

Variables and Resumption in Child Spanish

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Abstract

We present results from two pilot experiments investigating resumption in questions in Child Spanish. We tested the production and comprehension through an elicitation and an acceptability task respectively. The subjects were monolingual Spanish children, age 3-6, and a group of adult controls. Our results show that resumption is not attested in production by either group of subjects. Children, however, accept pronominals in embedded positions or in d-linked questions introduced by *cuál*, conditions which have independently been shown to favour resumption. Our results contrast with previous studies that have established productive use of non-target resumption in relative clauses in Child Spanish (Pérez-Leroux 1995). In particular, our results disconfirm Pérez-Leroux's 1995 hypothesis that overproduction of resumption in relative clauses is due to an underspecified [+/-variable] value for the pronominal, leading children to use pronouns as variables in quantificational chains (Lasnik & Stowell 1991). According to this hypothesis overproduction of pronominals is expected not only in relative clauses, but also in questions, a prediction not borne out in our results. We conclude that children do know that pronouns are not legitimate variables in quantificational chains and, in this respect, their grammar is not qualitatively different from that of adults.

1 Introduction

We present results from two pilot experiments investigating resumption in questions in Child Spanish. Previous studies have established productive use of non-target resumption in Spanish child relative clauses (Pérez-Leroux 1995). Pérez-Leroux 1995 takes such overproduction to be the consequence of an underspecified [+/-variable] value for the pronominal. Thus, children use pronominals as variables in quantificational chains (Lasnik & Stowell 1991). While they master movement, they have not acquired the [-variable] value of pronominals. A crucial aspect of this hypothesis is that overproduction of pronominals is expected not only in relative clauses, but also in questions. The main aim of the reported studies is to test the validity of this hypothesis.

2 Elicitation of questions

2.1 *Experimental design and materials*

The central issue is whether resumption is indeed attested in Child Spanish. It is, therefore, necessary to take into account factors that are known to affect resumption, such as embedding and d(iscourse)-linking. Embedding has been shown to improve

the acceptability of resumptive questions and relative clauses (Alexopoulou & Keller 2007, Erteschick-Shir 1992, McKee & McDaniel 2001). We, thus, included questions extracted from embedded positions, one from an infinitival clause like (1) and one from a finite clause like (2).

- (1) ¿Qué quieres comer?
What want-2sg eat-inf
What do you want to eat?
- (2) ¿Quién piensas/crees que mandó Winnie a buscar la pelota?
Who think/believe-2sg that sent-3sg Winnie to find the ball
Who do you think Winnie sent to find the ball?

Questions headed by d-linked wh-phrases like *which X* have been argued to tolerate resumption, in contrast to non d-linked questions introduced by *who* (Cinque 1990, Anagnostopoulou 1994). We tested whether the contrast between d-linked *cuál* and non d-linked *qué* has an effect on the production of resumptive questions.

The design crossed the following factors: Embedding (matrix, infinitival, finite) X D-linking (*cuál, qué*), which resulted in 6 cells. English translations of sample targeted questions are given below. Two tokens of each condition were targeted, resulting in 12 experimental items.

- S1: What does Kanga carry in her belly? (**Qué, matrix**)
- S2: Which ice cream did Winnie eat? (**Cuál, matrix**)
- S3: What do you want to play? (**Qué, infinitive**)
- S4: Which juice do you want to drink? (**Cuál, infinitive**)
- S5: Who do you think Winnie sent to find the ball? (**Qué, finite**)
- S6: Which car do you think Tiger hid in the house? (**Cuál, finite**)

2.2 Methodology

The elicitation task was modelled on Thornton 1996. The experimenter introduced children to a puppet, Pingu, who came from the fictional far away “childrens’ land”. During the warm-up phase children were encouraged to find out things about Pingu and his country by asking questions to Pingu. During the experimental phase a story was acted out with toys and witnessed by the child. The puppet was either assumed to not always pay attention or was prevented from watching the story developing (by covering his eyes). The children were then encouraged to ask the puppet questions to ascertain its comprehension of what was going on. The puppet was furthermore said to talk only to children and not to adults. An example of such interactions is given in (3).

