the corpora under analysis and so the child name and the age at which each example was produced appears to the right of each instance.

According to the different types of anaphors, as discussed in section 2.2.1 above, there are 9 differentiated forms: 5 singular reflexives corresponding to the 1st, 2nd and 3rd person (*myself* (as in 15a), *yourself* (as in 15b), *himself* (as in 14c), *herself* (as in 15d), and i*tself* (as in 15e)), 3 plural reflexives for each of the grammatical persons (*ourselves* (as in 15f)*, yourselves* (as in 15g)*,* and *themselves* (as in 15h)), and 2 reciprocals (*each other* (as in 15i), and *one another* (as in 15j)).

(15)

a.	I hurt **myself**	\<Thomas 4;10\>
b.	Don't hurt **yourself**	\<Adam 3;01\>
c.	He almost cut **himself**	\<Adam 3;11\>
d.	She got it all **herself**	\<Lara 3;00\>
e.	It can do it **itself**	\<Lara 2;10\>
f.	We bought all by **ourselves**	
g.	Behave **yourselves**	
h.	I thought the records could go in by **themselves**	\<Adam 3;08\>
i.	We've got **each other** in bed	\<Lara 2;08\>
j.	We must speak to **one another** again	

With regards to the function, 7 categories were differentiated: indirect object (as in 16a), direct object (as in 16b), complement of preposition (as in 16c), subject of a finite clause (as in 16d), subject of a non-finite clause (as in 16e), subject of a small clause (as in 16f), contained within the subject (as in 16g), and emphasis (as in 16h).

(16)

a.	Would you like to pour **yourself** a drink?	
b.	I am washing **myself**	\<Lara 2;09\>
c.	I don't want to do it all by **myself**	\<Adam 3:08\>
d.	He thinks that **himself** should be invited	
e.	She considers **herself** to be intelligent	
f.	He thinks that they consider **each other** the best friend	
g.	She wants Peter to know that pictures of **himself** will be published.	
h.	I want to do something **myself**	\<Thomas 3;10\>

With respect to adulthood, the data analyzed in this study are divided in adult-like forms (as in 17a) and non-adult-like forms (as in 17b, 17c, 17d, 17e, 17f and 17g)).

(17)

a.	I wanna do it by **myself**		\<Naomi 2;2\>
b.	He hurt **herself**		\<Lara 2;08\>
c.	She hurts **themselves**		
d.	Excuse me I go **herself**		\<Sarah 2;11\>
e.	Why fall and hurt **myself**?		\<Adam 3:00\>
f.	He check **hisself**		\<Adam 3;05\>
g.	It's **myself**		\<Adam 3;08\>

Non-adult-like forms are divided in 5 differentiated categories: gender mismatch (as in 17b), number mismatch (as in 17c), or person mismatch between antecedent/binder and anaphor (as in 17d), absence of antecedent (as in 17e), wrong spelling of the anaphor (as in 17f), and use of an anaphor instead of a pronoun (as in 17g).

Data have also been analyzed in terms of the MLU (Mean Length of Utterance) as it is an indicator of linguistic development according to Brown (1973). An MLU analysis could associate the increase of the adult-like productions with a gradual process in the acquisition of anaphors.

4.3. Data analysis

This section consists in two different parts: the first part has to do with the computerized programs used to analyze the data quantitatively. The second part shows a grammatical analysis of the data according to anaphor form, function, adulthood, and MLU correlations.

4.3.1. Automatic searching: the CLAN programs

The CLAN (Computerized Language ANalysis) programs available in the CHILDES project were used to analyze the data from the corpora. The specific CLAN programs used are the following: MLU, FREQ, and KWAL.

The MLU program calculates the MLU (Mean Length of Utterance), that is, it computes the average number of morphemes or words per utterance and, therefore, it indicates how long sentences are on an average. A typical MLU output appears in (18).

---

(18)

mlu +t*CHI @

From file <c: \brown\adam\adam15.cha>

MLU for Speaker: *CHI:

MLU (xxx, yyy and www are EXCLUDED from the utterance and morpheme counts):

         Number of: utterances = 751, morphemes = 2170

         Ratio of morphemes over utterances = **2.889**

         Standard deviation = 1.608

The MLU output in (17) shows information about the speaker, Adam, within a file (file < adam15.cha > which appears as @ in the syntax line <mlu +t*CHI @> marked in bold type). This information is the following: number of utterances produced by Adam in this file (751), number of words or morphemes (2170 morphemes in this case), ratio of morphemes over utterances, that is, the actual MLU value that appears underlined in (17) (2.889), and the standard deviation (1.608). This MLU calculation shows, therefore, that Adam's production in this file includes sentences that are, on an average, almost 3- morpheme long (MLU=2.889).

