MASTER IN COGNITIVE SCIENCE AND LANGUAGE

MASTER THESIS

The acquisition of raising verbs: the case of Catalan *semblar*

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Abstract: There are structures which pose a challenge to children. Similar to passive, the acquisition of Subject-to-Subject Raising (StSR) is delayed. Many scholars (Wexler, 2004; Hyams & Snyder, 2006; Becker, 2006; Hirsch & Wexler, 2007; Hirsch, Orfitelli & Wexler, 2008; Hirsch, 2011; Orfitelli, 2012) have accounted for this phenomenon in English. Some others have attempted to do the same in Spanish (Mateu, 2019) and Catalan (Jo, 2022). The present study is a follow-up of the work by Jo (2022). By means of a truth-value judgement task carried out with children in the age range of 3 to 7, the present study is aimed at evaluating if children understand the verb *semblar* "seem" and its structure. Assuming children understand the meaning of the verb is assuming children understand the difference between reality and appearance. Whereas children seemed not to struggle with *semblar* in Jo (2022), the present study suggests that children use a copular strategy to overcome difficulty. This strategy does not ensure success, as children do not always differentiate between reality and appearance. Therefore, three different patterns in performance have been observed: Children who do not show understanding of the task, children who interpret the items at individual-level and misinterpret sentences with *semblar* and children who give a stage-level interpretation to the predicates and, consequently, succeed in those items with *semblar,* as they deal with appearance.

Keywords: raising, *semblar* "seem", stage-level predicates, individual-level predicates, acquisition

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1. Introduction

There are structures which pose a challenge to children. Similar to passive, the acquisition of Subject-to-Subject Raising (StSR) is delayed. Many scholars (Wexler, 2004; Hyams & Snyder, 2006; Becker, 2006; Hirsch & Wexler, 2007; Hirsch, Orfitelli & Wexler, 2008; Hirsch, 2011; Orfitelli, 2012) have investigated this late acquisition by carrying out studies which involve raising verbs such as English *seem.* Moreover, other studies (Mateu, 2019; Jo, 2022) have attempted to do the same for Spanish and Catalan verbs *parecer* and *semblar* "seem".

Whereas Hirsch, Orfitelli and Wexler (2008) claim that the delay in StSR acquisition is due to an instance of illicit movement, Orfitelli (2012) asserts that the intervention of the experiencer argument is at the root of late acquisition. Mateu (2019) and Jo (2022) carry out their respective studies on Spanish and Catalan and conclude that Spanish- and Catalan-speaking children do not show a late acquisition of the structure of these verbs and, assuming that *parecer* and *semblar* are raising verbs, and arguably the absence of the experiencer is what makes it easier for Spanish- and Catalan-speaking children to acquire sentences with *parecer* and *semblar*. On the other hand, Torrego (1996, 1998), Ausín (2001) and Gallego (2007) argue that *parecer* and, possibly, *semblar* may behave as raising verbs, but they can also behave as modal verbs or control verbs.

This study is a follow-up of the work by Jo (2022) on Catalan *semblar*. In his work, he assumed that children can differentiate between reality and appearance. However, this may not be taken for granted, and any study on *semblar* "seem" should ensure children understand the meaning of the verb. This is therefore the motivation for this study. The dissertation is divided into two main parts: the theoretical background and the experimental study, with its results and related discussion. The following section provides a brief introduction to the concept of raising verb and an overview of previous studies on children's late acquisition of *seem, parecer* and *semblar.*

1.1. Subject-to-Subject raising

English *seem,* Spanish *parecer* and Catalan *semblar* have been defined as raising verbs, as it is assumed that their syntactic structure implies A-movement. Within the framework of transformational grammar (Rosenbaum, 1967; Chomsky, 1973; Postal, 1974), raising has been defined as the movement of an argument from its original position to a position in the matrix clause. In this respect, Subject-to-Subject raising refers to the movement of the subject of the embedded clause to the position of the matrix Spec-T. Raising verbs such as *seem* do not select an external argument, but a clause. That is to say these verbs do not assign a thematic role to the subject position, which would violate the Extended Projection Principle (EPP) proposed by Chomsky (1981).

(1) Extended Projection Principle (Chomsky, 1981)
The position of the specifier of TP must always be occupied.

The EPP claims that clauses must have an external argument. Verbs such as the English *seem* or the Catalan *semblar* may fill this gap by means of an expletive subject, which may be overtly produced (2) or not (3). Otherwise, this gap is filled by means of a moved subject, as exemplified in (4).

(2) It seems that the dog is blue.
(3) Sembla que el gos sigui blau.
seem-3sg that the dog be-subj blue
"It seems that the dog is blue."
(4) The dog seems to be blue.

In sentences such as (2) and (3), not only do the verbs assign a theta-role to the DP, but they must also assign nominative case. This means *the dog* has already been given the case, which blocks it from moving to another position to get the case assigned. Consequently, it is the expletive subject that fills the position of the specifier of TP, as illustrated in (2) and (3). In this position, the expletive subject matches the TP requirements. By contrast, the verb in (4) is nonfinite, which means it can assign the thematic role to the subject, but it does not assign nominative case. This fact forces the DP to move to the position of the matrix Spec-T to receive Case. Thereby, the DP *the*

dog which has been generated in the position of the subject of the embedded clause needs to raise to the matrix clause. Subject-to-Subject raising is illustrated in (5) to (7):

(5) [The dog] seems [~~the dog~~ to be blue].