- (3) Small acted out story: Winnie is with Piglet and looking for honey; they find two ice-creams, one vanilla and one strawberry. Piglet chooses vanilla and Winnie strawberry.
Experimenter: Let’s find out if Pingu understood what happened.
En esta historia habia dos helados, uno de vainilla y uno de fresa.
In this story there were two ice creams, a vanilla and a strawberry one.

Winnie comió uno de esos. Pregúntale a Pingu cuál.
Winnie ate one of the two. Ask Pingu which.

Experimental items were presented in random order and interspersed with 2-4 fillers. Note, finally, that all the referents of *wh*-items were contextually salient since they had been introduced in the story or in the space of interaction.

2.3 Subjects

The participants were 15 monolingual Spanish children, age 3-6. They were divided into 3 groups according to age, namely 3-4, 4-5 and 5-6. The data collection was carried out at a school in Madrid, in November 2006. In addition, we had a control group of 4 adult speakers of Spanish.

2.4 Results

Table 1 presents the results of the elicitation task in raw numbers and percentages. The task aimed at obtaining two sets of the items illustrated in S1-S6. In Table 1 we ignore the *d*-linking condition. Thus, results for S1&S2 type items are given in the left column (matrix), results for S3&S4 in the middle column (infinitival embedding) and results for S5&S6 in the right column (finite embedding). The top row for each age group indicates the total of elicited utterances in each condition. For example, 3-year olds produced 35 items in the matrix condition, 26 in the infinitival embedding condition and 45 in the finite embedding condition. The reason the numbers vary across conditions is because in some cases the experimenter would make the puppet give answers which were wrong in the context of the story, and the child was encouraged to ask again, giving the puppet "one more chance". The second row indicates the number and percentage of elicited *wh*-questions. For instance, of the 35 elicited utterances of 3-year olds, 7 were *wh*-questions in the matrix condition while of the 35 elicited items of the 4-year olds in the finite embedded condition, 30 were *wh*-questions. The 3rd and 4th row indicate the number and percentage of matrix and embedded questions in each condition. For example, of the 17 items elicited from 4-year olds in the infinitival embedding condition, 10 were *wh*-questions; of those 10 questions, 2 were matrix (like S1/S2) and 8 were embedded (like S3/S4).

		matrix	infinitival embedding	finite embedding
3yr olds	total of elicited items	35	26	45
	wh-questions	7 (.20)	5 (.19)	24 (.53)
	matrix	7 (1.)	3 (.60)	24 (1.)
	embedded	0	2 (.40)	0
4yr olds	total of elicited items	15	17	35
	wh-questions	4 (.27)	10 (.59)	30 (.86)
	matrix	4 (1.)	2 (.20)	30 (1.)
	embedded	0	8 (.80)	0
5yr olds	total of elicited items	37	22	59
	wh-questions	24 (.65)	22 (1.)	57 (.97)
	matrix	24 (1.)	6 (.27)	40 (.70)
	embedded	0	15 (.68)	17 (.30)
adults	total of elicited items	27	17	27
	wh-questions	27 (1.)	17 (1.)	27 (1.)
	matrix	18 (.67)	3 (.18)	11 (.41)
	embedded	9 (.33)	14 (.82)	16 (.59)

Table 1: Wh-questions (matrix, embedded) elicited in matrix, infinitival and finite embedded conditions, in raw numbers and percentages.

Consider the adult controls. Their responses involve 100% wh-questions. In addition, their questions match the experimental condition: 67% matrix questions in the matrix condition, 82% embedded questions in the infinitival embedding condition and 59% embedded questions in the finite embedding condition. The production of embedded questions in the matrix condition is traceable to clefts as in (4) produced mainly when questions were cued by *cuál*. The adult controls sometimes use matrix questions in embedded conditions, which are not infelicitous: they just represent alternative ways of asking an appropriate question in that particular context, as for instance in (5) where the target is “which animal do you think you have heard?” Despite such instances of matrix questions, the crucial point is that the adults are able to ask complex questions involving extraction from a finite embedded clause in this condition.

