SPANISH SUBJECT PRONOUNS

Adult and Child comprehension and production of subject pronouns in inter-sentential anaphora. Evidence from Chilean Spanish.

D I S S E R T A T I O N
zur Erlangung des akademischen Grades
doctor philosophiae
(Dr. phil.)

eingereicht an
der Philosophischen Fakultät II
der Humboldt-Universität zu Berlin

von

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1 INTRODUCTION

The beginning is essential to a good story. The first sentence –they say– is a powerful hook to grab the reader's attention. Of course, every writer knows this, though only some of them are remembered and celebrated for their beginnings. Ray Bradbury (1953) is a good example: the opening of *Fahrenheit 451* ('It was a pleasure to burn') is quoted once and again as an instance of how a good hook may look like. In the literature in Spanish, a common place is the Columbian writer Gabriel García Márquez.

One of García Márquez's famous beginnings is that of *Chronicle of a death foretold* (1981):

(1)a. El   día en que lo   iban   a matar,   Santiago Nasar se   levantó
       The day in that him was going to kill,   Santiago Nasar refl. got up

       a las 5:30 de la mañana   para esperar el buque en que   llegaba
       at   5:30 of the morning   to   wait   the ship on which   the bishop

       el obispo.
       came

       'On the day they were going to kill him, Santiago Nasar got up at 5:30 in the morning to wait for the boat the bishop was coming on'.

In only one sentence, the narrator manages to introduce one of the main characters (Santiago Nasar), to reveal his final destiny and to give hints about the physical and cultural environment in which the novel takes place. Having done this, the following sentence (1b) goes on to give more information about the character. For that, the narrator uses the most common anaphoric resource of Spanish language: clauses without grammatical subjects (marked below as ø):

(1) b   Había soñado   que   ø   atravesaba   un bosque   de higuerones   donde
      ø   had   dreamed   that   ø   was going through   a forest   of fig trees   where

      caía   una llovizna tierna, y   por un instante   fue feliz   en el sueño,
      was falling   a   drizzle   gentle   and for   an instant   ø   was happy in the dream,

      pero al   despertar   se   sintió por completo   salpicado   de cagada   de
      but by the   awakening   ø   refl.   felt   completely   spittered   of shit   of

      pájaro
      bird

> 'He'd dreamed he was going through a grove of fig trees where a gentle drizzle was falling, and for an instant he was happy in his dream, but when he awoke he felt completely spattered with bird shit'.

Example (1) serves to illustrate a typical case of what will be the topic of this thesis: Spanish inter-sentential anaphora. Despite the fact that the three clauses of (1b) lack a subject, the reader immediately knows that these clauses are telling him something about Santiago Nasar. This is possible because Spanish, like Italian and Chinese, is a null-subject language. In null-subject languages, overt subjects are not mandatory. In fact, Spanish speakers avoid them quite often. Intuitively, the absence of a subject in (1b) seems to be justified by the fact that the first sentence already tells us 'who we are talking about'. The narrator neither needs to repeat himself, mentioning the protagonist again, nor to use another anaphoric expression, like a personal pronoun. He can simply drop the subject altogether. In this work, we run a series of experiments that provide evidence about how different anaphoric devices are used and interpreted by children (around the age of five) and adults in discourses similar to (1). Specifically, we are concerned with how overt or covert subject expressions refer back to an entity already introduced in the previous discourse.

     Dropping the subject is probably the best example of how far the Gricean maxim of quantity can go. English speakers, however, are not allowed to be that thrifty. As the translation of (1b) shows, the corresponding expression to the null subject

would be the personal pronoun 'he', since overt subjects are obligatory in the English case. The simple translation of the passage suggests that null subjects and pronouns like 'he' have something in common. Even though we cannot perceive the former, linguists tend to agree that they are somehow there: null subjects –we are told– represent a special kind of pronominal *expression* that happens to be 'phonetically empty'. In syntactic jargon, Spanish –but not English– allows the subject position of a tensed clause to be *occupied* by an 'empty' pronoun. Assuming this, henceforth we will refer to null subjects as null subject pronouns (NSP for short).

Considering that the NSP in (1b) are roughly equivalent to instances of the pronoun 'he' in the English translation, one might wonder whether Spanish overt personal pronouns are ever used in subject position. For, if the more economical NSP is available, it looks like speakers should simply avoid them. However, things are not that easy. Grice (1975) not only noted that speakers tend to follow certain maxims. He also remarked that they don't always do. As a matter of fact, he explained that flouting them is the usual way that speakers take to communicate non-conventional, implicated meanings. So a speaker using an overt subject pronoun (henceforth OSP) instead of a NSP need not be just wasting energy. Through the violation of the maxim of quantity, she might be intending to communicate something else.

Suppose, for example, that the narrator of García Márquez's novel had decided to use an OSP (1b') instead of a NSP (1b) in the second sentence:

(1) a. El día en que lo iban a matar, Santiago Nasar se levantó a las 5.30 de la mañana para esperar el buque en que llegaba el obispo.

     'On the day they were going to kill him, Santiago Nasar got up at 5:30 in the morning to wait for the boat the bishop was coming on'.

  b'. Él había soñado (…)
     He *had dreamed* (…)

Confronted to (1b'), a Gricean theorist is expected to ask himself why the narrator didn't use the minimal NSP. The standard picture predicts that readers of (1b') will interpret the narrator as intending to communicate more than just the proposition conveyed by the use of the unmarked NSP. For Grice, the additional meaning would constitute an implicature. Departing from him, linguists like Levinson (2000) have pointed out that the proposition conveyed by the use of the marked form may stand instead and not in addition to the proposition conveyed by the use of the unmarked one. But what alternative proposition could an utterance of (1b') convey?

The usual way of answering this question is to propose that different kinds of pronouns have different anaphoric preferences: the use of an OSP would signal that the preferred referent of the pronoun is not the antecedent selected by the NSP, but an alternative one. This idea has been fruitfully used to account for the contrast between different kinds of referring expressions in a number of languages, both within (Levinson 2000, Gundel et al. 1993) and outside Grice-inspired accounts (Givón 1983, Kameyama 1999). Of special interest for our purposes is Kameyama's (1999) account of English unstressed and stressed pronouns. According to her, unstressed and stressed pronouns have complementary anaphoric preferences (see also Sheldon 1974, Solan 1983, Beaver 2004). Assimilating NSP to unstressed and OSP to stressed pronouns (Luján 1986, Larson and Luján 1989), the idea of complementarity can be naturally extended to null subject languages like Spanish (onwards, we will refer to this view as *CAP*, a short-cut for complementary anaphoric preferences). Taken at face-value, *CAP* says that, if the NSP in (1b) picks out Santiago Nasar, the OSP in (1b') should pick out someone else. Looking back at the preceding sentence (1a), we find one possible candidate: the bishop. The dream described in the alternative beginning of the novel, then, would not be the dream of Santiago Nasar, but of the priest that arrives in the boat. The result is a rather strange beginning for a novel, but not a bad hook anyway (who knows what the dream might symbolize when dreamed by a bishop).

The *CAP* approach can be spelled out in different ways. In this work, we consider three different versions: the *Strong Complementarity* hypothesis, the *Parallelism* hypothesis, and the *Topic* hypothesis. Each of them makes clear predictions about adult language. The first predicts complementarity between NSP and OSP across the board, while the others specify certain conditions for it to obtain: structural parallelism between the sentences involved or the presence of a well-established topic at the antecedent sentence, respectively. According to the *Parallelism* hypothesis, under the presence of parallelism NSP prefer subject antecedents and OSP prefer object antecedents. According to the *Topic* hypothesis, NSP are interpreted as continuing the topic of the antecedent sentence, while OSP are interpreting as instantiating a topic-shift. In this work, the three hypotheses are tested through a series of comprehension and production experiments.

The results obtained by adult participants put into question the *CAP* approach, contradicting several predictions made by the three versions considered. At the same time, the results illuminate the discussion about how and why children around the age of five differ from adults in their comprehension and production of these pronouns. [1] In line with previous experimental evidence coming from other languages, our experiments show that children have problems interpreting subject pronouns in absence of clear pragmatic biases (eg. Wubs, Hendriks, Hoeks and Koster 2009, for Dutch). Further, they show that children tend to produce NSP more often than adults. As a consequence, their utterances sometimes result ambiguous or conduce to unintended interpretations (eg. Karmiloff-Smith 1985 for English and French). By dealing the case

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[1] Under the assumption that some version of the *CAP* approach was right, the initial idea of this thesis was to focus on how child language differed from a clearly established adult pattern. Adults would participate in the proposed experiments as mere control groups, as it was taken for granted that they were going to behave in a certain way, compatible with the *CAP* approach. However, the results obtained in a series of questionnaires conducted during the preparation phase of the experiments (see Appendix 2) suggested that the *CAP* approach could be wrong. As a result of this, the project turned into a different direction: the experiments would not only provide evidence about the differences between children and adult language, they would also serve to test the *CAP* approach and to look for alternative explanations.

of Spanish, we contribute to the existing literature with new evidence and with a discussion that may also be relevant for other languages.

Given that *CAP*'s predictions are often not fulfilled, we look for an alternative view that can provide a better explanation of the phenomena under study. The view that we consider is based on how the sentences of a discourse are related through rhetorical (coherence) relations.[2] According to it, the resolution of pronouns can be seen as a by-product of inferring these relations. The difference between using a NSP and an OSP would not obey pre-determined anaphoric preferences (for subject and object antecedents, for instance), but depend on how pronouns contribute to the establishment of discourse coherence (see Hobbs 1990, Kehler 2002, Venditti et al 2002. Other accounts that use rhetorical relations to explain pronoun resolution include Asher et al 2004, de Hoop 2004, Jasinskaja et al 2007). We will refer to this view as Rhetorical-relational Anaphoric preferences (*RRAP*). Within it, NSP and OSP may pick out the same antecedent in some contexts, while picking out different antecedents in other contexts.

Rhetorical relations are typically signaled by the use of discourse markers such as 'porque' ('because'), 'pero' ('but') or 'si' ('if'). For example, the NSP in the examples below is interpreted as referring to the previous subject (Juan) in one case (2) and to the previous object (Pedro) in the other (3):

(2) Juan evita a Pedro porque no se atreve a pelear
   Juan avoids PREP *Pedro because* NSP *no* REFL. *dares to fight*

   'Juan avoids Pedro because he doesn't dare to fight'

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[2] The kind of relations we are concerned with have received different names in the literature. While Mann and Thompson (1988) and Asher and Lascarides (2003) call them 'rhetorical relations', Hobbs (1990) and Kehler (2002) call them 'coherence relations'. Other authors talk about 'discourse relations' (e.g. Taboada 2007). We have opted for the term 'rhetorical', given that the term 'coherence' is also used within views that base pronoun resolution in structural preferences (e.g. Centering Theory (Grosz, Joshi and Weinstein 1995)).

(3) Juan desprecia a   Pedro porque   no se   atreve a pelear
    Juan despises   ₚᵣₑₚ *Pedro because* NSP *no* ᵣₑ𝒻ₗ *dares to fight*

'Juan despises Pedro because he doesn't dare to fight'

In both cases, the connector 'porque' ('because') signals an *Explanation* relation, which –given the verbs of the first clauses– favors a subject antecedent in (2) and an object antecedent in (3).

Beyond discourse markers, relations may also be signaled by different morphological (e.g. tense), syntactic (e.g. embedding) and semantic (e.g. verb meaning) mechanisms (see Taboada 2009). Based on Kehler (2005), Kehler et al (2008) and de Hoop's (2004) accounts of stressed English pronouns, we consider the possibility that, as a marked form, OSP may only be felicitous within a limited range of relations, like *Parallel* or *Contrast*. In them, the entity selected by the OSP is contrasted in some respect with another discourse entity. The unmarked NSP, in turn, is not supposed to be limited to specific relations, but just to be used and interpreted in such a way that it fits the relations signaled by other mechanisms. For example, in the beginning of García Márquez's novel (repeated below as (4)), the interpretation of the NSP in (4b) as referring to Santiago Nasar would be determined by the use of the past perfect after a simple past (4a). This combination might signal a relation of of *Background* between (4b) and the previous discourse. Intuitively, the establishment of such relation is only possible if the character that 'had dreamed' is the same that 'got up at 5:30' (something reinforced by our world knowledge about the semantic and typical temporal connection between dreaming and getting up):

(4) a. El día en que lo iban a matar, Santiago Nasar se levantó a las 5.30 de la maña-
      na para esperar el buque en que llegaba el obispo.

      'On the day they were going to kill him, Santiago Nasar got up at 5:30 in the
      morning to wait for the boat the bishop was coming on'.

b. Había soñado (…)
    (NSP) *had dreamed (…)*

b'. Él había soñado (…)

   ***He** (OSP) had dreamed (…)*

In the case of the alternative beginning (4b'), where an OSP is used instead of a NSP, one could expect the pronoun to be resolved as referring to the antecedent favored by one of the relations where OSP can typically appear. In them, the selected referent is supposed to be contrasted in some respect with a different, alternative referent. But, intuitively, it seems that the passage doesn't offer a clear ground for contrasting the selected element with another one, for the situation described in the second sentence doesn't seem to be comparable with the situation described in the first one, whatever referent we select (a situation in which someone 'had dreamed' something doesn't seem to put 'the dreamer' in opposition to an individual that 'got up' or 'arrived in a boat'). Moreover, as we have seen, there are elements that induce the establishment of relations such as *Background*. So, at least in absence of further context, the OSP might be infelicitous in (b').[3]

In contrast to (4b), the OSP in (5) does appear to be felicitous:

(5) Nora disfruta viendo   películas de horror con Ida. Ella prefiere las de acción.
    Nora enjoys   watching films   of horror with Ida. **SHE** *prefers the of action.*

   'Nora enjoys watching horror films with Ida. SHE prefers the action ones'.

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[3] To use an OSP in this case, where no evident contrast can be established, would be analogous to use 'porque' ('because`) before a clause that doesn't provide an explanation:

   ? Juan se   tropieza porque Pedro   no se   atreve a pelear
     Juan REFL stumbles *because* Pedro *no* REFL. *dares to fight*
   ? 'Juan stumbles because Pedro doesn't dare to fight'

If the OSP is interpreted as referring to Ida, it looks like we can contrast the two referents with respect to the kind of movies that they like: one likes horror movies and the other likes action movies. But if the OSP is interpreted as referring to Nora, then the relation would not obtain, for there is no common topic against which the elements can be contrasted (under this interpretation, all we know about Ida is that Nora enjoys watching horror films with her, something unrelated to the kind of movies that Nora prefers). So the establishment of *Contrast* would determine the resolution of the pronoun in favor of Ida.

The *RRAP* approach is used to interpret a range of results obtained in the experiments. With respect to OSP, the point that we make is that, like (4b), some of the discourses used or elicited in the experiments do not meet the conditions for this form to be felicitous. The overall discussion of the experiments shows that *RRAP* can be a fruitful approach to the study of both child and adult use and comprehension of subject pronouns. It also notices some of its limitations and suggests alternative explanations.

The remainder of the dissertation is structured as follows:

Chapter 2 introduces the system of Spanish subject pronouns and identifies different kinds of uses, narrowing the scope of the dissertation to the contrast between NSP and OSP in inter-sentential anaphora. After this, the *Complementary Anaphoric Preferences* view (*CAP*) is presented as a possible frame to account for the differences between the two kinds of pronouns. Then we go on to distinguish three different versions of *CAP*: the *Strong Complementarity* hypothesis, the *Parallelism* hypothesis and the *Topic* hypothesis. Within each version, we motivate a series of predictions about the comprehension and production of NSP and OSP in adult and child language. These predictions are tested in chapters 3 and 4.

Chapter 3 reports and discusses a set of comprehension experiments designed to test the different predictions presented in chapter 2. Experiment 1 is concerned with the *Strong Complementarity* hypothesis. The results obtained show that, when adults hear discourses lacking a number of biases that have been said to guide pro-

noun interpretation, they interpret NSP as referring to the previous subject, but OSP turns out to be ambiguous. Children, in turn, show a slight preference for interpreting both kinds of pronouns as referring to the previous object, something that suggest that a recency strategy is at stake. Experiments 2 and 3 are concerned with the *Parallelism* hypothesis. When hearing discourses conformed by parallel pairs of sentences, adults uniformly interpret the NSP as referring to the previous subject, and show a slight preference for interpreting the OSP as referring to the previous object. This shows that the presence of an OSP is not enough to invert the NSP preference. Children, in turn, tend to interpret NSP as referring to the previous subject, while their interpretation of OSP shows a slight preference for objects. The latter preference does not vary when children are confronted to OSP in non-parallel discourses. So, at first sight, the results suggest that children make use of parallelism to solve NSP, but not OSP. Experiments 4 and 5 are concerned with the *Topic* hypothesis. The results of experiment 4 show that adults interpret NSP as referring to a topical antecedent (in subject position), while the preference of OSP for a non-topical antecedent is at chance level. In the case of children, NSP show a slight preference for topical antecedents, both when interpreting NSP and OSP. Further scrutiny (Experiment 5) suggests that –in the discourses used– children often fail to use structural information to determine which antecedent is the topic at the sentence preceding the pronoun. In those cases, the entity that has been the topic throughout the previous discourse appears to be the preferred one (this also seems to be the case of a group of elderly adults included in the experiment).

Chapter 4 goes on to report and discuss two experiments that test predictions for production. Experiment 6 tests the *Parallelism* hypothesis. The results show that both children and adults use NSP to refer to an antecedent in subject position and prefer full NP to refer to antecedents in object position. Children, however, sometimes also use NSP in the latter case. The fact that OSP remain unused cannot be explained by the *Parallelism* hypothesis. Experiment 7 goes on to test the *Topic* hypothesis. The results show that participants use NSP to refer to a topic antecedent (which, in the

stories elicited, is also in subject position). When referring to a non-topic (and object) antecedent, participants prefer to use a full NP. But, like in the previous experiment, children (and also a group of elderly adults) sometimes use NSP in the second case.

In chapter 5, a discussion of the overall results is presented. Abandoning the *CAP* approach, the data is analyzed under the light of rhetorical relations. It is argued that rhetorical relations can partly explain the results obtained. However, when discourses are not connected by clear-cut relations, the interpretation and use of pronouns appear to be determined by the topic status of the antecedents. To determine the topic, the position of the antecedents in the sentence preceding the pronoun is often crucial. The problem for children is that they do not appear to take into account this information.

The conclusion summarizes the main achievements of the previous chapters and offers perspectives for future work and for a possible account within the frame of Optimality Theory (Prince and Smolensky 1993). Finally, the appendix presents the material used in the experiments and reports a series of relevant preliminary studies not included in the main text.

2 SUBJECT PRONOUNS IN DISCOURSE

This chapter elaborates on the distinction between null and overt subject pronouns in Spanish (NSP and OSP), motivating a series of predictions about the comprehension and production of these forms in inter-sentential anaphora. It is divided into five parts: in section 2.1, the system and main uses of Spanish subject personal pronouns are briefly sketched in order to delimitate more clearly the topic of this dissertation. Section 2.2 presents the *Complementary Anaphoric Preferences* view (*CAP*). Three different hypotheses about how to conceive *CAP* are taken into account: the *Strong Complementarity*, the *Parallelism* and the *Topic* hypotheses. Each of them provides precise predictions about adult language. Section 2.3 goes on to consider child language within the frame of *CAP*. Drawing on the precedent sections and on the evidence of prior studies, it discusses possible differences between children and adults' comprehension and production of pronouns, motivating predictions about children's performance. Section 2.4 relates the predictions of the previous sections to the set of experiments to be reported in chapters 3 and 4. Section 2.5 summarizes the content of the chapter.

2.1. NULL AND OVERT SUBJECT PRONOUNS

2.1.1 Pronouns and verb inflection

Spanish is a language with rich agreement morphology. As can be seen in table 2.1 below, part of the information encoded in personal pronouns is also present in the verb.

Singular		Plural	
Pronoun	Verb	Pronoun	Verb
yo	salt-o	nosotr-o-s	salt-amos
1SG	1SG	1PL-MASC	1PL
'I jump'		'we jump'	
tú	salt-a-s	vosotr-o-s	salt-áis
2SG-FAM	2SG-FAM	2PL-MASC-FAM	2PL-FAM
'you jump'		'you jump'	
		vosotr-a-s	
		2Pl-FEM-FAM	
		'you jump'	
él	salt-a	ell-o-s	salt-an
3SG-MASC	3SG	3PL-MASC	3PL
'he jumps'		'they jump'	
ella		ell-a-s	
3SG-FEM		3PL-FEM	
'she jumps'		'they jump'	
usted		usted-es	
3SG-POL		3PL-POL	
'you jump'(polite)		'you jump' (polite)	

Table 2.1. Personal pronouns and verb inflection in Spanish
(simple present)

This seems to justify the use of NSP, since the absence of a subject need not be an obstacle to work out what or who we are talking about. In fact, a traditional explana-

tion for the existence of null-subject languages is that NSP are licensed by rich agreement morphology (cf. Taraldsen 1978, Perlmutter 1971, and the discussions in Huang 2000 and Filiaci 2010). As long as verb morphology allows the recovery of a NSP's content –we are told– the use of an OSP appears to be superfluous.

However, it happens that this is a bad explanation. It is not sufficient for romance languages like Spanish and it is completely flawed to account for cross-linguistic variation.[4] If we look more carefully at the table above, we will see that the 'richness' of verb morphology is relative, to the point that it often turns out useless in determining the referent of a pronoun. However, neither speakers avoid the use of NSP in these cases, nor hearers hesitate in interpreting them. A good example of this is (1):

(1) Juan persuadió a   Ana de encontrarse con usted. Luego fue   a   casa.
    John persuaded PREP Ana to meet   with you   Then   went PREP home
    'Juan convinced María to meet you. Then (he/she/you?) went home'

We can see that the use of a third person verb in (1) leads to a three-way potential ambiguity: since inflection does not specify gender, the NSP can have a masculine or a feminine antecedent (Juan or María). Further, it can refer to the hearer in a non-familiar or polite way (corresponding to the pronoun 'usted', the formal 'you').[5] But this is not a problem at all: speakers use sentences like this all the time and hearers clearly interpret them as referring to a particular referent (in this case, to the subject 'Juan'). Our interest will be precisely centered on how inter-sentential anaphora

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[4] This becomes evident from the fact that null subjects are present in languages with no identifying morphology, like Japanese, while absent in languages with rich identifying morphology, like Icelandic. (cf. Cole 2009). Jaeggli and Safir (1989), Rizzi (1997) and Huang (2000), between others, have provided more subtle accounts of the relationships between verb morphology and the emergency of null subjects across languages.

[5] In some tenses of the indicative (the so-called 'imperfecto' and 'pluscuamperfecto' pasts, as well as the 'simple' and 'perfecto' conditionals) and in the whole subjunctive, the ambiguity turns out to be four-way, since the first person form inflection coincides with the third. So the NSP in the sentence '(NSP) Caminaba a casa' ('NSP was walking home') might correspond to the speaker (I), the hearer (you, addressed in the polite form), and a feminine or a masculine referent (she or he).

works in cases where more than one antecedent is possible –that is, in cases where verb inflection does not do the work–.

2.1.2 Different uses of NSP and OSP

To delimit more precisely the scope of the dissertation, it is important to take into account that there are also non-anaphoric uses of pronouns. In the case of NSP, Huang (2000) distinguishes between expletive, quasi-argumental and referential uses. In expletive (2) and quasi-argumental (3) uses, the NSP is mandatory, since there is no alternative overt expression that can be used instead:[6]

(2) Está lloviendo.
     NSP raining
     'It's raining'

(3)   Parece que el día estará lluvioso.
      NSP seems   that the day will be rainy
     'It seems that the day will be rainy'

In referential uses, in turn, NSP may alternate with overt expressions like OSP. Within referential uses, we can distinguish those where NSP and OSP function as indexicals (4) from those that are anaphoric (5):

(4) a.   Estoy mojado
          NSP   am   wet

     b. Yo   estoy mojado
         I   am   wet

         'I'm wet'

---

[6] See Zagona (2001) and Montrul (2004) for further examples of obligatory null subjects in Spanish.

(5) a. María   corre   bajo   la   lluvia.   Olvidó   su   paraguas.
         María   runs   under   the   rain.   **NSP**   *forgot   her   umbrella*

     b. María   corre   bajo   la   lluvia.   Ella   olvidó   su   paraguas.
         María   runs   under   the   rain.   **She**   *forgot   her   umbrella*

     'María runs under the rain. She forgot her umbrella'.

Indexicals like (4) differ from anaphors like (5) in the way the pronouns determine their reference. While in utterances of (4a/b), the pronouns signal the speaker, in utterances of (5a/b) they refer back to an entity of the previous discourse. How both referential uses of pronouns relate to each other is a matter of controversy that will not be treated here in detail; however, in chapter 5 we will consider some similarities between the use of OSP as an anaphor and the use of it as a (demonstrative) indexical.[7]

2.1.3. Anaphoric uses of NSP and OSP

Within anaphoric uses of NSP and OSP, we go on to delimit more precisely the kind of cases we are interested in. We have emphasized that, despite the fact that verb inflection is often useless to determine reference, anaphoric NSP are used extensively in real communicative situations. In turn, OSP are much less frequent (see Taboada 2008 for a corpus study).

There are many cases where, despite the presence of two potential antecedents, it seems completely obvious that one of them should be preferred. What happens is that the referent of the pronoun is semantically or pragmatically connected to the previous discourse, the context of the utterance or/and to general world knowledge. It is, in linguistic terms, semantically or pragmatically biased towards a given

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[7] (4) is an example of what Kaplan calls a pure indexical (cf. Kaplan 1989). Another kind of indexicals are demonstratives. Of the two pronominal forms we are concerned with, only OSP can work as a demonstrative, if accompanied by an appropriate pointing gesture (e.g. 'Él es chileno', *He is Chilean*).

interpretation. For example, in (6a), there are two available antecedents in the previous discourse (Fernanda and María), but nobody would doubt that the NSP refers to María:

(6) a. Fernanda encontró a María.   Estaba en el paradero.
     Fernanda found   _A *María. **NSP** was   in the bus-stop*

   b. Fernanda encontró a María. Ella estaba en el paradero.
     Fernanda found   _A *María. **She** was   in the bus-stop*

   'Fernanda found María. She was in the bus-stop'[8]

The pronouns in (6) are clearly biased to favor this interpretation, for the hearer can easily relate her location –expressed in the second sentence- with Fernanda's finding –expressed in the first–, somehow inferring the interpretation on the basis of the previous discourse. Such inference doesn't seem plausible if the pronouns are interpreted as referring to Fernanda. To the extent that semantics and pragmatics favor the intended interpretation over its competitor, the use of NSP appears to be the best option for the speaker. In fact, the OSP in (6b) sounds odd. Cases like (6) are –at least at first sight- 'easy cases' (though a proper explanation of them can turn out to be very complex).

     Our interest, however, is concerned with more 'difficult cases', that is, with cases where previous discourse, world knowledge and context do not evidently guide the resolution of the pronoun. Cases which, like (7), are not (or at least not obviously) biased:

(7)   a. Francisca   encuentra a Antonia.   Está feliz
        Francisca   meets   _A *Antonia* **NSP** *is   happy*

     b. Francisca   encuentra a Antonia. Ella   está feliz

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[8] In 'encontró a María' (found María), 'a' is a marker for animate objects. In what follows, we will use the subscript 'A' to identify it and differentiate it from the homonymous preposition 'a'.

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Francisca   *meets*   ₐ *Antonia.* **She**   *is*   *happy*

'Francisca meets Antonia. She is happy'

Which of the women is happy? No evident linguistic or extra-linguistic information appears to guide the resolution of the pronouns in favor of one of the antecedents. So, how do hearers interpret (7)? Do they interpret NSP and OSP in the same way? And do speakers produce instances of discourses like (7), despite its apparent ambiguity?

Summarizing, our aim is to investigate the differences in the anaphoric behavior of NSP and OSP when two possible –in principle equally plausible– antecedents are present.[9]

2.1.4 NSP and OSP as an instance of the unstressed/stressed opposition

At this point, we need to make a fairly standard assumption: in Spanish, NSP and OSP can be seen as an instance of the opposition between stressed and unstressed personal pronouns (cf. Bauuw et al 2004). While in English this opposition is characterized by the presence or absence of intonational prominence (pitch accent) in the pronoun, in Spanish it is characterized by the overt or covert realization.[10] Evidence

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[9] Since our focus is in the opposition between NSP and OSP, we will only be concerned with cases where both forms may legitimately alternate. This leaves out anaphoric uses like the following:

a. Francisco   busca   su   impermeable.   Está   en   su   mochila
   Francisco   *searches*   *his*   *raincoat-MASC.*   *NSP*   *is*   *in*   *his*   *rucksack*

b. Francisco   busca   su   impermeable.   # Él   está   en   su   mochila.
   Francisco   *searches*   *his*   *raincoat-MASC*   *# He*   *is*   *in*   *his*   *rucksack.*

'Francisco looks for his raincoat. It is in his rucksack'

Despite the fact that both possible antecedents have the same gender, an OSP is not acceptable as referring back to the raincoat, since OSP further requires the antecedent to be animate (cf. Alonso-Ovalle et al. 2002). Our experiments will test discourses were both antecedents are human.

[10] In the case of object pronouns, the English stressed/unstressed opposition is parallel to the opposition between Spanish (stressed) object pronouns and (unstressed) clitics.

about similarities in the behavior of Spanish NSP/OSP and English stressed/unstressed pronouns can be found in Larson and Luján (1999) and Bauuw et al (2004).[11] So, in what follows, we will consider NSP as analogous to unstressed and OSP as analogous to stressed pronouns (where by OSP we specifically refer to **personal** pronouns, letting apart other kinds of pronouns).[12] In chapter 5, this assumption will be discussed in relation to the results of the experiments.

2.2 COMPLEMENTARY ANAPHORIC PREFERENCES (*CAP*)

A possible way of explaining the contrast between NSP and OSP in Spanish is to propose that they have complementary anaphoric preferences. We have referred to this view as *CAP*. In its strongest version, *CAP* predicts that, if the NSP in (7) (repeated here as (8)) refers to 'Francisca', the OSP should refer to 'Antonia'.

(8) a. Francisca encuentra a Antonia.   Está feliz
    Francisca meets   A *Antonia* **NSP** *is   happy*

  b. Francisca encuentra a Antonia. Ella está feliz
    Francisca meets   A *Antonia.* **SHE** *is   happy*

  'Francisca meets Antonia. She/SHE is happy'

The *CAP* view finds support on the widely spread idea that different kinds of pronouns have different anaphoric preferences. This idea is present in the cognitive approaches of Gundel et al (1993), Ariel (1990) and Givón (1983) and it is part of the neo-Gricean approaches of Levinson (2000) and Huang (2000). Further, it can be in-

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[11] This assumption appears to be well-founded for Castillian and for most varieties of Spanish in Latin America, with some important exceptions: Caribbean Spanish and the Spanish speaking communities of the USA. The differences between the latter and other Latin American varieties of Spanish have been the object of numerous sociolinguistic studies (see e.g. Cameron 1994 and Flores Ferrán 2002).

[12] Henceforth, we will write the translation of OSP in capital letters, to signal its similarity to the stressed English form.

corporated into heuristically based models like Centering Theory (Grosz et al. 1995), as the work of Kameyama (1999) shows.

For Gundel et al (1993) 'different determiners and pronominal forms conventionally signal different cognitive statuses (information about location in memory and attention state), thereby enabling the addressee to restrict the set of possible referents' (275). Statuses and forms are related within an implicational hierarchy, where 'each status is a necessary and sufficient condition for appropriate use of a different pronoun or determiner' (Gundel 1998: 184). In this hierarchy, NSP and OSP occupy a different position: while OSP stands for a referent that is merely activated, NSP is supposed to realize an entity that is the current focus of attention:[13]

	IN FOCUS	>ACTIVATED	>FAMILIAR	>UNIQUELY IDENTIFABLE	>REFERENTIAL	>TYPE IDENTIFIABLE
English	**he**	**HE** this that this N	that N	the N	indefinite this N	a N
Spanish	**NSP**	**ÉL (OSP)** éste, ése aquél éste	ese N aquel N	el N		ø N un N

Table 2.2. The Givenness Hierarchy (Gundel et al. 1993)

Givón (1983) and Ariel (1990) also provide hierarchies of forms, which they relate to the availability or accessibility of the antecedents. What these approaches have in common is that they predict that speakers will select a form in virtue of some characteristic of the intended antecedent at the time immediately preceding the utter-

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[13] For the Spanish case, Gundel et al. (1993) include an unstressed 'él' under the 'in focus' status, together with the NSP. We omit it here since OSP cannot be de-stressed (see Casielles-Suárez 2004; 35).

ance. Conversely, hearers are normally expected to pick out a different antecedent when confronted to different pronominal forms. This component is also present in Levinson (1987, 2000) and Huang's (1991, 2000) neo-Gricean approach. According to it, the systematic interaction of Levinson's Q-, M- and I-pragmatic principles would determine a general pattern of anaphora across languages (Huang 1991: 309) predicting different interpretations for NSP and OSP in the case of Spanish:

(9) The general pattern of anaphora

> Reduced, semantically general anaphoric expressions tend to favor locally core-
> ferential interpretations; full, semantic anaphoric expressions tend to favor lo-
> cally non-coreferential interpretations

Though this pattern is primarily intended to apply to intra-sentential anaphora, Levinson (cf. 2000: 271) argues that, in discourse, a different concept of local domain is at stage. This is not given by syntax but by a theory of discourse, so that it applies to conversational sequences. The crucial point, however, is the same for both cases: the presence of OSP (a marked form) would signal that the stereotypical interpretation is not the intended one, so that an M-implicature arises. This implicature is complementary to the I-implicature that arises from the use of the simpler, unmarked NSP.[14]

The idea of complementary preferences between stressed and unstressed pronouns in inter-sentential anaphora is most remarkably defended in Kameyama's (1999) account of English (see also Beaver 2004). She proposes that, in contexts where two potential antecedents are present, the value of a stressed pronoun is calculated on the basis of the value of the unstressed counterpart, so that the former takes the complementary preference of the latter. Within the frame of Centering Theory, she offers a detailed procedure of how each form selects an antecedent. This procedure is based both on the position and on the form of the antecedent. Of course, other

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[14] See Blackwell (2003) for a study of Spanish narratives and conversations within this framework.

procedures are available in the literature, so that the general view of *CAP* can be spelled out in a variety of ways, going from purely syntactic to semantic and pragmatic criteria.