The FREQ program computes the number of times that a word (or words) appear(s) in a file. A typical FREQ output is shown in (19).

(19)

freq +t*CHI +s"myself" @

From file <c:\brown\adam\adam15.cha>

Speaker: *CHI:

  1 myself

----

   1 Total number of different item types used

   1 Total number of items (tokens)

1.0   Type/Token ratio

The FREQ output (in 18), provides the number of times the word *myself* has been produced by Adam in the file <adam15>. This keyword has been uttered once and therefore only one occurrence is output by FREQ.

The KWAL program searches data for specified words and shows the context in which those keywords have been produced. A typical KWAL output appears in (20).

(20)

kwal +t*CHI +s"myself" -w2 +w2 @

From file <c:\brown\adam\adam15.cha>

*** File "c:\adam\adam15.cha": line 2900. Keyword: myself

*MOT:	take two.
*CHI:	I want have some.
*CHI:	<u>have some myself.</u>
*MOT:	yes (.) you have some yourself.
*CHI:	okay.

KWAL was used in (19) to provide the only context in which the word *myself* has been produced by Adam in file <adam15>, as shown in (18). KWAL provides the sentence in which the word appears (as underlined in example 19) and it can also provide the utterances preceding and following the target sentence in which *myself* appears. In (19) KWAL shows two utterances before the target utterance (-w2), and two utterances following it (+2w). More or less surrounding context could be found changing the corresponding commands in the syntax line.

This automatic searching by means of these CLAN programs provided our study with the following useful information to carry out the grammatical analysis. In the case of FREQ, it provided the total number of anaphors used; the total number of anaphors per anaphor type; and the total number of anaphors per function. In the case of KWAL, it provided the context of different anaphors so that they can be classified in terms of adult-like or non- adult-like cases. And finally, in the case of MLU, it provided the linguistic development as reflected in the ratio of morphemes over utterances (that is, the actual MLU), as well as the number of words and utterances produced and the standard deviation.

4.3.2. Grammatical analysis

The data belonging to the 5 children of our study are going to be analyzed in this section. Three different factors have been taken into account: the type of anaphor used, the function of the anaphor in the sentence, and the adulthood of the examples. These are preceded by a developmental analysis in terms of MLU to determine the degree of comparability between the two groups of participants. The analysis of all participants have been done comparing the two different groups of participants: British and North American English.

Firstly, the production of anaphors in North American and British English child speech are compared in terms of the age and the MLU rate of the participants. Table 3 shows this relationship.

Table 3. Relation between age and MLU				
	Age 2-2.5	Age 2.5-3	Age 3-3.5	Age 3.5-4
British MLU	2.29	2.88	3.28	3.94
NA MLU	3.21	3.02	4.02	4.38

As it is shown in table 3 there is a clear relationship between the MLU rate and the age in the two groups of participants. On the one hand, the MLU rate of the British participants aged between 2 and 2.5 years old corresponds to 2.29. Meanwhile, the MLU rate of the North American participants is 3.21. On the other hand, the MLU rate of the British participants aged between 3.5 and 4 is 3.94, whereas the MLU rate of the North American participants corresponds to 4.38.

It can be seen that both groups of participants show different results: the MLU rate of the North American children is always higher than the MLU rate of the British participants. Furthermore, the MLU rate of the North American participants decreases instead of increasing when the MLU rate is between 2 and 2.5 (3.21) until when the MLU rate is between 2.5 and 3 (3.02). This decrease is due to the little number of North American participants as well as anaphors produced by those children when the MLU rate is between 2-2.5.

As a result it can be concluded that the linguistic development is higher in North American English child speech; that is, the British and the North American child speech analyzed are not at the same linguistic and chronological age. Therefore, the main difference found in their anaphor production can be attributed to their being at different linguistic developmental stages.

Secondly, the production of anaphors in North American and British English child speech is compared in terms of the form of the anaphor used. Table 4 shows the number of anaphors produced of each type by each child.

Table 4. Anaphors produced: form											
	Myself	**Yourself**	**Himself**	**Herself**	**Itself**	**Ourselves**	**Yourselves**	**Themselves**	**Each other**	**One another**	**Total**
NA Eng.	76 72.37%	7 6.66%	5 4.76%	1 0.95%	13 12.4%	0 0%	0 0%	3 2.86%	0 0%	0 0%	105 57.06%
Br Eng.	48 60.78%	11 13.9%	10 12.66%	4 5.06%	1 1.27%	0 0%	0 0%	0 0%	5 6.33%	0 0%	79 42.94%
Total	124 67.39%	18 9.78%	15 8.15%	5 2.72%	14 7.61%	0 0%	0 0%	3 1.63%	5 2.72%	0 0%	184 100%
Total per type	179 97.28%								5 2.72%		

Table 4 shows that the majority of the anaphors produced by the participants of the study are reflexives. 97.28% of the anaphors are reflexives, meanwhile only the 2.72% of them are reciprocals. In fact, only one British child, Lara, produced reciprocals.