- (4) ¿qué es lo que llevan los canguros en la barriguita?
 what is it that carry.3pl the kangaroos in the tummy.diminutive
 What is it that kangaroos carry in their tummy?’

(5) Experimenter: *Hemos escuchado un animalito. Pregúntale a Pingu qué animalito piensa él.*

Adult: We have heard an animal. Ask Pingu which animal he thinks.
¿qué animalito has escuchado?
which animal have you heard?

Turning to children, it is noticeable that not all of the elicited material consists of wh-questions and the proportion in which they produce wh-questions varies. 5-year olds approach the adult standard, with the proportion of questions in their elicited utterances ranging from 65% to 100%. By contrast, for 4-year olds the proportion of questions ranges from 27%-86% and drops to 20%-53% for 3-year olds. In addition, age groups differ in the proportion of embedded questions they produce in the relevant conditions. It is striking that 3- and 4-year olds fail to produce any embedded questions in the finite embedding condition. This contrasts with 5-year olds who produce 30% embedded questions in the finite embedding condition and adults who produce 59%. Instead, 3- and 4-year olds only produce matrix questions. Most of them reproduce the cue offered and change the agreement, as in example (6) below. Non-finite embeddings as in (7), on the other hand, are more productive. Note also that although 5-year olds produce embedded questions in the finite condition, the majority of their questions are matrix.

(6) Experimenter: *Hemos formado un animalito. Pregúntale a Pingu cuál piensa él.*

Child: We have formed a little animal. Ask Pingu which one he thinks.
¿cuál piensas tú?
which one think.2s you
Which one do you think?

(7) *¿a qué quieres jugar?* (Celia, 4 yrs)

what want.2s play.infinitive
'what do you want to play?'

Table 2 shows the types of responses children produce when they do not produce the targeted wh-questions. Children may use intonation, a yes-no question (e.g. Winnie ate strawberry ice cream or vanilla ice-cream?), repeat the cue or answer the question themselves. This last response is dominant in 3- and 4-year olds but fades away with 5-year olds. Interestingly, it is pronounced in the matrix condition, (60% and 53%) but is less frequent in the embedded conditions (27% and 36% for 3-year olds and 24% and 9% for 4-year olds). Another frequent response is cue repetition. In this case they use the cue as a basis for a question, but since the question is addressed to the puppet, they change agreement from 3rd to 2nd person, as in example (6). An exact repetition of the cue is fairly rare. Despite the high proportion of answers in the matrix condition (which deserves further investigation), in the majority of cases children attempt to formulate questions, indicating that they do understand the task. This is particularly evident in the embedded conditions where most items are attempted questions; the absence of the targeted long distance questions from the production of younger children indicates a genuine difficulty in formulating such complex questions.

		matrix	infinitival embedding	finite embedding
3yr olds	total of elicited items	35	26	45
	intonation	4 (.11)	0	1 (.02)
	answers	21 (.60)	7 (.27)	16 (.36)
	yes-no questions	2 (.06)	8 (.31)	0
	cue repetition	1 (.03)	5 (.19)	4 (.09)
	matrix	7 (.20)	3	close to cue 24 (.53)
	embedding	0	2	0
4yr olds	total of elicited items	15	17	35
	intonation	0	0	2 (.06)
	answers	8 (.53)	4 (.24)	3 (.09)
	yes-no questions	2 (.13)	1 (.06)	0
	cue repetition	1 (.06)	1 (.06)	
	no answer	0	1 (.06)	0
	matrix	4 (.27)	2 (.12)	close to cue 28 (.80) other 2 (.06) (.86)
	embedding	0	8 (.47)	0
5yr olds	total of elicited items	37	22	59
	intonation	5 (.13)	1 (.05)	1 (.02)
	answers	5 (.13)	0	0
	yes-no questions	0	0	0
	cue repetition	3 (.09)	0	1 (.02)
	matrix	24 (.65)	6 (.27)	close to cue 23 (.39) other 17 (.29)
	embedding	0	15 (.68)	17 (.29)