2.2.1. The Strong Complementary Hypothesis

In our work, we focus on three conceptions of complementarity present in the literature: first, we consider the *Strong Complementarity* hypothesis, which predicts complementarity across the board. In absence of clear pragmatic or semantic biases, NSP (unstressed) and OSP (stressed) pronouns are expected to prefer a different antecedent. For the discourses to be considered in the experiments, we will assume at this point that the referents are selected on the basis of their syntactical position. In particular, we assume that NSP prefer subject antecedents, while OSP prefer antecedents is lower positions:[15]

(10) a. Pedro   visita   a   Jaime.   Está   triste.
          Pedro   *visits*   A   *Jaime.*   **NSP**   *is*   *sad.*

       b. Pedro   visita   a   Jaime.   Él   está   triste
          Pedro   *visits*   A   *Antonia.*   **HE**   *is*   *sad.*

    'Pedro visits Jaime. He/HE is sad'

So, the prediction of the *Strong Complementarity* hypothesis is that, in comprehension, the NSP will be interpreted by adults as referring to Pedro, while the OSP will be interpreted as referring to Jaime. In production, it predicts that NSP will be used to refer to antecedents in subject position, while OSP will be use to refer to antecedents in lower positions. In the next chapters, the hypothesis will be tested for comprehen-

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[15] Kameyama's account (1999) of English stressed and unstressed pronouns and Carminati's (2002) account of Italian null and overt pronouns are two examples of different forms to instantiate this hypothesis. On the basis of the latter, Alonso-Ovalle et al.(2002) discusses the Spanish case.

sion, but not for production, since the elicitation of pronouns within discourses similar to (10) doesn't seem feasible (preliminary tests using two picture stories showed that speakers tend to repeat full NP when referring to a character for the second time, especially if the situation presented in the second picture appeared to be unrelated to the previous one).

2.2.2 The Parallelism Hypothesis

The *Parallelism* hypothesis is a more restricted version of complementarity: it predicts that complementarity obtains when the sentence in which the pronoun appears is structurally parallel to the antecedent sentence (cf. Solan 1983 for English unstressed and stressed pronouns). When this is the case, a parallel preference for the previous subject is expected in the case of NSP and an anti-parallel preference in the case of OSP. The preference for a parallel antecedent is often referred in the literature as the 'Parallel-function strategy' (see, for example, Smyth 1994). The effect of the OSP would be a cancellation of this preference (Baauw, Ruigendijk and Cuetos 2004). So, in the example below (translated and adapted from Venditti, Stone, Nanda and Tepper 2002), the NSP is expected to be interpreted as referring to John, while the OSP is expected to refer to Bill:

(11) John golpeó a Bill. Then …
    John hit ₐ *Bill. Then* …
    'John hit Bill. Then…'

    a.   golpeó a George
        NSP *hit*   ₐ *George*
        'he hit George'

    b. Él   golpeó a George
        HE *hit*   ₐ *George*
        'HE hit George'

In the experiments, we assume that the *Parallelism* hypothesis applies to pair of sentences that show full structural parallelism. This differentiates it from the *Strong Complementarity* hypothesis. When the sentences of the discourse are not completely parallel (as is the case of (10) above), the *Parallelism* hypothesis makes no predictions. In production, the prediction is that, whenever speakers use a subject pronoun to refer to a parallel subject antecedent, this pronoun will be a NSP. In contrast, if speakers use a pronoun to refer to a non-parallel object antecedent, this will be an OSP.

2.2.3 The Topic Hypothesis

The last case to consider is the *Topic* hypothesis. According to it, NSP are used to refer to topic antecedents, while OSP are used to refer to non-topic antecedents. In other words, NSP instantiate topic continuity, while OSP instantiate a topic shift. In principle, the *Topic* hypothesis looks just like a different way of spelling out strong complementarity. However, we distinguish both hypotheses by assuming that topical entities have to be 'discourse-old'. Hence, the *Topic* hypothesis makes a weaker claim: it predicts that complementarity obtains when at least one of the two possible antecedents of the pronoun has been previously introduced into the discourse (and, therefore, qualifies as topic). In (12) (translated and adapted from Beaver 2004), for example, the topic of the third sentence would be Jack, so that the use of NSP in the fourth sentence is predicted to be interpreted as further continuing this topic, while a OSP is predicted to be interpreted as instantiating a topic shift:

(12) a. Jack fue   al   restorán.
          Jack went   to-the   restaurant.
          'Jack went to the restaurant'

     b.   Estaba   comiendo
          NSP   *Was   eating*
          'He was eating'

c.   vio   a   Jim.
     NSP   *saw* _A   *Jim*
     'He saw Jim'

d.   hizo   un guiño
     NSP made a   wink
     'He winked'

d.' Él   hizo   un guiño
     HE   made a   wink
     'HE winked'

In production, the *Topic* hypothesis predicts that speakers will use NSP to refer to a continued topic, while they will often use OSP to refer to a non-topic, instantiating a topic shift. A discussion about relevant aspects of the notion of topic in play will be provided under the light of the experiments.

2.3. NSP AND OSP IN CHILD LANGUAGE

2.3.1 Previous research

Though most of the literature on the acquisition of pronouns is focused on early stages of syntactic development, the literature concerning later stages –where the use of inter-sentential anaphoric pronouns emerges- has grown significantly during the last years. Special attention has been given to intra-sentential anaphora and, in particular, to the controversy about possible asymmetries between production and comprehension during the acquisition of the binding principle B in different languages (for English, Chien and Wexler 1990, Grimshaw and Rosen 1990, Reinhart 2004; for Spanish, Baauw and Cuetos 2003). But the literature on inter-sentential anaphora has also proliferated: older works like Karmiloff-Smith (1985), Solan (1983) and Wykes (1981) have been re-vitalized by a whole range of recent studies (some examples are Arnold,

Brown-Smith and Trueswell 2007 for English, Wubs, Hendriks, Hoeks and Koster 2009 for Dutch, Bittner, Kühnast and Gagarina 2011 for German, Russian and Bulgarian, Sorace and Serratrice 2009 for Italian and English and Hickmann 2003 for a variety of languages).

What most studies have in common is their commitment to some version of the idea that different forms have different anaphoric preferences. With little exceptions (e.g. Kehler, Hayes and Barner 2011), rhetorical (coherence) relations are not taken into account and the discussion is centered on the factors that make an antecedent more salient than the other for children, such as position (subject preference), form, topical status, parallelism, first mention and recency of mention. Further, studies normally do not consider stressed pronouns (but see de Lange 2003, Solan 1983, Zuckermann et al 2002). In Spanish, the only relevant experimental studies we have found that compare the acquisition of Spanish (stressed) OSP and (unstressed) NSP in monolingual speakers are Bauuw et al (2004) and Shin and Smith (2009). The former is a comprehension experiment that falls under the *Parallelism* hypothesis, while the latter is concerned with production and is presented as an instance of the *Topic* Hypothesis. To our knowledge, there are no studies concerning the *Strong Complementarity* hypothesis.

Bauuw et al (2004) use a picture selection task to test children's (aged 5) comprehension of parallel sentences like (13):

(13) Primero la   mujer   besó   a la   niña y   luego…
     First   the woman kissed ₐ *the girl and then…*
     'First the woman kissed the girl and then…'

   a.   besó   al   niño
        NSP kissed ₐ*the boy*
        'She kissed the boy'

   b. Ella besó   al   niño
        SHE kissed ₐ*the boy*
        'SHE kissed the boy'

Children interpreted NSP as referring to the previous subject 72% of the time; in turn, they interpreted OSP as referring to the object only 43% of the time. Taking the *Parallelism* hypothesis for granted (their control group has only five participants), the authors try to explain why children deviate from the adult pattern. Children around the age of five, they say, have knowledge about NSP parallel preferences and OSP anti-parallel preferences, but are often not able to apply this knowledge because of difficulties in retaining the syntactic structure of the sentences. According to the authors, the reason why children perform better in the NSP condition is that, whenever they are unable to retain the syntactic structure of the antecedent sentence, they resort to the alternative strategy of selecting the topic of the previous sentence, which happens to be the subject (note that there use of 'topic' allows discourse initial sentences to have a topic). To select the topic –they argue- children don't need to make use of syntactic information. So the strategy is easier to apply. As a result, it improves children's performance in the NSP condition, while diminishing it in the OSP condition. An evaluation of this position is left for the discussion sections of Experiments 2 and 3. Our results will show the importance of testing a significant amount of adults before explaining children's performance in relation to it (given that the hypothesis proposes that OSP cancels the preference for parallel antecedents, the percentage of NSP assignments to the previous subject are supposed to be similar to the percentage of OSP assignments to the object, something that our experiments will put into question). But even imagining that the *Parallelism* hypothesis were right for adults, we can point out that the results obtained by Baauw et al. (2004) could be explained without the need of positing alternative strategies. It would be simpler to propose that children still haven't acquired the relevant knowledge concerning OSP; that is, that they know that NSP refers to parallel, but not that OSP refers to non-parallel antecedents.

The study of Shin and Smith (2009) is presented in terms of continuity or switch of reference, something that makes it fall under the *Topic* hypothesis. Howev-

er, the stimuli used make it impossible to conclude whether their evidence supports this hypothesis or the *Parallelism* hypothesis.

In the experiment, children of different ages see a representation of a story with dolls. Then, they have to select which of two discourses describes better what they have seen: one has a NSP and the other an OSP. All represented stories have two dolls of different gender, so that the corresponding discourses with OSP uniquely refer to one of them. In some representations, the same doll performs two subsequent similar actions (Continue condition). In others, each doll performs a single action (Shift condition). (14) is an example of the two options given in the discourses that follow the representations:

(14) María y   José cantan canciones. María canta una ranchera.   Luego…
    Maria and José sing   songs.   Maria sings a   ranchera. Later…

   a.   canta la de Pimpón.
     NSP sings the of   Pimpón
     'She sings the ones of Pimpón'.

   b. ella canta la de Pimpón   (Continue condition)
     SHE sings the of   Pimpón.
     'SHE sings the ones of Pimpón'

    b'. él canta la de Pimpón   (Shif condition)
     HE sings the of   Pimpón.
     'HE sings the ones of Pimpón'

The younger children of this study were seven years old. They selected the option with an OSP for the continue condition 41% of the time and for the shift condition 51% of the time. The difference was not significant. Though the use of dolls with different gender introduces a factor that is beyond our concern, what is relevant for us is that this group of children selected NSP quite often in the shift condition, an

option that would lead an adult hearer to assign an unintended referent. So the group's performance is in line with the results of Karmiloff-Smith's (1985) production experiments for English and with those of Wubs et al (2009) for Dutch.

In contrast to young children, older children (9, 11 and 13 years-old) and adults gave different answers in each condition: the OSP was favored in the shift case, while the NSP was preferred in the continue. The preference for OSP in the former case is not surprising, since gender guarantees a correct identification of the referent, while NSP conduces to an unintended interpretation. However, since in the experiment the OSP is the only option they have to the NSP, we cannot simply conclude that it is a good option. All we can say is that OSP is better than NSP in the shift case. But maybe a full NP would be preferred if participants could describe the representations spontaneously. Our experiments will throw some light on this, but – since we will only consider characters of the same gender- more work is required to clear up this point. Further, we will be careful to use material that tears apart the predictions of the *Topic* hypothesis from those of the *Parallelism* hypothesis.

2.3.2 Child language and complementarity

As explained above, in our experiments we consider different kinds of discourses designed to test three different hypotheses within the *CAP* view (*Strong Complementarity, Parallelism* and *Topic).* These hypotheses, however, only make direct predictions for adult language. To provide predictions for children, we consider the relevant results from the experiments from Baauw et al (2004) and from Shin and Smith (2009) and project them as a possible outcome of our own experiments. So, when testing each of the three hypotheses for adults, we will assume that children can be expected to deviate from the predicted adult pattern in the way that is suggested by the two experiments quoted. In the case of comprehension, the results from Baauw et al. suggest that children know how to interpret NSP but not OSP. In the case of production, the results from Shin and Smith suggest that children produce NSP not only where ap-

propriate, but also where OSP is supposed to be a better option. So, under the assumption that in each case the hypothesis under discussion is correct for adults, we should expect that, in the comprehension experiments, (a) children preferably interpret NSP as expected for adults and (b) show no clear preference in interpreting OSP. In turn, in the production experiments, we should expect children to overproduce NSP, that is, to produce them in the cases that adults also do and, in addition, to produce them in cases where adults would prefer an OSP or a full NP. The detailed predictions for each experiment are given in the next section.

2.4 THE EXPERIMENTS

In the previous two sections, we have given general predictions both for adults and children. Below, we present a brief description of each of the experiments to be reported in the next chapter, together with the specific predictions. After that, the predictions are summarized in a table. The idea is just to give an impression about the whole set of experiments to be presented in chapters 3 and 4. The details are left for the corresponding sections of these chapters.

It is important to remark that the predictions take the hypotheses in isolation from other preferences that could be active. For example, when an adult hearer is confronted with a pair of non-parallel sentences, the *Parallelism Cancellation* hypothesis predicts no preference, even in cases where –at least for NSP– it seems obvious that there is one. The idea is to first evaluate the hypotheses in their strict sense, and then look whether they can plausibly interact with other preferences (or whether it is better to abandon them altogether).

2.4.1 Comprehension Experiments

Experiment 1

The first comprehension experiment is concerned with the *Strong Complementarity* hypothesis. It evaluates the comprehension of two sentence non-parallel discourses. The second sentence has a NSP or an OSP with two possible antecedents. Participants have to answer a question about the referent of this pronoun. An example is (15):

(15) a. La mamá saluda a la tía.   Está alegre
    the mother greets _A *the aunt. NSP is   happy*
    'The mother greets the aunt. She is happy'.

  b. La mamá saluda a la tía. **Ella** está alegre
    the mother greets _A *the aunt. SHE is   happy*
    'The mother greets the aunt. SHE is happy'.

  Q: ¿Quién está alegre?
    'Who is happy?'

Adults are expected to interpret NSP as referring to the previous subject and OSP as referring to the previous object. Children (around the age of five), in turn, are also expected to interpret NSP as referring to the previous subject, but their interpretation of OSP is not expected to favor a particular interpretation.

Experiment 2

The second experiment is concerned with the *Parallelism* hypothesis. The discourses used consist of two parallel sentences. The second sentence has either a NSP or a OSP. Again, two antecedents are available:

(16)　Primero la tía　le　　　entrega un vaso a　　la mamá
　　　*first　　the aunt her-*CLIT *gives　a　glass to　　the mother.*
　　　'First María gives a glass to the mother'

　a. Después　　　　le　　　entrega un plato al　　papá.
　　 *then　　NSP　her-*CLIT *gives　a　plate to the father.*
　　 'Then she gives a plate to the father'

　b. Después ella　　le　　　entrega un plato al　　papá
　　 *then　　SHE　her-*CLIT *gives　a　plate to the father*
　　 'Then SHE gives a plate to the father'

　Q.: Who gives a plate to Manuel?

The predictions are that adults will interpret the NSP as referring to the previous subject (given the NSP parallel preference) and OSP as referring to the previous object (given the OSP anti-parallel preference). In the case of children, they are expected to interpret the NSP as referring to the previous subject and the OSP at chance level (like in the previous experiment).

Experiment 3

This experiment is also concerned with the *Parallelism* hypothesis. It compares the interpretation of OSP in parallel discourses with the interpretation of it in non-parallel discourses:

(17)　Primero la tía　le　　　trae　　un sándwhich a　la　　mama.
　　　*first　　the aunt her-*CLIT *brings a　sandwich　to　the　mother*
　　　'First the aunt brings a sandwich to the mother'

　a. Después　ella le　　　trae　　un café　al　　tío.
　　 *then　　she her-*CLIT *brings　a　coffee to the uncle*
　　 'Then SHE brings a coffee to the uncle'

　b. Después　ella prepara café.
　　 Then　　SHE makes　coffee.
　　 'Then SHE makes coffee'

Q: ¿Quién prepara café?
  Who makes coffee?

Following the *Parallelism* hypothesis, the prediction is that adults will interpret the OSP in parallel discourses as referring to the previous object (that is, in favor of the non-parallel antecedent). In non-parallel discourses, no determinate preference is predicted. As in the previous two experiments, children are expected to interpret OSP at chance level, irrespective of the presence or absence of parallelism.

Experiment 4

Experiment 4 is concerned with the *Topic* hypothesis. It compares the interpretation of NSP and OSP in short four-sentence stories where the pronouns can select either a topic or a non-topic antecedent.

(18) a. Un cocinero está limpiando un restorán
        A cook is cleaning a restaurant
        'A cook is cleaning a restaurant'

   b.   Llama a un mozo
        NSP *calls* ₐ *a waiter*
        'He calls a waiter'

   c. El cocinero lava los platos con el mozo
        The cook washes the dishes with the waiter
        'The cook washes the dishes with the waiter'

   d.   Está aburrido de trabajar
        NSP is bored of working
        'He is bored of working'

   d.' Él está aburrido de trabajar
        OSP is bored of working
        'HE is bored of working'

> Q: ¿Quién está aburrido de trabajar?
>   'Who is bored of working?'

The predictions say that adults will interpret the final NSP as referring to the previous topic (and subject), so that the topic is continued in the last sentence. Further, they are expected to interpret the OSP as referring to a non-topic antecedent, so that a topic-shift takes place at the end. Children, in turn, are expected to have the same preference than adults in the case of NSP and to show no clear preference for OSP.

Experiment 5

Experiment 5 is the last comprehension experiment. It is also concerned with the *Topic* hypothesis. It evaluates the comprehension of NSP in two kinds of four-sentence short stories. In one of them, the antecedent topic (the baker in sentence c) has been the continued topic throughout the discourse. In the other, the antecedent topic (the firefighter in sentence c') is a new, shifted topic:[16]

(19) a. Un   bombero   necesita   ayuda   para pintar una casa.
      a   firefighter-MASC   *needs   help   to   paint   a   house*
      'A firefighter needs help to paint a house'

   b.   Va   a   buscar a   su amigo el   panadero
      NSP goes to look   for his friend the baker-MASC
      'He goes to look for his friend the baker'

   c. El bombero   pinta la casa junto   con el   panadero.
      the firefighter paints the house together with the baker

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[16] Our use of 'topic' is discourse-based. We adopt the view that only discourse entities qualify as topics. In discourses like (19), we assume that the position of the entities is what determines the topic of the third sentence, considering that both entities are realized as full NP and have been already introduced in the discourse (if one of the entities were realized as pronoun and the other as full NP, it could be argued that the topic is the one that is realized as pronoun, irrespective of its position). For the moment, we leave open whether position is to be understood in terms of grammatical role or of order of mention.

'The firefighter paints the house with the baker'

c'. El panadero pinta la casa junto con el bombero.
   the baker   paints the house together with the firefighter
   'The baker paints the house together with the firefighter'

d.   Encuentra que la casa quedó   muy bonita.
   NSP finds   that the house turned out very nice.
   'He finds that the house turned out very nice'

Both adults and children are expected to select the antecedent topic (the previous subject) in the two kinds of stories.

2.4.2 Production Experiments

Experiment 6

Experiment 6 is concerned with the *Parallelism* hypothesis.[17] Through the use of video material, discourses with two parallel sentences describing two similar actions are elicited. In some cases, the discourses describe actions performed by the same agent. In the others, the discourses elicited describe actions performed by two different agents. Following the *Parallelism* hypothesis, the prediction is that adults will use NSP to refer to antecedents in the parallel (subject) position and OSP to refer to antecedents in a non-parallel (object) position. In the case of children, the prediction is that they will use NSP in both conditions.

b. Experiment 7

This experiment is designed to test the *Topic* hypothesis. As they watch a series of storybooks, participants produce discourses where the topic is continued or shifted

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[17] As announced above, the *Strong Complementarity* hypothesis is not tested in production, for it is very difficult to elicitate discourses similar to the ones used in Experiment 1.

throughout the story. The prediction is that adults will use NSP to refer to a character that was the topic in the antecedent sentence (that is, to refer to a topic that is continued in the target sentence), while preferring an OSP to refer to a character that was not the topic in the antecedent sentence (that is, to an entity that becomes the new topic in the target sentence, instantiating a topic-shift). Children, in turn, are expected to choose a NSP not only when the topic is continued but also when it is shifted.

Since children's performance has been related by Bauuw et al (2004) to limited processing resources, all experiments also include a memory test to look for correlations between memory scores and children's performance. Further, experiments 5 and 7 also include the participation of elderly adults, who also have such limitations, so that we can compare results and discuss whether lack of knowledge or just processing limitations are at stake. Table 2.3 below summarizes the predictions made for each experiment.

COMPREHENSION	ADULTS	CHILDREN
Exp.1: two sentence non-parallel discourses with NSP or OSP	NSP: subject preference OSP: object preference	NSP: subject preference OSP: no clear preference
Exp. 2: two sentence parallel discourses with NSP or OSP	NSP: subject preference OSP: object preference	NSP: subject preference OSP: no clear preference
Exp. 3: two sentence parallel and not parallel discourses with OSP only	OSP: object preference in parallel discourses and no clear preference in non-parallel discourses	OSP: no clear preference
Exp. 4: four sentence discourses with continued topic and NSP or OSP	NSP: subject (topic) preference OSP: object (non-topic) preference	NSP: subject (topic) preference OSP: no clear preference
Exp.5: four sentence discourses with continued and shifted topic as antecedent	NSP: subject (topic) preference (both when the antecedent is a continued and when it is a shifted topic)	NSP: subject (topic) preference (both when the antecedent is a continued and when it is a shifted topic)

PRODUCTION	ADULTS	CHILDREN
Exp. 6: elicitation of parallel discourses describing two similar actions performed by the same or two different agents	NSP to refer to antecedent in subject position OSP to refer to an antecedent in object position	NSP to refer to antecedents in subject or object position
Exp. 7: elicitation of short stories with and without topic shift	NSP to refer to a topic antecedent OSP to refer to a non-topic antecedent	NSP to refer to topic and non-topic antecedents

Table 2.3: Predictions for Experiments

2.5 SUMMARY

In this chapter, we have sketched the Spanish system of subject personal pronouns and presented different uses of these forms. Then, we have delimited the scope of this work to the study of null and overt subject pronouns (OSP and NSP) in inter-sentential anaphora. After that, we have presented a general view about the contrast between the two forms. This view –which we call *CAP* (for *Complementary Anaphoric Preferences*) – proposes that NSP and OSP are used to refer to different antecedents. We have then identified three possible ways of spelling out the *CAP* approach: the *Strong Complementarity* hypothesis, the *Parallelism* hypothesis and the *Topic* hypothesis. Each hypothesis makes predictions about adults' comprehension and production of NSP and OSP, to be tested in a series of experiments. On the basis of existing evidence, we have also provided predictions about children's performance within the frame of the *CAP* view. Finally, we have advanced the content of the experiments to be presented in chapters 3 and 4.

3 COMPREHENSION EXPERIMENTS

In this chapter, we report and discuss five different experiments testing adult and children comprehension of null (NSP) and overt (OSP) subject pronouns. The chapter is divided on the basis of the three hypotheses about the distribution of NSP and OSP presented in the last chapter: section 3.1 tackles the *Strong Complementarity* hypothesis (Experiment 1), section 3.2 tackles the *Parallelism* hypothesis (Experiments 2 and 3) and section 3.3 the *Topic* hypothesis (Experiments 4 and 5). The first of the hypotheses predicts anaphoric complementarity between both forms across the board, while the second and third restrict it to more specific environments: the presence of structural parallelism or of a previously established topic as antecedent.

3.1 THE STRONG COMPLEMENTARITY HYPOTHESIS

3.1.1 Introduction

In chapter 2, we used the label *CAP* (*Complementary Anaphoric Preferences*) to group those approaches defending the idea that in adult language stressed and un-stressed pronouns are in complementary distribution with respect to their anaphoric preferences. The *Strong Complementarity* hypothesis is the most general way of conceiving *CAP*. According to it, wherever both forms may legitimately alternate and more than one possible antecedent is present, if one form prefers a determinate antecedent, the other form will prefer a different one. The standard accounts present in the literature propose first an explanation of how unstressed pronouns select their referents, and then derive from it the preference of the stressed counterparts (cf. Kameyama 1999, Beaver 2004). Taking OSP and NSP to be instances of the stress-unstressed opposition, different versions of the *Strong Complementarity* hypothesis have been extended to null subject languages (see e.g. Carminati 2002 for Italian and Alonso-Ovalle, Clifton, Frazier, and Fernández Solera 2002 for Spanish).

One way of testing this hypothesis is to generate discourses where two alternative antecedents are present, but none of the readings seems to be semantically or pragmatically biased over the other:

(1). a. Alfredo habla con Arturo.　　Está triste.
　　　　Alfredo talks with Arturo. NSP is sad.
　　　　'Alfredo talks to Arturo. He is sad'.

　　b. Alfredo habla con Arturo. Él está triste.
　　　　*Alfredo talks with Arturo **HE** is sad.*
　　　　'Alfredo talks to Arturo. **HE** is sad'.

In (1), there is no obvious connection between the event of the first sentence and the state of the second (for example, one that could be unequivocally established in terms of rhetorical relations). Further, world knowledge doesn't provide any help and there is no contextual information that could favor one antecedent over the other. Moreover, the discourses avoid other factors that have said to influence interpretation: these include the use of structurally parallel sentences (Smyth 1994), differences in the form of the antecedents (Kameyama 1999, Beaver 2004), and the use of a verb exhibiting the feature of implicit causality (Caramazza, Grober, Garvey and Yates 1977).

The *Strong Complementarity* hypothesis predicts that the interpretation of the OSP in (1b) will be complementary to the one of the NSP. Assuming that the NSP will refer to the previous subject (and first mentioned entity) Alfredo, the OSP should refer to the object Arturo.[18]

Discourses like (1) are also useful to test the predictions for children. Let's begin with NSP. Based on the results from Baauw et al (2004), we have just assumed for the moment that, at the age of five, children have the relevant knowledge about the anaphoric preference of NSP (in this case, the pretended knowledge that NSP prefers a subject antecedent. In the case of OSP, we assume that children haven't learned yet that OSP refers to the object. So they are expected to guess.

Since children's performance have been said to be related to processing limitations, the following experiment also incorporates a memory test to see if there are correlations between children's performance and their memory scores.

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[18] The discourses used in this experiment do not isolate the assumed preference of NSP for subject antecedents from topic or first mention antecedents. The distinction between them is considered in section 3.3 and in the general discussion (chapter 5).

3.1.2 Experiment 1

Method

Participants

The participants of this experiment were 24 children around the age of five (ages ranged between 4;5 and 5;6, with a mean of 4;11) and 24 young adults (range 24;10-35;5, mean 30;1). All children were normally developing monolingual speakers of Spanish and attended Kindergarten classes at a private school in the city of La Serena, Chile. Adults were either university students or young professionals. They were recruited individually and received no payment for their participation.

Material

(a) Comprehension Discourses: The material consisted of pre-recorded stories that were heard by participants. Twelve two-sentence discourses were constructed. In the first sentence, two characters of the same gender are introduced using full nominal phrases, one of them in subject and the other one in object position. The second sentence begins either with a NSP or with an OSP. Both full NP in the first sentence are possible antecedents for the pronouns. A question about the referent of pronoun in the second sentence follows each discourse:

(2) a. La   mamá   saluda   a la   tía.   Está alegre
    the   mother   greets   ₐ the   aunt. NSP   is   happy
    'The mother greets the aunt. She is happy'.

   b. La mamá saluda a la   tía.   **Ella** está alegre
    the mother greets ₐ the aunt. SHE is   happy

'The mother greets the aunt. SHE is happy'.

Q: ¿Quién está alegre?
  'Who is happy?'

Two counterbalanced forms including all twelve discourses were constructed. In each, six of the items contained a NSP and six contained an OSP. The discourses were combined with twelve filler items. Then a single block randomization was made. Reversion of the forms to rule out ordering effects lead to a total of four forms. These were incorporated into a *PowerPoint* presentation that included two practice items and partial instructions to be read aloud by the experimenter.[19]

(b) Memory Test: The memory test consisted of the auditory sequential memory sub-test of the Illinois Test of Psycholinguistic Ability (ITPA). This sub-test consists on the verbal repetition of 28 series of digits, which increase gradually from two to eight elements.

Procedure

Sessions took place individually in a quiet room and lasted around twenty minutes. In the case of children, two experimenters were present. For the adult group, there was only one. At the beginning of the session, one of the experimenters explained the tasks to the participant. Then, the participant was invited to sit in front of the computer screen with the experimenter at her side. This experimenter used a mouse attached

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[19] Filler items had either an OSP that unambiguously identified one of two possible antecedents (a) or an NSP that was biased towards the subject (b):
  a. La mamá le regala una chaqueta al papá. Él está sorprendido.
    'The mother gave a jacket to the father. HE (OSP) is surprised'
  b. La tía toma desayuno con el tío. Después va a trabajar.
    'The aunt has breakfast with the uncle. Then she (NSP) goes to work'

to the computer to show the slides. Speakers were installed to assure a good sound quality. The second experimenter sat further away, in front of another computer, where she wrote the participants' answers. The presentations began with two practice items, during which participants were allowed to make questions. Then no more questions were accepted and the experiment began. After twelve stories, a pause was made and the memory task was administrated. Then the remaining stories were presented. To maintain motivation, children were told both at the beginning and during the pause that they were going to receive colorful stickers for their participation. These were only given at the end to avoid distraction during the experiment.

Results

(a) Comprehension stories: Repeated measures ANOVA were performed to the response proportions per participant (F1) and per item (F2). Three factors were considered: Response type (Subject, Object and Other assignments), Type of Pronoun (NSP, OSP) and Age Group (Children, Young Adults). An arcsine transformation was used for the proportions. The analyses showed a main effect of Type of answer ($F1(2,92)=77.783$, $F2(2,20)=130.002$, both $p<.001$), as well as a two-way interactions between Type of Answer and Age Group ($F1(2,92)=20.338$, $F2(2,20)=165.371$, both p-values $<.001$) and between Type of pronoun and Type of answer ($F1(2,92)=17.431$, $F2(2,20)=32.796$, $p<.001$). However, these effects were qualified by a three-way interaction between all three factors ($F1(2,92)=24.907$, $F2(2,20)=84.332$, both $p<.001$).

	Children		Adults	
	NSP	*OSP*	*NSP*	*OSP*
Subject	36,1	38,9	88,9	47,9
Object	54,2	47,2	11,1	52,1
Other	9,7	13,9	0	0

*Table 3.1 Results of experiment 1
(expressed in percentages)*

Follow up analyses showed that, for adults, there was a significant interaction between Type of Pronoun and Type of Answer (F1(2,46)=31.041, F2(2,20)=64.993, both p<.001): adults preferred to interpreted NSP as referring to the subject of the first sentence (88,9%; SE 3%) over the object (10,1%; SE 3%) (both p values <.001), while their interpretation of OSP as referring to the object (52,1%; SE 7%) was not significantly different from assignments to the subject (48,9%; SE 7%) (both p values >.5).[20]

For children, there was a main effect of type of answer (F1(2,46)=25.043, F2(2,20)=38.402, both p values<.001), but no significant interaction between Type of Pronoun and Type of answer (F1(2,46)=174.877 p=.45, F2(2,20)=.385). Both in the NSP and in the OSP conditions, they showed a higher preference for objects (overall 50,7%; SE 3%) than for subject (37,5%; SE 3%,). This difference was significant in the analysis by participants and near to significant in the analysis by items (p1<.05, p2=.063).

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[20] Overall, the results obtained for adults are very close to those of Alonso-Ovalle et al (2002) for Castillian Spanish, who used similar stimuli. Further evidence supporting these findings is presented in the Appendix 1, where the results of a preliminary study (Questionnaire 1) are reported. Using discourses very much like the ones of the current experiment, interpretations of the pronouns as referring to the previous subject reached 81,3%, in the case of NSP and 43,4% in the case of OSP.
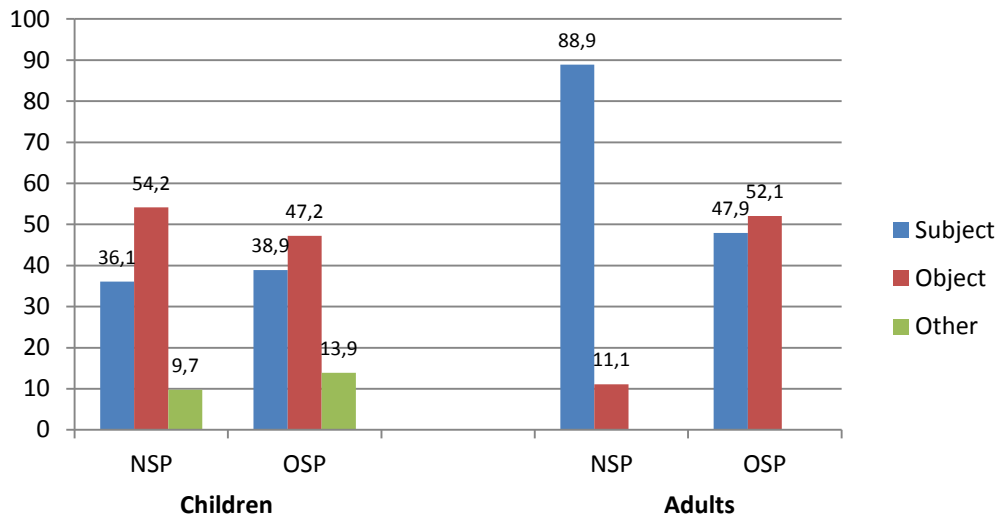
Fig. 3.1 Experiment 1: Interpretation of NSP and OSP in two-sentence discourses

b) Memory test and correlations: The results obtained in the Memory Test by children (mean=5.7917, SD=1.47381) and adults (mean=23.3750, SD=1.81330) differed significantly (T(46)=-36.864, p<.001). Within each group, there were no significant correlations between memory scores and age (children (r=.263, p>.1); adults (r=-.086, p>.5). Nor we found correlations between memory and the results of the experiment (analyzed on the basis of Subject assignments) in any of the two conditions (NSP condition: children, r=-.033, p>.5, adults, r=-.008,p>.5; OSP condition: children, r=-.263, p>.1, adults, r=.211,p>.1), or between age and results (NSP condition: children, r=.013, p>.5, adults, r=-.132, p>.5; OSP condition: children, r=.207, p>.1, adults, r=-.150, p>.1)

Discussion

In the case of adults, the *Strong Complementarity* hypothesis predicted NSP and OSP to have complementary preferences. The results obtained provide strong evidence against this hypothesis: while NSP clearly preferred the subject antecedent, OSP

showed no clear preference. In the case of children, the prediction was that NSP were going to show a preference for subject antecedents and OSP were going to show no clear preference. Again, the results go against predictions. Children tended to inter- preted both NSP and OSP as referring to the previous object.

Let us begin with adults' interpretation of NSP. Even in absence of semantic and pragmatic biases, NSP show a strong subject preference. This preference is wide- ly attested in the literature (see e.g. Taboada 2008)[21] and will be considered in later sections as a possible mechanism of NSP resolution. Turning to OSP, the fact that no preference arose clearly counts as evidence against the *Strong Complementarity* hy- pothesis. This result doesn't mean that the *CAP* view is wrong. What it signals is the necessity to specify the conditions under which complementary may obtain. While the OSP seems to be inappropriate in the discourses used in this experiment, it may be felicitous in discourses with parallel sentences or with a clearly established topic.

We go on now to discuss the case of children. Again, the results do not sup- port the predictions. Children tended to interpret NSP as referring to the previous ob- ject (and not to the subject, as the prediction said). The results suggest that children haven't learned or cannot apply the preference of NSP. The former is consistent with the memory tests: in it, children that selected object antecedents for NSP didn't get lower scores than those who -like adults- preferred subjects.