Reflexives are the most frequently produced anaphors by the 2-to-4 year old children. Both in North American and British English child speech, the most frequent reflexives are those in singular, more specifically, the first person singular. An analysis of the data obtained from the production of the children in each set of data follows.

Starting with the three participants who speak North American English, they have produced a total of 105 anaphors. 72.37% of those anaphors corresponds to first person singular reflexives (*myself*), 6.66% of them are second person singular reflexives (*yourself*), 18.11% are third person singular reflexives (*himself, herself, itself*), and 2.86% are third person plural reflexives (*themselves*). No reciprocals are produced by these speakers in the data analyzed.

The two participants who speak British English have produced a total of 79 anaphors. 60.78% of the anaphors produced correspond to first person singular reflexives (*myself*), 13.9% of them are second person singular reflexives (*yourself*), 18.99% of the anaphors are third person singular (*himself, herself, itself*), and the last 6.33% are reciprocals (*each other*).

In conclusion, the production of anaphors according with their type is fairly similar in both North American and British English. The main difference is that we only have evidence of third person plural in the speech of one North American English child meanwhile there is no production of this type of anaphor in the speech of the British children analyzed. The opposite situation happens with the production of reciprocals. Only one British child produced this type of anaphor meanwhile there is no evidence of reciprocals in North American child speech.

Thirdly, the production of anaphors both in North American and British English child speech is compared in terms of their function, as in table 5.

Table 5. Anaphors produced: function								
	D.O.	I.O.	C. of Prep	S. Finite Cl.	S. non Finite Cl.	S. Small Cl.	Contained within S.	Emphasis
NA Eng.	44 41.9%	0 0%	49 46.66%	0 0%	0 0%	0 0%	0 0%	12 11.44%
Br Eng.	36 45.5%	0 0%	15 19.06%	0 0%	0 0%	0 0%	0 0%	28 35.44%
Total	80 43.48%	0 0%	64 34.78%	0 0%	0 0%	0 0%	0 0%	40 21.74%

As table 5 shows, every anaphor produced by North American, as well as by British children corresponds to the following functions: direct object (43.48%), complement of the preposition (34.78%), and emphasis (21.74%). However, there is no use of anaphors as

subjects or contained within the subject or as indirect object. Therefore, out of the 8 function categories available, only 3 are instantiated in the data.

On the one hand, the three North American participants have produced 41.9% of anaphors functioning as direct objects, 46.66% as complement of the preposition, and 11.44% of anaphors whose function is to emphasize who actually did the action or for whom this action is realized.

On the other hand, the two British participants have produced 45.5% of anaphors functioning as direct objects, 19.06% as complement of the preposition, and 35.44% of the anaphors that were used to give emphasis.

To conclude, the production of anaphors according to their function is almost the same in North American English and in British English. In both cases, the functions of the anaphors used by the participants coincide: direct object, complement of a preposition and emphasis. The percentages vary among the different groups of participants but it is clear that those three functions are the most common in both speeches. In particular, although both groups coincide in direct object anaphors being the ones used the most, a distinction appears with respect to the other two functions: in North American English the production of anaphors that function as complement of the preposition is four times higher than the production of anaphors that are used to emphasize; in British English the production of anaphors used to emphasize is almost twice the number of anaphors that function as complement of the preposition.

Fourthly, the data obtained in the analysis of the anaphors produced by the different participants are going to be classified in terms of their adulthood as table 6 shows.

Table 6. Adulthood of the anaphors				
	North American		British	
Adulthood	Adult-like	Non-adult-like	Adult-like	Non-adult-like
Myself	59	17	35	13
Yourself	5	2	11	0
Himself	3	2	5	5
Herself	0	1	2	2
Itself	11	3	1	0
Ourselves	0	0	0	0
Yourselves	0	0	0	0
Themselves	2	2	0	0
Each other	0	0	5	0
One another	0	0	0	0
Total	80 74.7%	27 25.3.%	58 74.4%	20 25.6%

Table 6 shows that the majority of the anaphors produced by both the North American and the British English participants are adult-like.

Results obtained from the North American participants are going to be analyzed first. They produced 80 adult-like anaphors and 27 non-adult-like anaphors. In other words, 74.7% of the anaphors produced are adult-like, meanwhile the 25.9% of the anaphors produced by the North American children are non-adult-like.