Table 2: Alternatives to wh-questions produced by children

2.5 Discussion

Neither the adult controls nor the children produced any resumptive structures. Recall that on the basis of Pérez-Leroux's (1995) hypothesis of an underspecified [+/-variable] value for pronominals, one should expect overproduction of pronominals in interrogatives, similarly to what happens in relative clauses. This prediction was not borne out in our data. Note further that we found no difference between structures which were expected to favour resumption, e.g. extraction out of finite embedded clauses, and those which don't, such as matrix clauses.

We observe age-related differences. While all the material elicited from the adults consists of wh-questions, this is not so for the children. Younger children, particularly

the 3-year olds, produce considerably fewer wh-questions than adults, and these are mainly matrix questions. 4-year olds produce not only matrix questions, but also questions involving extraction from embedded positions in infinitival complements. 5-year olds are much closer to adults in this respect.

With respect to the *cuál/qué* distinction, we observe that it is absent from 3-year olds who produce only *qué*-questions. This differentiation is available to 4-year olds. There is a contrast between children and adults: while children can combine both *qué* and *cuál* with an N, *cuál*+N clusters are not attested in the adults. Adult production appears to obey the prescriptive ban on *cuál*+N in Peninsular Spanish. Finally, adults, as opposed to children, are quite productive with clefts as an expression of d-linking.

As a next step, it is necessary to explore the possibility of resumption being available in comprehension, for which we tested the acceptability of the structures.

3 Acceptability of questions

The elicitation task established that children do not produce any pronominals in their questions. However, younger children in particular had difficulty producing longer questions involving extraction from embedded positions. The purpose of the second experiment was to approach the status of embedded questions and resumption through the acceptability of the relevant structures. In addition, McDaniel and McKee 2001 found that English speaking children accepted more resumptive pronominals in relative clauses than they produced in an elicitation study. We, therefore, wanted to find out whether a similar discrepancy exists in questions of Spanish speaking children.

3.1 Experimental design and materials

The experiment investigated the same factors with the elicitation study with the additional factor of resumption: Resumption (gap or pronominal) x D-linking (*qué*, *cuál*) x embedding (no-embedding, infinitive, finite). This resulted in 12 cells. Due to practical limitations only one token was used for each experimental condition. The tested items are listed below. All items with pronominals are ungrammatical in the target language, thus, experimental items were balanced for grammaticality.

S1g: ¿Qué empujó Kanga? (**Gap, matrix, qué**)

What pushed-3sg Kanga?

What did Kanga push?

S1p: ¿Qué lo comió Piglet? (**Res, matrix, qué**)

What it ate-3sg Piglet

What did Piglet eat?

S2g: ¿Cuál pelota golpeó el cerdito? (**Gap, matrix, cuál**)

Which ball kicked the piggy?

Which ball did the small pig kick?

S2p: ¿Cuál helado lo comió Winnie? (**Res, matrix, cuál**)

Which ice-cream it ate-3sg Winnie

Which ice-cream did Winnie eat?

- S3g:** ¿Qué quieres hacer? (**Gap, infinitive, qué**)
 What want-2sg do-inf
 What do you want to do?
- S3p:** ¿Qué quieres comerlo? (**Res, infinitive, qué**)
 What want-2sg eat-inf-it
 What do you want to eat?
- S4g:** ¿Cuál zumo quieres tomar? (**Gap, infinitive, cuál**)
 Which juice want-2sg drink-inf
 Which juice do you want to drink?
- S4p:** ¿Cuál cochecito quieres cogerlo? (**Res, infinitive, cuál**)
 Which car want-2sg take-inf-it
 Which car do you want to take?
- S5g:** ¿A quién piensas que mandó Winnie a buscar la pelota? (**Gap, finite, qué**)
 A who think-2sg that sent-3sg Winnie to look-for-inf the ball
 Who do you think Winnie sent to look for the ball?
- S5p:** ¿A quién piensas que lo pusimos en la casita? (**Res, finite, qué**)
 A who think-2sg that it put-1pl in the house
 Who do you think we put in the house?
- S6g:** ¿Cuál piensas que escondió Piglet? (**Gap, finite, cuál**)
 Which think-2sg that hid-3sg Piglet
 Which one do you think Piglet hid?
- S6p:** ¿Cuál muñequito piensas que lo pusimos en la casita? (**Res, finite, cuál**)
 Which doll think-2sg that it put-1pl in the house
 Which doll do you think we put in the house?