(6) [El gos] sembla [~~el gos~~ ser blau].
the dog seem-3sg be blue
"The dog seems to be blue."

(7) [El perro] parece [~~el perro~~ ser azul].
the dog seem-3sg be blue
"The dog seems to be blue."

1.2. Accounts for the late acquisition of raised *seem*

Several studies have been carried out in which it has been observed that there is delay in the acquisition of raising (Hirsch & Wexler, 2007; Hirsch, Orfitelli & Wexler, 2008; Hirsch, 2011). The following table shows the success rates by age and conditions obtained in Hirsch (2011).

Age Group	Copula	Unraised	Raised
3	98.8%	75.0%	2.5%
4	100%	70.0%	36.3%
5	100%	83.8%	33.8%
6	100%	85.0%	67.5%
7	100%	80.0%	71.3%
Mean	99.8%	78.8%	42.3%

Table 1. Success rates by age and conditions, Hirsch (2011)

There have been two main approaches to the late acquisition of raising: one in which the acquisition of raising relates to the acquisition of passives and their syntactic derivation (Wexler, 2004; Hirsch & Wexler, 2007; Hirsch, Wexler & Orfitelli, 2011), one that is based on intervention effects (Hyams & Snyder, 2006; Orfitelli, 2012). We consider them in turn.

1.2.1. Wexler (2004) and related work

To account for the delay in the acquisition of raising, Wexler (2004) analysis is based on a development of Phase Theory (Chomsky, 1999). To account for passive delay as well as delay in the acquisition of raising he proposed the Universal Phase Requirement (UPR).

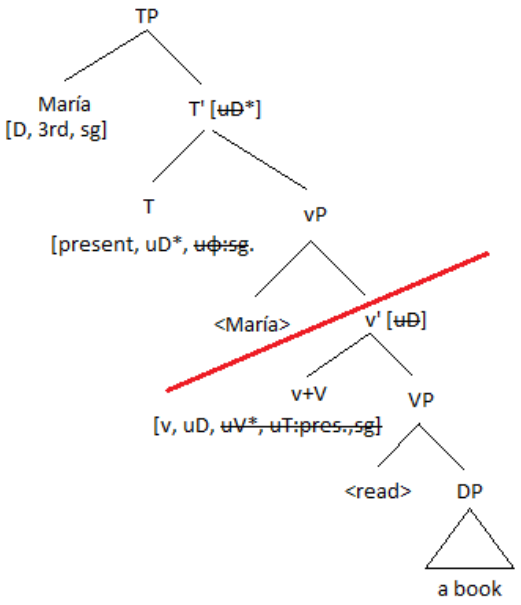
(8) Universal Phase Requirement (Wexler, 2004)
For children until age 5, *v* defines a phase, whether *v* is defective or nondefective.

Phase Theory (Chomsky, 2001) holds that derivations proceed in phases. At each phase, all uninterpretable features are eliminated and the derivation is sent to the interfaces in order to be interpreted. Once sent to the interfaces, the elements in that phase cannot be accessed by other phases. The only elements that are accessible by other phases are the head and the specifier of the phase. Nevertheless, the head is "inert" once the phase is considered to be closed. This means it cannot trigger computational operations anymore. This phase becomes "impenetrable" according to the Phase Impenetrability Condition (PIC) of Chomsky (2001).

(9) Phase Impenetrability Condition (PIC) (Chomsky, 2001)
In phase *a* with head H, only H and its edge are accessible to operations outside *a*.

Chomsky asserts that CP and *v*P are phases. For instance, in the following syntactic tree (10), the features right below the red line are not visible anymore to other phases.

(10)



Chomsky (2001) introduces defective phases, which allow for movement from within a phase in particular cases, for example in unaccusative constructions, passives and raising. These elements constitute an exception to PIC (9), since phases need to be non-defective to become impenetrable. For instance, in (5), the subject DP *the dog* needs to move from the embedded clause to the matrix clause because, although it can be assigned the theta-role in the embedded position, *v* is defective and does not assign Case. Then, DP is allowed to move. That is to say, the head and its edges are still active to interact with other phases when there is a defective element heading the phase. UPR (Wexler, 2004) holds that children's grammar is not mature in the sense that they consider *v* never to be defective, while in adult grammar it may be defective or non-defective. Thus, regardless of whether *v* is defective or not in the adult grammar, children consider it to head a phase. Therefore, the arguments within its boundaries cannot interact with other phases. According to Wexler (2004), it is not until children's grammar is mature enough that movement from defective phases is allowed and no longer thought to be a violation of the impenetrability of phases.

The empirical studies of Hirsch (2011) and Hirsch et al. (2007, 2008) support UPR. As Wexler predicts, children's performance should be poor when there is raising if the UPR applies, but not when there is no raising. In the results by Hirsch (2011) (see Table 1), it can be observed that children can understand all copular and virtually all unraised items, performing above chance in both conditions. However, they do not

succeed in raised items until they are 6 or 7. The raised condition would be the only that poses difficulty for children until their grammar matures out of UPR. Therefore, in this view conceptual or semantic difficulty is not at the root of children's late acquisition, since children show performance above chance in unraised items. Instead, difficulty should lie in the structure and derivation of sentences with raising. Moreover, according to Wexler (2004) and Hirsch et al. (2007, 2008, 2011), children struggle with raising sentences with or without experiencer.