Despite possible lack of knowledge, children did not simply guess. Instead, it looks like they often used an alternative strategy. One possibility is that they opted for interpreting the pronouns as referring to the most recently named entity. So a *re- cency* preference might be at stake. At first sight, choosing the last element seems to be the less demanding available strategy. In the case of OSP, saying that children do

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[21] Kehler (2008) points out that subject preference could just be a bias that emerges from general me- chanisms involved in the establishment of rhetorical (coherence) relations, so there would be no need to posit a separate heuristic. In chapter 5 we concede the fact that, more often than not, coherence dis- course relations tend to favor this preference over the alternative. However, the discourses we have considered in the experiment are –as far as we can see- ambiguous with respect to the rhetorical rela- tion involved and, still, the preference shows to be very strong.

not know the preference of OSP doesn't make much sense, given that adults gave responses at chance level. Like in the case of NSP, the *recency* strategy could have determined the mild preference for objects. We will return to this point when discussing the results of the other experiments and in chapter 5.

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3.2. THE PARALLELISM HYPOTHESIS

3.2.1. Introduction

The role of parallelism often appears in the literature as a strong preference bias for pronouns in adult language (Smyth 1994, Wolf, Gibson and Desmet 2004). According to these authors, in parallel pairs of sentences, subject pronouns prefer subject antecedents and object pronouns prefer object antecedents. Unstressed pronouns, like NSP, have been said to follow parallelism. Stressed pronouns, like OSP, have been said to cancel it (Akmajian, and Jackendoff 1970 for English, Baauw et al. 2004 for Spanish). We have called this hypothesis the *Parallelism* hypothesis. Experiment 2 and 3 test different predictions of this hypothesis.

3.2.2 Experiment 2

The *Parallelism* hypothesis predicts that, in parallel sentences, adults will resolve NSP to the subject antecedent, following parallelism. Further, it predicts that they will resolve OSP to a lower antecedent, cancelling parallelism.

Consider the following two-sentence discourse:

(3)   Primero María le   entrega un vaso a Francisca
        first   *María* *her*-CLIT *gives*   *a*   *glass* *to* *Francisca*
        'First María gives a glass to Francisca'

    a. Después   le   entrega un plato a Manuel
       then   *NSP*   *her*-CLIT *gives*   *a*   *plate* *to* *Manuel*

'Then she gives a plate to Manuel'

b. Después ella le entrega un plato a Manuel
  *then she her-*CLIT *gives a plate to Manuel*
  'Then SHE gives a plate to Manuel'

Here, we have complete syntactic parallelism. Further, the verb is the same in both sentences. The *Parallelism* hypothesis predicts that, in (3), the NSP will refer to María and the OSP will refer to Francisca. Both preferences are supposed to be similarly strong.

In the case of children, we assume that they have knowledge about the parallel preference of NSP, but not about the anti-parallel preference of OSP. So they are expected to show the same preference as adults in the first case and to guess in the second.

Method

Participants

Fifty-six children participated in this experiment. Twenty-nine of them were girls and twenty-seven were boys. Their ages ranged between 5;3 and 6;5 (mean: 5;9). All of them were normally developing speakers and attended classes at a private school in Santiago de Chile. A group of 16 adults (6 female and 10 male) also took part in the experiment. Their ages ranged between 28;8 and 35;0 (mean: 33;6). They were all young professionals with a university degree.

Material

(a) Comprehension stories: The material consisted of 12 pre-recorded 2-sentence stories. In the first sentence, two characters of the same gender are introduced with a name. The second sentence is syntactically parallel to the first one. It has a either a

NSP or an OSP and has the same verb used in the first sentence. Then, a third charac-
ter of a different gender is introduced in (indirect) object position. A question about
the referent of the last sentence subject follows each discourse:

(4)   Primero la mamá le   pasa un pincel   a la niña
      *first   the mother her-*CLIT* gives a paintbrush to the girl*
      'First the mother gives a paintbrush to the girl'.

   (a) Después   le   pasa una caja al   papa
        *then   NSP him-*CLIT* gives a   box to the father*
        'Then she gives a box to the father'

   (b) Después ella le   pasa una caja al   papa
        *then   she him-*CLIT* gives a   box to the father*
        'Then SHE gives a box to the father'

   Q: ¿Quién le pasa una caja al papá?
       Who gives a box to the father?

Two counterbalanced sets of the recorded stories were constructed. In each,
half of the items corresponds to discourses with NSP and half to discourses with
OSP. The discourses were mixed with twelve filler items and a single block randomi-
zation of the two forms was made.[22] Reversing the order of the items to avoid order-
ing effects, two more forms were obtained. The four resulting forms were presented
as part of a *PowerPoint* presentation that included two practice items and partial in-
structions to be read aloud by the experimenter.

(b) Memory test: Like in experiment 1, the memory task was the auditory sequential
memory sub-test of the Illinois Test of Psycholinguistic Ability (ITPA).

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[22] The filler items were either discourses with two parallel sentences and an OSP disambiguated by
gender (a) or with non-parallel sentence and a NSP biased towards a subject interpretation (b):
(a) Primero el tío abraza a la mamá. Después ella abraza al papá
    'First the uncle hugs the mother. Then SHE hugs the father'
(b) Primero el papá se despide de la mamá. Después va a comprar al supermercado.
    'First the father says goodbye to the mother. Then he (NSP) goes shopping to the supermarket'.

Procedure

The procedure followed was the same of Experiment 1.

Results

(a) Comprehension Stories: Repeated measures ANOVA were performed on the basis of response proportions per participant (F1) and per item (F2). The factors considered were Type of Answer (Subject, Object and Other assignments), Type of Pronoun (NSP, OSP) and Age Group (Children, Young Adults). The analyses showed a main effect of Type of answer (F1(2,140)=165.581, F2(2,20)=402.267), both p<.001), and a two-way interaction between Type of Answer and Age Group (F1(2,140)=24.007, F2(2,20)=84.496, both p-values<.001) and between Type of answer and Type of pronoun (F1(2,140)=99.215, F2(2,20)=138.052, both p <.001). These effects were qualified by a three-way interaction between all three factors (F1(2,140)=40.715, F2(2,20)=67.242, both p<.001) .

	Children		Adults	
	NSP	*OSP*	*NSP*	*OSP*
Subject	53,3	39,3	99,0	45,6
Object	40,5	57,1	1,0	58,3
Other	6,3	3,6	0	0

Table 3.2 Results of experiment 2
(in percentages)

Follow up analysis showed that, in the case of adults, there was a significant interaction between Type of pronoun and Type of answer (F1(2,30)=55.387, F2(2,20) =206.791, both p-values<.001). Adults interpreted NSP almost exclusively as referring to the subject (99%, SE 1%), while the preference for interpreting OSP as refer-

ring to the previous object (58,3%; SE 6%), was not significantly different from the preference for the previous subject (41,7%; SE 6%)(both p-values>.05).

The analysis for children shows that there was a significant interaction between Type of Pronoun and Type of answer (F1(2,110)=17,880, p<.001, F2(2,20)=7.400, p<.005). They interpreted NSP more often as referring to the previous subject (53,3%; SE 3%) than as referring to the object (40,4% SE 3%) (p1<.05, p2=.17), or to other character (6,3%; SE 2%) (both p-values<.01) In the case of OSP, the pattern was different: children interpreted them more often as referring to the object (57,1%; SE 3%) than to the subject (39,3%; SE 3%) (p1<.05, p2=.059) or to other character (3,6%; SE 1%) (both p-values<.001), although the results were not in all cases significant in the analyses by items.
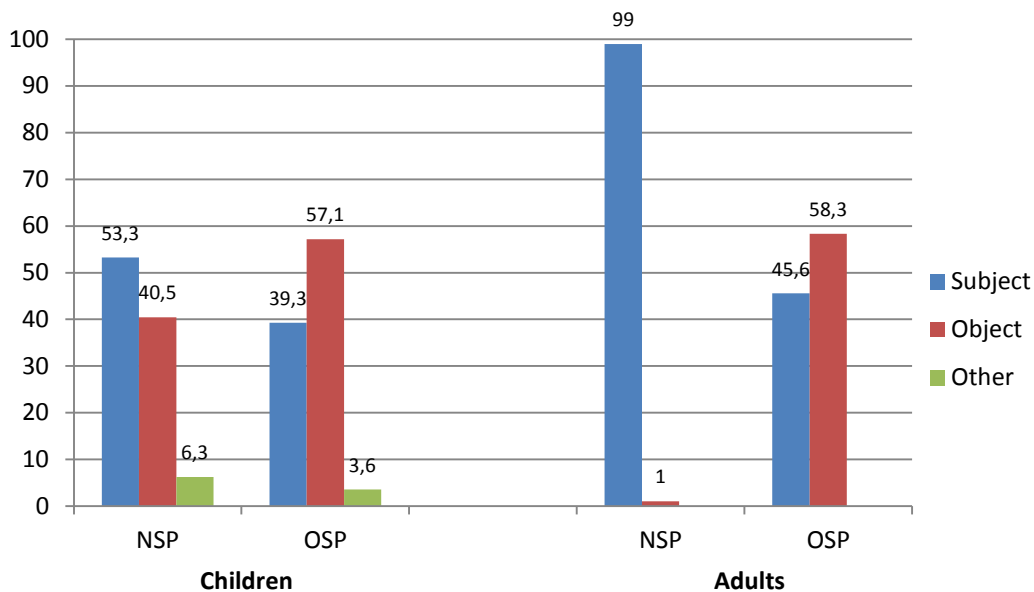
Figure 3.2 Experiment 2: Interpretation of NSP and OSP in parallel discourses

(b) Memory test and correlations: Like in Experiment 1, the results obtained in the Memory Test by children (mean=9.68, SD=3.070) and adults (mean=23.56, SD=1.315) differed significantly (T(70)=-17.567, p<.001). Within each group, there

were no significant correlations between memory scores and age (children (r=.124, p>.362); adults (r=.001, p>.5). Nor we found correlations between memory and the results of the experiment (analyzed on the basis of Subject assignments) in any of the two conditions (NSP condition: children, r=.053, p>.5, adults, r=.098,p>.719; OSP condition: children, r=.088, p>.5, adults, r=.261, p>.1), or between age and results (NSP condition: children, r=.064, p>.5, adults, r=-.262, p>.1; OSP condition: children, r=.088, p>.5, adults, r=.077, p>.5)

Discussion

In the case of adults, a preference of NSP for subject and a preference of OSP for object antecedents was predicted. Since the hypothesis states that OSP cancels parallelism, both preferences were expected to be similarly strong. The results don't support these predictions. While NSP shows an overwhelming preference for subjects, the preference of OSP for objects was not significantly different from the preference for subjects. Against the *Parallelism* hypothesis, OSP don't show the inverted preference of NSP. The result is surprising if we consider that, for example, Bauuw et al. (2004) takes parallelism cancellation for granted. However, the number of adult participants was too small to conclude that parallelism has no effect on OSP interpretation. Maybe there is an effect in interpretation, albeit not so strong as the one predicted by the current hypothesis. The next experiment will explore more on this topic.[23] In the general discussion (Chapter 5), we will provide a possible explanation for these results.

　　In the case of children, we predicted a preferred interpretation of NSP for subjects and no clear preference of OSP. The results are arguably in line with the former, but not with the latter prediction. In the case of NSP, we can see that the preference for the subject was much lower than the one of adults. However, if we consider that

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[23] See also Questionnaire 2, reported in the appendix.

in the previous experiment –where the discourses were not parallel– NSP preferred an object antecedent, we might hypothesize that the effect of parallelism in interpretation is relatively strong, or at least strong enough to beat the *recency* strategy that was observed in the other experiment. It can be that children are learning the effect of parallelism, and that this is currently in competition with the alternative *recency* strategy. This will be discussed in chapter 5, where we propose that this effect has more to do with rhetorical (coherence) relations than with the syntactic structure of the sentences.

A further point to note is that, like in the previous experiment, we found no correlations between low memory scores and attributions of NSP to the previous subject, so we have no evidence in favor of the idea that processing limitations are at stake.

Going to OSP, a *recency* preference might also explain the results. Here, we can defend the idea that children do not have relevant knowledge about the effect of using an OSP. Instead, they may resort to *recency*. Experiment 3 will show that similar performance of children and adults in interpreting OSP can have different causes: in the case of adults it can be explained in relation to parallelism and in the case of children in relation to *recency*. However, we need to be cautious about the effect of *recency*, considering that in the experiments from Baauw et al (2004) the object preference didn't show up in children. The differences in the results between the two experiments may be related to the method used (picture selection vs. question). The fact that in Bauuw et al's (2004) experiment children simply had to signal a picture without having to wait for a question may imply less processing load than in our experiments, disfavoring the preference for the last-mentioned antecedent (probably the less demanding strategy). Another difference between the experiments concerns the thematic roles of the object antecedents. In our experiment the object was a Goal and in the case of Bauuw et al. it was a Patient. This may have made the former more salient for Children. A further difference is the use of 'y' ('and') to connect the parallel sentences in Baauw et al., which might have favored more co-referential readings than the use of our stimulus (note that children's interpretation of NSP as referring to the

subject antecedent was also stronger than in our experiment). Finally, there is also the possibility that the differences in the results have to do with the varieties of Spanish under study (Asturian vs. Chilean), though we do not have evidence that supports this view.

3.2.3 *Experiment 3*

The *Parallel* hypothesis predicts complementarity of NSP and OSP in discourses with parallel pairs of sentences. This differentiates it from the *Strong Complementarity* hypothesis, which doesn't restrict complementarity to a given kind of discourse. According to the former, OSP are expected to be interpreted by adults as referring to the object if the sentence containing the OSP is structurally parallel to the antecedent sentence. If not, the hypothesis predicts no clear preference. The current experiment tests these predictions, comparing parallel and non-parallel discourses with OSP. In the case of children, we had assumed that they don't have knowledge about how to interpret OSP. The original prediction is that they should guess in both cases (though the precedent experiment puts this into question).

Method

Participants

The participants of this experiment were 32 children (16 girls and 16 boys) and 28 adults (11 female and 17 male). All children attended a private school in the region of Valparaíso, Chile, and were normally developing monolingual speakers of Spanish. Their ages ranged between 4;5 and 6;3, with a mean of 5;5. Adults, in turn, were all professionals with a university degree. They were recruited individually and received no payment for their participation. Like children, they were monolingual speakers of Spanish. Their ages ranged between 23; 2 and 35;4, with a mean of 30;4.

Material

(a) Comprehension Stories: Sixteen pre-recorded two-sentence stories were constructed. In the first sentence, two characters of the same gender are introduced with a name. The second sentence has an OSP and is either syntactically parallel or not parallel to the first one. When parallel, it has the same verb used in the first sentence and introduces a third character of a different gender in indirect object position. When non-parallel, it has a different verb and no indirect object. The discourse is followed by a question about the referent of the OSP in the last sentence:

(5) Primero la tía le   trae   un sándwhich a   la   mama.
     *first   the aunt her-*CLIT *brings a   sandwich to the   mother*
     'First the aunt brings a sandwich to the mother'

   a. Después   ella le   trae   un café   al   tío.
      *then   she her-*CLIT *brings a   coffee to the uncle*
      'Then SHE brings a coffee to the uncle'

   b. Después   ella prepara café.
      Then   she makes   coffee
      'The SHE makes coffee'

   Q: ¿Quién prepara café?
      Who makes coffee?

Two counterbalanced sets of the recorded stories were constructed. In each, half of the items corresponds to parallel and half to non-parallel discourses. The discourses were then mixed with other sixteen filler items and a single block randomization of the two forms was made. Reversing the order of the items to avoid ordering effects, two more forms were obtained. The four resulting forms were presented as part of a *PowerPoint* presentation that included two practice items and partial instructions to be read aloud by the experimenter. Each presentation was divided into two parts, to be applied in different days.

(b) Memory test: Like in the other experiments, the memory test was the auditory sequential memory sub-test of the Illinois Test of Psycholinguistic Ability (ITPA).

Procedure

The procedure used was the same of experiments 1 and 2. The only difference is that, in the case of children, this experiment was separated into two parts, applied in two consecutive days, since there were too many items to keep children concentrated the whole time. Each part took around fifteen minutes. The memory test was administrated at the end of the second part. In the case of adults, there was only one session.

Results

(a) Comprehension stories: In the analysis of the data, three factors were considered: Age (Children and Adults), Type of Story (Parallel and Non-Parallel) and Type of answer (Subject, Object, Other). Repeated measures ANOVA were applied to the response proportions (arcsine-transformed). We found a main effect of Type of answer ($F1(2,116)=71.131$, $F2(2,20)=381.134$, both $p<.001$) and a two-way interaction between Type of answer and Type of Story in the analysis per participants ($F1(2,116)=4.015$, $p <.05$, $F2(2,20)=.944$, $p>.1$).

	Children		Adults	
	Parallel	*Non-Parallell*	*Parallel*	*Non-Parallel*
Subject	34,4	35,9	37,5	48,2
Object	60,9	60,2	62,5	51,8
Other	4,7	3,9	0	0

Table 3.3 Results of experiment 3 (in %)

Follow up analysis showed that, in the case of adults, there was a main effect of type of answer (F1(2,54)=25.332, F2(2,20)=664.830, both p<.001) and a significant interaction between Type of Story and Type of Answer (F1(2,54)=4.720, F2(2,20)=3.970, p<.05). Parallel sentences were interpreted more often as referring to the object (62,5% ,SE 6%) than to the subject (37,5%, SE 7%). The difference between both preferences was near to significance in the analysis by participants (p1=.054) and significant in the analysis per items (p2<.05). In turn, in non-parallel sentences, the preference for object antecedents (51,8%; SE 6%) was not different from the preference for subjects (48,2%; SE 6%) (both p values>.5).

In the case of children, the analysis shows that there was a main effect of Type of Answer (F1(2,62)=57.970, F2(2,20)=113.497, both p<.001), but no interaction between Type of Story and Type of answer (F1(2;62)=.242, p=.78, F2(2,20)=.032, p=969). OSP were preferably interpreted as referring to the object both in parallel and in non-parallel discourses. Overall, the preference for object antecedents reached 60,5% (SE 4%) and was significantly different from the preference for subject antecedents (35,2%; SE 4%) (both p-values <.05) and from other responses (4,3%; SE 2%) (both p values<.01).
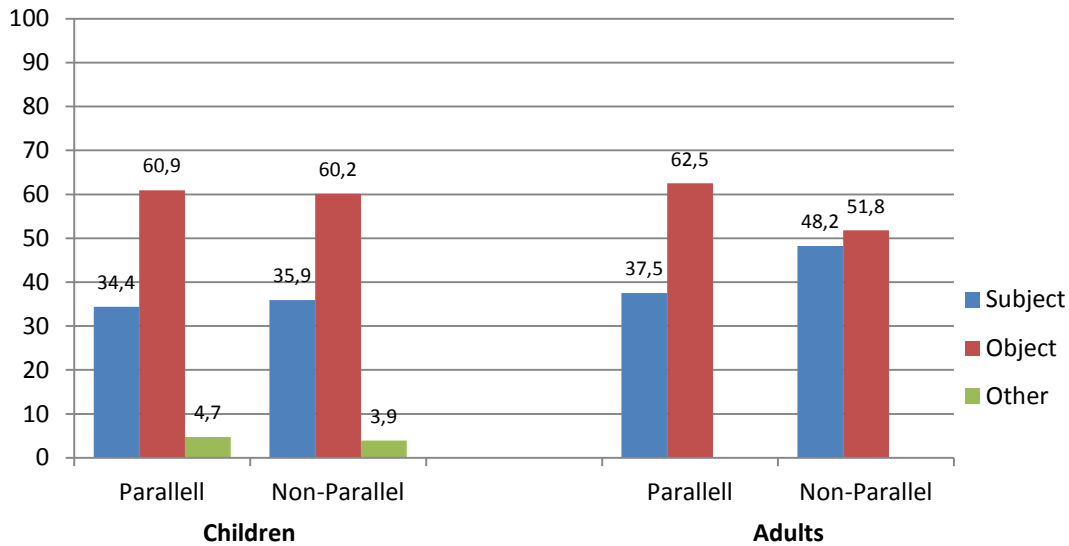
Fig 3.3. Experiment 3: Interpretation of OSP in parallel and non-parallel discourses

(b) Memory test and correlations: Children (mean=9.09, SD=3.041) and adults' (mean=23.32, SD=1.827) scores in the memory test differed significantly (T(70)=-23.086, p<.001). There was a close to significant correlation between memory scores and age in the case of children (r=.348, p=051), but not in adults (r=.113, p>.5). We didn't find correlations between memory and the results of the experiment in each group (analyzed on the basis of Subject assignments) in any of the two conditions (Parallel condition: children, r=-.118, p>.5, adults, r=.291,p>.1; Non-parallel condition: children, r=-.048, p>.5, adults, r=.163, p>.1), nor between age and results (Parallel condition: children, r=.075, p>.5, adults, r=-.025, p>.1; Non-parallel condition: children, r=-.270, p>.1, adults, r=.301, p>.1).

Discussion

The prediction of the *Parallelism* hypothesis for adults was that participants were going to prefer an object antecedent for OSP in parallel sentences, but not in the non-

parallel ones. The results appear to support these predictions: the interpretation of OSP in parallel sentences evidences a mild preference for objects, while in non-parallel discourses it was at chance level (the main problem for the *Parallelism* hypothesis has to do with the results of Experiment 2, which showed that the preference of NSP for subjects is much stronger than the preference of the OSP for objects). What the results tell us is that the presence of parallelism may have an effect in the interpretation of OSP. When the discourses are parallel, it seems that OSP tend to be interpreted in a certain way; when not, they appear to be ambiguous (in absence of semantic and pragmatic biases).[24] As announced above, in chapter 5 we will explain this within the frame of an approach based on rhetorical relations.

The prediction for children was that they were going to interpret OSP at chance level in both conditions. However, the results show that they preferred to interpret them as referring to the previous object. In the discussion of the other experiments, we have attributed this to a *recency* strategy. The experiment seems to confirm this view. If it had something to do with parallelism, then there should be differences between the responses given in both conditions. But there are not. We can conclude that children do not have the adult knowledge about how to interpret OSP. The fact that both groups show a similar pattern of response in the case of parallel sentences obeys to different reasons: in the case of adults, to the presence of parallel sentences; in the case of children, to a *recency* strategy.

3.3   THE TOPIC HYPOTHESIS

3.3.1 Introduction

Some authors (e.g. Sorace 2004 for Italian) have characterized the difference between NSP and OSP in terms of the topic status of the entities present in the discourse. Ac-

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[24] See also the results obtained by adults in Questionnaire 2, reported in the appendix.

cording to them, NSP refer to topical antecedents and OSP to non-topical antecedents. So, while the former are specialized for signaling topic continuity, the latter signal a topic-shift. We have referred to this position as the *Topic* hypothesis. According to this hypothesis, the presence of an OSP should be sufficient to generate a topic-shift interpretation. To test this, we will look at discourses where (a) the topic of the sentence preceding the pronoun has been continued from the beginning of the discourse, (b) both the topic and a non-topic entity are available as antecedents of the pronoun, (c) there are no pragmatic biases favoring one antecedent over the other. An example of such a discourse is (6):

(6)   a.   Un cocinero está limpiando un restorán
             A   cook   is   cleaning a   restaurant
             'A cook is cleaning a restaurant'

     b.   Llama a un mozo
           NSP *calls*   _A a   waiter
           'He calls a waiter'

     c.   El   cocinero lava   los platos con el   mozo
           The cook   washes the dishes with the waiter
           'The cook washes the dishes with the waiter'

     d.   Está aburrido de trabajar
           NSP is   bored   of working
           'He is bored of working'

     d'. Él   está aburrido de trabajar
          HE is   bored   of working
          'HE is bored of working'

In (6), the *Topic* hypothesis predicts that the NSP will be interpreted as referring to the cook, while the OSP should be interpreted as referring to the waiter.

Going to child language, the prediction is that children will interpret the NSP like adults, but will show no clear preference in the interpretation of OSP. The idea

behind this is that children have knowledge about how to interpret NSP, but not about how to interpret OSP. [25]

3.3.2 Experiment 4

Method

Participants

Twenty-eight children (thirteen girls and fifteen boys) participated in this experiment. Their ages ranged between 4;3 and 6;2 (mean=5;3). All of them were normally mono-lingual developing speakers of Spanish and attended Kindergarten classes at a private School in Viña del Mar, Chile. A group of fourteen adults (five female, nine male) also took part in the experiment. They were all young professionals (ages 27;3-35;0, mean 30;2) with a university degree.

Material

(a) Comprehension Stories: Twelve short stories were constructed. Each story has two characters of the same gender. In the first sentence, the first character is intro-duced with an indefinite NP in subject position. The second sentence has a NSP (re-

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[25] There are a number of competing notions of 'topic', both in the syntactic literature and in discourse studies. According to most –if not all– of them, the topic in the third sentence would be the cook. Using discourses like (6), the following experiment is constructed in such a way that it is compatible with different definitions of the term. In the previous chapter, however, we have restricted our understanding of 'topic' by applying it only to discourse entities and by assuming that, in order to qualify as topic at a given sentence, an entity has to be realized in the preceding discourse. This move has been made to distinguish the current hypothesis from *Strong Complementarity*, and is based in the discursive notion of topic present in Centering Theory (the so-called 'backward-looking center' of Grosz et al (1995)). Further, we will assume that, when the potential topics present are realized by the same form (a definite NP in the experiments), the topic of a sentence is determined by the position in which the entity is realized (where position can be understood either in terms of grammatical role or of order of mention). This second assumption will become relevant for experiment 5 and in the general discussion of chapter 5.

ferring back to the first character) and introduces the second character with a full NP in object position. In the third sentence, the first character is still realized in subject position (this time by a definite NP), while in a lower position a definite NP refers to the second. The last sentence has two versions: one with a NSP and one with an OSP referring back to one of the characters, while the other one is absent:

(7) a. Una profesora   quiere jugar tenis.
      A   teacher-$_{FEM}$ wants play tennis.
      'A teacher wants to play tennis'

   b.   Se   junta a jugar un partido con una peluquera
      NSP $_{REFL}$ joints a play a   match with a   hairdresser-$_{FEM}$
        'She joints a hairdresser to play a match'

   c. La profesora se esfuerza por ganarle   a la peluquera
      The teacher $_{REFL}$ toils   to beat her-$_{CLIT}$ $_A$ *the hairdresser.*
      'The teacher toils to beat the hairdresser'

   d.   Está muy entretenida jugando
      NSP is   very amused   playing
      'She is very amused playing'

   d.' Ella está muy entretenida jugando
      SHE is   very amused   playing
      'SHE is very amused playing'

   Q: ¿Quién está entretenida?
        'Who is amused?'

Note that (7) doesn't seem to provide any cues about the preferred antecedent of the final NSP. Different pragmatic, semantic and structural features affecting interpretation are (as far as it gets) avoided. First, neither world knowledge nor contextual information is useful to relate the sentence containing the pronoun with the previous one. Second, the verbs used don't show the feature of Implicit Causality (Caramazza et al 1977) and are all in present tense. Third, since both are realized as definite NP in

the third sentence, the form of the antecedent is irrelevant. Finally, there is no structural parallelism (Smyth et al 1994) between the last two sentences.

Two counterbalanced sets of stories were elaborated and recorded. In each, half of the stories had a NSP and half an OSP. A single block randomization of the two forms was made. Reversion of the forms to rule out ordering effects lead to four forms. The audio files were incorporated into a *PowerPoint* presentation. This presentation included two practice items, as well as partial instructions given by icons (e.g. an ear signaling when to hear) and short texts (the words 'Listen' and 'Answer' and the number of the item).

(b) Memory Test: The material for the memory test is, like in the previous experiments, the sequential memory sub-test of the Illinois Test of Psycholinguistic Ability (ITPA).

Procedure

The procedure was the same of experiment 1 to 3.

Results

(a) Comprehension stories: The analysis considered three factors: Age group (Children, Adult), Type of Pronoun (NSP, OSP) and Type of Answer (Subject, Object and Other assignments). Repeated measures ANOVA were applied on the basis of arcsine-transformed proportions per participant (F1) and on proportions per item (F2). The analyses showed a two-way interaction between Type of Pronoun and Type of answer (F1(2,80)=13.624, F2(2,20)=32.684, both p<.001) as well as a three-way interaction between Type of Pronoun, Age Group and Type of answer (F1(2,80)=15,655, F2(2,20)=18.050, both p<.001).

	Children		Adults	
	NSP	*OSP*	*NSP*	*OSP*
Topic	58,9	60,1	89,3	42,9
Non-Topic	37,5	36,9	10,7	57,1
Other	3,6	3,0	0	0

Table 3.4 Results of experiment 4 (in %)

In the case of adults, there was both a main effect of Type of Answer (F1 (2,26)=72.139; F2(2,20)=89.358, both p<.001) and an interaction between Type of Pronoun and Type of answer (F1(2,26)=10.042; F2(2,20)=32.094, both p <.001). Adults interpreted NSP as referring to the previous topic (and subject) (Topic: 89,3%, SE 5%; Non-topic 10,7%; SE 10%) (both p values<.001). In the case of OSP, in turn, the preference for interpreting the OSP as referring to the non-topical object (57,1%, SE 10%) was not significantly different from its counterpart (Topic 42,9%; SE 5% (both p-values >.05)

In the case of children, the pattern was different: there was no interaction between Type of Pronoun and Type of Answer (F1(2,54)=.198, p=.198; F2(2,20)=.027, p>.5) but only a main effect of Type of Answer (F1(2,54)=59,230; F2(2,20)=129.109, both p-values<.001). Both in the NSP and in the OSP conditions, children preferred to interpret the pronoun as referring to the topic (and subject) of the previous sentence (overall 59,5%; SE 5%) rather than to the non-topic antecedent (37,2%; SE 4%) (both p-values <.05).
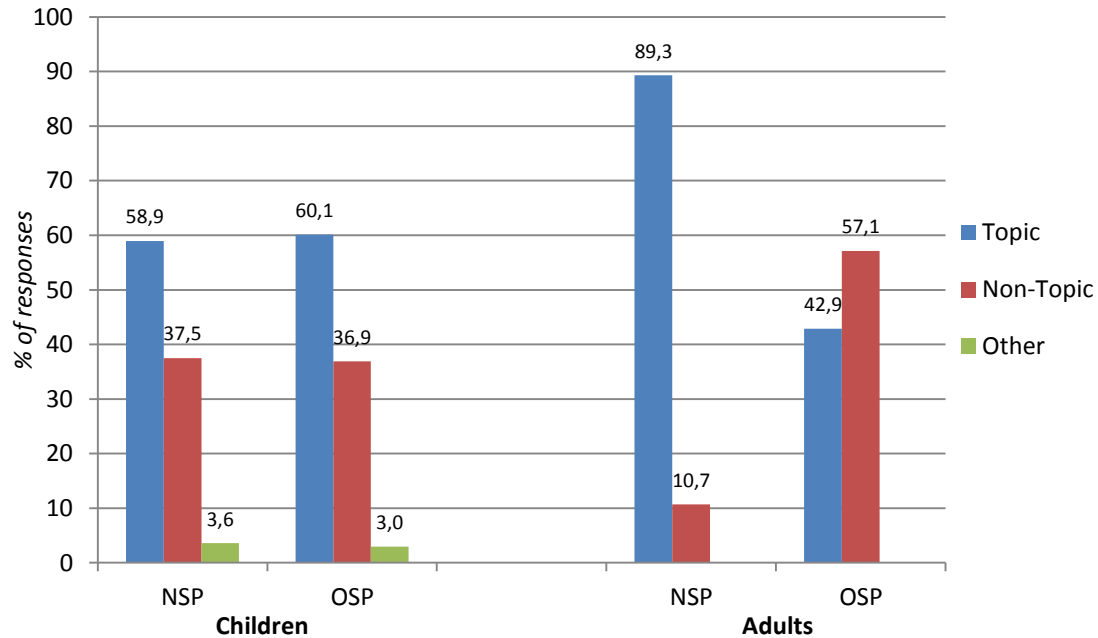
Figure 3.4 Experiment 4: Interpretation of NSP and OSP as
referring to topic and non-topic antecedents

(b) Memory Test and correlations: The difference between the scores of children (mean=9.68, SD=3.244) and adults (mean=24.00, SD=2.0) in the memory test was highly significant (T(40)=-15.094, p<.001). Within each group, there were no significant correlations between memory scores and age (children, r=.123, p>.5, adults r=-164, p>.57). Further, we didn't find correlations between memory and the results of the experiment in each group (analyzed on the basis of topic (subject) assignments) in any of the two conditions (NSP condition: children, r=.137, p>.1, adults, r=-.046, p>.5; OSP condition: children, r=-.066, p>.7, adults, r=.322, p>.1). There was no significant correlation between age and results in the NSP condition (children, r=.262, p>.1, adults, r=.021, p>.5). In the OSP condition, there was a near to significant positive correlation in the case of children (children, r=.351 p=.067, adults, r=-.105, p>.5). Older children tended to give more topic (subject) responses than younger children.

Discussion

The prediction for adults was that they were going to interpret NSP as referring to the previous topic (and subject) and OSP as referring to the previous non-topic. According to the *Topic* hypothesis, these preferences should be of a similar strength. However, they were quite dissimilar: while the NSP preference for subjects was quite strong, the OSP preference for objects was not significantly different from the preference for subjects. So, against the *Topic* hypothesis, the preferences of OSP and NSP do not appear to be complementary in the discourses used. The use of OSP seems not enough to shift the topic.

In the case of children, the prediction was that they were going to interpret NSP as referring to the previous topic (also the subject and first-mentioned entity) and OSP at chance level. The first prediction was fulfilled, but not the second: children preferably interpreted both forms as referring to the previous topic. In their case, the results can be plausibly explained as determined by the discourse preceding the third sentence, rather than by the position of the elements in this sentence. For, if position were determinant, then they should have also chosen the subject (and first-mentioned entity) in shorter discourses. Experiment 1 shows that this was not the case.[26] In that experiment, the antecedent sentences were discourse initial and had no topic (according to our assumption about topics) or, at least, not a very salient one (if another definition of topic is adopted). Instead of choosing the previous subject, children preferred the most recently named entity. So, if a subject (or first-mentioned)

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[26] It could be argued that the fact that in the current experiment the second antecedent often appears within a prepositional phrase makes it less salient than when it is a direct or indirect object, favoring assignments to the subject (topic).This is something that needs to be further investigated using short-stories with the second antecedent in different object positions (thanks to Dagmar Bittner for making this point). But note that the items of experiment 1 (see Appendix) also include short stories with the second antecedent in a propositional phrase. Despite this, children tended to choose this entity and not the one in subject position, like in the current experiment. So the idea that the preceding discourse is crucial seems well-founded.

preference were at stake in the current experiment, we would have to explain why children didn't use this preference in Experiment 1. We believe, then, that what children did in the current experiment is favoring an interpretation that results in a continued topic throughout the story, without considering the position that the entities had in the sentence preceding the pronoun. Before the third sentence, the identification of the topic can be achieved without taking into account the position of the entities: since the first sentence introduces one character, only this character qualifies as the topic in the second sentence (given that the other character is discourse-new). Further, the discourse-old character is realized as a pronoun, while the other is introduced with an indefinite NP. Hence, children can make use of two cues other than position to identify the topic: discourse oldness and form (pronoun or definite NP). The same reasoning can be extended to children's interpretation of OSP in experiments 2 and 3. Why didn't they select a subject antecedent there? Because –unlike adults– they didn't use position as a cue. Further, given that the entity occupying the subject position was discourse-initial and had the same form (definite NP) as the entity occupying the object position, other cues to identify a topic were not available. In all those cases children tended to pick out the most recently named entity, a less demanding strategy. However, in the current discourses, children can identify the topic in the second sentence and favor an interpretation that results in a unitary topic across the story.