Results obtained by the British participants are going to be discussed next. They produced a total of 78 anaphors. There are 58 adult-like anaphors, and 20 non-adult-like anaphors. This is to say that 74.4% of the anaphors produced are adult-like meanwhile 25.6% of the anaphors produced by those British children are non-adult-like.

In terms of the form of the anaphor, the production of adult-like anaphors is always higher than the production of non-adult-like anaphors, except in the case of the North American children who produced the same number of adult and non-adult-like *herself,* as well as the British production of *himself* and *herself.*

In conclusion, there is almost the same number of adult-like anaphors in the speech of North American English and British English children. The same parallelism is, therefore observed in the case of non-adult-like anaphors.

Table 7 offers a classification of the non-adult-like production of anaphors in five different error types: gender mismatch, number mismatch, absence of antecedent, misspelling of the anaphor, and the use of anaphors instead of pronouns.

Table 7. Non-adult-like anaphors						
	Gender mismatch	**Number mismatch**	**Person mismatch**	**No antecedent**	**Misspelling**	**Instead of pronoun**	**Total**
NA Eng.	0	1 3.7%	2 7.4%	16 59.26%	4 14.82%	4 14.82%	27 100%
Br Eng.	2 10%	3 15%	0	12 60%	2 10%	1 5%	20 100%
Total	2 4.25%	4 8.5%	2 4.25%	28 59.57%	6 12.77%	5 10.64%	47 100%

Table 7 shows that most North American as well as British children produced non-adult-like anaphors because they did not use any antecedent as it is shown in (17e).

The North American participants produced a total of 27 anaphors that were not adult-like and 59.25% of those were because of the absence of antecedent (as illustrated in 17e). There were 14.82% of non-adult-like anaphors that were misspelled (as in 17f), as well as 14.82% of non-adult-like anaphors that were used instead of a pronoun (as in 17g). The 7.4% of the cases were not-adult-like because of a person mismatch (as in 17d). Finally, there were 3.7% of the non-adult-like anaphors because of a number mismatch (as in 17c).

The British participants produced a total of 20 non-adult-like anaphors. There were 60% of the anaphors that were non-adult-like because of the absence of antecedent. 15% of the non-adult-like anaphors are so because of number mismatch, 10% of them are non-adult- like anaphors because of gender mismatch (as illustrated in 17b). The 10% of the non- adult-like cases were misspelled. Finally, 5% are non-adult-like anaphors that were produced instead of a pronoun.

It is worth to say that the main number of misspelling mistakes made by the children are concentrated in 2 different forms of the anaphors that are the following: *himself* and

themselves. The children produced those anaphors as *"hisself"* and *"theirselves",* respectively.

In conclusion, the anaphors that are non-adult-like have a very similar distribution in North American and in British child speech. The main differences are two. The first one is that in North American child speech there are no errors according to gender mismatch meanwhile in the British child speech one participant made two errors of this kind. The second one is that the percentage of the use of anaphors instead of pronouns is higher in North American child speech than in British one.

To sum up the comparison between the production of anaphors in North American English and in British English child speech renders very similar results and so it could be said to be fairly similar. Firstly, in both speeches the production of reflexives is much higher than the production of reciprocals. The most frequently used reflexives are those in singular, concretely, the first person singular (*myself*) with 72.7% in North American English and 60.78% in British English.

Secondly, the production of anaphors in both groups according to their function is centered in three types: direct object, complement of a preposition and emphasis.

Thirdly, according to the production of adult-like and non-adult-like anaphors we can conclude that there are very similar percentages. 76.2% of the anaphors produced by the North American children are adult-like, meanwhile this percentage is a 74.4% in the case of the British English participants.

Finally, in both North American and British English child speech, the most common mistake is the absence of an antecedent with 59.25% of occurrence in North American English and 60% in British English.

As it have been discussed above, no differences appear in the distribution of the different anaphor forms and functions nor in the adulthood of the cases, which confirms our first initial hypotheses. The next analysis deals with a developmental approach to the data in terms of adulthood comparing its rate to the MLU values across the study period in order to determine whether differences appear through the developmental process of each child group (our second hypotheses).