In response to some observations of Becker (2006) that I will omit for reasons of space, Hirsch introduces some key items in his experimental design apart from the raising structure (11). Examples of each condition are given in the sentences (11) to (13):

(11) The dog really seems to be purple.

(12) The dog really is white.

(13) It really seems that the elephant is in the sun.

A copular condition in the present tense (12) is introduced to test whether children interpret predicates as stage-level or individual-level. Unraised condition (13) is also added to the experimental paradigm in order to see whether *seem* is understood or not when raising is not involved. Finally, the word *really* is used in all the conditions in order to force the individual-level interpretation, since Hirsch et al. (2007, 2008, 2011) and Orfitelli (2012) claim that children may interpret the predicate at two different levels. Stage-level predicates refer to those which define the characteristics of an element only during a certain period. That is to say, in (14), being excited is not an inherent trait of the girl, but it refers to that specific moment. Conversely, individual-stage predicates deal with inherent characteristics of the element being defined, as in (15). By adding *really* to those predicates that may be misinterpreted, children are forced to think of how X really is instead of how X seems to be at the moment.

(14) The girl is excited.

(15) The girl is tall.

Furthermore, Hirsch studies children's performance in raising sentences with a fronted experiencer (16) in order to check whether intervention can be a key issue or not.

(16) To the girl, the boy seems to be holding a ball.

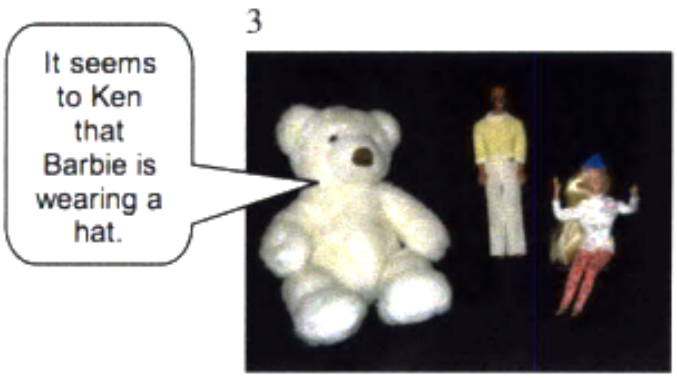
Hirsch et al.'s (2007, 2008, 2011) results indicate that children do not struggle with the meaning of the verb, since they fully comprehend *seem* when it does not appear in a raising construction. On the other hand, the children tested by Hirsch (2011) perform at chance in sentences with raising with or without an experiencer. When difficulty is faced, some strategies are thought to be used in order to ensure interpretation. For instance, according to Hirsch (2011) there is evidence that, when the fronted experiencer occurs, it is ignored as a strategy to interpret the sentence anyway. Hirsch et al. suggest there are two main strategies to interpret *seem*: the copular strategy and *think*-analysis. The copular strategy is used when no experiencer intervenes. Otherwise, when an experiencer occurs between the subject position in the embedded clause and the subject position in the matrix clause, children use a *think*-analysis. Instances of these strategies are given in the following matches:

(17) Materials

(18) The dog seemed to be purple.

(19) The dog was purple.

(20) Materials



(21) Ken seems to Barbie to be wearing a hat.

(22) *Ken thinks Barbie to be wearing a hat.

If children use the copular strategy and give a stage-level interpretation to the predicate (according to the image) instead of an individual-level interpretation (according to the inherent characteristics of the element), the answer for (17) would be "true" regardless of whether the children understand *seem* (18) or *be* (19). On the other hand, if children interpret *seem* (21) as *think* (22), they would give a wrong answer to (20), since in the picture Barbie is the one wearing the hat and the experimental sentence states that it is Ken who wears it. Then, whereas the expected answer would be "false", the given answer would be "true".

To summarise, Hirsch et al. support Wexler's UPR in as much as they prove that the difficulty with *seem* is not directly related to the misunderstanding of the verb or the overt intervention. The results support the idea that the difficulty that children encounter is due to the movement of the argument within the structure, since items with *seem* and raising seem to be the only ones that pose difficulty for children until they are 6 or 7 years old. Besides, they also claim that children use certain strategies to overcome these challenges, creating a false sense of comprehension. In this sense, the experiencer seems to play a role, since the copular strategy may only be used when no experiencer intervenes. However, the occurrence of an experiencer forces *think*-analyses when children do not understand raised *seem.*

1.2.2. Intervention accounts: Hyams and Snyder (2006) and Orfitelli (2012)

According to Orfitelli (2012), the structure of *seem* is unusual, since raising verbs tend not to allow experiencers. She considers it to be "a cross-linguistic rarity" (Orfitelli 2012: 25) and asserts that this could be reflected in the late acquisition of this structure by English-speaking children. The experiencer implies the intervention of an argument between the original position of the subject and the matrix subject position (23), which should prevent the subject from raising. This seems to be exemplified in the Spanish example (23), since raising seems not to be possible when the experiencer occurs. However, this structure exists and is produced by English-speaking adults (24), which suggests that adults allow *seem* structures to violate Relativized Minimality (Rizzi, 1990).

(23) *[Este taxista$_i$] me parece [$_i$ estar cansado]
this taxi driver to me seem-3pl be tired
"This taxi driver seems to me to be tired"

(24) [The dog$_i$] seems (to Mary) [$_i$ to be blue].