3.3.3   Experiment 5

It seems obvious that a discourse which changes its topic once and again will be more difficult to understand than a discourse that has a continued, unitary topic. In terms of Centering Theory (Grosz et al. 1995), discourses with shifted topics suppose refocusing of the hearer's attention and are, therefore, more difficult to process than discourses with continued topics. In line with this, the *Topic* hypothesis predicts that NSP will prefer topic antecedents. The problem is that there is no consensus about

what a topic is. So the prediction can result true or false, depending on what we understand for 'topic'. Hence, it is important to clarify the criteria we use to identify the topic in the discourses of the current experiment.

Until now, we have made two assumptions about topics. First, we have assumed that an entity can only be the topic at a given sentence if it has been introduced in the previous discourse. Second, we have assumed that, when the potential topical entities are realized by the same form (a definite NP in our experiment), the topic of the sentence is determined by the position that the entities occupy in it.[27] The second assumption implies that, in (8) below, the topic of sentence (c) corresponds to the firefighter while, in (c'), it corresponds to the baker:

(8) a. Un bombero necesita ayuda para pintar una casa.
         a firefighter needs   help to   paint a   house
         'A firefighter needs help to paint a house'

    b.   Va   a buscar a   su amigo el panadero
        NSP *goes to look   for his friend the baker*
        'He goes to look for his friend the baker'

   c. El bombero pinta la casa junto   con el panadero.
      the firefighter paints the house together with the baker.
      'The firefighter paints the house with the baker''

   c.' El panadero pinta   la casa   junto   con el   bombero.
      the baker   paints the house together with the firefighter.
      'The baker paints the house together with the firefighter''

   d.   Encuentra que la casa quedó   muy bonita.
      NSP finds   that the house turned out very nice.
      'He finds that the house turned out very nice'

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[27] The sentences we use are always in Spanish canonical word order (SVO), so the topic of the sentence is always, at the same time, the subject and the first mentioned entity. Later we will discuss whether position should be understood in terms of grammatical role or of order of mention. In the first case, subject position would be the crucial factor. In the second, first-mention is decisive.

Apart from the two versions of the third sentence, everything else remains the same. In both stories, the *Topic* hypothesis predicts an adult hearer to interpret the NSP of the final sentence as referring to the previous topic (in the first version to the first character, the firefighter, and in the second to the other character, the baker). In one case, we would have a single continued topic throughout the discourse. In the other, a topic-shift would occur. [28]

The prediction for children is the same as for adults: in both version of the story, they are expected to interpret the final NSP as referring to the topic of the third sentence. Experiment 4 has provided evidence that this is the case in the first version of the story (with a continued topic throughout the story). However, it is not clear whether this will be the case in the second version, where only a consideration of the position of the entities in the third sentence favors the predicted interpretation. So children would need to know that the position of the antecedents is the key element. And even supposing that they have this knowledge, they would need to keep the structure of the antecedent sentence in working memory to apply it, something that could be beyond their processing capacities. If this is right, the prediction should not be fulfilled. Further, we should expect not only children, but also other hearers with processing limitations to deviate from the adult pattern. To test this, we decided to incorporate a group of elderly adults into this experiment, given their limitations in working memory. As in the other experiments, the memory test was applied.

To resume, in discourses like (8), the predictions are that all participants will select the topic in both variants –that is, when the topic is the firefighter and when it is the baker–. However, since in the latter case the topic of the sentence preceding the

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[28]Strube and Hahn (1999) note that cases like this pose a problem for the algorithm of Centering Theory, which predicts that the pronoun should be interpreted in both cases as referring to the firefighter, given that (a) the firefighter occupies a higher syntactical position in the second sentence and is therefore, the backward looking center of both version of the third sentence and (b) continue transitions are preferred to other transitions. The authors point out that the algorithm could be improved by considering preferences over pairs of transitions and not over transitions alone. As a result of this, the interpretation of the final pronoun would be different in each case, as it is predicted by the *Topic* hypothesis under the assumptions we have made.

target pronoun is determined only by its position, we have reasons to doubt that children will select the same entity as adults.

Method

Participants

The participants of this experiment were 28 children (14 male and 14 females, ages 5;1-6;1, mean: 5;8), 28 elderly adults (9 male and 19 females, ages 65;7-85;9, mean 73;10) and 28 young adults (20;1-34;10, mean: 25;6). All children were normal native developing speakers of Spanish and attended kindergarten classes at a private school in Viña del Mar, Chile. Elderly adults were healthy; none of them had a diagnosed cognitive disease. They had all completed formal school education (a total of 12 years). 9 of them had also a university degree. As for young adults, they were either university students or young professionals. All subjects participated voluntarily and were not given any payment.

Material

(a) Comprehension stories: The material consisted of twelve pre-recorded four-sentence stories with two characters of the same gender, followed by a question about the referent of a NSP in the last sentence. The stories were structured following the model of example (8) above: in the first sentence, the first character is introduced with an indefinite NP in subject position. The second sentence has a NSP (referring back to the first character) and introduces the second character with an indefinite NP in object position. In the third sentence, each discourse has two forms: (a) one with a definite NP in subject position referring to the first character and a definite NP in (indirect or prepositional) object position referring to the second character and (b) one with a definite NP in subject position referring to the second character and a definite

NP in (indirect or prepositional) object position referring to the first character. The last sentence has a potentially ambiguous NSP referring back to one of the characters, while the other is absent.

(9) a.   Un   marinero   tiene   hambre
a   sailor   has   hunger
'A sailor is hungry'

b.   Se   sienta   al   lado   de   un   soldado.
NSP   se −REFL   sits   at the   side   of   a   soldier
'He sits beside a soldier'

c   El   marinero   comparte   un   sándwich   con   el   soldado
The   sailor   shares   a   sandwich   with the soldier.
'The sailor shares a sandwhich with the soldier''

c.'   El   soldado   comparte   un   sándwich   con   el   marinero.
The   soldier   shares   a   sandwich   with the sailor
'The soldier shares a sandwhich with the sailor''

d.   Encuentra   que   el sándwich   está   muy   rico.
NSP   finds   that   the sandwhich   is   very   tasty.
'He finds that the sanwhich is very tasty'

Q: ¿Quién encuentra que el sándwich está muy rico?
Who finds that the sandwhich is very tasty?

Note that (9), like the discourses of the previous experiment, doesn't seem to provide any useful information about the preferred antecedent of the final NSP. Further, the antecedents are always realized as definite NP.

Two counterbalanced sets of the recorded stories were constructed. In each, half of the items correspond to one version of the third sentence and half to the other version. A single block randomization of the two forms was made. Reversion of the forms to rule out ordering effects lead to four forms. Each of them was incorporated

into a *PowerPoint* presentation. The presentation included two practice items and basic instructions supported by icons that indicated when to listen and when to answer the question after each story.

(b) Memory test: Like in the other experiments, the memory test was the auditory sequential memory sub-test of the Illinois Test of Psycholinguistic Ability (ITPA).

Procedure

The procedure was the same as the one of the previous experiment. The memory test was administrated at the end.

Results

	Children		Elderly adults		Young adults	
	Cont	*Shift*	*Cont*	*Shift*	*Cont*	*Shift*
First Character	53	51,2	68,5	33,9	84,5	19
Second Character	41,6	44,6	31,5	66,1	15,5	81
Other	5,4	4,2	0	0	0	0

Table 3.5. Results of Experiment 5 (in %)

(a) Comprehension Stories: Repeated measures ANOVA were performed on the basis of answer proportions per participant (F1) and per items (F2). Three factors were considered: Type of Story (with topic continuity (+TC) and without topic continuity (-TC) throughout the story), Type of Answer (First character, Second character, Other responses), and Age Group (Children, Young Adults and Elderly Adults). The analyses showed a main effect of Type of Answer ($F_1(2,162)=391.960$, $F_2(2,20)=176.285$, both p<.001) and a two-way interaction between Type of Story and Type of Answer ($F_1(4,162)=88.272$, $F_2(4,40)=42.077$, both p <.001). These inte-

ractions were modified by a an interaction between all three factors (F1(4,162)=19.059, F2(4,40)=21.704, both p<.001).

In the case of young adults, the interaction between Type of Story and Type of Answer was significant (F1(2,54)=161,784, F2(2,20)=57.484, both p<.001). In the +TC condition, the preference for the first character was above 80% (first character 84,5%; SE 4%. Second character 15,5%; SE 3%) (both p-values<.01). In the −TC condition, in turn, the preference was for the second character (first character 19%; SE 3%. Second character 81%; SE 3%) (both p-values<.01). In the case of children, there was no interaction between Type of Story and Type of answer (F1(2,54)=1.644, p=.20, F2(2,20=1.698, p=.208)). Children preference for the first character (Overall, 52,2%; SE 4%)) was not significantly different from answers favoring the second character (43,1%; SE 3%) (both p-values >.1). In turn, the results of Elderly Adults show a significant interaction between Type of Story and Type of answer (F1(2,54)=24.256, F2(2,20)=20.588, both p<.001). In the +TC condition, they preferred the first character (68,5%; SE 5%) over the second character (31,5%; SE 6%) (both p-values<.05), while in the -TC condition, the preferences were the inverse: the second character (66,1%; SE 4%) was preferred over the first (33,9%; SE 4%). (p1<.05, p2=.072), although in the latter case, the difference between subject and object preferences was not in the analysis by items.
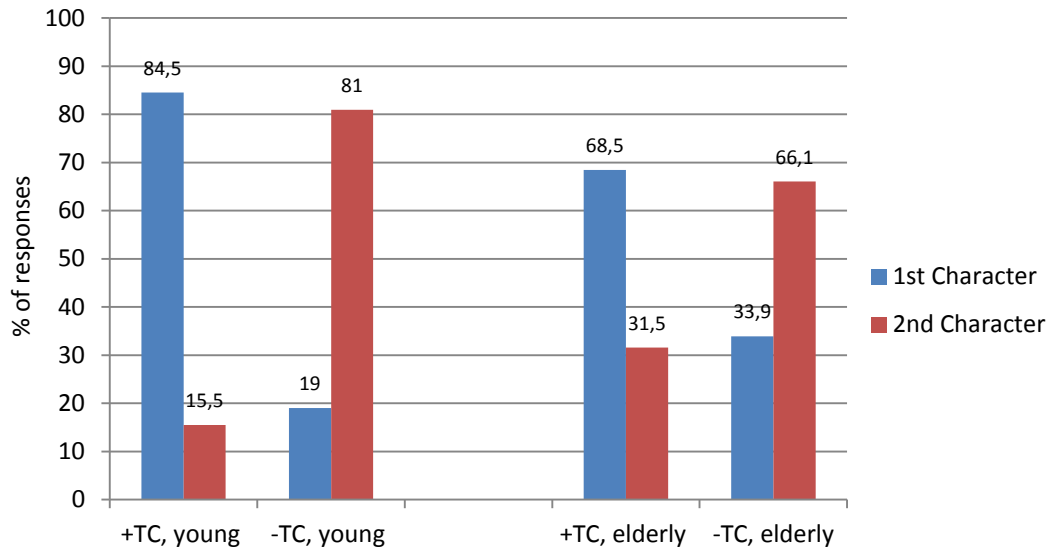
Figure 3.5.: Experiment 5. Young and Elderly Adults' percentages of reference as-signments in +TC and -TC stories.
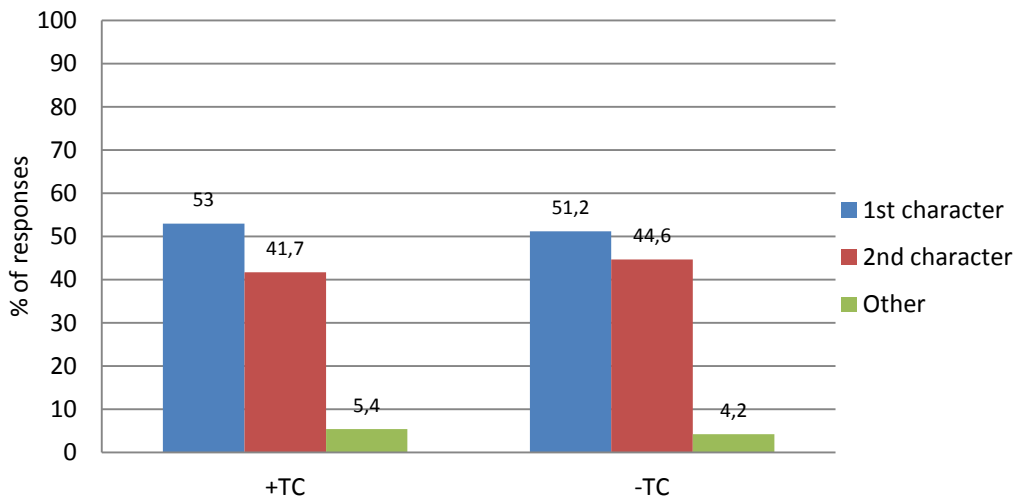
Figure 3.6.: Experiment 5. Children's reference assignments in +TC and -TC stories.

Summarizing, both adults and elderly adults selected the topic of the third sentence (the first character in +TC and the second in –TC) as antecedent of the NSP present in

the fourth sentence. Children, in turn, selected more often the first character in both kinds of discourses, independent of its position in the third sentence. However, this preference was not significantly different from its counterpart.

(b) Memory Test: A Univariate ANOVA showed that the difference between the memory scores of children (mean=8.46, SD=1.915), young adults (mean=23.32, SD=1.827) and elderly adults (mean=16.75, SD=5.183) was highly significant (F(2,81)=137,492, p<.001). Young adults got higher scores than elderly adults, which in turn got higher scores than children. There was no significant correlation between memory scores and age within each group (children, r=.040, p>.5, adults r=147, p>.5, elderly adults r=.060, p>.5), nor between memory and the results of the experiment within each group (analyzed on the basis of first character assignments) in any of the two conditions (+TC condition: children, r=-.020, p>.5, adults, r=-.209, p>.1, elderly adults, r=-176, p>.1; -TC condition: children, r=-.024, p>.5, adults, r=, p>.1, elderly adults, r=.-331, p=.085). The scores of elderly adults in the −TC condition, however, might signal a tendency of participants with low scores to (incorrectly) pick out the first character. The difference between age and results was neither significant in the +TC condition (children, r=.201, p>.1, young adults, r=.147, p>.1, elderly adults, r=-.232) nor in the -TC condition: children, r=.183 p=.353, young adults, r=-.047, p>.5, elderly adults, r=.107, p>.5).

Discussion

The predictions said that all groups were going to interpret NSP as referring to the topic of the third sentence. They were fulfilled in the case of adults and elderly adults, but not in the case of children.

First, let us consider the results obtained by adults. These show that the *Topic* hypothesis seems to be right with respect to NSP (the problem of the hypothesis is not the interpretation of NSP, but the fact that OSP do not show the complementary

preference of NSP, as the previous experiment shows). To solve the NSP in the fourth sentence, adults had to determine the topic of the previous sentence by taking into consideration the position that the two alternatives had in it (form does not help, since both are realized as definite NP). The circumstance that the first character had been the topic before the third sentence didn't make a difference in interpretation: the preference for the first character in the +TC condition was not different from the preference for the second character in the –TC condition. The experiment, as we have recognized, cannot distinguish whether position is to be understood as grammatical role or as order of mention. However, it seems clear that one or the other is the key factor to determine the topic of the third sentence and, thereby, to solve the pronoun of the fourth: whenever there was a change in the position of the antecedents, the interpretation of the final pronoun changed too.

Going to the results obtained by elderly adults, we can see that, even though they show the same preferences as young adults, these were milder in both conditions. The reason, in their case, cannot be lack of knowledge, but only limited processing capacities. It may be that, when elderly adults are unable to keep the structure of the third sentence in working memory, they end up guessing. The memory test, however, do not provide significant evidence for this (though in the -TC condition the results are not far away from a correlation between low memory scores and first character assignments).

Moving to children's responses, we see that they didn't show a significant preference in any of the two types of stories. Experiment 4 had suggested that children tended to prefer the entity that was the topic in the second sentence, so that topic continuity throughout the story was favored. However, the current experiment does not provide further evidence in favor of this view. Maybe if longer discourses had been used, with the first character as a continued topic through a longer series of sentences before the sentence preceding the target pronoun, then we would have gotten a significant preference for this character in both condition (this is the result obtained, for example, by Wubs et al 2009 in their experiments with Dutch pronouns and six-

sentence discourses). From the current results, it looks like children guessed or applied conflicting strategies (choosing the topic in some occasions and the most recently named entity in others). In any case, what is clear is that children have problems to use the position of the entities in the third sentence as a cue to solve the final pronoun. As we have noted, the explanation for this can be given in terms of processing resources or in terms of lack of knowledge. On the one hand, the difference between the results obtained by adults and elderly adults tell us that processing limitations are at stake (though the memory test does not provide further evidence). On the other, to justify the opinion that children have this knowledge but cannot apply it, one would have to give a convincing argument about how this is possible (for example, by defending the innateness of the knowledge, something unusual for a preference that goes beyond sentence boundaries and that can be easily overridden by semantic and pragmatic factors). It seems easier to propose that children haven't learned yet that when an entity occupies a higher position (either grammatical or linear) in a sentence, it is more probable that it will be further realized in the next sentence than when it occupies a lower position. Position could then be conceived as a statistical cue that children have to learn and that would require a large amount of linguistic input (cf. Arnold et al 2001).[29] The fact that children have limited processing capacities would provide one reason to explain why by the age of five they haven't learned this cue yet.

This idea fits with the view that the topic is the most salient element of a sentence of the discourse and, therefore, the preferred antecedent of a subsequent pronoun in absence of semantic or pragmatic biases. When hearers cannot distinguish the topic by its form, they tend to determine it on the basis of its position and, in consequence, they interpret subsequent pronouns as referring to the subject or first mentioned antecedent. But this may be an interpretive strategy that emerges in time, as

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[29] Arnold et al (2001: 61) defends this position with respect to order-of-mention, saying that 'children may have to learn the link between order-of-mention and accessibility by observing that first-mentioned entities tend to be more important to the upcoming discourse than other entities. This observation would require the accumulation, and therefore should take time'.

hearers accumulate evidence that NSP are more often used to refer to antecedents in higher positions.

3.4 SUMMARY

In this chapter, we have presented a series of five comprehension experiments. The results obtained by adults put into question different versions of the Complementary Anaphoric Preference (*CAP*) view. Neither the *Strong Complementary* hypothesis, nor the *Parallelism* hypothesis, nor the *Topic* hypothesis finds support in our experiments. In all the discourses considered, NSP show a clear strong preference for a determinate antecedent. OSP, however, is either interpreted at chance level (experiments 1, 2 and 4) or show only a mild preference for the antecedent that is not chosen by the NSP (the parallel discourses of experiment 3). These results call for an alternative explanation. In chapter 5, we will consider an approach based in the establishment of rhetorical (coherence) relations.

The results obtained by children show that they have problems interpreting pronouns. They appear not to use the structural position of the antecedents as a cue to resolve them, like adults do for NSP. Instead, it looks like they resort to strategies like choosing a previously established topic (Experiment 4) or –when the antecedent sentence is discourse initial– the most recently named entity (Experiments 1 and 3). Only in the case of discourses with parallel sentences, they interpret NSP and OSP differently (Experiment 2). This suggests that parallelism has an effect in their interpretation of NSP (but not of OSP, as Experiment 3 shows). In chapter 5, we will see that this pattern may be better explained if we consider the parallel sentences used in the experiments as a cue that children use to infer determinate rhetorical (coherence) relations.

The fact that children do not appear to use the position of the antecedents to solve NSP can be related to limited processing capacities (as the difference between

elderly and young adults' interpretation of these forms in experiment 5 appears to confirm). These may prevent children's learning of the link between antecedent position and pronoun interpretation. Following Arnold et al (2001), this link can be conceived as a statistical cue that requires accumulation of linguistic input in order to become an active strategy when other cues are absent.

4   PRODUCTION EXPERIMENTS

This chapter is focused on the different forms that speakers select to refer back to salient entities at the discourse level. Two experiments are presented. Experiment 6 (section 4.1) evaluates the predictions of the *Parallelism* hypothesis for production, while experiment 7 (section 4.2) evaluates the *Topic* hypothesis.[30]

The comprehension experiments showed that, in adult language, NSP and OSP were not in complementary distribution in any of the types of discourses evaluated. Often, OSP was interpreted at chance level. This suggests that, if similar discourses are elicited in an experimental setting, OSP will not regularly appear as an alternative to NSP, as the hypotheses predict. Instead, a more prolix form can be expected to identify the referent univocally. With respect to children's interpretation, in turn, the main problem concerned NSP. Given that children often interpreted this form quite different from adults, we can also expect them to use this form equivocally. Evidence found in other experimental studies (cf. Karmiloff-Smith 1981 for English and Hendriks et al. 2009 for Dutch) shows that children around the age of five tend to overproduce unstressed pronouns. If NSP production in Spanish speaking children is similar to that of unstressed pronouns in English and Dutch, then NSP should also be overproduced.

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[30] To test the *Strong Complementarity* hypothesis in comprehension, we used discourses where two events were not clearly related to each other. Preliminary studies for the design of production experiments matching this type of discourses showed that it wasn't feasible to elicit pronouns by asking children to describe images that were not clearly related to each other. So we decided to focus in the elicitation of stories with parallel events and of short stories with topic shift or continuity.

4.1 THE PARALLELISM HYPOTHESIS

4.1.1 Introduction

The results of experiment 2 showed that, in discourses with parallel sentences, both adults and children tended to interpret NSP as referring to a subject antecedent (adults almost 100% and children around 55% of the time) and OSP as referring to an object antecedent (both around 60% of the time). However, adults' results cannot be considered as evidence in favor of the *Parallelism* hypothesis, since one preference was far stronger than the other. In the case of children, parallelism appeared to guide their interpretation of NSP, but not of OSP, which looks to be more a result of a *recency* strategy (as shown by the fact that in experiment 3 children interpreted the OSP in non-parallel discourses just like in the parallel ones). Given these results, what can we expect from an elicitation task of discourses where parallel actions have to be described? In the case of adults, and assuming a high degree of symmetry between comprehension and production, we can expect that they will use NSP to describe subsequent parallel actions performed by the same agent. Second, we can expect them to use an alternative form when describing parallel actions done by different salient agents, for a NSP would lead to ascribe both actions to the same agent. Now, since the comprehension experiments showed that an OSP was often not understood as referring to a different agent, a more prolix form might be a better candidate. Hence, full NP are expected to arise. However, the *Parallel* hypothesis predicts that OSP should be used.

In the case of children, symmetry is not warranted. Poor comprehension is in general associated to poor production.[31] But this needn't result in a symmetric pattern. While children might guess between the available referents in comprehension, guess-

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[31] Children's interpretation of intra-sentential object pronouns seems to be an exception: while children around the age of five appear to produce reflexive and non reflexive pronouns correctly, they often interpret non-reflexives incorrectly as referring to the subject (Ex. 'Bert washed him', where 'him' is interpreted as co-referring with Bert). See Reinhart (2004) and Hendriks and Spenader (2005/6).

ing is not a possibility in production, where children have to choose within a whole repertoire of referring expressions. As the evidence from Karmiloff-Smith (1985) and others show, when children are unable to select the most appropriate form, they end up picking the most economical one. In the case of Spanish, this form is a NSP. So an overuse of NSP is expected.

4.1.1 Experiment 6

This experiment is designed to elicit discourses with parallel sentences (e.g. *First X gives a pencil to Y. Then X/Y gives a ruler to Z*). The *Parallelism* hypothesis predicts that, when adults use parallel sentences to describe a situation where one character is the agent of two subsequent similar actions, the utterance describing the second action will contain a NSP. However, when different characters perform each action, it predicts that OSP will arise. In the case of children, the prediction is that NSP will arise in both types of situations.

Method

Participants

The participants of this experiment were 28 (14 girls and 14 boys) and 28 adults (14 female and 14 male). All children were normally developing monolingual speakers of Spanish and attended Kindergarten classes at a private school in the city of Viña del Mar, Chile. Their ages ranged between 4;2 and 6;2, with a mean age of 4;11. Adults were either university students or young professionals. They participated voluntarily and received no payment. Their ages ranged between 23;8 and 29;4, with a mean of 26;4.

Material

(a) Elicitation task: The material consisted of a series of eight videos of puppets. In them, two subsequent similar actions occur. In half of the videos, the same character is the agent of both actions. First, he transfers an object to a second character of the same gender. Then, he transfers a different object to a third character of a different gender (see fig. 4.1). The other half of the videos has a different structure: the first action is the same, but in the second the character that first receives an object is the one that then transfers a different object to a third character (see fig. 4.2). The target for the analysis is the description of the last scene. To induce pronominalization and to assure that the scenes were described using sentences in which the agent is mentioned in subject position, all videos started with a scene in which the agent of the first action appears alone.

Sc.1: the first character is presented   Sc.2: the first character gives an object to the second character   Sc.3: the **first** character gives an object to the third character
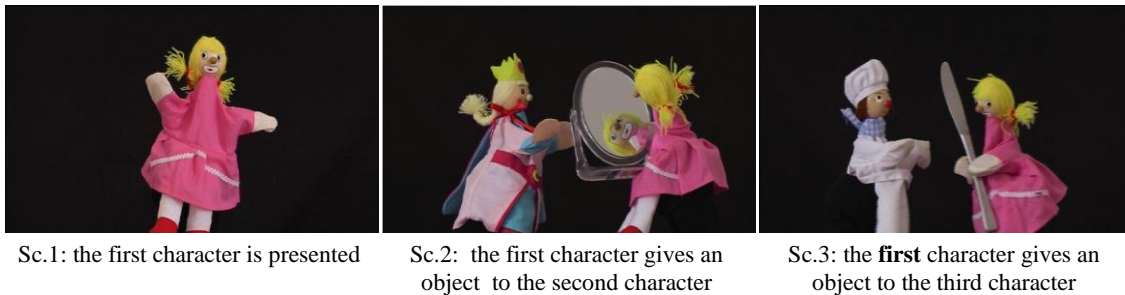
Fig. 4.1. Experiment 4: Example same-agent condition

Sc.1: the first character is presented   Sc.2: the first character gives an object to the second character   Sc.3: **the second** character gives an object to the third character

Fig. 4.2 Experiment 6. Example different-agent condition

Two counterbalanced sets of videos were constructed. In each, four items corresponded to the first version and four to the second. Then a single block randomization of the forms was made. Reversion of the forms to rule out ordering effects resulted in four different forms. These forms were incorporated into a series of *PowerPoint* presentations. After each video, a frame with snapshots of the three scenes present in the video was inserted (see *Procedure* for an explanation of this decision). The presentations also included (a) an initial video where all characters are introduced on screen for identification; (b) two practice items and (c) partial instructions signaling when to watch and when to speak.

(b) Memory test: Like in the other experiments, the memory test was the auditory sequential memory sub-test of the Illinois Test of Psycholinguistic Ability (ITPA).

Procedure

The sessions took place in a quiet room and lasted around fifteen minutes. The memory test was administrated at the end. Like in the comprehension experiments, two experimenters were present. One experimenter gave the instructions and watched the presentation of the videos together with the participant. The other experimenter sat further away in front of another computer. Participants were instructed to tell what happened in the videos to this second experimenter, who couldn't see them from her position.

After receiving general instructions, participants watched the introductory video where all characters (six in total) are presented. These characters were all stereotypical figures that could be easily identified by children (King, Queen, Cook, Witch, Clown and Girl). To check this, children were asked to name them as they appeared. Then two practice items followed. Participants were told that they first had to

observe each video in silence and only describe the actions after it, when the three snapshots resuming the three scenes of the video appeared on screen. This was necessary because, as the material was tested, it became evident that both adults and children were often not able to retain which characters were present in the actions. Further, it was unviable to make them describe the actions at the same time they were taking place, since the presentation of each action took too much time to make the adjacent utterances natural, affecting the goal of eliciting pronouns (pictures were not an option either, for it wouldn't have been clear who gives the object to whom). The snapshots resumed what happened in the videos and resulted appropriate for participants to be described.

With respect to the structure of the discourse, it was necessary to give precise directions in order to get parallel sentences. Participants were told to begin the discourse presenting the first character (snapshot 1) using a fixed introductory sentence: 'Había una vez un… ('Once upon a time there was a...'). Then they were told to describe the first action (snapshot 2) beginning with: 'Primero (First)…' and to describe the second action (snapshot 3) beginning with 'Después… (Then…)'. A little bit of training was required until children understood this procedure. Participants were allowed to make questions and the practice items were repeated if necessary. Then the experiment started and no more questions were allowed. The discourses were registered using a portable voice recorder and later transcribed for analysis. To maintain motivation, children were told at the beginning that they were going to receive colorful stickers for their participations. These were only given at the end to avoid distraction during the experiment.

Results

(a) Elicitation task: The design of the experiment was successful: adults and children produced parallel pair of sentences in both conditions (adults 100% of the time and children 94%). The analysis of the data was done exclusively on the basis of the dif-

ferent types of expressions used in subject position to describe the last scene, that is, we only considered the expression used in the second of the two parallel sentences. Figure 4.3 shows the percentages of NSP and Full NP that were used to describe this scene in each condition. OSP remained unused. The analyses are done on the basis of NSP use.

Same-agent videos

	Children	Adults
NSP	64,3	67,9
Full NP	35,7	32,1

Different-agent videos

	Children	Adults
NSP	36,9	6,0
Full NP	63,1	94,0

Table 4.1. Results of experiment 6 (in percentages)

ANOVAs were performed on the basis of the (arcsine transformed) NSP proportions per participant (F1, averaged over items) and one on the NSP proportions per item (F2, averaged over participants). The analyses included two factors: Video type (with the same and different agent) and Age Group (children and adults). In the analysis by participants, Video Type was treated as within-participants factors, while Age Group was treated as between-participants. In the analysis per items, Age Group was treated as within-items, while Video Type was considered a between-items factor.

The analyses showed an interaction between both factors (F1(1,54)=16.088, F2(1,10)=72.233, both p <.001) as well as a main effect of Video Type in the analysis by participants (F(1,54)=88.955, p<.01) and a main effect of Age Group in the analysis by items (F(1,10)=57,963, p<.01). T-tests analyses show that, in the case of adults, the difference between the same-agent condition and the different-agent condition was highly significant (T1(27)=-10.186, T2(5)=-11.270, both p<.001). In the same-agent condition, adults produced a majority of NSP (67,9%; SE 4%). In the different

agent condition, they produced almost only full NP (94%; SE 2%). Very few NSP appeared, while OSPs where completely absent.

The analysis for children also shows a significant difference between the use of NSP in each condition (T1(27)=-3.607, T2(5)=-6.718), both p<.001). In the same agent condition, children produced, like adults, a majority of NSP (64,3%, SE 5%). However, in the different agent condition, despite a majority of full NP, NSP were often produced (36,9%, SE 4%).
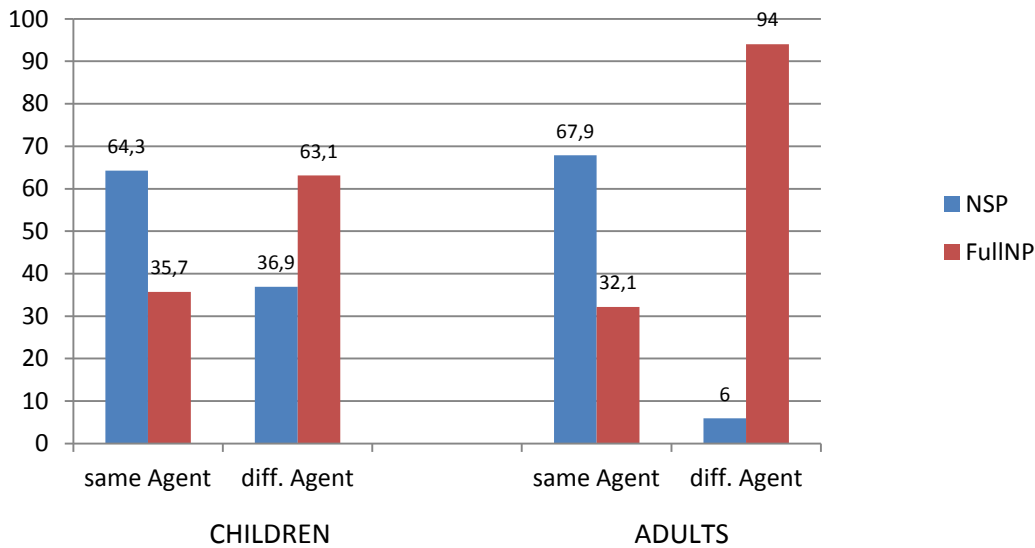
Fig. 4.3. Experiment 6: Use of referring expressions in videos with parallel actions and same or different agent

(b) Memory Test and correlations: The difference between the scores of children (mean=7.79, SD=2.807) and adults (mean=22.25, SD=2.335) in the memory test was highly significant (T(54)=-20.962, p<.001). Within each group, there was no signifi-cant correlation between memory scores and age (children, r=.051, p>.5, adults r=-.323, p>.093), nor between memory and the results of the experiment (analyzed on the basis of NSP use) in any of the two conditions (same-agent condition: children, r=.018, p>.5, adults, r=.080, p>.5; different agent condition: children, r=-.149, p>.1,

adults, r=-.121., p>.5). The difference between age and results was not significant in the same agent condition (children, r=.086, p>.5, adults, r=-.121., p>.5) and was significant for children in the different agent condition: children, r=-522 p=.004, adults, r=-.040, p>.5). This negative correlation shows that younger children tended to use NSP incorrectly more often.

Discussion

The *Parallelism* hypothesis predicted that adults were going to use NSPs when the same agent performed the second action and that OSP was going to be used when the agent changed. The results confirmed the prediction for NSP, but, as we thought, OSP were not used. Further, the prediction for children was that they were going to use NSP both when the same agent performed the actions and when the agent changed. The results confirmed this. Though in the second case children used full NP more often than NSP, the amount of NSP produced was considerably higher than the one produced by adults (almost 37% against 6%).

Beginning with adults, we can see an interesting relation between the results obtained here and in the corresponding comprehension experiment (Experiment 2). Since NSP were almost 100% interpreted as referring to the previous subject, it is not a surprise that adults opted for this form to express agent continuity. What is interesting is the absence of OSPs. If the *Parallelism* hypothesis were right, then there is no reason for OSP to be blocked in production. The problem, as we noted, is that the elicitation of structural parallelism is not enough to license an OSP. If used, an OSP would have lead to interpretation problems, as the comprehension experiment showed (recall that less than 60% of adults interpreted the OSP as referring to the object). As we will see in the next chapter, OSP may need a contrastive context to be felicitous.