3.2 Methodology

The acceptability task was modelled on McDaniel and Smith-Cairns 1996. Data were collected over two sessions, a training and an experimental one. During the training session children met their familiar character, *Pingu*, and were asked to help him with his Spanish by telling him if his sentences were good or bad. Training items involved judgements of words, declarative sentences and questions. Ungrammatical items involved word order and agreement errors. Children picked up the task easily. When they rejected an item the experimenter encouraged them to give the correct version. In most cases children did this easily. The test session included a warm-up phase with a subset of items from the training session and then the set of the 12 experimental items interspersed by 4 ungrammatical fillers. All fillers involved wh-questions, on a par with the experimental items and were all ungrammatical to control against a potentially high rate of positive responses to ungrammatical experimental items. Each item was preceded by a small story as illustrated in the following example.

S4p: [Context: two cars]

Pingu: *Acá tenemos dos cochecitos, un rojo y un azul. Si Eli quiere coger uno de éstos y yo quiero saber cuál, ¿está bien preguntar a Eli: Eli, ¿cuál cochecito quieres cogerlo?*

Here we have two cars, a red and a blue one. If Eli (= the experimenter) wants to take one of these and I want to know which one is it o.k. to ask Eli: Eli, which car you want to take it?

3.3 Subjects

Subjects came from the same school in Madrid as in the elicitation study. Data were collected in April 2007, approximately 5 months after the elicitation study. 11 children completed both the training and test session. Of those, 3 children were excluded from analysis.¹ Of the remaining 8 children 6 had completed their 5th birthday and 2 their 3rd at the time of data collection. All 8 children picked up the ungrammaticality of the 4 filler items. The test session was also completed by 4 adult controls.

3.4 Results

Results from all 8 children are tabulated in Table 3. Children systematically judged gap structures as acceptable. They are also clearly sensitive to resumption, but there is more variability in their responses depending on the condition. Resumptive items range from ungrammatical (S1p, S3p) to essentially acceptable (S4g, possibly S6g). Children's responses are split for S2p and S5p.

S1g	7	S1p	0
S2g	8	S2p	4
S3g	8	S3p	2
S4g	8	S4p	7
S5g	7	S5p	4
S6g	7	S6p	6

Table 3 Number of acceptable questions per condition. Gap structures are on the left (S1g-S6g) and resumptive structures on the right (S1p-S6p).

Embedding has an effect on the acceptability of resumptive structures. As indicated in Table 4, embedded resumptive structures are judged as acceptable more than twice as often as corresponding non-embedded structures. For both types of embedded structures this effect is more pronounced in the *cuál* condition. It would appear that this is more so for infinitival embedding.

1 One did not understand the task; one was evidently tired and distracted during the test session and one gave an uncharacteristically high number of negative responses during the test session indicating he possibly enjoyed over correcting the puppet.

Matrix (S1p&S2p)	Infinitival Embedding (S3p&S4p)	Finite Embedding (S5p&S6p)
(0+4=) 4	(2+7=) 9	(4+6=) 10

Table 4: Number of acceptable resumptive questions in non-embedded and embedded conditions.

Resumptive structures headed by *cuál* were judged acceptable more often than resumptive structures headed by *qué* (Table 5). This appears to be the strongest factor affecting the acceptability of resumption. While children unanimously reject S1p, only half of them reject S2p. The combination of *cuál* and embedding results in resumptive questions with the highest scores, S4p and S6p, which receive scores comparable with the corresponding gap structures.