Many theories have dealt with this intervention in adults (see Torrego 1996, 1998, Boeckx 1998, Ausín 2001 and Gallego 2007, among others). However, while it is evident that this argument does not pose a difficulty for adults, some scholars suggest it is the main reason why children cannot easily understand StSR *seem* structures. Along this line, the Universal Freezing Hypothesis (25) by Hyams and Snyder (2006) and the Argument Intervention Hypothesis (26) by Orfitelli (2012) are put forth.

(25) Universal Freezing Hypothesis (Hyams and Snyder, 2006)
For the immature child, the Freezing Principle always applies: No subpart of a moved phrase can ever be extracted.

(26) Argument Intervention Hypothesis (Orfitelli, 2012)
Children are delayed in acquiring those structures which require A-movement across a structurally intervening argument.

Hyams and Snyder (2006) propose that the main source of difficulty in the StSR *seem* structure is the fact that the experiencer intervenes, blocking A-movement. As the experiencer is the closest antecedent of the raised subject, it should be the one selected by the subject, intervening between one position and the other. Adults can overcome this Minimality constraint; according to Hyams and Snyder (2006), they overcome it through the smuggling operation. The smuggling operation (Collins, 2005) consists in moving a larger constituent, so that the features of the moved element do not coincide with the ones of the experiencer. For example, as Belletti & Collins (2019) present, in sentence (27) the participle phrase *written the book* crosses the PP. Once it has moved across the PP, the NP *the book* can move higher without being blocked by another argument with similar features.

(27) a. The book was written by John
b. *The book was [$_{vP}$ [$_{PP}$ by John] [$_{VP}$ written the book]]

This strategy is an exception to the Freezing Principle, which states that an element which has already moved (*the book*) is not supposed to be able to move once again. According to Hyams and Snyder, children cannot access smuggling mechanisms until their grammar is mature enough. That is why, in children's grammar, raising is blocked by the experiencer.

According to Mateu & Hyams (2020), Orfitelli is not committed to the smuggling hypothesis. However, Orfitelli (2012) agrees with Hyams and Snyder on the fact that children's difficulty lies in the intervention of an argument, which seems to block A-movement across it. Furthermore, Orfitelli (2012) aims to show that the experiencer occurs in the argument structure, regardless of whether it is overtly pronounced or not. Similar to previous studies (Wexler 2004; Hirsch 2007 and Hirsch, Orfitelli and Wexler 2007), Orfitelli argues that sentences without raising will be understood while sentences with raising will not. Nevertheless, she claims that it is not raising itself that causes difficulty, but the intervention effect. In order to give empirical evidence for this assertion, different studies are carried out. In the tasks, raising elements with experiencer (*seem*) (28) and without experiencer (*be about*) (29) were included. Her argument is that *to be about* is a raising predicate, but one without an

experiencer. The following table shows the number of children (out of 10) who perform above chance in one condition in comparison with the other.

(28) The dog really seems to be white.

(29) The pig is about to roll in the mud.

	Raised *seem*	**Raised *be about***
4 years	0	10
5 years	1	10
6 years	7	10

Table 2. Number of children who perform above chance by age and condition, Orfitelli (2012).

These results show that children struggle with raising when the verb selects an experiencer. However, they all perform above chance when the structure does not involve an experiencer. Orfitelli (2012) concludes that the intervention of the experiencer is at the root of children's delay in the acquisition of raised *seem*.

To summarise, the majority of children up to the age of 6 or 7 perform poorly in sentences with raised *seem.* Becker (2006) attempts to prove that there is no such poor performance. However, other scholars (Wexler, 2004; Hirsch, 2007 and Hirsch, Orfitelli & Wexler, 2007) carry out some studies that contradict this idea. Within this framework, there are studies which suggest the A-movement poses difficulty for children, whose grammar is not mature enough to process the structure of raising (Wexler, 2004; Hirsch et al. 2007, 2008, 2011). Other studies derive this result from intervention effects. Hyams & Snyder (2006) and Orfitelli (2012) suggest it is not the movement itself which raises difficulties, but the experiencer argument intervening. Whereas Hyams and Snyder (2006) justify it by means of UFH, Orfitelli focuses on the idea that the experiencer is always present in the structure, overtly or covertly, and proposes the Argument Intervention Hypothesis (AIH).

Thus far, the focus has been on *seem.* Nevertheless, *seem, parecer* and *semblar* may behave differently. According to some studies (Mateu, 2019; Jo, 2022), this is due to the fact that *parecer* and *semblar* may not select an experiencer. In the following

section, an overview of two studies on Spanish *parecer* and Catalan *semblar* "seem" is provided.

1.2.3. *Parecer and semblar*

It may be assumed that *seem, parece* and *semblar* behave similarly. However, scholars like Torrego (1996), Ausín (2001) and Gallego (2007) have asserted that *parecer* does not exactly behave like *seem.* Torrego (1996) claims that dative clitics (experiencer) with *parecer* need to be associated with an expletive pronoun thus raise to the subject position (31). In doing so, they block other elements from moving to subject position (33). Furthermore, Torrego (1998) claims that, in Spanish, experiencer merges with V. This idea leads to the thought that *parecer* with experiencer has a different meaning from that of *parecer* without experiencer. Torrego (1996, 1998) suggests there are two different *parecer* depending on whether it selects an experiencer (31) or not (30), (31)[1]. These two *parecer* are what studies such as Mateu (2009) identify as functional and lexical *parecer*. In her experimental work, Mateu (2019) focuses on functional-*parecer* (30), (31) in order to check if the intervention accounts correctly predict the behaviour of *parecer* without an experiencer.