Going to children, we see that the tendency to use the most economical form corresponds with their difficulties in comprehension. In the same agent condition, the adult-like results obtained do no indicate that children simply know how to use NSP,

but that they often opt for this form when they are unable to select the optimal one. Trivially, the optimal solution is also the default solution in this case, so their performance is improved to the point of reaching an adult level. The relatively poor results of the comprehension experiment reinforce the idea that they are getting things right for the wrong reasons. This is corroborated by the outcome of the different agent condition. Here, the optimal form is different from the default NSP. And so, children performance deviates drastically from adults, who don't use NSP at all.

A final point to take into consideration is that children's production was not that bad. Full NPs were often used when required. This indicates that children at this age are often aware that the most economical form is not a good option. Whether parallelism helps them to arrive to this outcome is something we will discuss in the next chapter.

4.2 THE TOPIC HYPOTHESIS

4.2.1 Introduction

Experiment 4 showed that, hearing short stories, adults interpreted a vast majority of NSP as referring to a topic (and subject) antecedent but showed no significant preference in their interpretation of OSP. In contrast, children had a weak tendency to interpret both NSP and OSP as referring to the previous topic.[32]

Adults' strong preference for topic antecedents in the interpretation of NSP makes it clear that they will produce this form to refer to them. In turn, the lack of preference in the OSP case suggests that this form will not be the preferred one to refer to non-topics. Instead, like in the previous experiment, full NP are expected. However, the *Topic* hypothesis predicts that OSP should be used.

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[32] Recall that in the experiment both possible antecedents had the same form (definite NP). If one of them had been a pronoun and the other a full NP, the outcome would have been probably different.

With respect to children, difficulties to interpret pronouns correctly are expected to be reflected in production as well. Their tendency to interpret pronouns as referring to the topic should induce a majority of NSP production when topic continuation is elicited. However, we have seen that children also tend to use NSP as a default form. So we can expect that NSP will also appear when a topic-shift is elicited. Now, overuse of unstressed pronouns has been related to limited processing capacities (cf. Hendriks et al 2008). To see if this is the case of NSP, we also included a group of elderly adults (the same of Experiment 4), who, like children, have such limitation but do not lack knowledge.

4.2.2 Experiment 7

This experiment uses a series of storybooks to elicit referential expressions realizing both topic continuity and topic shift. The procedure is based on similar studies by Karmiloff-Smith (1985), Wubs et al. (2009) and Koster et al (2011). Resuming, the predictions based on the *Topic* hypothesis are that: young adults will use NSP only in discourses were the topic is continued and OSP in discourses where a topic shift takes place. The predictions for children are that they will not only use NSP in discourses with a continued topic, but also in discourses with a topic shift. Futher, if the overuse of NSP is related to processing limitations, then elderly adults are also expected to overuse NSP.

Method

Participants

28 (14 male, 14 female), 28 young adults (10 male, 18 female) and 28 elderly adults (9 male, 17 female) participated in this experiment. Children ages ranged between 5; 1 and 6; 1 (mean 5; 8), young adults between 19;2 and 35;1 (mean 26;2) and elderly

adults between 65;7 and 85;9 (mean 73;10). Children were all native monolingual normal developing speakers of Chilean Spanish and attended Kindergarten classes at a private School in the city of Valparaíso, Chile. Young adults were either university students or professionals with a university degree. Elderly adults had all completed formal school education (a total of 12 years) and nine of them also had completed university studies. Two of the elderly adults failed to follow instructions and where left out of the analysis. All children and young adults completed the task as expected.

Material

(a) Elicitation task: The material consisted of eight six-picture storybooks. All story-books included two characters of the same gender and had two versions: one designed to elicit topic continuity, with the same protagonist throughout the story and one designed to elicit a topic shift, with a change of protagonist towards the end.

The structure of the pictures was as following: in the first picture, the first character is present alone. In the second picture, the first character is in the fore-ground and the second character appears in the background. The third picture is a close up on the first character performing an action. In the fourth picture both charac-ters are present again and the first character performs an action that affects the second one, who remains passive. The idea of this structure is that in the fourth picture we achieve a situation where the first character is the topic and is realized in subject posi-tion, while the second character is a non-topic (his presence in the second picture –and his passiveness in the fourth– should diminish the probability that speakers fo-cus their attention on him and make an unwanted topic shift). The remaining two pic-tures have two versions: in one version, the first character appears both in the second to last (target) and last pictures. In the other version, the second character is the one that appears in these pictures. The first version is designed to elicit topic continuity, so that adult speakers are expected to use a NSP to refer to the character of the fifth picture (provided that the character was realized as subject in the previous utterance).

The second is designed to elicit a topic shift, so that adults are expected to use a full NP to refer to the character of the fifth picture. See table 4.1 and the examples of storybooks below (Fig. 4.3 and 4.4, the target picture is signaled with a red border).

	Character 1		*Character 2*		*Goal*
Pict.	*Description*	*Expected*	*Description*	*Expected*	
1	alone	indef. NP- subject	absent	-	introduce character 1
2	foreground	NSP or object pronoun	background	indef. NP-subject or indef. NP-object	introduce character 2
3	close-up	NSP or def. NP-subject	absent	-	consolidate character 1 as topic
4	gives object	NSP	receives object	def. NP-object or object pronoun	elicit topic continuity
SHIFT ELICITATION					
5 a	**absent**	**-**	**alone**	**def. NP-subject (TARGET)**	**elicit topic shift**
6 a	absent	-	alone	NSP or def. NP-subject	avoid discourse-final effects at 5a
CONTINUE ELICITATION					
5 b	**alone**	**NSP (TARGET)**	**absent**	**-**	**elicit topic continuity**
6 b	alone	NSP or def. NP-subject	absent	-	avoid discourse-final effects at 5b

Table 4.2 Description of storybooks experiment 7 (pictures 1 to 6)
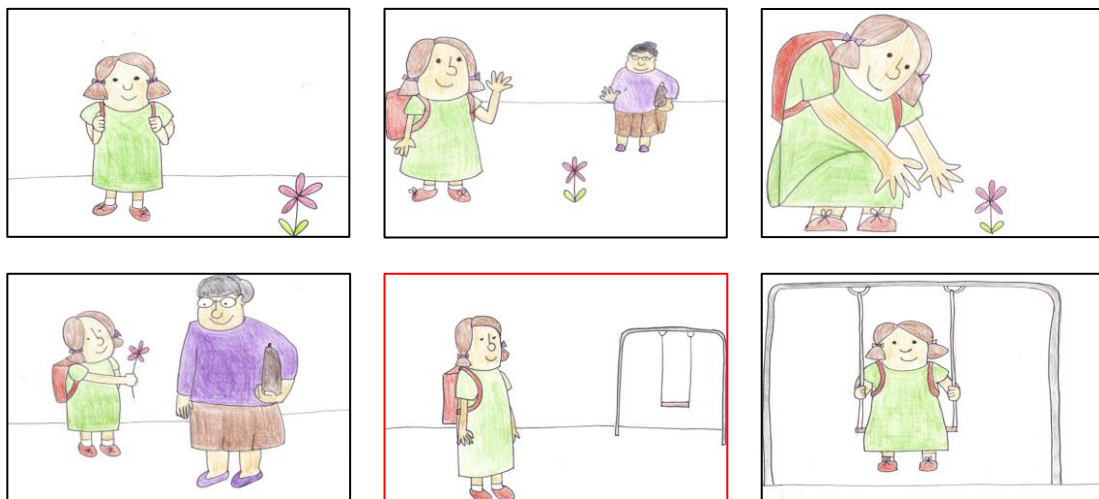
Fig. 4.4 Experiment 7. Example Topic Continuity condition
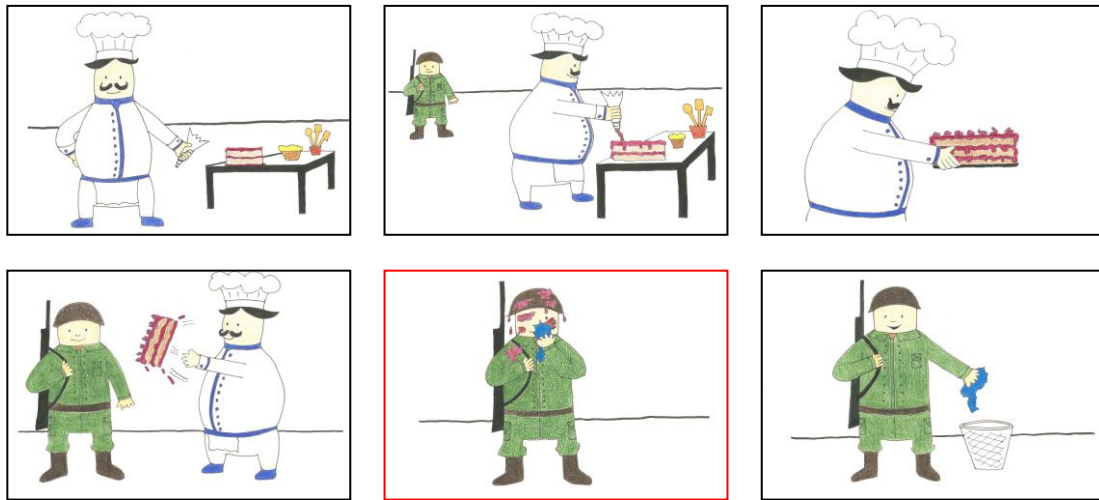
Fig. 4.5 Experiment 7: Example of Topic Shift condition

Two counterbalanced sets of storybooks were constructed. In each, half the items corresponded to the first version and half to the second. A single block randomization of the two forms was made. Reversion of the forms to rule out ordering effects resulted in four forms. Each form was inserted into a *PowerPoint* presentation, with single pictures of the storybooks occupying whole slides to be shown in a 14" full screen. The presentations also included an introduction of all characters, two practice items and partial instructions to be read aloud by the experimenter.

(b) Memory Test: like in the other experiments, the ITPA test was applied.

Procedure

Sessions took place in a quiet room and lasted around fifteen minutes. The procedure was similar to the one of the precedent experiment: two experimenters were present; one of them gave the instructions and showed the storybooks to the participant. The

other one sat further away in front of another computer and was the addressee of the story told by the participant.

Before looking at the storybooks, participants saw on screen pictures containing all characters present in them. Children were asked to identify each character. Like in the previous experiment, these were prototypical (nurse, none, football player, fireman, cook, etc.). The drawings were as simple as possible to avoid focusing in details irrelevant to the experiment. After the characters were identified, the tester told a practice story from a three-picture story-book as example. Then the participants told a second practice story with the same structure. Questions regarding the procedure were answered. Then the experiment began and no more questions were accepted.

Each story was presented twice in a row, picture by picture. The first time, participants only observed the sequence; the second, they had to describe what happened. The resulting discourses were registered with a portable voice recorder and later transcribed.

Results

(a) Elicitation Task: the analyses included three factors: Type of expression (NSP, full NP, OSP and Other), Type of Story (Continue or Shift) and Age Group (Children, Adults and Elderly Adults).[33] Type of expression concerned only the expressions used in subject position to describe the fifth picture of the storybooks, provided that in the preceding utterance (description of the fourth picture) the character referred to in subject position was a continued topic (the girl in fig. 4.4 and the cook in fig. 4.5). This was always the case, except for the discourses produced by two elderly participants, who were left out of the analyses. When participants used two sentences to describe the target picture, only the first was considered for the analysis.

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[33] The 'Other' responses include mainly demonstrative pronouns like 'éste' o 'ésta' (masculine or feminine 'this').

Continue Storybooks

	Children	Elderly Adults	Young Adults
NSP	92,9	76,9	84,8
Full NP	6,2	18	10,7
OSP	0,9	5,1	4,5
Other	0	0	0

Shift Storybooks

	Children	Elderly Adults	Young Adults
NSP	41,1	19,6	2,7
Full NP	57,1	64,1	83
OSP	1,8	6,7	9,2
Other	0	9,6	5,1

Two repeated measures ANOVA were performed, one on the basis of the type of expression's proportions per participant (F1, averaged over items) and one on the type of expression's proportions per item (F2, averaged over participants). The analyses showed a main effect of Type of expression ($F1(3,237)=195.124$, $F2(2,12)=105.505$, $p<.001$) and two-way interactions between Type of expression and Age Group ($F1(6,237)=7.982$, $F2(4,12)=18.294$, both $p<.001$) and between Type of expression and Type of story ($F1(3,237) =256.307$, $p <.001$, $F2(2,12)=174.593$). These interactions were modified by a three-way interaction between all factors ($F1(6,237)=6.491$, $F2(4,24)=8.824$, both $p<.001$).
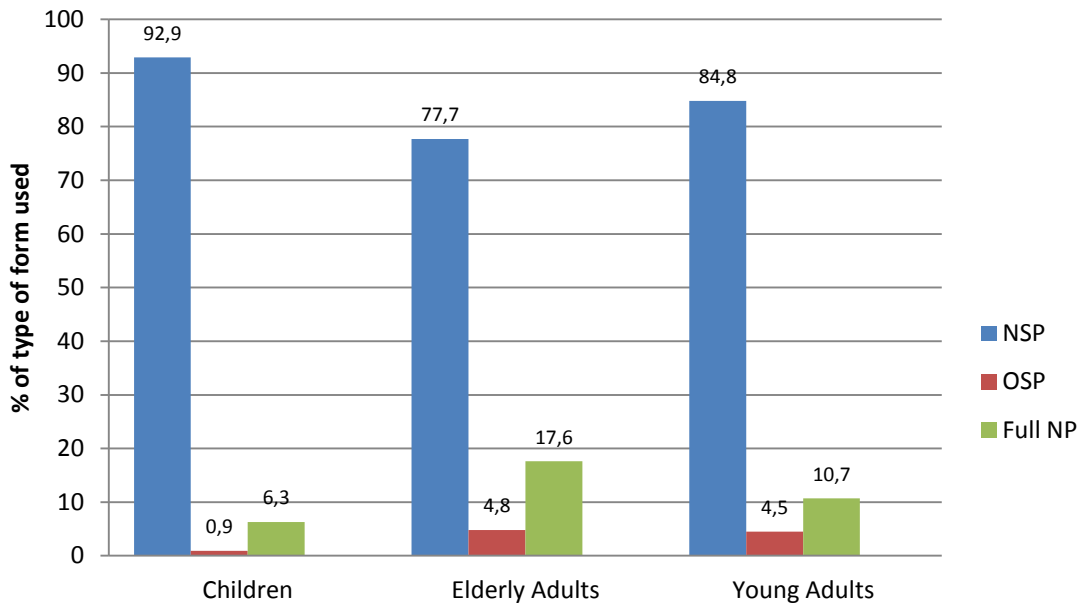
Figure 4.5. Experiment 7. Use of referring expression in the Continue condition.

Follow up analysis showed that, in each age group, there was a significant interaction between Type of expression and Type of Story (Adults (F1(3,81)=181,383, F2(2,12)=116.319), Children (F1(3,81)=65,568, F2(2,12)=44.570), Elderly Adults (F1(3,75)=47.760, F2(2,12)=38.395, all p <.001). All groups produced a majority of NSP in the Continue condition and a majority of full NSP in the Shift condition (OSP were marginally used by adults and elderly adults in both conditions). The distribution of the expressions between groups was similar in the Continue condition. Adults used NSP 84,8% (SE 4%) of the time, while their use of full NP reached 10,7% (SE 3%) and of OSP 4,5% (SE 3%). In the case of Children, the use of NSP was of 92,9% (SE 7%), while full NP reached 6,2%; (SE 3%) and OSP 0,9% (SE 1%). Finally, elderly Adults' use of NSP was of 76,9% (SE 4%), while their use of full NP was of 18% (SE 4%) and of OSP of 5,1% (SE 2%). In all cases, the difference between NSP and the other options was significant (all p-values<.05). In the

shift condition, however, we find different distribution patterns. Children produced a high percentage of NSP (41,1%), which was not significantly different from the amount of full NP (57,1%; SE 6%) (both p-values >.1). In the case of young and elderly adults, the difference between NSP and full NP was significant. Adults used full NP 83% of the time (SE 4%), while NSP remained practically unused (2,7%; SE 2%) (both p-values <.001). Elderly Adults, in turn, also used a majority of full NP (64,1%; SE 5%), which was significantly different from their use of NSP (19,6%; SE 4%) (both p- values <.05).

(b) Memory test and correlations: A Univariate ANOVA showed that the difference between the memory scores of children (mean=8.54, SD=2.009), young adults (mean=23.11, SD=2.149) and elderly adults (mean=16.23, SD=4.910) was highly significant ($F(2,79)=140.548$, $p<.001$). Young adults got higher scores than elderly adults, which in turn got higher scores than children. There was no significant correlation between memory scores and age (children, r=.140, p>.1, adults r=-,045, p>.5, elderly adults r=.065, p>.5), nor between memory and the results of the experiment within each group (analyzed on the basis of NSP use) in any of the two conditions (Continue condition: children, r=-.179, p>.1, adults, r=.227, p>.1, elderly adults, r=.095, p>.5; Shift condition: children, r=-286, p>.1, adults, r=-.127, p>.5, elderly adults, r=.060, p>.5). The difference between age and results was neither significant in the Continue condition (children, r=.031, p>.5, young adults, r=.206, p>.1, elderly adults, r=-.292, p>.1) nor in the Shift condition: children, r=-.333, p=.083, young adults, r=-.095, p>.5, elderly adults, r=.246, p>.1). However, children's results in the Shift condition appear to show a tendency of younger children to use more NSP than the older ones.
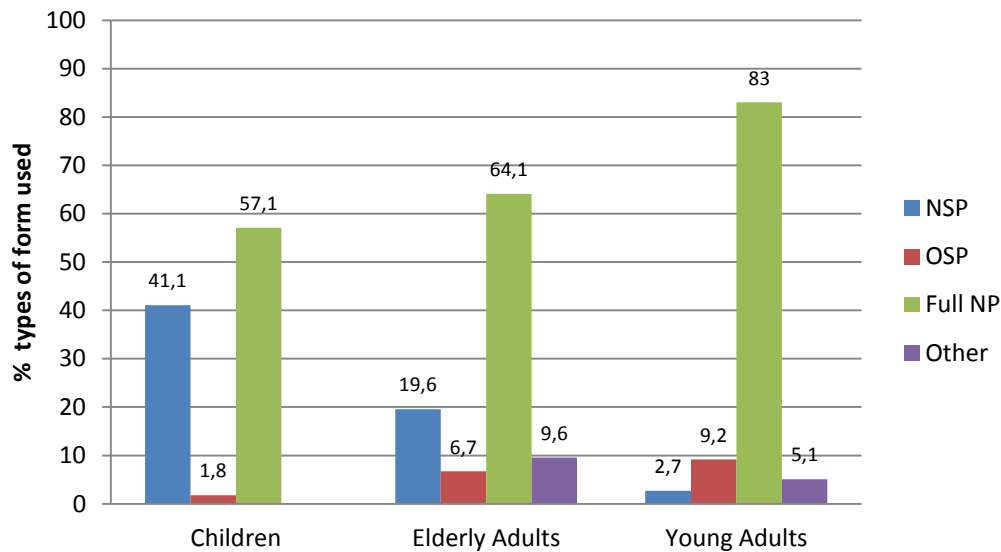
Fig. 4.6 Experiment 7. Use of referring expressions in the Shift Condition

Discussion

The prediction of the *Topic* hypothesis was that young adults were going to produce NSP in the Continue stories, but not in the Shift stories. Instead, it predicted that they were going to produce OSP. Further, the prediction was that children and elderly adults were going to produce NSP in both conditions. The predictions were confirmed with one exception: as we thought, OSP were not used by adults to shift the topic. Instead, definite NP was the option.

The marginal cases of OSP in adults confirm that the *Topic* hypothesis cannot be right. OSP only appeared in counted occasions, which were equally distributed between the two conditions. If this hypothesis were right, then there is no reason not to produce OSP in the Shift stories. And even seeing them just as a possible alternative to full NPs, at a minimum they shouldn't have appeared in the Continue condition. Like in the previous experiment, our explanation is that the storybooks didn't elicit an appropriate context for OSP. In the next chapter, and considering both the

comprehension and the production experiments as a whole, we will elaborate on what is needed for an OSP to be felicitously used. A view based on rhetorical (coherence) relations may provide a plausible explanation.

Even though all participants produced a majority of definite NP in the Shift stories, elderly adults and especially children produced a high percentage of NSP, a form that was practically absent in the case of young adults and that may lead the hearer to assign the NSP to an unintended character. An example of this is (1) below. The discourse, produced by a child that participated in the experiment, is based in the storybook of the cook above (fig. 4.4). To describe the target picture, this child used a NSP in the fifth sentence (bold). This might lead a hearer to interpret the NSP as referring to the cook and not to soldier, as was the child intention:

(1) a. Había   un cocinero que estaba preparando   un pastel
       There was   a   cook   that   was   preparing   a   cake
       'There was a cook that was preparing a cake'

   b. Y   se   encontró con un militar
      And REFL *met   with a   soldier*
      'And he met a soldier'

   c. Después   se   lo   iba   a pasar al   militar
      *Then   NSP him-*CLIT *it-*CLIT *was going to give to the soldier*
      'Then he was going to give it to the soldier'

   d. Y   se   lo   tiró
      *And NSP him-*CLIT *it-*CLIT *threw*
      'And he threw it to him'

   e. Entonces   se   limpió en la   cara con un paño
      Then   NSP REFL *cleaned in the face with a   towel*
      'Then he cleaned himself in the face with a towel'

   f. Y   botó el   paño
      And NSP threw the towel
      'And he threw the towel'

The results of elderly adults suggest that processing limitations are at stake, as claimed by Hendriks et al (2008). It can be argued that the results are directly related to the pattern observed in the comprehension of NSP (Experiment 5). Elderly adults sometimes might not be able to retain and take into account the structure of the preceding discourse, both in interpreting and in producing pronouns (however, this was not supported by correlations between the results and the memory test). In the case of children, as we argued in the previous chapter, it might be that they just haven't learned the preference of NSP for topic antecedents (to learn it, probably they need to be able to retain the syntactic structure of them first). In comprehension, they go for the easiest interpretation (like a previously established topic or the most recently named entity). In the case of production, they opt for the most economical form: the NSP. This leads to adult-like results in cases like the ones elicited by the Continue condition and to a different pattern in cases like the ones elicited by the Shift condition. Adults, in turn, can consistently interpret NSP as referring to the previous topic (the subject or first mentioned entity in absence of other cues) and use it to refer to topic antecedents (the subject or first mentioned entity when both antecedents have the same form).

4.3 SUMMARY

In this chapter, we have presented two production experiments concerning the use of subject pronouns. The first of them (experiment 6) showed that, when adults produced discourses with parallel pairs of sentences, they used NSP to refer to antecedents in a parallel position and full NP to refer to antecedent in a non-parallel position. Against the *Parallelism* hypothesis, OSP were not used at all. If OSP are characterized for taking the complementary preference of NSP in pairs of parallel sentences, then there is no reason not to use them. The second production experiment showed that adults produced NSP to refer to topic antecedents and full NP to refer to non-topic antecedents. Against the *Topic* hypothesis, OSP remained almost unused (and,

when they showed up, they were used both to refer to topics and to non-topic antecedents). If, as the *Topic* hypothesis proposes, OSP are supposed to be used to refer to non-topic antecedents, then there is no reason for this outcome.

The comprehension experiments had already shown that the different versions of the *CAP* approach made wrong predictions. Together, the production experiments provide further evidence against *CAP*. In the next chapter, we look for an alternative explanation in terms of rhetorical (coherence) relations.

In the case of children, both experiments showed similar results. Children, like adults, used NSP to refer to antecedents in parallel positions (in experiment 6) and to topic antecedents (in experiment 7), but preferred full NP for non-parallel and for non-topic antecedents. Nevertheless, they sometimes also used NSP in the latter case, something that adults avoided completely. In experiment 7, a group of elderly adults also participated. The fact that they also overproduced NSP suggests that processing limitations affect pronoun production. This need not mean that children have complete knowledge but cannot apply it. It can also mean that these limitations have prevented them from completely acquiring the relevant knowledge that determines adults' preferences. The next chapter will consider comprehension and production together and sketch a possible way of explaining the overall results.

5   GENERAL DISCUSSION

In this chapter, we discuss the overall results of the experiments. In section 5.1, we summarize the main findings for adults. These indicate that the *CAP* approach is inappropriate to account for the contrast between NSP and OSP. In section 5.2 we consider an alternative approach based on rhetorical (coherence) relations (*RRAP*), which offers better perspectives to understand some aspects of adults' and children's performances in the experiments. Then we go on to discuss the comprehension and use of NSP under this approach (section 5.3). We note that in some of the experiments the establishment of rhetorical relations is not enough to link the NSP with one particular antecedent over the other. We propose that, in those cases, the topic status of the antecedents may be crucial to interpret or use this pronoun felicitously. Selecting the antecedent topic as a preferred interpretation (or producing the pronoun felicitously to refer to it) often requires the hearer/speaker to retain and use information about the structure of the previous sentence, something that could be too demanding for children around the age of five. This can explain why they resort to alternative, less demanding strategies. Going to the case of OSP (section 5.4), we consider the idea that, under certain conditions, these pronouns induce the establishment of rhetorical relations like *Parallel* or *Contrast*. We affirm that these conditions were often not met by the discourses used and elicited in the experiments. This may explain why in most cases OSP is interpreted by adults at chance level and why children applied alternative strategies.

5.1 EVIDENCE AGAINST THE *CAP*

5.1.1 Comprehension

The results obtained by adults in the experiments have shown that the predictions made by different versions of the *CAP* approach were not successful. In all cases, the NSP exhibited a clear preference for a given antecedent, but OSP did not show the complementary preference of it (see table 5.1). Moreover, in three of the four experiments that included OSP, interpretation was at chance level. Only in one of the two experiments with parallel sentences (Experiment 3), OSP was preferably interpreted as referring to the complementary preference of NSP. However, this preference was much weaker that the one that the NSP had for parallel antecedents.

	NSP	*OSP*
	% of winning preference	% of complementary preference
Strong Complementarity		
Experiment 1	88,9	52,1
Parallelism		
Experiment 2	99	58
Experiment 3	Not tested	62,5 (Parallel)
		51,8 (Non-parallel)
Topic		
Experiment 4	89,3	57,1
Experiment 5	84,5 (Cont.)	Not tested
	81 (Shift)	

Table 5.1 Adults' overall performance in comprehension experiments

A defender of the *CAP* view may argue that the discourses used in the experiments were not felicitous and that, in other contexts, OSP will clearly show the complementary preference of NSP. The *Parallelism* and the *Topic* hypotheses pre-

dicted OSP to be felicitous under well defined circumstances. Their predictions failed. But maybe if these circumstances are further restricted, a different version of one of the hypotheses could be supported by experimental evidence. However, imposing further conditions would result in less explanatory power. As we will see in the next section, OSP can occur in a variety of contexts, to the point that any version of complementarity would only be capable of covering some, but not all of them. Crucially, we will see that OSP may occur in contexts were only one antecedent is present and in contexts where –under the presence of two possible antecedents– the preferred antecedent is the same than the one chosen by the NSP. Both cases fall beyond any possible version of complementarity, so they need additional, explanations. As far as we can see, it seems better to look for a principled account that explains OSP in its own right. That is, not just as a counterpart to the anaphoric preference of NSP, but as a form that has particular effects in meaning. [34]

5.1.2 Production

The results obtained by adults in the production experiments are fully consistent with the results obtained in comprehension. If OSP are not interpreted as referring to the complementary preference of NSP in the discourses used, then there is no reason to use them with that intention in similar discourses. Instead, every time the speakers wanted to refer to an entity different from the one the NSP would select, they chose a

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[34] We notice two cases not considered in our experiments where complementarity probably obtains:

(a) Discourses with two pronouns, like 'Juan encuentra a Pedro. NSP/Él le cuenta un secreto` (John meets Pedro. He/HE tells him a secret). Here, when an OSP is used, the clitic form 'le'(him) probably prefers to pick out the previous subject (Juan), so that the OSP would select the object, Pedro. This indicates that, when interacting with a weaker pronoun, OSP may refer to the less salient antecedent.

(b) Coordinated discourse like 'Juan empuja a Pedro y NSP/él cae al suelo' (Juan pushes Pedro and ø/he/HE falls to the floor). Here, the absence of an overt subject seems to be equivalent to English NP ellipsis, and indicate that Juan fall to the floor, while the OSP may correspond to the unstressed 'he', and refer to Pedro. This shows that the correspondence between NSP/OSP and unstressed/stressed English pronouns does not always obtain. OSP sometimes cover cases that correspond to unstressed pronouns. In (a) and (b), the complementarity between the forms results from an interaction with other factors and not from inherently different anaphoric preferences.

full NP. OSP remained almost unused. The counted occasions in which they appeared (only in Experiment 7) were evenly distributed between references to the previous topic (subject) and to the previous non-topic (object).

	NSP	*OSP*
	% of use to refer to…	% of use to refer to…
Parallelism	parallel antecedent	non-parallel antecedent
Experiment 6	67,9	0
Topic	topic antecedent	non-topic antecedent
Experiment 7	84,8	4,5

Table 5.2 Adults' performance in production experiments

The option of using full NP cannot be explained by a general reluctance to pronominalize, because speakers were ready to use NSP when appropriate. It has been noticed, however, that when an entity is introduced in an object (or not first mentioned) position, it is common in Spanish to repeat the name in subject (initial) position before it is pronominalized (cf. Taboada 2008). This might have been a reason why pronominal forms remained completely unused in one of the conditions of Experiment 6 (where the second character is discourse-new in the utterance preceding the target scene), but not in the corresponding condition of Experiment 7 (where the second character is discourse-old before before the target picture is described).

The results can neither be directly explained as an attempt to avoid gender ambiguity for, if this were a motivation, then also NSP should have been avoided. However, it would be interesting to investigate whether OSP emerge when the videos and storybooks incorporate characters of different gender. Maybe if the characters had different gender, speakers would have often opted for an OSP instead of repeating the name. In that case, we would get stories like (1):

(1) a. (…) El   cocinero   toma el   pastel
      *(...) The cook-*MASC *takes the cake*
      'The cook takes the cake'

   b.   Se   lo   tira   a la enfermera
      *NSP her-*CLIT *it-*CLIT throws *to the nurse-*FEM
      'He throws it to the nurse'

   c. Ella se   limpia la   cara
      She REFL *cleans* the *face*
      'She cleans her face'

This would give some support to the idea that OSP is used to refer to elements not selected by the NSP. But the condition that they have to be distinguishable by gender would turn the *CAP* approach into a modest and limited view.[35]

Summarizing, the results obtained by adults in the comprehension and production experiments indicate that we should abandon the *CAP* view in favor of a different approach. In the next sections, we will see whether a vision based on Rhetorical relations can give a better explanation not only of adults', but also of children's (and elderly adults') performance.

5.2 RHETORICAL-RELATIONAL ANAPHORIC PREFERENCES (*RRAP)*

The rhetorical-relational view (*RRAP*) reacts against the idea that pronouns should be distinguished for having distinct anaphoric preferences. According to *RRAP*, pronoun resolution in general is a side-effect of the establishment of rhetorical (coherence) relations through a process of abductive inference (Hobbs 1990, Kehler 2002).

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[35] Note that the English version of (1) would probably involve an unstressed subject pronoun rather than a stressed one. This might be another case where the correspondence between OSP and stressed pronouns is not adequate.

As we saw in the introduction, rhetorical relations are typically signaled by the presence of connectors like 'because', 'but' or 'then', though they can also be signaled by other means, including morphological, syntactic, semantic and pragmatic mechanisms. For the sake of illustration, let us consider a case where the presence of 'because' induces an *Explanation* relation and follow Kehler's (2008) analysis of a well-known example adapted from Winograd (1972):

(2)   The city council denied the demonstrators a permit because…
      a…they feared violence
      b…they advocated violence

In the relation of *Explanation*, the hearer infers that the state or event asserted in one sentence can be explained or caused by a state or event asserted in a subsequent sentence.[36] Such inferences normally require a good amount of world knowledge. This becomes clear from Kehler's treatment of example (2), where the relevant knowledge is presented as an axiom (Kehler 2008:199):

(3)   fear (X,V) ∧ advocate (Y,V) ∧ enable_to_cause (Z,Y,V) → deny (X,Y,Z)

What the axiom says is that 'if some X fears some V, some Y advocates that same V and some Z would enable Y to bring about V, then X may deny Y of Z' (Kehler 2008:199). The match between the consequent of this axiom and the first sentence of (2) triggers an inferential process that bounds X to *city council*, Y to *demonstrators* and Z to *permit*. Then, using the information of the (2 a-b) follow-ons to match the antecedent of the axiom, we get that the pronoun 'they' receives different

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[36] Kehler (2008:109) defines Explanation as follows:

Explanation: Infer P from the assertion of S1 and Q from the assertion of S2, where normally Q→P.

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bindings in each case: the *city council* in (2a) and the *demonstrators* in (2b). Hence, the interpretation of the pronoun follows as by product of establishing *Explanation*.

If we replace the pronoun 'they' for a NSP, the example works perfectly all right in Spanish:

(4) Los concejales le negaron un permiso a los manifestantes porque
The councilors CLIT *denied a permit to the demonstrators because*
'The councilors denied the demonstrators a permit, because…'

a … temían la violencia
NSP feared the violence
'…they feared violence'

b … propugnaban la violencia
NSP advocated the violence
'…they advocated violence'[37]

Examples like (2/4) represent a problem for those accounts that base preferences at a surface structural level. For, if the pronoun itself has a preference for one of the two antecedents (say, for the one occupying the subject position), then it should pick out the same antecedent in (2a) and in (2b). Since cases like (2) are very common, a defender of this idea is often forced to point out that the preference of the pronoun can be easily overridden by the semantics or the pragmatics of the utterances involved. Kehler (2008) proposes that this can be avoided by abandoning structural preferences altogether. Under this view, the use and interpretation of pronouns would be determined by the rhetorical relations that are established in the discourse. The question is how this approach can help us to understand the contrast between OSP and NSP. If we consider OSP as a stressed pronoun, a possible answer can be found in Kehler (2005) and Kehler et al (2008).

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[37] We use 'councilors' instead of 'city council' to match the subject with the plural verb of the second clause.

For Kehler, stress in the pronoun is not to be analyzed as if it were only a feature affecting pronominalization, but as an instance of the interaction between stress in general and the establishment of rhetorical relations (see also de Hoop 2004). In particular, we can expect that the constraints imposed by certain relations require an element to be stressed under certain circumstances and unstressed under other circumstances. Correspondingly, when a subject pronoun is used in Spanish, these constraints will determine its overt or convert realization.

Let us consider the case of resemblance relations like *Parallel* and *Contrast*.[38] What characterizes these relations is the presence of commonalities and contrasts between the pairs formed by similar elements of two sentences. While *Parallel* highlights the commonalities (typically through the use of 'and'), *Contrast* emphasizes the differences (typically through the use of connectors like 'but'). Crucially, the commonalities should allow the subsumption of both sentences under one common (or contrasting) theme.[39] Hence, structural parallelism is not enough for the establishment of the relations. The sentences must also have a related semantic content.