Graph 1 analyzes whether the rate of adulthood of the sentences produced by the participants of the study correlates with the MLU. This is based on the relation between the MLU (mean length of utterance) and the adult-like and non-adult-like sentences produced by the 5 participants of our study.
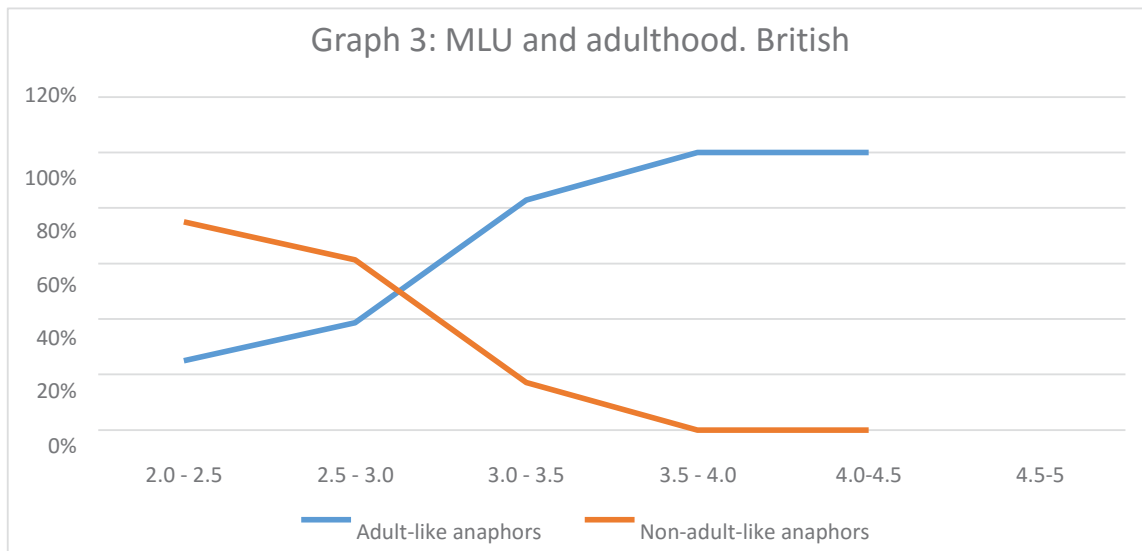
Graph 1: MLU and adulthood. All participants
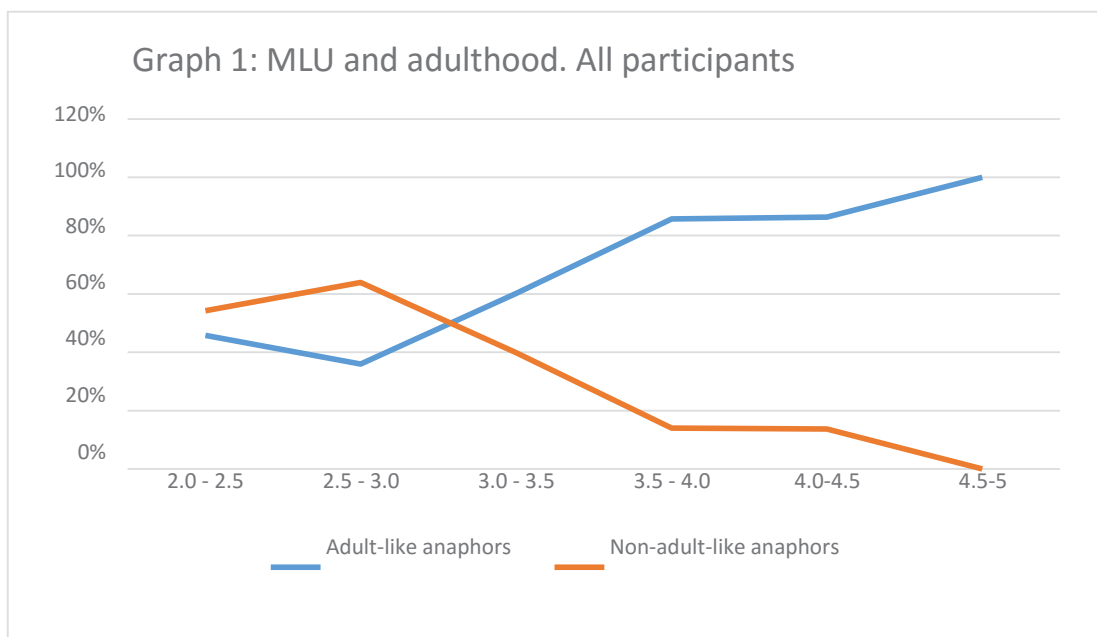
Graph 1 shows a clear and direct relation between the increase of the MLU and the increase in the rate of adult-like sentences produced by the participants of this study. It is to say that a higher production of adult-like sentences occurs as linguistic development progresses. The non-adult-like productions are always lower than the adult-like cases, and they decrease as the MLU rate increases. When the MLU is between 2.5 and 3 the adult-like cases correspond to 36.02% of the sentences. The adult-like cases increase until they correspond to a 100% of the cases when the MLU rate is between 4.5 and 5. There is an interval in which the production of adult-like sentences decreases instead of increasing. This interval is when the MLU rate is between 2 and 2.5 (45.8% of adult-like cases) until when the MLU rate is between 2.5 and 3 (36.02% of adult-like sentences). This decrease is not very pronounced and it has to do with the decrease in the MLU rate of the North American participants within this interval.