(30) Parece que Juan es bastante listo.
seem-3sg that Juan be-3sg quite smart
"It seems that Juan is quite smart."

(31) Me parece que Juan es bastante listo.
to me seem-3sg that Juan be-3g quite smart
"It seems to me that Juan is quite smart."

(32) Juan parece ser bastante listo.
Juan seem-3sg be quite smart
"Juan seems to be quite smart."

(33) *Juan me parece ser bastante listo.
Juan to me seem-3g be quite smart
"Juan seems to me to be quite smart."

[1] Actually, in languages such as Dutch, there exist two different words that may be translated to "seem": *schijnen* and *lijken*. As Koring (2014) asserts, these two different lexical items can also be defined in terms of lexical verb (*lijken*) and functional verb (*schijnen*).

According to the previous theories, children perform below chance in StSR structure with *seem,* but perform above chance with unraised items. While Wexler (2004) suggests this is due to the raising itself, Orfitelli (2012) claims this difficulty is because of the intervention of an argument, either an overt experiencer or a covert experiencer. All things being equal, for Spanish Wexler (2004) would predict poor performance in raising *parecer*, with or without experiencer. Instead, intervention accounts (both the UFH and the AIH) would predict adult-like performance in Spanish functional *parecer*, since it does not select an experiencer. The following table summarises Mateu's results in raised and unraised conditions for Spanish *parecer* and English *seem*.

	Mateu (2019)	**Mateu (2019)**
	Parecer	*Seem*
Unraised	93%	94.44%
Raised	91.6%	56.94%

Table 3. Comparison between Spanish- and English-speaking children's results

Figure 1 shows Spanish-speaking children's success rates in the three conditions tested, including copular items.

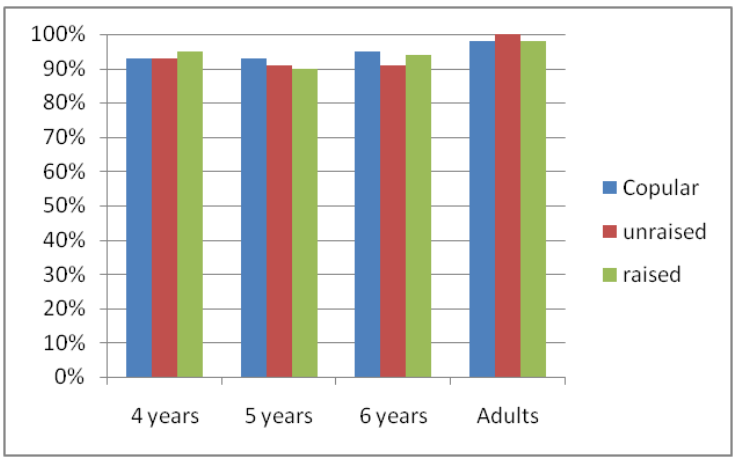


Figure 1. Spanish-speaking children's results by conditions and age.

The results indicate that Spanish-speaking children show understanding of each condition, and no significant difference emerges between sentences with and without

raising. Conversely, as it had already been claimed in other studies, English-speaking children seem not to understand sentences with raising, but they do understand sentences with *seem* without raising. Whereas there is a significant difference between sensteces without raising (94.44%) and sentences with raising (56.94%) sentences in English, functional *parecer* does not pose a difficulty for Spanish children. Success rates are 91.6% with *parecer* and raising and 93% in sentences without *parecer*. Therefore, in English, *seem* is conceptually understood -as the percentage of the unraised items show-, but raised structure seems to pose difficulties. According to Mateu (2019), the fact that Spanish-speaking children succeed by the age of 4 in both conditions seems to support the idea that functional *parecer* does not select an experiencer[2]. Mateu argues that her results provide evidence for Orfitelli's (2012) and Hyams and Snyder's (2006) hypotheses, which claim that the experiencer is at the root of children's delayed acquisition.

Jo (2022) carries out a study in order to test whether the behaviour of Catalan *semblar* can be accounted for by means of Wexler's UPR (2004) or, otherwise, Orfitelli (2012) better predicts the results. As it is assumed that Catalan *seem* and Spanish *parecer* work similarly, the results should be similar to Mateu's (2019). At worst, slightly poorer performance would be expected in raised items in Catalan, since, according to Gallego (2007), Catalan presents more restrictions as far as raising is concerned. The following table shows the results obtained by Jo (2022).

Age	Unraised	Raised
3y/o	58.3%	52.8%
4y/o	74.1%	75.8%
5y/o	81.4%	87%
6y/o	89.9%	92.9%
7y/o	88.9%	91.7%
Mean	78.7%	80%
Adults	98.3%	90.8%

Table 4. Percentages by age group and condition, Jo (2022)

[2] This could also suggest that functional *parecer* is not a raising verb, but it behaves as a semi-modal as Ausín suggests. Nevertheless, Mateu does not contemplate this possibility.