In English, the constraints imposed by *Parallel* and *Contrast* would determine that a pronoun (in fact any referring expression) receives accent when it is not co-referential with its parallel element. In Spanish, the same constraints would determine

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[38] In Kehler (2002:16), *Parallel* and *Contrast* are defined in the following way :

   Parallel: Infer $p(a_1,a_2,…)$ from the assertion of S1 and p $(b_1,b_2,..)$ from the assertion of S2, in which for some property vector $\vec{q}$, $q_i(a_i)$ and $q_i(b_i)$ for all *i*.

   Contrast (i): Infer $p(a_1,a_2,…)$ from the assertion of S1 and $\neg\, p$ $(b_1,b_2,..)$ from the assertion of S2, in which for some property vector $\vec{q}$, $q_i(a_i)$ and $q_i(b_i)$ for all *i*.
   Contrast (ii) Infer $p(a_1,a_2,…)$ from the assertion of S1 and p $(b_1,b_2,..)$ from the assertion of S2, in which for some property vector $\vec{q}$, $q_i(a_i)$ and $\neg\, q_i(b_i)$ for some

In the first definition of *Contrast*, the predicates denoted in each sentence are contrasted. In the second, the contrast is only between entities. *P* represent a common or contrasting relation that applies over the set of entities $((a_1,a_2,…);(b_1, b_2…)$ of both sentences (S1 and S2), along with a set of common properties (q_i) of the arguments $(a_i$ and $b_i)$.

[39] Kehler (2008) talks about 'common topic' in the sense of Lakoff (1971). We prefer to use 'theme' here to avoid confusion with the term 'topic' that we have been using throughout this work.

the overt realization of the (subject) pronoun. This is shown in 5 (*Parallel*) and 6 (*Contrast*), below:

(5) Juan contacta a   Pedro por correo y…
    Juan contacts ₚᵣₑₚ *Pedro per mail   and…*
    'Juan contacts Pedro per email and…'

    a.   llama a   María por teléfono
      NSP calls ₚᵣₑₚ *María per telephone*   (NSP=Juan)
      'he calls María per telephone'.

    b. él   llama a   María por teléfono   (OSP=Pedro)
      OSP calls ₚᵣₑₚ *María per telephone*
      'HE calls María per telephone'.

(6) Cristóbal admira a   Alberto. Sin embargo…
    Juan   admires ₚᵣₑₚ *Alberto. However…*

    a.   detesta a   José   (NSP=Cristóbal)
      NSP detests ₚᵣₑₚ *José*
      'He detests José'

    b. él admira a   José   (OSP=Alberto)
      HE admires ₚᵣₑₚ *José*

    Under *Parallel* and *Contrast*, OSP would serve, then, to contrast the referent of the pronoun (or some properties of it) with that of its parallel, non-co-referential expression. NSP, in turn, would be part of the common elements that the relations require, by being co-referential with a parallel expression.[40] Anaphoric complemen-

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[40] The common themes could be, for example, how Juan communicates with his friends (5a), how a group of friend communicate with each other (5b), the feelings of Cristóbal towards other people (6a) and who admires who (6b). Note that the verbs of (6a) and (6b) have to be different to satisfy the requirements of *Contrast* (induced by 'however'). (6a) corresponds to the first and (6b) to the second definition of the relation.

tarity is obtained under these relations. However, this doesn't mean that NSP and OSP will have complementary preferences under other relations.

As Kehler et al. (2008) remark, it is not that, in general, unstressed pronouns are constrained to refer to structural parallel entities and stressed pronouns to non-parallel entities. What happens is that *Parallel* and *Contrast* relations require the fulfillment certain constraints in accentuation, while other relations impose different constraints. We can see this by considering pairs of structurally parallel sentences where the relation involved need not be of the resemblance type, but can be some kind of contiguity relation (which Hobbs (1990) and Kehler (2002) call *Occasion*), signaled by the use of 'luego'(then):[41]

(7) Ramón fue al   teatro   con Julio. Luego…
    Ramón went to the theatre with Julio. Then…
    'Ramón went to the theatre with Julio. Then…'

    a.   fue al   restaurant con Andrés
        NSP went to-the restaurant with Andrés   (NSP=Ramón)
        'He went for dinner with Andrés'

    b. él   fue al   restaurant con Andrés
        OSP went to-the restautant *with Andrés*   (OSP=?)
        'He went for dinner with Andrés'

Ignoring the details, what is important in this relation is to link the final state of the assertion of the first sentence with the initial state of the second. The relation involves no mapping between parallel entities, so it doesn't impose accent on the pronoun when this is not co-referential with the parallel element. So, in it, the use of an OSP might be infelicitous. As we will see in 5.4, this might serve to explain the results obtained by adults in the comprehension experiments. Before going to them, we will see

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[41] Kehler's definition (2008) of *Occasion* is:
    Infer a change of state for a system of entities from the assertion of S2, establishing the initial state for this system from the final state of the assertion of S1.

that the *RRAP* approach may serve to explain why OSP is used in contexts were only one antecedent is present, something that falls beyond any account presented in terms of complementarity.

As Taboada (2009) mentions, relations can be defined in broader terms than the ones normally used in the literature. The definitions of the relations could be broaden to involve not only a link between what is asserted in two adjacent or near standing sentences, but also between asserted material on the one hand, and implicated or presupposed material on the other. In particular, following Venditti et al (2002), when a stressed pronoun cannot be mapped onto a contrasting entity in the preceding discourse, a proposition may be inferred and accommodated, so that a *Contrast* between the assertion and the inferred proposition obtains. This relates the establishment of *Contrast* as a rhetorical relation with the notion of 'contrast' present in the literature on information structure. For Rooth (1992), for example, accent is a way of marking constituent (or narrow) focus, which evokes a contextually salient set of contrasting alternatives to the accented element. One of these alternatives might help provide a relevant proposition that can bear a relation of *Contrast* with what is actually asserted in discourse.[42]

In (8), for example, only one of the antecedents is possible, since they have different gender:

(8) Jaime   es amigo de Alicia.   Él   viene de   Sevilla.
     Jaime-MASC is *friend of Alicia*-FEM.   *HE comes from Sevilla.*
     'Jaime is (the) friend of Alicia. HE comes from Madrid'

Here, a *Contrast* can be established by inferring and accommodating the proposition that 'Alicia is not from Sevilla', where Alicia is contrasted with Jaime.

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[42] A proper account should make clear how both notions of contrast are related. See Umbach (2004) for an overview of different ways of understanding 'contrast' and Matos-Amaral and Schwenter (2005) and Mayol (2010) for different approaches to the relation between OSP and contrast.

An explanation on these lines may be extended to cases were only one antecedent is present, and the contrast can be established between the referent of this antecedent and the speaker (9a). Further, it may cover a range of indexical (non anaphoric) uses of OSP, where the presence of second and first personal OSP may serve to establish a *Contrast* relation involving the hearer and the speaker ((b), (c) and (d)) or one of them and a third discourse entity ((c) and (d)):

(9) Francisco tiene muchas deudas…
   Francisco has many debts…
   'Francisco has many debts…'

  a. Y   él   cree   que   las   va   a   poder pagar
     And HE believes that NSP them-$_{CLIT}$ *is going to   can   pay*
     'And HE believes that he will be able to pay them'

     Inferred proposition: 'The speaker doesn't believe that Francisco will be able to pay his debts' (Francisco and the speaker are contrasted)

  b. Y   tú   crees   que   las   va   a   poder pagar
     And YOU believe that NSP them-$_{CLIT}$ *is going to   can   pay*
     'And YOU believe that he will be able to pay them'

     Inferred proposition: 'The speaker doesn't believe that Francisco will be able to pay his debts' (The hearer and the speaker are contrasted)

  c. Y   yo voy   a   tener que pagarlas
     And I   am going to have to   pay them-$_{CLIT}$
     'And I will have to pay them'

     Inferred proposition: 'Francisco won't have to pay his debts' or 'The hearer won't have to pay Francisco's debts' (The speaker and Francisco or the speaker and the hearer are contrasted)

  d. Y   tú   vas   a   tener que pagarlas
     And YOU are going to have to   pay them-$_{CLIT}$
     'And YOU will have to pay them'

Inferred proposition: 'Francisco won't have to pay his debts' or 'The speaker won't have to pay Francisco's debts' (The speaker and Francisco or the speaker and the hearer are contrasted)

Summarizing, the *RRAP* approach seems to offer better perspectives to account for the relation between NSP and OSP. The approach will serve to explain part of the results obtained in the experiments. We will note that many of the discourses used or elicited do not trigger the establishment of clear relations, in which case adults and children resort to different strategies.

5.3 RHETORICAL RELATIONS AND NSP IN THE EXPERIMENTS

5.3.1 The topic preference

Of the discourses used in the experiments, only the ones that evaluated the *Parallelism* hypothesis (Experiments 2 and 3) had clear cues to infer rhetorical relations. These discourses included the connectors 'Primero ('first')….Después ('then')…' (which typically signal *Occasion*) and parallel sentences with a common verb (which normally trigger the establishment of *Parallel*):

(10) Primero la mamá le   pasa un pincel   a la niña
      *first   the mother her-*CLIT *gives a   paintbrush to the girl*
      'First the mother gives a paintbrush to the girl'.

   a. Después   le   pasa una caja al   papa
      *then   NSP him-*CLIT *gives a   box to the father*
      'Then she gives a box to the father'

   b. Después ella le   pasa una caja al   papa
      *then   she him-*CLIT *gives a   box to the father*
      'Then SHE gives a box to the father'

But experiments 1, 4 and 5 didn't provide clear cues. There were no conjunctions, no parallelism, and no semantic or pragmatic hints triggering relations that favored one antecedent over the other, at least within the spectrum of relations considered by Kehler (2002) and Hobbs (1990)). Surely, hearers may infer a more or less plausible relation, but the discourses were constructed in such a way that this couldn't easily serve to solve the pronoun, as the following story used in Experiment 4 shows:

(11) a. Un   cocinero   está limpiando   un restorán
          A   cook   is   cleaning   a   restaurant
          'A cook is cleaning a restaurant'

      b.   Llama a un mozo
          NSP calls   ᴀ a   waiter
          'He calls a waiter'

      c. El   cocinero lava   los platos con el   mozo
          The cook   washes the dishes with the waiter
          'The cook washes the dishes with the waiter'

      d.   Está aburrido de trabajar
          NSP is   bored   of working
          'He is bored of working'

Here, it is not clear what the relation between the two last sentences might be. The state described in the second sentence can arguably be interpreted, for example, as a consequence of the situation of the first, so that a *Result* relation obtains. But, since both characters work washing the dishes, any of them could be bored. However, the experiments showed that the NSP is clearly interpreted as referring to the cook. As we have discussed in the previous chapters, this could be the effect of a preference of NSP for subjects, first mentioned entities or topic antecedents. Though in this case it cannot be distinguished between the three, there is some evidence that the topic status of the antecedent seems to be the most important, as the examples in (12) below suggest:

(12) a. Pedro saluda a   Diego.   Está feliz
        Pedro greets ₚᵣₑₚ *Diego. NSP is   happy*
        'Pedro greets Diego. He is happy'

                                                                (NSP=Pedro)

    b. A Diego lo   saluda   Pedro.   Está. feliz
       ₐ *Diego him-*ᴄₗᵢₜ *greets   Pedro NSP is   happy*
      (Left dislocated direct object, roughly equivalent to 'It is
      Diego who Pedro greets')

                                                                  (NSP=Diego)

    c. Diego camina en la   playa. Pedro lo   saluda.   Está feliz.
      *Diego walks   at the beach. Pedro him-*ᴄₗᵢₜ *greets NSP is   happy*
      'Diego walks at the beach. Pedro greets him. He is happy'
                                                                (NSP=?)

Like in (11), it seems that rhetorical relations do not provide clear help. The fact that the referent of the pronoun 'is happy' could be interpreted as a *Result* of being greeted (in which case Diego should be preferred) or it could be seen as an *Explanation* for greeting somebody (in which case Pedro should be preferred). But none of these relations can explain why (12a) and (12b) receive different interpretations. So we go on to see whether subject position, first-mention or the topical status of the antecedents can serve to explain the preferences.

    Supposing that the entities referred to with proper names above are all discourse-old (so that, according to our assumptions, they can qualify as topics), we can see that, in (12b), where the object is dislocated, the preferred interpretation is not Pedro (like in 12a), but Diego. This speaks against a subject preference and in favor of a preference for first-mentioned antecedents. First-mention, in turn, can be taken as one of different factors determining topicality, like discourse-oldness and referential form (see Casielles-Suárez 2004 for more Spanish examples of topicalizing dislo-

cated constructions).[43] The fact that there are different factors would explain why in (11c) the NSP is not readily interpreted as referring to the first mentioned entity of the antecedent sentence (Pedro). Given that Diego is realized as a pronoun (the clitic 'lo') in the antecedent sentence, it also becomes a topic candidate for that sentence and, in consequence, a plausible antecedent for the pronoun. When both antecedents are realized with the same form, like in the third sentence of (11) above, the final NSP favors the first mentioned antecedent.[44]

In the previous chapters, we have assumed that topics have to be discourse-old. This implies that discourse initial sentence will generally lack a topic. Despite this, it seems that an NSP in the following discourse would still be interpreted as referring to the first mentioned antecedent:

(13) a. Un hombre saluda a   un niño.   Está feliz
          A man   greets PREP *a boy.   NSP   is   happy*
          'A man greets a boy. He is happy'

                                                                    (NSP=the man)

We assume that, in this case, hearers select the entity that has more probability of becoming the topic of the following sentence. Since NSP are typically used to refer to topics in an on-going discourse and given that they are most often the first-mention entity in the antecedent sentence, NSP following a discourse initial sentence are also interpreted as referring to the entity in this position. From the production perspective, selecting a NSP to refer to topic antecedents seems to obey the Gricean maxim of quantity: the most reduced form is used to refer to the most salient antecedent.

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[43] Example (12b) also speaks against a preference for agents over patients. Further evidence can be found in passive constructions like 'Diego es saludado por Pedro' ('Diego is greeted by Pedro'), where the NSP is also preferably interpreted as referring to Diego.

[44] The interaction between form and position of the antecedents as determining the referent of a pronoun is expressed by Kameyama (1999) through two different rankings of preferred centers of attention. Following standard accounts of Centering Theory for English, the position ranking is stated in terms of grammatical role. The form ranking, in turn, is similar to Gundel et al (1993) hierarchy. When the highest ranked entity of the rankings is not the same, her proposed algorithm renders the referent of the pronoun as undetermined. This aspect differs from standard Centering accounts, were the form of the antecedents do not play the same role.

Following the RRAP view, we propose that NSP are generally interpreted as a by-product of inferring rhetorical relations that give coherence to the discourse. However, as we have seen in this section, the establishment of these relations interacts with a preference of NSP for topic antecedents. Often, when rhetorical relations do not clearly guide the resolution of a NSP, the preference for topic antecedents is determining. Considering this, in the next two sections we can give a possible explanation to the results obtained by adults and children in the experiments. [45]

5.3.2. Adults' Comprehension and production of NSP

The explanation for how adults interpreted NSP in the experiments follows from what we have presented in the sections above. The discourses of experiment 2 provided both connectors and parallel sentences that could trigger the inference of rhetorical relations, as shown by (10), repeated here as (14) (omitting the variant with OSP):

(14)   Primero la mamá le   pasa un pincel   a la niña
       *first   the mother her-*CLIT *gives a   paintbrush to the girl*
       'First the mother gives a paintbrush to the girl'.

       Después   le   pasa una caja al   papa
       *then   NSP him-*CLIT *gives a   box to the father*
       'Then she gives a box to the father'

The presence of 'First… Then' usually signals an *Occasion* relation. In Hobbs (1990) and Kehler's (2002) account, *Ocassion* is inferred by relating the final state asserted in the first sentence with the initial state of the second. In (14), however, the two actions seem to be independent from each other, in the sense that what happens in the second situation is not linked to the final state of the first (as it would be if the

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[45] The relation between Spanish NSP and topic antecedents seems to be in line with Italian. NSP (see Samek-Ludovik (1996) and Frana (2009) for Italian).

object that is handed over in each case were the same). So it seems that, at least under the definition that Kehler makes of the relation, it doesn't clearly help to solve the pronoun.[46] Interestingly, in Asher and Lascarides (2003), the correspondent relation (which they call *Narration*) incorporates a constraint that requires the presence of a common theme that summarizes the narrative (similar to what Kehler's requires from *Parallel*). The more informative a summary is, the more coherent the passage results. Applied to anaphora resolution, this constraint could contribute to solve the pronoun: an interpretation in which the same entity performs the two actions would probably provide a better summary than one in which the actions are performed by two different entities. So the relation could favor 'la mamá' in (14).[47]

Now, (14) also offers the possibility of inferring a *Parallel* relation, given the presence of entities that can be mapped onto each other and of a common verb. As we have seen above, the NSP in this case would be preferably interpreted as referring to the entity occupying the same position in the antecedent sentence so, again, the relation would favor an interpretation where the NSP refers to the mother.

Finally, the topic preference that we have observed also points in the same direction. By way of being the first mentioned entity, 'la mamá' would be the best candidate to become the topic of the second sentence. So, given that different strategies seem to favor the same referent, it is not strange that in Experiment 2 the NSP preference for the first antecedent was almost of 100% (table 5.3 below repeats the relevant results of NSP interpretation).

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[46] In other cases, a verb of transfer of possession might show a preference for the antecedent that has the thematic role of Goal, like in 'John gave the book to Jim. He …' (see Stevenson, Crawley and Kleinman (1994). In our discourses the presence of 'después' ('then') blocks this reading.

[47] Asher and Lascarides (2003) do not present this constraint in relation to the resolution of anaphoric pronouns. The idea that reduced forms like NSP tend to be associated with the most informative interpretations is central to Levinson (1987, 2000) account of anaphoric pronouns. Co-referential interpretations are generally regarded as more informative about one referent than non-co-referential about either referent.

	NSP interpretation	
Experiment 1	88,9	non-parallel
Experiment 2	99	parallel
Experiment 3	-	-
Experiment 4	89,3	continued topic
Experiment 5	84,5	continued topic
	81	topic-shift

Table 5.3 NSP preference for subject (first-mentioned) antecedent (Adults)

In experiments 1, 4 and 5, the situation is a little bit different. As we have seen, these discourses seem to be underdetermined from the perspective of rhetorical relations. We believe that the preference that adults showed is the result of selecting the topic (experiments 4 and 5) or the most probable topic (experiment 1, where the antecedents appear in a discourse-initial sentence) as the referent of the NSP. Experiment 5 showed that this preference seems to be quite independent of the topical status of the entities in the discourse preceding the last sentence before the final pronoun (the Continue and Shift conditions this status was different). So the evidence points to the use of the immediate local discourse to solve the pronoun and not to more global considerations. The absence of clear rhetorical cues may explain why the preference was milder in these experiments than in experiment 2.

Going to the results of the production experiments, we can see that adults' choices of referring expressions are in correspondence with their preferred interpretations. Whenever speakers had to communicate meanings like the ones they assigned to NSP in the comprehension experiments, they preferred to use this form. When other meanings were intended, they chose another form.

The fact that in Experiment 7 more NSP were produced is probably related to the nature of the tasks. In experiment 6, the relevant utterance was a description of the third scene of a video, where the action presented was similar, but independent of the one present in the second scene. So maybe the discourse was too short and the actions too disconnected to encourage the use of pronouns. So, repeating the full NP

instead of using a NSP was not a bad option. In Experiment 7, in turn, the picture of the storybook that has to be described was the fifth of a well-connected and sound story with a clear protagonist. So, the repetition of a full NP was less preferred. Finally, we note that in experimental settings speakers tend to be more explicit and informative than in real communication situations, where a higher percentage of NSP can be expected for the kind of situations described.

	NSP production	
Experiment 6	*same agent*	*different agent*
	67,9	6
Experiment 7	*topic*	*non-topic*
	84,8	2,7

Table 5.4. Production of NSP (Adults)

5.3.3 Children's comprehension and production of NSP

Considering our view about how interpretation and production of NSP was determined in adult language, we can go now to the case of children. We begin with the comprehension experiments (Table 5.5 below recalls the relevant results. In brackets we include the percentage of preferences for the alternative available antecedent, since sometimes children gave responses that identified the pronoun with a third entity, not present in the discourse). We will first go experiment by experiment to get a clearer idea of what may have determined the results. While the discussions in chapter 3 have already suggested possible explanations for each experiment, here we incorporate insights from the *RRAP* approach and from the topic preference into the discussion. Then we go on to consider whether the single explanations can form a consistent, general picture.

	NSP interpretation
Experiment 1	36,1 (vs. 54,2)
Experiment 2	53,3 (vs. 40,5)
Experiment 3	-
Experiment 4	58,9 (vs.37,5)
Experiment 5	53 (vs. 41,6) in Cont. cond. 41,7 (vs. 51,2) in Shift cond.

Table 5.5.NSP preference for subject (first-mentioned) antecedents (Children)

Recall the kind of discourses used in experiment 1:

(15) La   mamá   saluda   a   la   tía.   Está alegre
the   mother   greets   PREP *the aunt. NSP is   happy*
'The mother greets the aunt. She is happy'.

The results show that children slightly favored resolutions to the object (last mentioned) antecedent. This preference is the inverse of adults. Since the discourses do not provide clear cues to infer rhetorical relations, and since the topic of the antecedent sentence is not defined, only the position of the antecedents can help children to solve the pronoun. We have argued above that adults use the position as an indicator of what entity has a higher probability of becoming the topic in the second sentence, so that they solve the pronoun in favor of this entity. Following the discussions of chapter 3, we believe that children haven't learned yet the role of the initial position in the antecedent sentence. A possible reason for this is that they first have to accumulate a big amount of input, as suggested by Arnold et al (2001). Further, it seems that they cannot accumulate this input until they have enough working memory to retain and use the structure of the previous sentence while processing the pronoun. This doesn't mean that children do not know that a pronoun prefers a topic antecedent. What they still don't know is that, in absence of further indicators (like referen-

tial form), it is position what determines the topic (or most probable topic) and, therefore, the preferred interpretation. In such a situation, children may end up guessing or, as the results suggest, selecting the most recently named antecedent, which seems to be the less demanding strategy available in this case.

In experiment 2, apart from the position of the antecedents, there is the possibility of interpreting the pronouns by inferring a rhetorical relation, either on the basis of the connectors used ('First…Then…', which may signal *Occasion*) or on the basis of the resemblance of the sentences (which may signal *Parallel)*. An example of an item with NSP is (10a) repeated below as (16):

(16)   Primero la mamá le   pasa un pincel   a la niña
        first   *the mother her-*CLIT *gives a*   *paintbrush to the girl*
        'First the mother gives a paintbrush to the girl'.

        Después   le   pasa una caja al   papa
        then   *NSP him-*CLIT *gives a*   *box to the father*
        'Then she gives a box to the father'

As discussed above, both *Occasion* and *Parallel* may determine a resolution in favor of the first mentioned antecedent.

The results show what seems to be a reversion of the preference exhibited in the first experiment. In the current experiment, children did not tend to select the most recently named antecedent. Instead, there is a slight preference for the one that was first-mentioned. Since we cannot argue that this difference has to do with using the position of the antecedents as a cue, we conclude that the presence of connectors and/or of sentences that resemble each other affected interpretation. It can be that children sometimes infer *Occasion* and opt for a discourse with a single agent performing two actions, or that they infer *Parallel* and attribute two similar actions to one entity. In any case, since the difference between the preferences is small, it may be that children sometimes still resort to a recency strategy or just end up guessing the answer.

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Experiments 4 and 5 used four-sentence stories with and without topic-shift. While in Experiment 4 all stories had a continued topic until the pronoun appeared, experiment 5 also incorporated stories with a topic shift in the sentence preceding the pronoun. Below, we repeat an example of an item of experiment 5 (the version with sentence (c) was also used in experiment 4):

(17) a. Un bombero necesita ayuda para pintar una casa.
        a firefighter needs   help to   paint a   house
        'A firefighter needs help to paint a house'

     b.   Va   a buscar a   su amigo el   panadero
        NSP goes to look   for his friend the baker
        'He goes to look for his friend the baker'

     c. El bombero pinta la casa junto   con el panadero.
        the firefighter paints the house together with the baker.
        'The firefighter paints the house with the baker''

     c.' El panadero pinta la casa junto   con el   bombero.
        the baker   paints   the house together with the firefighter.
        'The baker paints the house together with the firefighter''

     d.   Encuentra que la casa quedó   muy bonita.
        NSP finds   that the house turned out very nice.
        'He finds that the house turned out very nice'

In Experiment 4 (stories with continued topic), children preferably interpreted the NSP as referring to the entity that was the topic throughout the story. In Experiment 5, this preference also appeared for stories with continued topic, but was not statistically significant. In the case of stories with a shifted topic (that is, in stories like the version with sentence (c') above, where the topic of the third sentence differs from the topic of the preceding discourse), a slight preference for the entity that was the initial topic of the story appeared. Again, this preference was not significantly different from its counterpart.

As we have pointed out, discourses like (17) do not provide a clear ground to infer rhetorical relations. Further, Experiment1 showed that children didn't use first-mention as a cue to determine the topic and solve the pronoun. Instead, it looks like sometimes a recency strategy was used. So, as we proposed in chapter 3, we believe that the discourse preceding the third sentence can make a difference. When children cannot determine the topic of the antecedent sentence on the basis of its position, they probably assume that the topic is continued from the previous discourse, and so, they can solve the pronoun as referring to that entity. Children can plausibly identify this entity as topic without the need of structural information: first, because it was the only character in the initial sentence, and second, because it was realized as a pronoun in the following one.[48] The evidence of Experiment 4 is compatible with the observation that, if the topic is clearly established, children around the age of five tend to interpret subject unstressed pronouns as referring to it (Tyler 1983, Arnold et al 2001). The idea behind is that a referent that has been present in discourse across a sequence of utterances is more salient for children than a new competitor. Though our results in the stories with topic-shift (Experiment 5) were not significant, we believe that a clear preference for the topic of the preceding discourse would have arisen if we had used longer stories, that is, stories with a long chain of continued topics going from the beginning until the sentence preceding the target pronoun. Wubs et al (2009) and Koster et al (2011) have provided evidence that children around the age of five interpret unstressed Dutch pronouns following this preference in stories with six sentences. As van Rij, van Rijn and Hendriks (2010) propose, the frequency with which an entity is referred to is probably crucial to the way in which children learn to solve pronouns in stories. When children cannot use or haven't learned the importance of the structure of the sentence immediately preceding the pronoun, global saliency can make the dif-

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[48] The fact that elderly adults performed worse than young adults shows that using structural information to solve the pronoun can be a demanding process.

ference.[49] In future work we expect to find stronger evidence that this is also the case of Spanish NSP.

Summarizing, we propose that children can sometimes make use of rhetorical relations like *Parallel*. This is supported by the studies of Solan (1983), who tested children's comprehension of a whole range of parallel construction, concluding that children made use of semantic or pragmatic rather than grammatical information (just as coherence relations presuppose). When semantics and pragmatics are not enough, we believe that at the age of five children do not reliably use yet the order of mention of a sentence to determine its topic and solve a subsequent NSP (according to the topic preference present in adult language). Instead, they probably resort to less demanding strategies like selecting the most recently named entity or the entity that was the topic at an earlier stage of the discourse.[50]

Going to production, we can see that, in Experiment 6 (videos), children used NSP to describe the second of two similar actions performed by the **same** agent, just as adults did. This may have two coexisting causes: on the one hand, it can be the result of taking the perspective of the hearer into account, producing the minimal form required to communicate the intended meaning, which the hearer in this case can access through the inference of rhetorical relations; on the other hand, it can be the result of just producing the most economical form, irrespective of the intended mean-

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[49] In our discourses, both characters were present in the second and third sentences. Only in the initial one the first character was alone. So this was probably not enough to make a big difference. Further, the rather unnatural use of full (definite) NP in the third sentence might have affected interpretation: as attested in the literature, the repetition of a name where a pronoun is the more natural form carries processing difficulties (cf. Gordon et al 1993). In the continue condition of experiment 5, the repetition of the name of the first character is unexpected, given that it is a continued topic, and continued topics are generally pronominalized. In the shift condition, it is not unexpected, given that entities that have been introduced into the discourse with a full NP in object position normally appear again as Subject full NP before being pronominalized (cf. Taboada 2008). The idea of presenting both entities as full NP was to avoid that the form (pronoun or full NP) of the antecedent played a role in determining the referent. However this might have also affected the preference for a continued topic.

[50] Children's mean ages and age-spans vary from experiment to experiment, for it was not feasible to access more homogenous groups. So direct comparisons between experiments might be put into question in some cases. However, at least within each group that we used, we didn't find relevant significant correlations between results and age.

ing. The existence of the former strategy is supported by the fact that full NP were the preferred form to describe the second of two similar actions performed by **different** agents. However, we should also note that full NP appeared in the same-agent condition something that shows that in some cases children avoided the use of pronouns even when appropriate, probably because of the unnatural experimental setting. In real communicative situations, we should expect children to produce (and overproduce) more NSP. So the claims about their competence to use full NP when appropriate have to be softened.

The existence of the latter strategy, in turn, seems to be supported by the fact that, even being less preferred, a considerable amount of NSP also appeared in the different-agent condition. When children do not have the knowledge or competence to select the adequate form, it seems natural that they opt for the less demanding option.

	NSP production	
Experiment 6	*same agent*	*different agent*
	64,3	32,1
Experiment 7	*topic*	*non-topic*
	92,9	41,1

Table 5.6. Production of NSP (Children)

Experiment 7 presents a higher use of NSP, probably because the storybooks incentivized more the use of pronouns, by providing material to construct a story through a series of well connected actions. Like in the previous experiment, we believe that children's use of NSP to refer to continued topics is partly the result of their knowledge about the fact that it is the most appropriate form and partly the result of its use as a default expression.[51] Again, the dispreferred but not depreciable use of NSP to

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[51] The fact that elderly adults also overused NSP seems to show how demanding it is to consider the structure of the previous discourse when choosing a referring expression. Further, it supports the view that the minimal NSP is preferred when processing limitations are at stake.

refer to non-topic antecedents seems to support this view. The asymmetry between comprehension and production of NSP seems to be the result of different ways of resolving situations where lack of knowledge or of processing capacities prevents an adult-like behavior. In comprehension, when children cannot resolve the antecedent of a pronoun, they use alternative less demanding strategies (like choosing the most recently named entity or the preponderant topic of the discourse) or just end up guessing. In production, guessing is not option, and children just go for the easiest and most economical form: the NSP.

5.4 RHETORICAL RELATIONS AND OSP IN THE EXPERIMENTS

5.4.1 OSP and Resemblance relations

In section 5.2, we have already advanced a possible explanation about when OSP can be expected to be felicitous. We have said that resemblance relations like *Parallel* and *Contrast* require that, if a pronoun does not co-refer with a parallel element in the antecedent sentence, it should be overtly realized. Other relations, however, are not based on a mapping between the elements of the sentences involved and, therefore, they do not impose constraints about the overt realization of the pronoun.

We have also pointed out that sometimes an OSP can be felicitous by way of instantiating a *Contrast* relation between the proposition expressed by the sentence where the OSP is present and an inferred (implicated) proposition, in which another contextually salient referent is compared and contrasted with the referent of the OSP. In what follows we will argue that most of the discourses used in the experiments were not appropriate to induce resemblance relations. This observation may contribute to explain adults and children answers both in comprehension and production.

5.4.2 Adults' comprehension and production of OSP

As we noted when discussing the case of NSP, only the discourses that included pa-
rallel sentences and the connectors 'Primero…Después…' ('First…Then…') present
clear cues to infer rhetorical relations. We will start considering these experiments (2
and 3) and then go on to the other cases (1 and 4). Table 5.7 summarizes the main
results of all comprehension experiments.

	OSP interpretation	
Experiment 1	52,1	in unrelated disc.
Experiment 2	58,3	in Parallel disc.
Experiment 3	62,5	in Parallel disc.
	51,8	in Non-parallel disc.
Experiment 4	57,1	in disc. with continued topic

Table 5.7. OSP preference for object (last-mentioned) antecedent (Adults)

An example of the discourses used in experiments 2 and 3 is (18a) below (in the case
of experiment 3, discourses with non-parallel sentences (18b) were also used):

(18)   Primero la tía   le   trae   un sándwhich a   la   mamá.
       *first   the aunt her-*CLIT *brings a   sandwich to the   mother*
       'First the aunt brings a sandwich to the mother'

   a. Después   ella le   trae   un café   al   tío.
      *then   she her-*CLIT *brings a   coffee to the uncle*
      'Then SHE brings a coffee to the uncle'

   b. Después   ella prepara café.
      Then   she makes   coffee
      'The SHE makes coffee'

   Q: ¿Quién prepara café?
      Who makes coffee?

The problem regarding the interpretation of the OSP in (18a) is that the discourses simultaneously signal two possible different rhetorical relations that, in this case, may favor different interpretations. On the one hand, parallel sentences with a common verb may induce the inference of a *Parallel* or *Contrast* relation. On the other, the temporal connectors 'First…Then…' may induce the establishment of *Occasion*. If the first kind of relation is inferred, we should expect the pronoun 'ella' to refer to the antecedent that is not parallel in the previous sentence ('la mamá'). Guided by the resemblance of the sentences, this is what probably many hearers did in the experiment. If the latter kind of relation is inferred, we should expect a reading favoring a common agent for the two actions. So the presence of the connectors may explain why the preference for non-parallel antecedents was so weak. Further, since an OSP is unexpected in this case, because the *Occasion* relation does not impose a constraint requiring the pronoun to be overtly realized, many hearers might have ended up guessing.

When the discourses were not parallel and a different verb was used (18b), the possibility of inferring a *Parallel* relation was not there anymore. We have said, however, that when OSP appear in discourses where there is no resemblance between the sentences involved, a proposition might be inferred to establish a *Contrast* relation. In that case, the hearer seems to have two possibilities: assigning the referent of the OSP to the aunt and inferring that it is not the case that the mother makes coffee or assigning the referent of the OSP to the mother and inferring that it is not the case that the aunt makes coffee. Which is better? The prior discourse doesn't provide information that makes one of the two inferable propositions easier to accommodate than the other. Both seem to be equally ungrounded. So the OSP could not have been solved on this basis. Again, the alternative was to infer *Occasion*, in which case the OSP is unexpected, something that may explain why the answers were at chance level.

This discussion may also serve to explain the results of experiments 1 and 4. In the discourses of these experiments, there were no clear elements inducing the establishment of rhetorical relations, as we have noticed in previous sections. Below,

we repeat examples of items included in these experiments ((19) is from experiment 1 and (20) is from experiment 4):

(19) La   mamá   saluda   a la   tía.   Ella   está   alegre
    the   mother   greets ₐ the aunt.   SHE   is   happy
    'The mother greets the aunt. SHE is happy'.