Graphs 2 and 3 deal with the relation between the MLU and the rate of adulthood of the sentences produced by both groups of children separately. On the one hand, graph 2 shows

this relation applied to the 3 North American children. Meanwhile, graph 3 shows the same relation on the production of the 2 British children of our study. The aim of these graphs is to demonstrate whether the MLU determines the production of adult-like and non-adult-like cases in both child groups, as well as to show if the production of anaphors is the same in North American and in British English child speech.
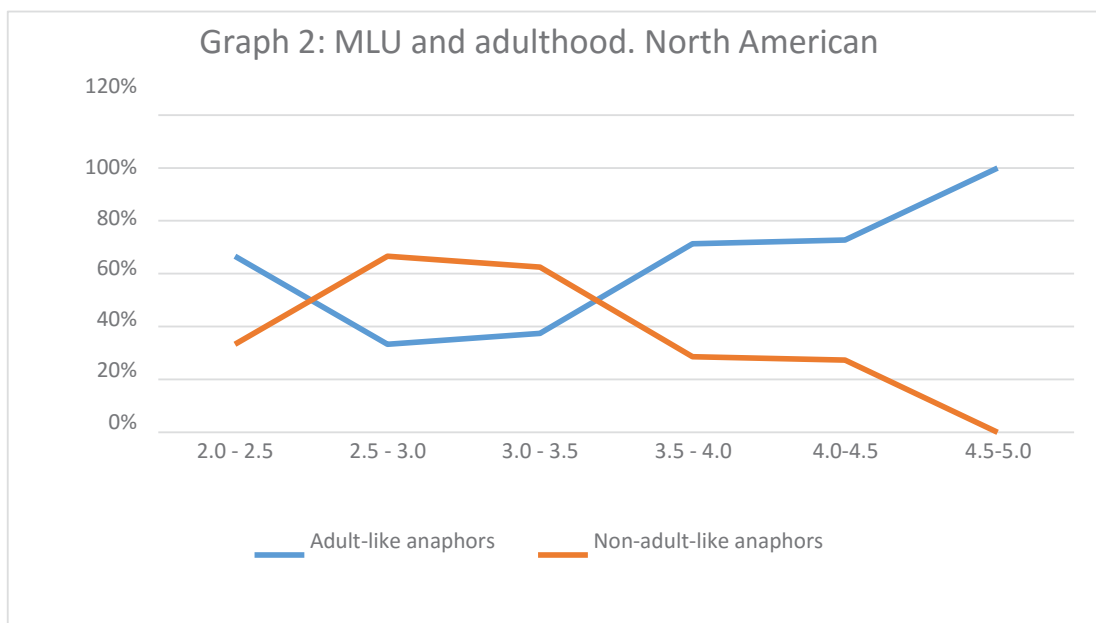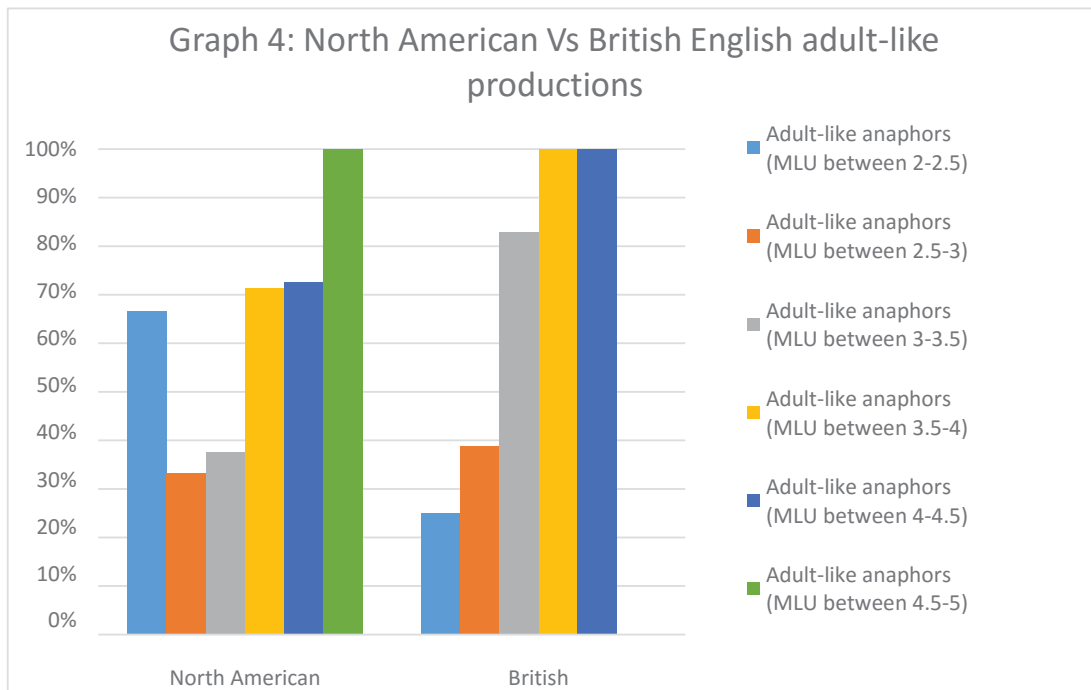