Jo (2022) concludes that there is not a delay in the acquisition of StSR in Catalan, agreeing with Mateu's (2019) results for Spanish *parecer.* Whereas Jo's results are slightly lower than Mateu's, they still show performance above chance from the age of 4, with 77.8% target comprehension in unraised items and 82.4% in raised sentences. As for 3-year-olds, they perform at chance in every condition. These results show that Catalan *seem* and Spanish *parecer* are not acquired as late as English *seem* with raising. According to Mateu (2019), this supports Orfitelli's AIH (2012). However, as Gavarró and Jo (to appear) point out, a deeper analysis of the syntactic behaviour of *semblar* is needed, since these studies assume that *parecer* and *semblar* are raising verbs. However, some scholars (Torrego, 1996, 1998; Ausín, 2001; Gallego, 2007) claim that, when they do not select an experiencer, they may not be considered as raising verbs. In the absence of a deeper analysis of their syntactic behaviour, what can be pointed out is that, in neither of the studies, differences exist between success rates in sentences with and without raising.

Furthermore, Jo (2022) points out a shortcoming in his study. When shown a picture of a white cat under a purple light, item 23 (34) was generally understood below chance by every age group. Poor performance in it may suggest that participants were interpreting all the predicates as stage-level, without differentiating between appearance and reality. This claim would be consistent with Hirsch's claims.

(34) Els gats són blancs.
the cat-pl be-3pl white-pl
"The cats are white."

In the following tables, we can see again the results by age and condition. This time the first column corresponds to the percentages of all children and adults who participated in the study. In the second one, we can observe the percentages from the participants who answered correctly to item 23.

Age	all participants	target (23) participants
3y/o	58.3%	56%
4y/o	74.1%	
5y/o	81.4%	77.8%
6y/o	89.9%	
7y/o	88.9%	
Mean	78.7%	66.9%
Adults	98.3%	-

Table 5. Mean of the unraised condition by age, Jo (2022).

Age	all participants	target (23) participants
3y/o	52.8%	51.2%
4y/o	75.8%	
5y/o	87%	82.4%
6y/o	92.9%	
7y/o	91.7%	
Average	80%	66.8%
Adults	90.8%	-

Table 6. Mean of the raised condition by age, Jo (2022).

As may be observed, percentages are slightly lower in the second column. Yet, it shows performance above chance in both conditions. The only group which does not show good understanding is the one of 3-to-4-year-old children. Therefore, while Jo (2022) concludes that the results seem to match with Mateu's (2019), he notes the importance of adding copular items in the study. Moreover, Jo (2022) also claims that, as suggested by Hirsch et al. (2007, 2008, 2011), an element such as *really* should be used in order to force the individual-level interpretation. That way, it would be possible

to see if children differentiate between reality and appearance or not. That is why the present study was carried out.

1.3. Goals

On the basis of Jo's study (2022), the present study is aimed at overcoming the shortcomings of the previous study on the acquisition of *semblar* "seem". First, it attempts to test whether children understand the meaning of *semblar* and are able to differentiate between reality and appearance. Second, as in Jo (2022), the present study asks if *semblar* poses a challenge to children or, otherwise, children understand it at an early age, as happens in Spanish (Mateu, 2019).

If we follow Orfitelli (2012) and Hyams & Snyder (2006), assuming Spanish *parecer* or Catalan *semblar* are raising verbs, they should not pose a difficulty when the functional verb is used, since it does not select an experiencer, as shown in the following examples.

(35) Sembla que les papallones siguin petites.
seem-3sg that the butterflies be-subj small
"(It) seems that the butterflies are small."

(36) Les papallones semblen ser petites.
The butterflies seem-3pl be small
"The butterflies seem to be small."

Otherwise, if we adopt Wexler's (2004) theory, which asserts that the difficulty has to do with the raising structure itself, poor performance in items with raising would be predicted. Furthermore, special attention should be given to the results of the copular items, since this is the problematic condition in Jo's (2022) study. By doing so, we may clarify the remaining issue in Jo (2022): do children differentiate between appearance and reality in their use of *semblar*?

2. Methodology

2.1. Experimental design and materials

The task carried out is a Truth-Value Judgment Task (TVJT). Essentially, a TVJT requires subjects to assert whether a statement is true of a given situation, in this case, a picture presented to them. For our study, we designed a modified version of Jo (2022). It was modified in order to overcome the shortcoming previously indicated: lack of copular items in which reality and appearance were confronted. Moreover, as in Hirsch & Wexler (2007), *de veritat* "really" was added to items in order to force the individual-level reading. Consider the contrast in (37) and (38).

(37) Els gats són blancs.
the cat-pl be-3pl white-pl
"The cats are white."

(38) Els gats de veritat són blancs.
the cat-pl really be-3pl white-pl
"The cats really are white."

In comparison to Jo (2022), 10 copular items with the modifier *de veritat* were added, 4 control elements were removed and four *semblar* sentences, two raised and two unraised, were removed as well.

Thus, our study consists of 10 items with raising with *semblar*, 10 items with *semblar* without raisisng, 10 copular items with the Catalan verb *ser* 'to be' and 5 control items. Half of the sentences of each condition were true and half of them, false. Moreover, the same pictures as in Jo (2022) were used, except for some minor modifications. Instances for each condition are illustrated in (39) to (41):

(39) Sembla que els gats siguin grossos. (unraised)
seem-3sg that the cat-pl be-subj big-pl
"It seems that the cats are big."

(40) Els hàmsters semblen ser blancs. (raised)
the hamster-pl seem-3pl to be white-pl
"The hamsters seem to be white."