Cuál resumptive questions (S2p,S4p&S6p)	Qué resumptive questions (S1p,S3p&S5p)
(4+7+6=) 17	(0+2+4=) 6

Table 5: Number of questions judged acceptable in the *cuál* and *qué* conditions.

All 4 adult controls rejected all resumptive questions. They accepted all gap questions introduced by *qué* but rejected gap questions introduced by *cuál* (S2g, S3g).

3.5 Discussion

The results clearly indicate that children are sensitive to resumption in questions and do not treat pronominals as variables on a par with traces. In addition, while they accept more resumptive questions than adult controls, this is clearly linked to two specific conditions, embedding and d-linking. This is true for the youngest children as well. In this respect, their grammar does not appear to be qualitatively different from the adult grammar in having an underspecified representation of the variable value of pronouns as hypothesised by Pérez-Leroux. Underspecification would result in random optionality between pronominals and gaps, clearly not the case in our results.

Adults tend to reject the sequence *cuál*+N in both gap and resumptive questions and tend to correct to *qué*+N. *Cuál*+N is productive in Latin American Spanish but prescriptively banned in Peninsular Spanish. There is no sign that children disprefer *cuál*+N. We believe that adults are being prescriptive in their judgement of *cuál*+N while children of preschool age offer more genuine judgements on this. Children accept all *cuál*+N gap questions and many *cuál*+N resumptive questions. The contrast between questions introduced by *qué* and questions introduced by *cuál* indicates that children are aware of known interactions between discourse linking and pronouns (Cinque 1990). Note, however, that it is impossible to properly evaluate whether adults are also sensitive to these interactions since adults always reject *cuál*+N sequences irrespective of whether a gap or a pronoun is involved.

Finally children accept resumptive structures more often in embedded conditions. This result patterns with findings from adult grammars and can be explained as a consequence of the processing complexity involved in such structures (Alexopoulou and Keller 2007, Dickey 1996, Erteschick-Shir 1992).

4 Elicitation vs. acceptability results

In the elicitation task we found no evidence of resumption under any condition. However, children do accept pronominals in some questions, even though they do not produce them. McKee and McDaniel 2001 report a similar discrepancy between production and acceptability in relation to resumption in relative clauses of English children. The replication of this result for Spanish questions indicates a more general and systematic phenomenon. Following McKee and McDaniel 2001, we attribute the discrepancy to higher complexity involved in comprehension, as opposed to production. Indeed the fact that pronominals were accepted in embedded positions indicates their involvement in easing the processing load of long distance questions (see Dickey 1996 and Alexopoulou and Keller 2007 on this). Recall that, as indicated by the results of the elicitation study, younger children in particular have difficulty in formulating complex questions involving extraction from embedded clauses. The contrast between matrix and embedded questions observed in the elicitation study is also present in the acceptability study. The only difference is that in the acceptability study, the additional complexity of comprehension yields acceptance of resumptive elements which were not produced in the elicitation study. By contrast, adults showed no difficulty producing embedded questions; their data from the acceptability study are, thus, on a par with their elicitation data in showing no contrast between matrix and embedded questions. Under this view, child grammars are essentially target-like. The contrast with adults lies in the increased complexity of long-distance questions for young children.

5 Conclusion

We have explored the availability and nature of resumption in Spanish child grammar, focussing on the production and comprehension of questions. Contrary to expectations based on an underspecification account of pronominals, we did not find generalised resumption in wh-interrogatives. The cases of resumption we find are consistent with a last resort strategy to ease processing load at an early developmental stage. Further, resumptive questions are subject to a d-linking condition. A number of interesting questions arise. What is the source of the difficulty children have in formulating long distance questions? Are adults really insensitive to interactions between d-linking and resumption? As this was only a pilot study, such questions as well as the precise nature of the interactions between the various investigated factors will only be clarified with a further large scale investigation.

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