Graph 2 shows that the adult-like cases are higher when the MLU rate increases, excluding the interval that corresponds to the MLU rate between 2 and 3, in which the adult-like cases decrease from 66.66% to 33.33% of the cases. This decrease is due to a decline of the MLU rate between the ages of 2 and 3.The increase of adult-like cases is from MLU 2.5-3; and the decrease of non-adult-like anaphors is from MLU 2.5-3. The MLU rate at which the children produce 100% of correctness, is the same in the graph of the North American children and in the graph that includes both groups of children, that is at MLU 4.5-5.0.

Graph 3: MLU and adulthood. British

Legend: Adult-like anaphors — Non-adult-like anaphors

X-axis: 2.0 - 2.5, 2.5 - 3.0, 3.0 - 3.5, 3.5 - 4.0, 4.0-4.5, 4.5-5

Y-axis: 0%, 20%, 40%, 60%, 80%, 100%, 120%

Graph 3 demonstrates that there is a clear relation between the MLU rate and the adulthood of the sentences produced by the British English children. This relation consists on an increase of the adult-like production of anaphors while the MLU rate is rising. The difference between this graph and graph 1 is that the linguistic development progress is always positive meanwhile in graph 1 we can see that there is brief interval (MLU rate is between 2 and 2.5, and 2.5 and 3) in which the linguistic development decreases. Another important difference is that the complete adulthood of the anaphors produced in the British English child speech is reached at the MLU rate interval that goes between 3.5 and 4, meanwhile, the complete adulthood of the anaphors produced by all the participants is reached at the MLU rate interval that goes between 4.5 and 5.

Graph 4 represents the main differences between the production of anaphors in North American and in British English child speech by comparing the MLU rate and the adulthood of the sentences produced by both groups. These differences are given by comparing the data obtained in graph 2 and 3

Graph 4: North American Vs British English adult-like productions

Legend:
- Adult-like anaphors (MLU between 2-2.5)
- Adult-like anaphors (MLU between 2.5-3)
- Adult-like anaphors (MLU between 3-3.5)
- Adult-like anaphors (MLU between 3.5-4)
- Adult-like anaphors (MLU between 4-4.5)
- Adult-like anaphors (MLU between 4.5-5)

Graph 4 suggests that the production of anaphors of each group develops in a different way as the percentage of adult-like anaphors is not the same for both groups of children in the different developmental stages marked by the MLU. Generally, the production of adult-like anaphors is higher for the British English children than for the North American.

The only case in which the production of correct anaphors is higher in the North American child speech (66.67% of the anaphors are adult-like) than in the British child speech (25% of the anaphors are adult-like) is when the MLU rate is between 2 and 2.5. In all other cases, there is a higher number of adult-like sentences in the British English child speech than in the North American English child speech.

When the MLU rate is between 2.5 and 3, the production of correct anaphors in the British English child speech (38.71% of the anaphors are adult-like) very similar to the production of North American English child speech (33.33% of the anaphors are adult-like).

Meanwhile the percentage of adult-like sentences produced by the British children corresponds to 82.87% when the MLU rate is between 3 and 3.5, the percentage of correct anaphors produced by the North American children corresponds to 37.50%.

British English child speech reached 100% of the adult-like production of anaphors when the MLU rate is between 3.5 and 4, but the adulthood of the anaphors produced by the

North American children within the same MLU rate corresponds to 71.40% of adult-like sentences.

When the MLU rate is between 4 and 4.5 the percentage of correct anaphors produced by the North American corresponds to 72.73%, meanwhile the adult-like anaphors produced by the British English children correspond to 100%.