(41) Els ratolins de veritat són blancs. (copular)
the mouse-pl really be-3pl white-pl
“The mice are definitely white.”

In the same way as the other studies (Jo 2022; Mateu 2019) the task was administered through a laptop and a voice recording of each item was made. The subject was firstly presented with two drawings depicting a situation of reality versus appearance. Once they had seen both drawings, only one of the drawings was projected on the screen. Then, the subject heard the voice recording of the experimental items and was required to indicate whether the sentence corresponded to the image or not. An example of each situation presented would be the following:

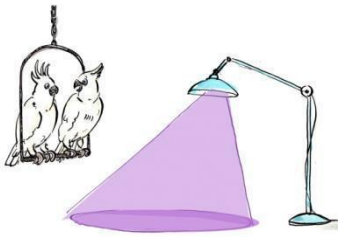
(42)

(43)

The subject was presented with the drawings (42) and (43). In these two pictures we can observe how small the pigs really are in comparison with how big they seem to be when using a magnifying glass. Then, after looking at them, only the drawing (43) is presented on the screen of the laptop and item (44) is uttered by the recorded voice. In this case, as the pigs are under the effect of the magnifying glass, the right answer should be “false”.

(44) Els porcs semblen ser petits.
the pigs seem-3pl be small
“The pigs seem to be small.”

Likewise, the response to (47) should be "false" when matched with the image (46), since the light beam makes them seem to be purple.

(45) 

(46) 

(47) Els ocells semblen ser blancs.
the birds seem-3pl be white
"The birds seem to be white."

The same kind of drawing was used for copular items with the verb *ser* "to be". In this case, though, the subject should not be misguided by the light or the magnifying glass, since we are talking about reality (*de veritat són* "they definitely are") instead of the appearance (*semblen ser* "they seem to be" or *sembla que* "it seems that"). Thereby, by using these copular items, we can verify that children differentiate between reality and appearance.

2.2. Participants

The study was conducted in two primary schools in Badalona, the Escola Bufalà and the Escola Artur Martorell, and a nursery school, Petit Cultural, in Badalona as well.

In total, 107 families gave authorisation to carry out the study with their children. From 107 children, four kids did not want to perform the task and one decided not to finish it. Moreover, four more were excluded, since they answered "true" or "false" to every item. Apart from that, the answers of thirteen more children have not been included in the study because, despite showing they were able to understand Catalan, they did not express themselves in the language. Therefore, only the answers of a total of 85 children have been included in the study.

In order to analyse the results, children were classified into groups depending on their age. Thus, five age categories have been used in the study, from 3 to 7 year-olds. The details of the child participants are the following:

	Number of subjects	Mean age	Age range
3 y/o	13	3;6,10	3;0,29 - 3;11,8
4 y/o	16	4;6,12	4;0,19 - 4;11,24
5 y/o	28	5;6,11	5;0,0 - 5;10,23
6 y/o	17	6;4,15	6;0,5 - 6;9,23
7 y/o	11	7;1,17	7;0,13 - 7;3,23
Total	85	5;4,29	3;0,29 - 7;3,23

Table 7. Participants.

Twelve Catalan-speaking adults were tested as controls.

2.3. Procedure

As mentioned, children from three different schools participated in the study. Before the study, their parents had signed an authorisation form previously sent to them by the principal. The authorisation was complemented with a brief explanation of how the task would proceed and how the data would be processed (see Appendix 2 and 3). Children who were not willing to go to a different room to do the task were not forced to do it in any event.

Thus, except for one 3-year-old kid who was tested in a relative's house, the task was conducted in the schools. In any case, regardless of the location, kids were alone with the experimenter in a room as far from any noise as possible, and sitting in front of the laptop. At the very beginning, mainly on the way from their classrooms to the separate room, they were chatting to the experimenter about their families and pets, or any topic that came up. Then, they were told they would see some drawings and they had to tell the experimenter if the voice they were listening to was telling the truth or not. Throughout the task, no feedback was given to them, except for some friendly comments about the pictures, such as "wow, look at this dog, I really like dogs!", if they

seemed to be tired or distracted. While they were looking at the pictures or answering, the experimenter was recording their answers and taking notes of any comment that may be considered to be relevant for the study.

Children were expected to answer *cert* or *veritat* "true" or *fals* "false". However, *sí* "yes" for "true" and *no* "no" for "false" were also accepted as answers. If they commented on the drawing and the recording, but they did not give an answer, the experimenter asked them directly: "But, then, is it true or false?". In addition, if any children needed to see the two drawings again or listen to the recording again, the experimenter showed them to them or played the audio once more. In general, the length of time with each kid was 15 minutes.

Likewise, adults were tested in a silent room either at home or at their workplace. Furthermore, following Jo's example, no questions were answered throughout the task.

The task was first run with an adult as a pilot test. After receiving feedback from this first person, some modifications were made, as he showed some difficulties with those items dealing with the size of the animals in the drawings. That is to say, some drawings were confusing inasmuch as the animals could not easily be identified as being big or small. Thus, before carrying out the task with the rest of the subjects, drawings of items 5, 9, 14, 16, 29 and 35 were modified, making the animals look smaller when not being under the effect of the magnifying glass.

2.4. Coding

The results were written down on an individual answer sheet where the name and the date of birth of each child were noted. In this individual sheet, "c" or "f" was written depending on whether the answer was *cert* "true" or *fals* "false". Once the tests were done, this information was introduced into an Excel sheet. Answers which matched with the expected response were coded as 1. By contrast, wrong answers were coded as 0. For reasons of time, no statistical analysis was conducted.