(20) a. Una profesora   quiere jugar tenis.
      *A   teacher-*FEM *wants   play   tennis.*
      'A teacher wants to play tennis'

    b.   Se   junta a jugar un partido con una peluquera
       NSP REFL *joints a play a   match   with a   hairdresser-*FEM
       'She joints a hairdresser to play a match'

    c. La   profesora se   esfuerza por ganarle   a la   peluquera
      The teacher REFL *toils   to   beat her-*CLIT ₐ *the hairdresser.*
      'The teacher toils to beat the hairdresser'

    d. Ella   está muy entretenida jugando
      SHE   is   very amused   playing
      'SHE is very amused playing'

Like in (18b), the possibility of inferring a proposition to establish *Contrast* cannot help, for there is no ground to prefer one option over the other. If one of the readings favored a stronger *Contrast*, then this reading would have been probably preferred (cf. Asher 1999). However, the previous discourse doesn't provide useful information to infer that one entity is more likely to be happy or not happy, or to be amused or not amused. Hence, it is not surprising that answers were at chance level (in experiment 5, against the prediction of the *Topic* hypothesis, according to which the use of a OSP should be enough to shift the topic).

Going to production, we can see that the results are in correspondence with the ones obtained in comprehension. Given that OSP were not clearly interpreted as referring to a determinate entity, it is not surprising that they were not used by speakers in the elicited discourses. In experiment 6, when speakers were asked to describe

two subsequent scenes performed by two different agents, the option chosen by adults was a full NP. It seems that the sequence of scenes didn't induce to express *Parallel*, so a stressed pronoun like OSP was not a good option. This is reaffirmed by the fact that the occurrences of full NP were in general not stressed by adults. If *Parallel* were at stake, then contrastive stress should have appeared when full NP were used. This was not the case. What speakers did was expressing two subsequent actions.

Full NP were also preferred in experiment 7, when speakers had to describe a storybook with a topic shift. In both cases, the use of a NSP would have leaded to an unintended interpretation, while the use of an OSP would have probably made the pronoun ambiguous, as the result from experiments 2 and 3 have shown.

	OSP production	
Experiment 6	*same agent*	*different agent*
	unused	unused
Experiment 7	*topic*	*non-topic*
	4,5	9,2

Table 5.8. Production of OSP (Adults)

5.4.3 Children's comprehension and production of OSP

The results obtained by children have to be seen in connection with the ones obtained by adults. Since in most of the experiments OSP were interpreted by adults at chance level, we can consider that, when children deviate from this pattern, is because they apply alternative strategies. In Experiment 1, we observe a weak preference for the most recently named antecedent, though this option was not significantly different from its counterpart. In Experiments 2 and 3, however, the difference was significant. This cannot be explained as the result of inferring *Parallel,* for in Experiment 3 the preference also appeared in the discourses with non-parallel sentences, where *Parallel* was not a plausible relation to infer (that's why adults performed different in the

two kinds of experiments). If children's interpretation were determined by the contrastive effect of OSP in the discourses with parallel sentences, then they should have performed different in the discourses with non-parallel sentences. But this was not the case. So, the similar patterns in adults and children appear to have different causes: in the case of adults, interpretation is related to inferring *Parallel*. In the case of children, their answers are probably the result of applying an alternative recency preference. This might be the less demanding strategy of all, since it requires the hearer to retrieve the minimal amount of information possible.[52]

	OSP interpretation	
Experiment 1	47,2	(vs. 38,2)
Experiment 2	57,1	(vs.39,3)
Experiment 3	60,9	(vs. 34,4) in Parallel disc.
	60,2	(vs.35,9) in Non-parallel disc.
Experiment 4	36,9	(vs. 60,1)

Table 5.10. OSP preference for last-mentioned antecedent (Children)

What we need to explain is why we considered plausible that children inferred *Parallel* when interpreting NSP, while it appears not to be an option for OSP. The difference is that, in the case of OSP, children need to be sensitive not only to resemblance, but also to the effect of stress (overt realization), so that the entities occupying the same position can be contrasted to each other. This probably requires children to keep both alternatives in mind at the same time, something that might be beyond their processing resources at this age (see Reinhart 1999, Chiercia et al 2001). In the case

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[52] In experiments 2 and 3, the distance between the OSP and the antecedent subject was higher in than in experiment 1. In the former experiments, a direct object (the sandwich in example (18) above) was located between the subject (the mother) and the indirect object (the aunt); in Experiment 1, there were no elements in between. This could have made subjects less accessible in experiments 2 and 3, increasing the recency preference with respect to Experiment 1. Independent evidence of the existence of a recency strategy in children interpretation of pronouns can be found in Van Rij et al (2010) and Kehler et al (2011)

of NSP, the pronoun is solved on the basis of the resemblance between the sentences. No contrast between the entities in subject position is implied, to the effect that they are interpreted as co-referring.[53]

Going to the discourses of Experiment 4, we observe that the preference for the most recently named antecedent does not show up anymore. Instead, children preferably interpreted the OSP as referring to the character that was the previous topic of the discourse. This is the same that happened with NSP. As we have observed, it seems that, in longer discourses, where there is a topic already activated in the mind of the hearer, the preference for that entity might override a recency preference. The difference between the two possible interpretations is weak so, as we have proposed for the case of NSP, we need to test longer discourses to see whether it becomes stronger.

	OSP production	
Experiment 6	*same agent*	*different agent*
	unused	unused
Experiment 7	*topic*	*non-topic*
	0,9	1,8

Table 5.8. % of OSP in production experiments (Children)

Finally, we briefly refer to the results obtained in the production experiments. Again, these are explainable in relation to adult's performance. Since the material used didn't elicit discourses with OSP in their case, it is not surprising that children didn't use them either. What is interesting of children's performance is that they often produce NSP when adults opt for a full NP, as we have noted and discussed in the previous section.

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[53] Evidence and discussions about children's sensitivity to contrastive stress can be found in Solan, (1983), McDaniel et al. (1992), Halbert et al. (1995), Reinhart (2004) and Gualmini et al., (2003).

5.4 SUMMARY

In this chapter, we have provided a general discussion of the results obtained in the experiments. Abandoning the *CAP* approach, we have tried to give plausible explanations of adults' comprehension and production of subject pronouns in terms of Rhetorical Relations (*RRAP*) and of the preference of NSP for topic antecedents. In the case of children, we have argued that, in comprehension, they are probably capable of inferring rhetorical relations like *Parallel.* However, when interpreting OSP, they appear to be insensitive to contrastive stress. Further, we have argued that children are often unable to take the structure of the previous discourse into account: when the topic status of an antecedent can only be determined by its position, children come into trouble and end up resorting to alternative strategies like choosing the most recently named entity or the entity that was the topic in the preceding discourse. In production, it looks that, whenever the structure of the previous discourse is not taken into account, children tend to use NSP, the most economical option.

6 CONCLUSIONS AND FUTURE WORK

6.1 CONCLUSIONS

In the introduction of this work, we asked ourselves what was the difference between using NSP and OSP as anaphors in discourse. The experiments have helped us to give a partial answer to this question: NSP and OSP do not (just) prefer complementary antecedents, as different versions of the *CAP* approach predict. On the face of the results obtained, we have argued that an approach based on the establishment of rhetorical relations (*RAPP*) may offer better possibilities to answer the question. Within the frame of *RAPP*, we have defended the idea that OSP are used to instantiate a contrast between the entity referred to with the pronoun and other discourse or contextually salient entity. This implies that OSP are restricted to contribute to the establishment of certain rhetorical relations like *Parallel* or *Contrast*, while being infelicitous in other contexts. Surely, this is not all the story there is to tell about OSP, but it helps to explain the results in the cases that were covered by the experiments. If we look a little bit beyond these cases, we will find that OSP also appear in discourses that do not fall under *Parallel* or *Contrast*. An exhaustive account of OSP should be able to cover the whole spectrum of uses, something that we haven't intended here. What our work has done is contributing to the existing literature by providing evidence against

the *CAP* approach, giving reasons to adopt a view based on rhetorical relations and advancing a plausible explanation for the results obtained. [54]

Going to NSP, we have noted that the *RRAP* approach can account for several cases. However, the discourses of the experiments also showed that the inference of rhetorical relations was often not enough to solve the pronouns. We have argued that, in these cases, NSP are preferably interpreted as referring to topic antecedents. It follows from this that pronoun resolution is not just a by-product of inferring rhetorical relations: for the case of NSP, there is also a default preference that applies in absence of clear semantic or pragmatic cues. From the point of view of production, adults generally used NSP to refer to topic antecedents, while they chose full NP to refer to non-topics. Only when there are clear semantic or pragmatic cues, can we expect speakers to use this form to refer to non-topics. Given that the apparatus of rhetorical relations is conceived from the perspective of interpretation, there is the question of whether production can also be treated within an account that incorporates these relations. During the discussion of the experiments, we have simply assumed that speakers take into consideration the perspective of the hearer when deciding which referential form to use. An account covering both comprehension and production of pronouns should provide a plausible way of incorporating both perspectives into one model. Some attempts of achieving this have been done within the frame of Optimality Theory (Prince and Smolensky 1993). Below we will briefly comment on how future work on Spanish pronouns could be developed within this frame.

Moving to child language, the results of the experiments showed that children around the age of five have difficulties interpreting pronouns and producing the right

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[54] Examples of non-contrasting uses of OSP include (1) and (2) (see note 34):

(1) Juan encuentra a Pedro. Él le cuenta un secreto   (Él=Pedro. *Occasion* relation)
   'John meets Pedro. HE tells him a secret'

(2) Juan empuja a Pedro y él cae al suelo'   (Él=Pedro. *Result* relation)
    'Juan pushes Pedro and he falls to the floor'

In (1), the interpretation of the OSP seems to be related to the presence of another pronoun in the second sentence. In (2), the interpretation of the pronoun seems to interact with syntactic constraints governing coordination (note that here the OSP corresponds to an unstressed English pronoun).

referential expression. The main points of the discussion was centered on NSP, given that in the case of this form we got a clear adult pattern against which we could compare children's performance. We have argued that, when clearly signaled, children are able to infer rhetorical relations and solve NSP according to them. However, when these do not provide help and other factors become decisive, children get into trouble. Specifically, they had difficulties to use the position of the possible antecedents as a guide to determine which of them is the topic, so they can solve the pronoun as referring to it. We have argued that position (in particular, first-mention) is the crucial cue that children probably haven't learned yet, maybe because it arises as a statistical cue that needs the accumulation of a large database, as suggested by Arnold et al (2001). Accumulating this database may also be prevented by limitations in working memory, for the identification of this pattern supposes that the hearer can retain the structure of the previous sentence when solving the pronoun.

While adults can use position to determine the referent of a NSP, we have presented some evidence that children resort to alternative less demanding strategies like picking out the most recently named entity or the entity that was the topic in the discourse before the antecedent sentence. This evidence, however, is not decisive and needs to be confirmed in future work.

In the case of production, we have seen that children overuse NSP. This form is not only used when appropriate, but often also when it can lead to unintended interpretations. The selection of it may obey a principle of less effort and occur whenever children are unable to take the structure of the preceding discourse into account. In sum, the results and discussion of the experiments provide interesting evidence and elements of analyses that should be considered in future empirical and theoretical work. Below we present some guidelines about how this work could be developed.

6.2 FUTURE WORK

6.2.1 New experiments

Our future empirical work on discourse anaphora is projected to follow two different paths: one is concerned with the interpretation of NSP and OSP in adult language, while the other is centered on child comprehension and production of NSP.

In the case of adults' interpretation of NSP, our interest is to apply experiments that can tear apart first-mention, subject position and topic status of the antecedents. This could be achieved by using items that alternate the order (SVO and OVS) and form in which the antecedents of a NSP appear in discourse. The results could serve to understand better the preference exhibited by NSP in absence of semantic and pragmatic biases that signaled determinate rhetorical relations.[55] In the case of adults' interpretation of OSP, our interest is to test discourses were a contrast between entities is more plausible than in the discourses used in our experiments. Further, we are interested in investigating how the interpretation of OSP varies when another pronoun is present in the sentence, so that each pronoun has to be interpreted as referring to one of two possible antecedents (see note 34). In all cases, it would be desirable to combine the methodology that we have applied with on-line methods like self-pace reading and eye-tracking.

Going to child language, we would like to investigate whether children interpret NSP correctly under the presence of different mechanisms signaling rhetorical relations. Further, in cases where the resolution of pronouns cannot clearly be guided by the establishment of these relations, we need to inquire more deeply in the exis-

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[55] Of special interest are discourses like (a), where the object appears before the verb in the antecedent sentence and (b) where the topic is realized as a clitic in object position:

(a) Juan y María recogen a sus amigos para ir a la fiesta. A Pedro lo recoge Juan. Está feliz.
    *Juan and Mary pick up their friends to go to the party .*ᴀ   *Pedro him picks up Juan.*NSP *is happy.*

(b) Juan sale a pasear por el parque. Pedro lo saluda. Está feliz.
    Juan goes for a walk in the park.. Pedro him greets. NSP is happy.

tence of alternative strategies that are different from those used by adults. Our experiments have suggested that children tend to select entities that had been the topic of the discourse, irrespective of its position in the antecedent sentence. The use of stories longer than the ones that we used, with a unitary topic until the antecedent sentence, could help to clear up this point. Other alternative strategy that seems to be at stake is that of selecting the most recently named antecedent. New experiments tackling this strategy should include other methods, for it could be that the time between the end of the stimulus and the question about the referent of the pronoun increases the processing load in a way that favors the selection of the last mentioned antecedent

Being focused on a particular moment of the development (age 5), our experiments do not tell us very much about the process of learning how to use and produce NSP. Future studies contemplate incorporating children of different ages. This could be particularly interesting in production, for there is some evidence (Shin and Smith 2009) that, after a long period during which children overproduce NSP, they come to a stage where they start avoiding them and overproducing full NP. The material we have used could serve to provide further evidence of this phenomenon and stress the importance of providing an account that can give a plausible explanation of it.

6.2.2 Optimality theory

Throughout this work, the discussion has been primary centered on comprehension. The explanations that had been advanced for production have simply assumed that mature speakers take into consideration the perspective of the hearer, as if selecting a form would imply checking whether that form can be interpreted as intended. In fact, the specific theoretical accounts we have referred to (for example, the relations proposed by Kehler (2002) or the anaphoric preferences of Centering Theory (Grosz et al 1995)) are models specifically proposed to account for comprehension, not for production. Whether comprehension and production of pronouns can be incorporated

into a single model is a complex matter that goes beyond the objectives of this dissertation. In future work, however, we would like to discuss the plausibility of doing this within the frame of Optimality Theory (Prince and Smolensky 1993).

OT treats the language faculty as a constraint-based system in which the same hierarchally ranked constraints can be used to account for the hearer and for the speaker perspectives. Blutner (2000) has shown a way of integrating both perspectives into a process of bidirectional optimization. Bi-directional OT has been used by Beaver (2004) to reformulate Centering Theory, so that it can also be applied for production. Further, he has offered a possible way of accounting for the contrast between stressed and unstressed pronouns in English. From the perspective of comprehension, de Hoop (2004) and Zeevat (2009) have incorporated rhetorical relations into the system of constraints that determines the interpretation of pronouns. From the perspective of production, Samek-Ludovic (1996) and Bresnan (1999) have given proposals to deal with the relation between pronoun form and topicality.

Going to child language, Wubs et al (2008) and Koster et al (2011) have used bi-directional OT to account for the acquisition of (unstressed) subject pronouns in Dutch. In their view, children around the age of five are supposed to share with adults the same ranking of constraints. The deficiencies in production and comprehension are seen as the result of children's incapacity to take the perspective of the other part into account. In OT-terms, it is argued that children are often unable to optimize bidirectionally. This supposes that bi-directional optimization is an on-line process. An alternative view can be taken on the basis of Jäger (2004). His account can serve to explain children's deficiencies as a result of not having acquired yet the adults' ranking of constraints. In this view, bi-directional optimization is an off-line process through which children learn the adults' ranking of constraints on the basis of observed statistical frequencies (see Blutner 2010, Blutner and Strigin (2010) and Mattausch and Güzlow (2007) for an explanation of the acquisition of pronominal binding within this frame).

In sum, we can see that recent work on OT has shown to be a fruitful approach to treat comprehension and production of pronouns, both in adult and child language. The challenge is to propose a system of interacting constraints that can account for the case of Spanish. Fortunately, some of the constraints that have been proposed in the literature may help to do the work. As for NSP, the main ideas that we have considered in the discussion of the experiments could be spelled out in terms of two constraints: one saying that pronouns prefer topic antecedents (for example, a version of de Hoop's (2004) *Continuing Topic*) and one determining that current topics are reduced (for example, Bresnan's (1999) *Reduced ↔TOP* or Beaver's (2004*) Pro-Top*). As proposed by Beaver (2004), the notion of topic can be constrained based rather than defined, so that other constraints would come into play. In the case of OSP, an additional constraint would be required (for example, de Hoop's *Contrastive Stress,* indicating that a rhetorical relation of *Contrast* (or *Parallel)* is intended).

With respect to acquisition, the approach defended by Hendriks and colleagues have been used to explain children (and also elderly adults') overproduction of pronouns as a result of an inability to take the perspective of the hearer into account. This could readily serve to explain our own results. On the other hand, the approach that sees bi-directional learning as determined by statistical frequencies promises a possible explanation for the fact that children did not use order of mention as a cue to interpret pronouns in our experiments. In future work, we hope to contribute to the existing literature with a discussion that takes into consideration the data presented here and new data arising from further experiments with Spanish speakers.

7 APPENDIX

7.1 APPENDIX 1: EXPERIMENTAL MATERIAL

7.1.1 Material comprehension experiments

Experiment 1

Items

1. a La mamá saluda a la tía. Está alegre
   b La mamá saluda a la tía. Ella está alegre.
      ¿Quién está alegre?

2. a La tía corre junto con la mamá. Está cansada.
   b La tía corre junto con la mamá. Ella está cansada.
      ¿Quién está cansada?

3. a El papá almuerza con el tío. Encuentra que el almuerzo está muy rico.
   b El papá almuerza con el tío. Él encuentra que el almuerzo está muy rico.
      ¿Quién encuentra que el almuerzo está muy rico?

4. a La mamá se junta con la tía. Está aburrida.
   b La mamá se junta con la tía. Ella está aburrida en la reunión.
      ¿Quién está aburrida?

5. a El tío toma café con el papá. Está entretenido.
   b El tío toma café con el papá. Está entretenido.
      ¿Quién está entretenido?

6. a La tía conversa con la mamá. Está nerviosa.
   b La tía conversa con la mamá. Ella está nerviosa.
      ¿Quién está nerviosa?

7. a El papá habla con el tío. Está triste.
   b El papá habla con el tío. Él está triste.
      ¿Quién está triste?

8. a La mamá va a comprar con la tía. Está apurada.
   b La mamá va a comprar con la tía. Ella está apurada.
      ¿Quién está apurada?

9. a El tío trabaja con el papá. Está estresado.

b El tío trabaja con el papá. Él está estresado.
¿Quién está estresado?

10. a La tía choca contra la mamá. Está adolorida.
b La tía choca contra la mamá. Ella está adolorida
¿Quién está adolorida?

11. a El papá va al cine con el tío. Está feliz.
b El papá va al cine con el tío. Él está feliz.
¿Quién está feliz?

12. a La mamá se acerca a la tía. Está enojada.
b La mamá se acerca a la tía. Ella está enojada.
¿Quién está enojada?

Fillers

1. El papá va a dejar a la mamá. Después juega tenis con el tío.
¿Quién juega tenis con el tío?

2. El tío se despide del papá. Después él va al gimnasio.
¿Quién va al gimnasio?

3. La tía toma desayuno con el tío. Después va a trabajar.
¿Quién va a trabajar?

4. La tía mira al tío. Después se va a la oficina.
¿Quién se va a la oficina?

5. El papá baja del bus con la mamá. Después ella va al teatro.
¿Quién va al teatro?

6. La tía escucha música con el tío. Él se pone a bailar.
¿Quién se pone a bailar?

7. El tío come con la tía. Ella no tiene mucha hambre.
¿Quién no tiene mucha hambre?

8. El papá le pasa un papel a la tía. Ella lo toma.
¿Quién toma el papel?

9. La mamá le regala una chaqueta al papá. Él está sorprendido.
¿Quién está sorprendido?

10. El tío le presta un lápiz a la mamá. Ella está agradecida.
¿Quién está agradecida?

11. La tía le trae un pastel al tío. Él se lo come muy rápido.
¿Quién se come el pastel muy rápido?

12.	El papá le entrega un paquete a la mamá. Ella está contenta.
	¿Quién está contenta?

Experiment 2

Items

1.	a	Primero la mamá le pasa un pincel a la tía. Después le pasa una caja al papá.
	b	Primero la mamá le pasa un pincel a la tía. Después ella le pasa una caja al papá
		¿Quién le pasa una caja al papá?

2.	a	Primero el papá le pasa un cuaderno al tío. Después le pasa un libro a la mamá.
	b	Primero el papá le pasa un cuaderno al tío. Después él le pasa un libro a la mamá.
		¿Quién le pasa un libro a la mamá?

3.	a	Primero la tía le entrega un collar a la mamá. Después ella le entrega un sacapuntas al tío.
	b	Primero la tía le entrega un collar a la mamá. Después ella le entrega un sacapuntas al tío.
		¿Quién le entrega un sacapuntas al tío?

4.	a	Primero el tío le entrega una carta al papá. Después le entrega un sobre a la tía.
	b	Primero el tío le entrega una carta al papá. Después él le entrega un sobre a la tía.
		¿Quién le entrega un sobre a la tía?

5.	a	Primero la mamá le da una flor a la tía. Después le da un gorro al tío.
	b	Primero la mamá le da una flor a la tía. Después ella le da un gorro al tío.
		¿Quién le da un gorro al tío?

6.	a	Primero el papá le da un plato al tío. Después le da un vaso a la tía.
	b	Primero el papá le da un plato al tío. Después él le da un vaso a la tía.
		¿Quién le da un vaso a la tía?

7.	a	Primero la tía le regala un chocolate a la mamá. Después le regala un dulce al papá.
	b	Primero la tía le regala un chocolate a la mamá. Después ella le regala un dulce al papá.
		¿Quién le regala un dulce al papá?

8.	a	Primero el tío le regala un dibujo al papá. Después él le regala una bufanda a la mamá.
	b	Primero el tío le regala un dibujo al papá. Después le regala una bufanda a la mamá.
		¿Quién le regala una bufanda a la mamá?

9.	a	Primero la mamá le presta un pañuelo a la tía. Después le presta un lápiz al papá.

	b	Primero la mamá le presta un pañuelo a la tía. Después ella le presta un lápiz al papá.
		¿Quién le presta un lápiz al papá?

10.   a   Primero el papá le presta un reloj al tío. Después le presta una tijera a la mamá.
       b   Primero el papá le presta un reloj al tío. Después él le presta una tijera a la mamá.
         ¿Quién le presta una tijera a la mamá?

11.   a   Primero la tía le convida un pan a la mamá. Después le convida un pastel al tío.
       b   Primero la tía le convida un pan a la mamá. Después ella le convida un pastel al tío.
         ¿Quién le convida un pastel al tío?

12.   a   Primero el tío le convida un helado al papá. Después él le convida una manzana a la tía.
       b   Primero el tío le convida un helado al papá. Después le convida una manzana a la tía.
         ¿Quién le convida una manzana a la tía?

Fillers

1.   Primero el tío abraza a la mamá. Después ella abraza al papá.
      ¿Quién abraza al papá?

2.   Primero la tía llama al papá. Después él llama a la mamá.
      ¿Quién llama a la mamá?

3.   Primero el papá se enoja con la mamá. Después ella se enoja con el tío.
      ¿Quién se enoja con el tío?

4.   Primero la mamá juega con el papá. Después él juega con la tía.
      ¿Quién juega con la tía?

5.   Primero el tío encuentra a la tía. Después ella busca al papá.
      ¿Quién busca al papá?

6.   Primero la tía pasea con el papá. Después él sale con la mamá.
      ¿Quién sale con la mamá?

7.   Primero el papá se despide de la mamá. Después va a comprar al super-
      mercado.
      ¿Quién va a comprar al supermercado?

8.   Primero la mamá trabaja con el tío. Después prepara la comida.
      ¿Quién prepara la comida?

9.   Primero la tía come con el papá. Después se va a acostar.
      ¿Quién se va a acostar?

10.   Primero el tío le da un beso a la mamá.
      Después se lava los dientes.
      ¿Quién se lava los dientes?

11.   Primero el papá conversa con la tía. Después duerme una siesta.
      ¿Quién duerme una siesta?

12.   Primero la mamá acompaña al tío. Después lee un libro.

¿Quién lee un libro?

Experiment 3

Items

1. a   Primero la mamá le pasa un pincel a la tía. Después ella le pasa un estuche al papá.
        ¿Quién le pasa un estuche al papá?
    b   Primero la mamá le pasa un pincel a la tía. Después ella busca un estuche.
        ¿Quién busca un estuche?

2. a   Primero el papá le pasa un cuaderno al tío. Después él le pasa un libro a la mamá.
        ¿Quién le pasa un libro a la mamá?
    b   Primero el papá le pasa un cuaderno al tío. Después él busca un libro.
        ¿Quién busca un libro?

3. a   Primero la tía le entrega un vaso a la mamá. Después ella le entrega un plato al tío.
        ¿Quién le entrega un plato al tío?
    b   Primero la tía le entrega un vaso a la mamá. Después ella trae un plato.
        ¿Quién trae un plato?

4. a   Primero el tío le entrega una carta al papá. Después él le entrega un sobre a la mamá.
        ¿Quién le entrega un sobre a la mamá?
    b   Primero el tío le entrega una carta al papá. Después él trae un sobre.
        ¿Quién trae un sobre?

5. a   Primero la mamá le da una flor a la tía. Después ella le da una planta al papá.
        ¿Quién le da una planta al papá?
    b   Primero la mamá le da una flor a la tía. Después ella toma una planta.
        ¿Quién toma una planta?

6. a   Primero el papá le da un sacapuntas al tío. Después él le da un lápiz a la mamá.
        ¿Quién le da un lápiz a la mamá?
    b   Primero el papá le da un sacapuntas al tío. Después él toma un lápiz.
        ¿Quién toma un lápiz?

7. a   Primero la tía le regala un chocolate a la mamá. Después ella le regala un dulce al tío.
        ¿Quién le regala un dulce al tío?

    b   Primero la tía le regala un chocolate a la mamá. Después ella saca un dulce.
        ¿Quién saca un dulce?

8. a   Primero el tío le regala un pañuelo al papá. Después él le regala un gorro a la tía.
        ¿Quién le regala un gorro a la tía?
    b   Primero el tío le regala un pañuelo al papá. Después él saca un gorro.
        ¿Quién saca uno gorro?

9. a   Primero la mamá le presta una bufanda a la tía. Después ella le presta unos guantes al papá.
        ¿Quién le presta unos guantes al papá?

    b   Primero la mamá le presta una bufanda a la tía. Después ella agarra unos guantes.
        ¿Quién agarra unos guantes?

10..   a   Primero el papá le presta un pegamento al tío. Después él le presta una tijera a la mamá.
        ¿Quién le presta una tijera a la mamá?
    b   Primero el papá le presta un pegamento al tío. Después él agarra una tijera.
        ¿Quién agarra una tijera?

11.   a   Primero la tía le convida un pan a la mamá. Después ella le convida un pastel al tío.
        ¿Quién le convida un pastel al tío?
    b   Primero la tía le convida un pan a la mamá. Después ella parte un pastel.
        ¿Quién parte un pastel?

12.   a   Primero el tío le convida helado al papá. Después él le convida yogurt a la tía.
        ¿Quién le convida yogurt a la tía?
    b   Primero el tío le convida helado al papá. Después él abre un yogurt.
        ¿Quién abre un yogurt?

13.   a   Primero la mamá le tira un papel a la tía. Después ella le tira una pelota de tenis al papá.
        ¿Quién le tira una pelota de tenis al papá?
    b   Primero la mamá le tira un papel a la tía. Después ella recoge una pelota de tenis.
        ¿Quién recoge una pelota de tenis?

14.   a   Primero el papá le tira una naranja al tío. Después él le tira un plátano a la mamá.
        ¿Quién le tira un plátano a la mamá?
    b   Primero el papá le tira una naranja al tío. Después él pesca un plátano.
        ¿Quién pesca un plátano?

15.   a   Primero la tía le trae un sándwich a la mamá. Después ella le trae un café al tío.
        ¿Quién le trae un café al tío?
    b   Primero la tía le trae un sándwich a la mamá. Después ella se prepara un café.
        ¿Quién se prepara un café?

16.   a   Primero el tío le sirve sopa al papá. Después él le trae un té a la tía.
        ¿Quién le sirve té a la tía?
    b   Primero el tío le sirve sopa al papá. Después él se prepara un té.
        ¿Quién se prepara un té?

Fillers

The same of Experiment 2, plus the following four:

1.   Primero el papá va a dejar a la mamá. Después él juega tenis con el tío.
    ¿Quién juega tenis con el tío?

2.   Primero el tío se despide de la mamá. Después él va al gimnasio.
    ¿Quién va al gimnasio?

3.   Primero la tía toma desayuno con el tío. Después ella va a trabajar.
    ¿Quién va a trabajar?

4. Primero la tía mira al tío. Despúes ella se va a la oficina.
    ¿Quién se va a la oficina?

Experiment 4

1. Un futbolista sale al patio.
    Se pone a jugar con un pirata.
    El futbolista corre por el patio junto al pirata.
    a. Está tan cansado que se tira al suelo
    b. Él está tan cansado que se tira al suelo
        ¿Quién está tan cansado?

2. Una enfermera camina por el hospital.
    Se encuentra con una doctora.
     La enfermera conversa con la doctora
    a. Está muy alegre porque no hay muchos enfermos.
    b. Ella está muy alegre porque no hay muchos enfermos
        ¿Quién está muy alegre?

3. Un marinero tiene hambre.
    Se sienta al lado de un soldado.
     El marinero comparte un sándwich con el soldado.
    a. Encuentra que el sándwich está muy rico.
    b. Él encuentra que el sándwich está muy rico.
        ¿Quién encuentra que el sándwich está muy rico?

4. Una monja va a un hogar de ancianos.
    Ve a una abuelita.
    La monja se acerca a la abuelita.
    a. Está emocionada.
    b. Ella está emocionada.
        ¿Quién está emocionada?

5. Un deportista corre en el parque.
    Dobla justo en la esquina donde pasa un jardinero.
    El deportista choca contra el jardinero
    a. Está adolorido.
    b. Èl está adolorido.
        ¿Quién está adolorido?

6. Una bailarina está en una fiesta
    Ve a una amiga secretaria

La bailarina habla con la secretaria.
a. Está pasándolo muy bien en la fiesta.
b. Ella está pasándolo muy bien en la fiesta.
   ¿Quién está pasándolo muy bien en la fiesta?

7.   Un bombero necesita ayuda para pintar una casa
      Va a buscar a su amigo panadero.
      El bombero pinta la casa junto con el panadero.
a. Encuentra que la casa quedó muy bonita.
b. Él encuentra que la casa quedó muy bonita.
   ¿Quién encuentra que la casa quedó muy bonita?

8.   Una cantante quiere ir al cine a ver una película.
      Invita a una actriz.
      La cantante se junta con la actriz
a. Disfruta mucho de la película.
b. Ella disfruta mucho de la película.
   ¿Quién disfruta mucho de la película?

9.   Un guardia descubre un incendio en un bosque.
      Llama a un policía.
      El guardia apaga el incendio con el policía.
a. Está contento porque sólo se quemaron dos árboles
b. Él está contento porque sólo se quemaron dos árboles
   ¿Quién está contento porque sólo se quemaron dos árboles?

10.   Una profesora quiere jugar tenis.
      Se junta a jugar un partido con una peluquera.
      La profesora se esfuerza para ganarle a la peluquera.
a. Está muy entretenida jugando.
b. Ella está muy entretenida jugando.
   ¿Quién está entretenida?

11.   Un cocinero está limpiando un restorán.
      Llama a un mozo.
      El cocinero lava los platos con el mozo.
a. Está aburrido de trabajar.
b. Él está aburrido de trabajar.
   ¿Quién está aburrido de trabajar?

12.   Una princesa va de paseo al campo.
      Habla con una campesina.
      La princesa recoge frutas junto con la campesina.
a. Está feliz.
b. Ella está feliz.
   ¿Quién está feliz?

Experiment 5

1.   Un futbolista sale al patio.
              Se pone a jugar con un pirata.
     a   El futbolista corre por el patio junto al pirata.
     b.   El pirata corre por el patio junto al futbolista.
            Está tan cansado que se tira al suelo
            ¿Quién está tan cansado?

2.   Una enfermera camina por el hospital.
            Se encuentra con una doctora.
     a.   La enfermera conversa con la doctora
     b.   La doctora conversa con la enfermera
            Está muy alegre porque no hay muchos enfermos.
            ¿Quién está muy alegre?

3.   Un marinero tiene hambre.
            Se sienta al lado de un soldado.
     a.   El marinero comparte un sándwich con el soldado.
     b.   El soldado comparte un sándwich con el marinero.
            Encuentra que el sándwich está muy rico.
            ¿Quién encuentra que el sándwich está muy rico?

4.   Una monja va a un hogar de ancianos.
            Ve a una abuelita.
     a.   La monja se acerca a la abuelita.
     b.   La abuelita se acerca a la monja.
            Está emocionada.
            ¿Quién está emocionada?

5.   Un deportista corre en el parque.
            Dobla justo en la esquina donde pasa un jardinero.
     a.   El deportista choca contra el jardinero
     b.   El jardinero choca con el deportista
            Está adolorido.
            ¿Quién está adolorido?

6.   Una bailarina está en una fiesta
            Ve a una amiga secretaria
     a.   La bailarina habla con la secretaria.
     b.   La secretaria habla con la bailarina.
            Está pasándolo muy bien en la fiesta.
            ¿Quién está pasándolo muy bien en la fiesta?

7.   Un bombero necesita ayuda para pintar una casa
      Va a buscar a su amigo panadero.
   a.   El bombero pinta la casa junto con el panadero.
   b.   El panadero pinta la casa junto con el bombero.
      Encuentra que la casa quedó muy bonita.
      ¿Quién encuentra que la casa quedó muy bonita?

8.   Una cantante quiere ir al cine a ver una película.
      Invita a una actriz.
   a.   La cantante se junta con la actriz
   b.   La actriz se junta con la cantante
      Disfruta mucho de la película.
      ¿Quién disfruta mucho de la película?

9.   Un guardia descubre un incendio en un bosque.
      Llama a un policía.
   a.   El guardia apaga el incendio con el policía.
   b.   El policía apaga el incendio junto con el guardia.
      Está contento porque sólo se quemaron dos árboles
      ¿Quién está contento porque sólo se quemaron dos árboles?

10   Una profesora quiere jugar tenis.
       Se junta a jugar un partido con una peluquera.
   a.   La profesora se esfuerza para ganarle a la peluquera.
   b.   La peluquera se esfuerza para ganarle a la profesora.
      Está muy entretenida jugando.
      ¿Quién está entretenida?

11.   Un cocinero está limpiando un restorán.
      Llama a un mozo.
   a.   El cocinero lava los platos con el mozo.
   b.   El mozo lava los platos con el cocinero
      Está aburrido de trabajar.
      ¿Quién está aburrido de trabajar?