There is no production of anaphors by the British English children when the MLU rate is between 4.5 and 5, but the sentences produced by the North American English children reached the 100% of the adulthood when the MLU rate is between 4.5 and 5.

5. Conclusion

This dissertation provides an empirical analysis in order to compare the acquisition of anaphors both in North American and in British English child speech. To this end, data from different North American and British corpora in CHILDES have been chosen and analyzed. These corpora are the Brown and the Sachs corpora for the North American children, as well as the Lara and the Thomas corpora for the British group of children. The data analysis leads us to achieve several conclusions in regard to the research questions and the hypotheses included in section 3.

The non-developmental analysis of the data shows that reflexives are acquired earlier than reciprocals because of their level of complexity. The usage of the less complex ones, reflexives, is more frequent than the usage of reciprocals that are more complex grammatically and semantically speaking. Within reflexives, the singular forms are acquired before the plural forms, especially, the first person singular reflexive *myself* which is the most frequently produced form by the children in both groups as well as the one that has the lowest non-adult-like rate.

According to the analysis in our study, there are only three grammatical functions of the anaphors used by the two groups of children: direct object, complement of the preposition, and emphasizer. The preferred function of the North American children is the complement of the preposition, meanwhile the favored one by the British children is the direct object function. There is little difference between the most used and the second preferred function

which is the direct object for North American children and the emphasizer function for the British children. The remaining functions are not used by the children under analysis.

This means that the non-developmental analysis shows a quite parallel linguistic behavior for the two child groups.

As shown in the developmental analysis, complexity as well as language development (measured in terms of MLU) have an important role in the construction of non-adult-like sentences. In the initial stages of acquisition, the percentage of non-adult-like cases is higher than in the following ones, although not every child group acquires anaphors at the same time. The non-adult-like anaphors produced by the North American as well as by the British children have to do, in most cases, with the absence of an antecedent. On the contrary, the fewest number of non-adult-like anaphors corresponds to gender mismatches in North American English child speech, and to the use of anaphors instead of pronouns in British English child speech. The whole production of anaphors by North American children is adult-like when the MLU is between 4.5 and 5. Meanwhile, British children's full adult-like production appears when the MLU is between 3.5 and 4.

This means that the developmental analysis shows a difference between the two child groups in that British English children reach adult-like anaphor production sooner than the American English children. Meanwhile, the non-developmental analysis does not show any significant difference between the British and the North American English children as both groups provided similar results. The results of both developmental and non-developmental analysis are described below.

Firstly, taking into account the different forms of anaphors there is a clear preference for the production of reflexives in North American and in British English child speech. The most frequent reflexives used in both geographic places are those in singular, more concretely, the first person singular. Those reflexives are the ones with the highest rate of correctness and, therefore, singular reflexives are acquired before plural reflexives.

Secondly, with respect to the grammatical functions of the anaphors, we cannot establish an order in their acquisition but we can state that the most frequent anaphor functions, and therefore, the ones that are easier to acquire are the following: direct object, complement of a preposition, and emphasizer. The same order does not appear in the acquisition of the

different grammatical functions of the anaphors in the British and North American English child speech.

On the one hand, the most frequent anaphors produced by the North American participants are the ones that function as complement of the preposition, followed by the ones that function as direct object and, finally, the less frequently produced anaphors function as emphasizers. On the other hand, the most frequent function of the anaphors produced by the British participants are the anaphors that function as direct objects, followed by the ones that are used to emphasize, and the ones that function as complement of the preposition.

Thirdly, taking into account the different types of mistakes, it is possible to establish that in both North American and British English child speech the most common mistake is due to the absence of an antecedent. However, there is not any other relationship between the mistakes made by the two groups of children. The British children produce a 100% of adult-like anaphors when they are between 3.5 and 4 years old. Meanwhile, the North American children achieve the whole production of adult-like anaphors from the age of 4 years old.

Finally, it can be set that the production of anaphors and their different properties are acquired gradually in both groups according to the increase of the MLU rate and the general rate of correctness taking into account that not every child acquires anaphors at the same pace. This relationship is not the same for both groups of children as the MLU rate at which the North American participants achieve a 100% of adult-like anaphors is between 4.5 and 5, meanwhile, this MLU is between 3.5 and 4 for the British participants.

In conclusion, it can be set that the production of anaphors in North American and British English child speech do not occur at the same linguistic developmental stages, since the MLU rate is always higher in the North American English child speech. Furthermore, there is a clear relationship between the increase in the age and in the MLU rate as well as in the increase of the adult-like rate of the anaphors they produce. Finally, non-developmentally, no differences appear in terms of anaphor form and function and so both British English and North American English child speech are alike in this respect.

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