12.   Una princesa va de paseo al campo.
   a.   Habla con una campesina.
   b.   La princesa recoge frutas junto con la campesina.
      La campesina recoge frutas junto con la princesa.
      Está feliz.
      ¿Quién está feliz?

7.1.2 Material production experiments

Experiment 6 (Snapshots of the video scenes)

a. Same-agent condition

Video 1

Video 2

Video 3

Video 4

Video 5

Video 6

b. Different agent condition

Video 7

Video 8

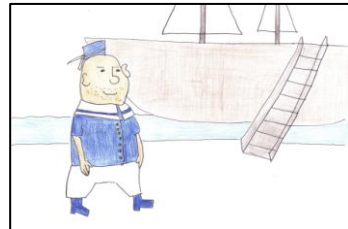*Video 9*

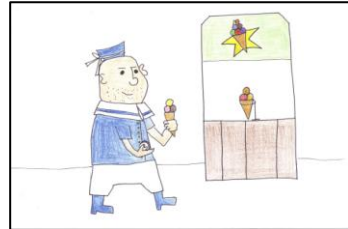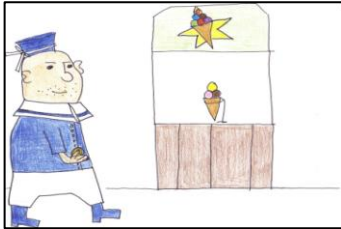*Video 10*

Video 11

Video 12

Material experiment 7

a. Continue Condition: One character present in all pictures.

Storybook 1

Storybook 2

Storybook 3
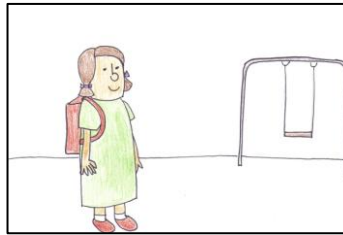
Storybook 4
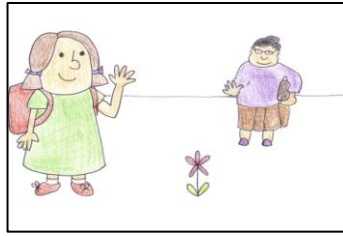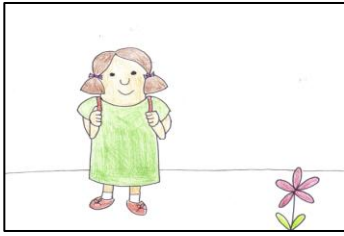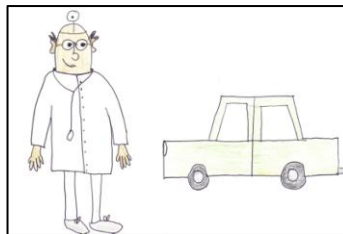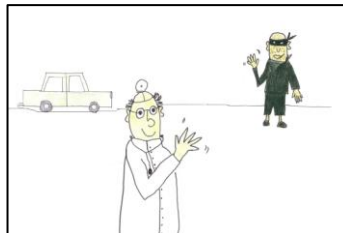
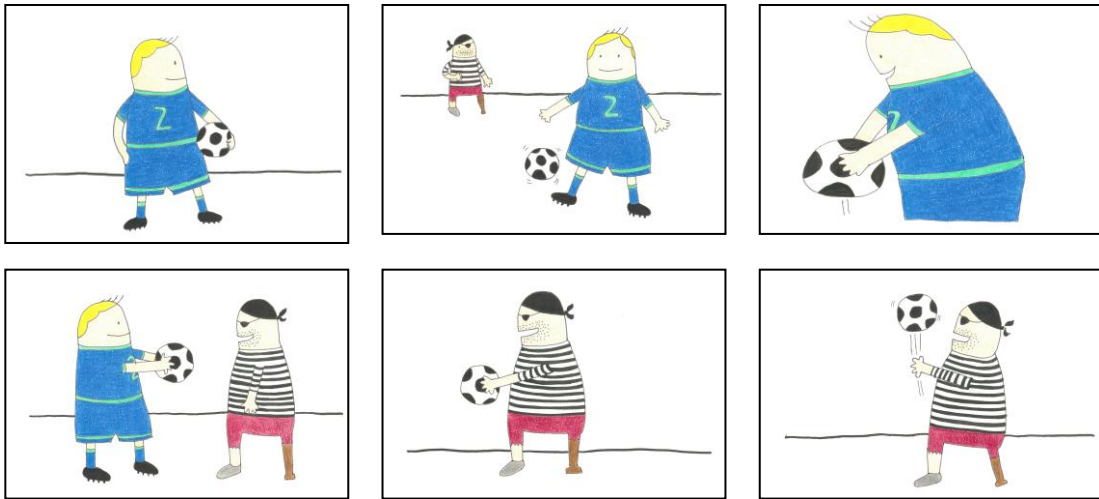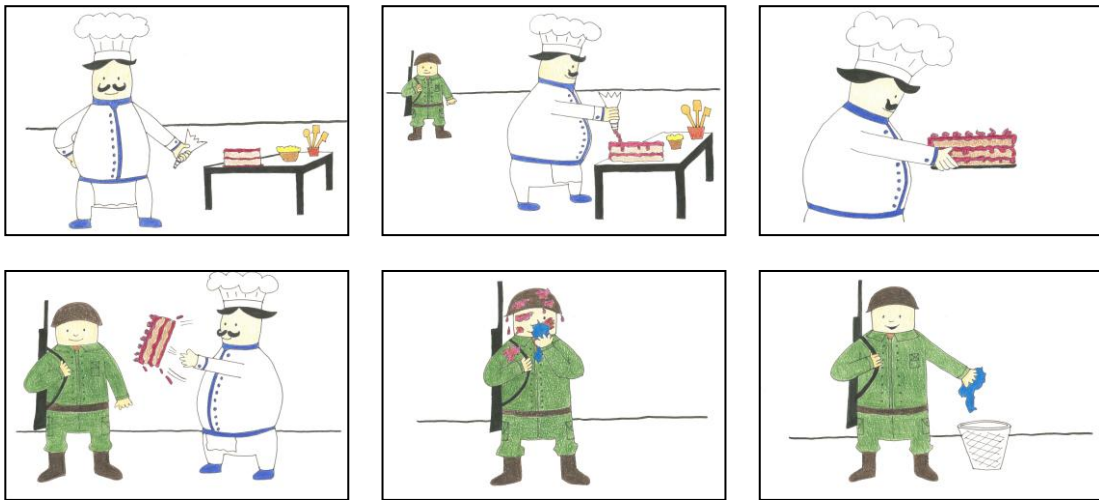*b. Shift condition: change in the main character.*

Storybook 5

Storybook 6

Storybook 7

Storybook 8

7.2 APPENDIX 2: PRELIMINARY STUDIES

During the process of design of the experiments, as set preliminary studies were prepared and applied to students of two Chilean universities. Below we report three of them. The results provide further evidence supporting our discussion of adults' performance in the experiments and explain some decisions

7.2.1 Questionnaire 1

Questionnaire 1 tests adults' comprehension of NSP and OSP in two-sentence discourses. In particular, it evaluates the *Strong Complementarity Hypothesis*, which predicts that OSP will show the reverse preference of NSP. This questionnaire served as a basis for Experiment 1, where the discourses used were adapted to be apt for children (for details about the characteristics of these discourses, see the passage on experimental material in section 3.1.2)

Method

Participants

Forty-eight undergraduate students at the University of Los Andes in Santiago de Chile participated in this experiment. Twenty were male and twenty eight female. Their ages ranged between 20; 1 and 33; 3. The mean age was 21; 9.

Material

Twelve two-sentence discourses were constructed. In the first sentence, two characters of the same gender are introduced using names, one of them in subject and the other one in object position. The second sentence begins either with a NSP or with an

OSP. Both names in the first sentence are possible antecedents for the pronouns. A question about the referent of the second sentence subject follows each discourse.

(1)   a.   Soledad se reúne con Gracia. Está aburrida.
             'Soledad meets Gracia. (**NSP**) is bored'.

        b.   Soledad se reúne con Gracia. Está aburrida.
             'Soledad meets Gracia. **SHE** (**OSP**) is bored'.

      Q: *¿Quién está aburrida?*
           'Who is bored?'

Four counterbalanced forms of the questionnaire were made. In each, six of the twelve items contain a NSP and six contain an on OSP. The twelve discourses were combined with twenty-eight filler items (sixteen of them are the items of experiment 3 and twelve are items with unambiguous pronouns), following written instructions and two practice items. A single block randomization of the four forms was made. Reversion of the forms to rule out ordering effects lead to a total of eight forms.

Procedure

Each participant received a printed questionnaire and a pencil. The questionnaire included written instructions that were read aloud by the experimenter. Participants were asked to read the items carefully and then write the answer to the questions, without time limit.

Results

Against the *Strong Complementarity Hypothesis*, OSP didn't show the reverse preference of NSP. While discourses with NSP were preferably interpreted as referring to

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the most salient antecedent of the previous sentence (81,3%), discourses with OSP were not (43,4%). The difference was highly significant ($F1(1,47)=57.392$; $F2(1,11)=64.410$, both $p<.001$). These results are in line with the ones obtained for adults in experiment 1 (See discussion in section 3.1.2).

7.2.2 Questionnaire 2

This questionnaire was designed to evaluate the *Parallelism Hypothesis.* According to it, NSP and OSP are expected to show complementary preferences under discourses with syntactic parallel, but not with non-parallell sentences. The design of this questionnaire served as a basis for experiments 2 and 3 (see sections 3.2.2 and 3.2.3 for details about the kind of items used).

Method

Participants

The same 48 students of questionnaire participated in this study (20 male and 28 female, ages 20; 1 - 33; 3; mean 21; 9).

Material

Sixteen two-sentence discourses were constructed. In the first sentence, two characters of the same gender are introduced with a name. The second sentence has a NSP or an OSP and is either parallel or non-parallel with the first sentence. When the second sentence is parallel, it has the same verb as the first sentence and introduces a third character of a different gender in (indirect) object position. When the second sentence is non-parallel, a different verb is used, such that it doesn't take an indirect object:

(2)   Primero Eugenia le presta un pañuelo a Verónica.
'Eugenia lends a handkerchief to Verónica'

    a. Después le presta un lápiz a Miguel.   (NSP-Parallel)
       'Then (NSP) lends a pencil to Miguel'

    b. Después ella le presta un lápiz a Miguel.   (OS-Parallel)
       'Then she (OSP) lends a pencil to Miguel'

    c. Después agarra un lápiz.   (Non-parallel)
       'Then (NSP) picks up a pencil'

    d. Después ella agarra un lápiz.   (Non-parallel)
       'Then she picks up a pencil'

A question about the referent of the second sentence subject follows each discourse (parallel: *¿Quién le presta un lápiz a Miguel?* 'Who lends a pencil to Miguel?'. Non-parallel: *¿Quién agarra un lápiz?* 'Who picks up a pencil?). As in the other questionnaire, there is no pragmatic information biasing the interpretation of the pronouns toward a particular antecedent. Four counterbalanced forms with four items of each condition were constructed.

	Parallelism	*Type of pronoun*
Condition 1	Parallel	NSP
Condition 2	Parallel	OSP
Condition 3	Non-parallel	NSP
Condition 4	Non-parallel	OSP

Table 8.1 Conditions of Questionnaire 2

The sixteen discourses were combined with twenty-four filler items (twelve of them are the items of experiment 2 and twelve are items with unambiguous pronouns). A

single block randomization of the four forms was made. Reversion of the forms to rule out ordering effects lead to a total of eight forms.

Procedure

The procedure was the same of questionnaire 1. Participants received a printed questionnaire with written instructions that were read aloud by the experimenter. They were asked to read the items carefully and then write the answer to the questions, without time limit.

Results

The *Parallelism Cancellation Hypothesis* predicts OSP to show the reverse preference of NSP in parallel sentences. However, the preference of OSP for objects was much milder than the preference of NSP for subjects. While NSP were interpreted 96,4% of the time as referring to the previous subject in parallel discourses (and 97,4% in the non-parallel ones), only 60,1% of the OSP were interpreted as referring to the previous object (in non-parallel discourses, the preference went down to 52,1%). A repeated measures ANOVA on the basis of the subject assignments showed a main effect of the type of pronoun ($F(1,47)$: 148.298, $p<.001$). There was no main effect of parallelism ($F(1,47)$: 3.781, $p=.058$), nor an interaction between factors ($F(1,47)$: 1.962, $p>.1$), though parallelism is near to significance. The results are in line with the ones of experiments 2 and 3 (see the discussion in sections 3.2.2 and 3.2.3), suggesting that, in the discourses used, parallelism has only a mild effect in the preference of OSP for objects.

	Parallelism	Type of pronoun	Subject/Object assignments
C 1	Parallel	NSP	96,4%/3,6%
C 2	Parallel	OSP	39,1%/60,1%
C 3	Non-parallel	NSP	97,4%/2,6%
C 4	Non-parallel	OSP	47,9%/52,3%

Table 8.2 Results of Questionnaire 2

7.2.3 Questionnaire 3

Questionnaire 3 was designed to evaluate the *Topic* hypothesis. According to it, NSP signal topic continuity, while OSP is preferably interpreted as instantiating a topic-shift. To tear apart this hypothesis from the *Strong Complementarity* hypothesis, the study also considers two kinds of discourses: discourses where, according to our assumptions, the topic has not been clearly established at the point where the pronoun occurs (like in questionnaire 1) and discourses where the topic is already established. It is in the latter case where the predictions of the *Topic* hypothesis apply.

Method

Participants

40 undergraduate students at the University of Los Andes in Santiago de Chile (17 male and 23 female, ages 18; 6- 25; 7; mean 19; 9).

Material

Sixteen discourses were constructed. Each of them had a version with three and a version with two sentences. The three-sentence discourses begin with a sentence that introduces two characters of a different gender using names, the first of them in subject and the second in object position. The second sentence has the first character again in subject position, so that his/her name is repeated and the topic is established through this repetition; in object position, it introduces a third character of the same gender than the first. In the last sentence, an OSP or a NSP is present. Both the first and third characters are possible antecedents for the pronouns. The two-sentence versions differ from the three sentence versions in the beginning: they just introduce two characters of the same gender (like in Questionnaire 1), without providing a previous linguistic context:

(3) a. Juan conversa con Pedro
          'Juan talks to Pedro'   .
     a.' Juan saluda a María. Después Juan conversa con Pedro.
           'Juan greets María. Then Juan talks to Pedro'

     b. Está alegre.
         '(NSP) is happy'
     b.' Él está alegre
         'He (OSP) is happy'

     Q.: ¿Quién está alegre?
          Who is happy?

	Established Topic?	*Type of pronoun*
Condition 1	No (discourse initial)	NSP
Condition 2	No (discourse initial)	OSP
Condition 3	Yes	NSP
Condition 4	Yes	OSP

Table 8.3: Conditions of Questionnaire 3

The sixteen discourses were combined with twenty-four filler items (16 of them with ambiguous and 8 with unambiguous pronouns). A single block randomization of the four forms was made. Reversion of the forms to rule out ordering effects lead to a total of eight forms.

Procedure

The procedure was the same of experiments 1 and 3: participants received a printed questionnaire with written instructions that were read aloud by the experimenter. They were asked to read the items carefully and then write the answer to the questions, without time limit.

Results

NSP were interpreted 79% of the time as referring to the previous subject in the three-sentence discourses with a established topic and 78% in the ones with two sentences. OSP, in turn, were interpreted 39% of the time as referring to the previous subject in the three-sentence discourses, and 45% in the ones with two sentences. A repeated measures ANOVA showed a main effect of Type of pronoun

(F(1,39)=41.474, p<.01). There was no main effect of topic (F(1,39)=.182, p>.5), nor an interaction between both factors (F(1,39)=.634,p>.1).

	Established Topic?	*Type of pronoun*	*Subject/Object assignments*
C 1	No	NSP	78% / 22%
C 2	No	OSP	45% / 55%
C 3	Yes	NSP	79% / 21%
C 4	Yes	OSP	39% / 61%

Table 8.4 Results of questionnaire 3

According to the *Topic* hypothesis, the preference of OSP for objects should have been as strong as the one of NSP, something that was not the case. Further, OSP was expected to prefer an object more often when the topic has been clearly established in the previous sentence. However, there was no difference between OSP interpretations in two and three-sentence discourses. For the experiments with children, we considered that, to get significant differences in the interpretation of OSP, probably a longer discourse with a more stable sequence of continued topics was needed, so that the salience of the topic was higher at the point where the pronoun occurs. This idea leaded us not to apply the material used in the questionnaire to children. Instead, we opted to evaluate the hypothesis using four-sentence discourses, so that the continued topic becomes more activated. We also decided to eliminate the presence of a third character, since this might make the discourses too complex for children (see Experiment 4 in section 3.2.4).

7.2.4 Material Questionnaires

Questionnaire 1

Items

1.   a   Juana saluda a Marta. Está alegre.
        b   Juana saluda a Marta. Ella está alegre.
          ¿Quién está alegre?

2.   a   Josefina corre junto a Viviana. Está cansada.
        b   Josefina corre junto a Viviana. Ella está cansada.
          ¿Quién está cansada?

3.   a   Ricardo almuerza con Juvenal. Encuentra que el almuerzo está muy rico.
        b   Ricardo almuerza con Juvenal. Él encuentra que el almuerzo está muy rico.
          ¿Quién encuentra que el almuerzo está muy rico?

4.   a   Soledad se reúne con Gracia. Está aburrida.
        b   Soledad se reúne con Gracia. Ella está aburrida.
          ¿Quién está aburrida?

5.   a   Nelson toma cerveza con Federico. Se entretiene mucho.
        b   Nelson toma cerveza con Federico. Él se entretiene mucho.
          ¿Quién se entretiene mucho?

6.   a   Diana discute con Beatriz. Se pone nerviosa.
        b   Diana discute con Beatriz. Ella se pone nerviosa.
          ¿Quién se pone nerviosa?

7.   a   Alfredo habla con Arturo. Está triste.
        b   Alfredo habla con Arturo. Él está triste.
          ¿Quién está triste?

8.   a   Lucía va de compras con Anita. Está apurada.
        b   Lucía va de compras con Anita. Ella está apurada.
          ¿Quién está apurada?

9.   a   Domingo estudia con Lucas. Está estresado.
        b   Domingo estudia con Lucas. Él está estresado.
          ¿Quién está estresado?

10.   a   Sara choca contra Ximena. Está adolorida.
         b   Sara choca contra Ximena. Ella está adolorida.
           ¿Quién está adolorida?

11.   a   Luciano va al cine con Álvaro. Está interesado con la película.
         b   Luciano va al cine con Álvaro. Él está interesado con la película.
           ¿Quién está interesado?

12. a Margarita se junta con Lidia. Está molesta.
    b Margarita se junta con Lidia. Ella está molesta.
       ¿Quién está molesta?

Fillers

1. Manuel va a dejar a Rocío. Después ella juega tenis con Raimundo.
   ¿Quién juega tenis con Raimundo?

2. Romina se encuentra con Julio. Después él va al gimnasio con Maite.
   ¿Quién va al gimnasio con Maite?

3. César desayuna con Catalina. Después ella trabaja con Rubén.
   ¿Quién trabaja con Rubén?

4. Consuelo observa a Silvio. Después él se va con Mónica.
   ¿Quién se va con Mónica?

5. Danilo toma el bus con Amanda. Después ella va al teatro con Ramón.
   ¿Quién va al teatro con Ramón?

6. Carla escucha música con Gabriel. Él se divierte.
   ¿Quién se divierte?

7. Alexis come con Miriam. Ella no tiene mucha hambre.
   ¿Quién no tiene mucha hambre?

8. Nicolás le pasa un cuestionario a Paola. Ella no tiene lápiz para responder.
   ¿Quién no tiene lápiz?

9. Olga le regala una mochila a Franco. Él está sorprendido.
   ¿Quién está sorprendido?

10. Samuel le presta un disco a Raquel. Ella está agradecida.
    ¿Quién está agradecida?

11. Gloria le trae un pastel a Darío. Él no tiene hambre.
    ¿Quién no tiene hambre?

12. Tomás le entrega un regalo a Dominga. Ella está encantada.
    ¿Quién está encantada?

Questionnaire 2

Items

1 a María le pasa un pincel a Francisca. Después le pasa una caja a Fernando.
      ¿Quién le pasa una caja a Fernando?
   b María le pasa un pincel a Francisca. Después ella le pasa una caja a Fernando.

¿Quién le pasa una caja a Fernando?
c María le pasa un pincel a Francisca. Después busca una caja.
¿Quién busca una caja?
d María le pasa un pincel a Francisca. Después ella busca una caja.
¿Quién busca una caja?

2 a Roberto le pasa un cuaderno a Juan. Después le pasa un libro a Andrea.
¿Quién le pasa un libro a Andrea?
b Roberto le pasa un cuaderno a Juan. Después él le pasa un libro a Andrea.
¿Quién le pasa un libro a Andrea?
Roberto le pasa un cuaderno a Juan. Después busca un libro.
c ¿Quién busca un libro?
Roberto le pasa un cuaderno a Juan. Después él busca un libro.
d ¿Quién busca un libro?

3 a Antonia le entrega un collar a Juana. Después le entrega un sacapuntas a Pedro.
¿Quién le entrega un sacapuntas a Pedro.
b Antonia le entrega un collar a Juana. Después ella le entrega un sacapuntas a Pedro.
¿Quién le entrega un sacapuntas a Pedro
c Antonia le entrega un collar a Juana. Después trae un sacapuntas.
¿Quién trae un sacapuntas?
d Antonia le entrega un collar a Juana. Después ella trae un sacapuntas.
¿Quién trae un sacapuntas?

4 a Ricardo le entrega una carta a José. Después le entrega un sobre a Carolina.
¿Quién le entrega un sobre a Carolina?
b Ricardo le entrega una carta a José. Después él le entrega un sobre a Carolina.
¿Quién le entrega un sobre a Carolina?
c Ricardo le entrega una carta a José. Después trae un sobre.
¿Quién trae un sobre?
d Ricardo le entrega una carta a José. Después él trae un sobre.
¿Quién trae un sobre?

5 a Paula le da una flor a Viviana. Después le da un gorro a Ramón.
¿Quién le da un gorro a Ramón?
b Paula le da una flor a Viviana. Después ella le da un gorro a Ramón.
¿Quién le da un gorro a Ramón?
c Paula le da una flor a Viviana. Después toma un gorro.
¿Quién toma un gorro?
d Paula le da una flor a Viviana. Después ella toma un gorro.
¿Quién toma un gorro?

6 a Pablo le da un plato a Jorge. Después le da un vaso a Lucía.
¿Quién le da un vaso a Lucía?
b Pablo le da un plato a Jorge. Después él le da un vaso a Lucía.
¿Quién le da un vaso a Lucía?
c Pablo le da un plato a Jorge. Después toma un vaso.
¿Quién toma un vaso?
d Pablo le da un plato a Jorge. Después él toma un vaso.
¿Quién toma un vaso?

7 a Alejandra le regala un chocolate a Luisa. Después le regala un dulce a Víctor.

        ¿Quién le regala un dulce a Víctor?

b   Alejandra le regala un chocolate a Luisa. Después ella le regala un dulce a Víctor.
        ¿Quién le regala un dulce a Víctor?

c   Alejandra le regala un chocolate a Luisa. Después saca un dulce.
        ¿Quién saca un dulce?

d   Alejandra le regala un chocolate a Luisa. Después ella saca un dulce.
        ¿Quién saca un dulce?

8   a   Pepe le regala un dibujo a Jaime. Después le regala una bufanda a Lucía.
        ¿Quién le regala una bufanda a Lucía?

   b   Pepe le regala un dibujo a Jaime. Después ella le regala una bufanda a Lucía.
        ¿Quién le regala una bufanda a Lucía?

   c   Pepe le regala un dibujo a Jaime. Después saca una bufanda.
        ¿Quién saca una bufanda?

   d   Pepe le regala un dibujo a Jaime. Después él saca una bufanda.
        ¿Quién saca una bufanda?

9   a   Eugenia le presta un pañuelo a Verónica. Después le presta un lápiz a Miguel.
        ¿Quién le presta un lápiz a Miguel?

   b   Eugenia le presta un pañuelo a Verónica. Después ella le presta un lápiz a Miguel.
        ¿Quién le presta un lápiz a Miguel?

   c   Eugenia le presta un pañuelo a Verónica. Después agarra un lápiz.
        ¿Quién agarra un lápiz?

   d   Eugenia le presta un pañuelo a Verónica. Después ella agarra un lápiz.
        ¿Quién agarra un lápiz?

10 a   Sebastián le presta un reloj a Diego. Después le presta una tijera a Cecilia.
        ¿Quién le presta una tijera a Cecilia?

   b   Sebastián le presta un reloj a Diego. Después ella le presta una tijera a Cecilia.
        ¿Quién le presta una tijera a Cecilia?

   c   Sebastián le presta un reloj a Diego. Después agarra una tijera.
        ¿Quién agarra una tijera?

   d   Sebastián le presta un reloj a Diego. Después él agarra una tijera.
        ¿Quién agarra una tijera?

11 a   Mariana le convida un pan a Natalia. Después le convida un pastel a Sergio.
        ¿Quién le convida un pastel a Sergio?

   b   Mariana le convida un pan a Natalia. Después ella le convida un pastel a Sergio.
        ¿Quién le convida un pastel a Sergio?

   c   Mariana le convida un pan a Natalia. Después parte un pastel.
        ¿Quién parte un pastel?

   d   Mariana le convida un pan a Natalia. Después ella parte un pastel.
        ¿Quién parte un pastel?

12 a   Matías le convida un helado a Cristián. Después le convida una manzana a Ana.
        ¿Quién le convida una manzana a Ana?

   b   Matías le convida un helado a Cristián. Después él le convida una manzana a Ana.
        ¿Quién le convida una manzana a Ana?

   c   Matías le convida un helado a Cristóbal. Después parte una manzana.
        ¿Quién parte una manzana?

   d   Matías le convida un helado a Cristóbal. Después él parte una manzana.

¿Quién parte una manzana?

13 a Angélica le tira un papel a Trinidad. Después le tira una pelota de tenis a Marco.
       ¿Quién tira una pelota de tenis a Marco?
    b Angélica le tira un papel a Trinidad. Después ella le tira una pelota de tenis a Marco.
       ¿Quién tira una pelota de tenis a Marco?
    c Angélica le tira un papel a Trinidad. Después recoge una pelota de tenis.
       ¿Quién recoge una pelota de tenis?
    d Angélica le tira un papel a Trinidad. Después ella recoge una pelota de tenis.
       ¿Quién recoge una pelota de tenis?

14 a Alberto le tira una naranja a Martín. Después le tira un plátano a Susana.
       ¿Quién le tira un plátano a Susana?
    b Alberto le tira una naranja a Martín. Después él le tira un plátano a Susana.
       ¿Quién le tira un plátano a Susana?
    c Alberto le tira una naranja a Martín. Después recoge un plátano.
       ¿Quién recoge un plátano?
    d Alberto le tira una naranja a Martín. Después él recoge un plátano.
       ¿Quién recoge un plátano?

15 a Pancha le trae un sándwich a Adriana. Después le trae un café a Enrique.
       ¿Quién le trae un café a Enrique?
    b Pancha le trae un sándwich a Adriana. Después ella le trae un café a Enrique.
        ¿Quién le trae un café a Enrique?
    c Pancha le trae un sándwich a Adriana. Después se prepara un café.
       ¿Quién se prepara un café?
    d Pancha le trae un sándwich a Adriana. Después ella se prepara un café.
       ¿Quién se prepara un café?

16 a Héctor le trae una sopa a Lucas. Después le trae un té a Julia.
       ¿Quién le trae un té a Julia?
    b Héctor le trae una sopa a Lucas. Después él le trae un té a Julia.
        ¿Quién le trae un té a Julia?
    c Héctor le trae una sopa a Lucas. Después se prepara un té.
       ¿Quién se prepara un té?
    d Héctor le trae una sopa a Lucas. Después él se prepara un té.
       ¿Quién se prepara un té?

Fillers

1.   María está en el trabajo. Le pasa un pincel a Francisca. Después le pasa una caja a Fernando.
     ¿Quién le pasa una caja a Fernando?

2.   Roberto va la biblioteca. Le pasa un cuaderno a Juan. Después busca un libro.
     ¿Quién busca un libro?

3.   Antonia saca cosas de su estuche. Le entrega una goma a Juana. Después ella le entrega un sacapuntas a Pedro.
      ¿Quién le entrega un sacapuntas a Pedro?

4.   Ricardo llega de la librería. Le entrega una carta a José. Después él trae un sobre.

¿Quién trae un sobre?

5.   Paula está feliz. Le da una flor a Viviana. Después le da un gorro a Ramón.
¿Quién le da un gorro a Ramón?

6.   Pablo sirve la comida. Le da un plato a Jorge. Después toma un vaso.
¿Quién toma un vaso?

7.   Alejandra sale a recreo. Le regala un chocolate a Luisa. Después ella le regala un dulce a Víctor.
¿Quién le regala un dulce a Víctor?

8.   Pepe está de visita. Le regala un dibujo a Jaime. Después él saca una bufanda.
¿Quién saca una bufanda?

9.   Eugenia es una buena amiga. Le presta un pañuelo a Verónica. Después le presta un lápiz a Miguel. ¿Quién le presta un lápiz a Miguel?

10.   Sebastián está en clases. Le presta un reloj a Diego. Después agarra una tijera.
¿Quién agarra una tijera?

11.   Mariana es generosa. Le convida un pan a Natalia. Después ella le convida un pastel a Sergio.
¿Quién le convida un pastel a Sergio?

12.   Matías quiere compartir. Le convida un helado a Cristóbal. Después él parte una manzana.
¿Quién parte una manzana?

13.   Angélica se entretiene jugando. Le tira un papel a Trinidad. Después le tira una pelota de tenis a Marco. ¿Quién tira una pelota de tenis a Marco?

14.   Alberto tiene un canasto con frutas. Le tira una naranja a Martín. Después elige un plátano.
¿Quién elige un plátano?

15.   Pancha va a buscar la comida. Le trae un sándwich a Adriana. Después ella le trae un café a Enrique. ¿Quién le trae un café a Enrique?

16.   Héctor termina de cocinar. Le trae una sopa a Lucas. Después él se prepara un té.
¿Quién se prepara un té?

17.   Danilo sale de su casa. Toma el bus con Amanda. Ella tiene prisa.
¿Quién tiene prisa?

18.   Carla sale del colegio. Escucha música con Gabriel. Él se divierte.
¿Quién se divierte?

19.   Alexis va al restorán. Come con Miriam. Ella no tiene mucha hambre.
¿Quién no tiene mucha hambre?

20.   Nicolás llega a la sala. Le pasa un cuestionario a Paola. Ella no tiene lápiz para responder.
 ¿Quién no tiene lápiz?

21.   Olga va al cumpleaños. Le regala una mochila a Franco. Él está sorprendido.
        ¿Quién está sorprendido?

22.   Samuel colecciona música. Le presta un disco a Raquel. Ella está agradecida.
        ¿Quién está agradecida?

23.   Gloria va a la panadería. Le trae un pastel a Darío. Él no tiene hambre.
        ¿Quién no tiene hambre?

24.   Tomás entra a la casa. Le entrega un regalo a Dominga. Ella está encantada.
        ¿Quién está encantada?

Questionnaire 3

Items

1   a   Juan saluda a Marta. Después Juan conversa con Pedro. Él está alegre.
      b   Juan saluda a Marta. Después conversa con Pedro. Él está alegre.
         ¿Quién está alegre?

2   a   Josefina juega con León. Después Josefina corre junto a Viviana. Ella está cansada.
      b   Josefina juega con León. Después corre junto a Viviana. Ella está cansada.
         ¿Quién está cansada?

3   a   Ricardo trabaja con Macarena. Después Ricardo almuerza con Juvenal. Él encuentra que el almuerzo está muy rico.
      b   Ricardo trabaja con Macarena. Después almuerza con Juvenal. Él encuentra que el almuerzo está muy rico. ¿Quién encuentra que el almuerzo está muy rico?

4   a   Soledad pasea con Felipe. Después Soledad se reúne con Gracia. Ella está aburrida en la reunión.
      b   Soledad pasea con Felipe. Después se reúne con Gracia. Ella está aburrida en la reunión.
         ¿Quién está aburrida?

5   a   Nelson come con Nicole. Después Nelson toma cerveza con Federico. Él se entretiene mucho
      b   Nelson come con Nicole. Después toma cerveza con Federico. Él se entretiene mucho.
         ¿Quién se entretiene mucho?

6   a   Diana molesta a Julián. Después Diana discute con Beatriz. Ella se pone nerviosa.
      b   Diana molesta a Julián. Después discute con Beatriz. Ella se pone nerviosa.
         ¿Quién se pone nerviosa?

7   a   Alfredo sale con Marcia. Después Alfredo habla con Arturo. Él está triste.
      b   Alfredo sale con Marcia. Después habla con Arturo. Él está triste.
         ¿Quién está triste?

8   a   Lucía acompaña a Rodrigo. Después Lucía va de compras con Anita. Ella está apurada.
      b   Lucía acompaña a Rodrigo. Después Lucía va de compras con Anita. Ella está apurada.
         ¿Quién está apurada?

9 a Domingo camina junto a Mercedes. Después Domingo estudia con Lucas. Él está estresado.
   b Domingo camina junto a Mercedes. Después estudia con Lucas. Él está estresado.
      ¿Quién está estresado?

10 a Sara trota con Hugo. Después Sara choca contra Ximena. Ella está adolorida.
    b Sara trota con Hugo. Después choca contra Ximena. Ella está adolorida.
       ¿Quién está adolorida?

11 a Luciano visita a Manuela. Después Luciano va al cine con Álvaro. Él está interesado con la película.
    b Luciano visita a Manuela. Después va al cine con Álvaro. Está interesado con la película.
       ¿Quién está interesado?

12 a Margarita llama a Antonio. Después Margarita se junta con Lidia. Ella está molesta.
    b Margarita llama a Antonio. Después se junta con Lidia. Ella está molesta.
       ¿Quién está molesta?

13 a Manuel va a dejar a Rocío. Después Manuel juega tenis con Raimundo. Él disfruta del partido.
    b Manuel va a dejar a Rocío. Después juega tenis con Raimundo. Él disfruta del partido.
       ¿Quién disfruta del partido?

14 a Romina se encuentra con Julio. Después Romina va al gimnasio con Maite. Ella tiene sueño.
    b Romina se encuentra con Julio. Después va al gimnasio con Maite. Ella tiene sueño.
       ¿Quién tiene sueño?

15 a César desayuna con Catalina. Después César trabaja con Rubén. Él se siente enfermo. ¿
    b César desayuna con Catalina. Después trabaja con Rubén. Él se siente enfermo.
       ¿Quién se siente enfermo?

16 a Consuelo observa a Silvio. Después Consuelo se va con Mónica. Ella tiene hambre.
    b Consuelo observa a Silvio. Después se va con Mónica. Ella tiene hambre.
       ¿Quién tiene hambre?

Fillers

The same of questionnaire 2

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