3. Results

The number of answers obtained from children was 2975 (35 responses from 85 children). To these responses, 420 should be added, which correspond to the answers given by adults. All individual answers are given in Appendix 5.

Throughout the analysis of the results, some percentages suggested there were a few items which had been misunderstood by a vast majority of subjects, adults included. In particular, a few items dealing with the size of the animals seemed to induce error. For item 31, only 9.09% of the responses given by the 7-year-old children were correct. Moreover, adults obtained a score of 66.7% on that item, which is considerably below the average (92.64%). By the same token, item 32 appeared to be confusing for adults, as they obtained the same percentage as in item 31. Finally -and despite size not being relevant for the answer-, item 1 was correctly answered by children only in a 32.46%, being the 7-year-old children's percentage the lowest one, with a 9.09%. These three cases suggest that the challenge was inherent in these items rather than the grammar of the verb *semblar*. Therefore, items 1, 31 and 32 were excluded from the results (details of these items are given in Appendix 1). That means that a total of 3.104 responses (2720 from children and 384 from adults) were finally considered. The percentages of success by age group and condition are shown in the following table:

Age	Control	Copular	Unraised	Raised
3y/o	44 (67.69%)	80 (68.38%)	67 (56.73%)	62 (52.88%)
4y/o	42 (57.5%)	111 (81.94%)	68 (53.13%)	76 (57.03%)
5y/o	93 (66.43%)	206 (81.75%)	91 (36.16%)	142 (56.25%)
6y/o	68 (80.55%)	121 (79,08%)	83 (54.41%)	101 (66.18%)
7y/o	48 (87.22%)	63 (63.64%)	63 (63.64%)	78 (78.41%)
Mean	59 (71.89%)	116 (74.96%)	74 (53.21%)	92 (62.15%)
Adults	54 (98.33%)	91 (91.67%)	91 (91.67%)	88 (88.89%)

Table 8. Raw number and percentage correct by age group and condition.

Adult performance ranged between 98.33% and 88.89%, which corroborates that the experimental design worked well. Children generally performed well for control items and sentences with copular *ser*. As we may observe, in general, mean percentages for raised and unraised *semblar* sentences are lower than those for copular and control items. Specially, the unraised *semblar* mean percentage is low. Moreover, contrary to what may be expected, percentages of success in the age group of 7 are not much higher

than those in the age group of 3 year-olds. Therefore, although it might be thought that age is relevant for the better understanding of control sentences and raised sentences, this does not seem to be so in our study (note, however, that both Orfitelli's/Hyams and Snyder's approach and Wexler's approach do not make this assumption, as performance is expected to be bad until maturation at age 6 to 7). Drawing further conclusions from these results seems to be difficult without a statistical study, which will not be undertaken here.

What might be claimed is that, whereas control and copular items were the least challenging for children, raised and unraised *semblar* items posed a problem for many of them. As a matter of fact, unraised items appeared to be the most challenging, although the percentages in both raised and unraised conditions are virtually the same except for the low performance of 4-year-old children in the unraised condition.

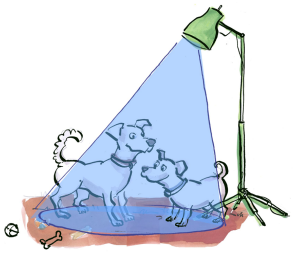
Group performance may not be enough to understand the children's behaviour, as it seems to suggest that every child, regardless of age or condition, is performing close to chance. We look at individual patterns below[3].

The main goal of this study was to overcome a shortcoming regarding copular items in Jo (2022). In this respect, it can be observed that children seem to understand copular items, since their performance appears to be above chance. However, this may not prove that children are able to differentiate between reality and appearance. Actually, images in which appearance and reality match get higher percentages than the ones which do not, a mean of 81.6% as opposed to 51.22%. The following two items show how children may be confused by appearance. Item 22 (48) is matched with image (49), in which the animals *seem to be* blue, instead of *being* blue. Nevertheless, many children answered "true" to item (48).

(48) Els gossos de veritat són blaus.
the dog-pl really be-pl blue-pl
"The dogs are definitely blue."

[3] While carrying out the task, it was observed that the size of the animals caused more confusion than the colour alteration. Therefore, percentages of those items in which the light beam featured were compared with those with the magnifying glass. No pattern was observed, since percentages were virtually the same. Therefore, this possibility was rejected.

(49)



The same happened with item 33 (50) and the image (51). The mean percentage of these two elements is only a 57.56%.

(50) Els coloms de veritat són blaus.
the pigeon-pl really be-pl blue-pl
"The pigeons are definitely blue."

(51)

For the purpose of trying to find a pattern of behaviour, individual results have been analysed and children have been divided into 3 different groups depending on their behaviour in the copular condition:

- children who score 8 or 9 out of 9 (#33) (group 1).
- children who score 6 or 7 out of 9, but who perform badly in items 17, 22 and 33 (#18) (group 2)
- children who seem to perform at chance (#34) (group 3)

We may consider children in group 1 to be adult-like regarding copular items. Children in group 3 do not follow any pattern of performance, as far as we can see.

Children in group 2 are misperforming precisely for those items in which the image does not match reality. We may assume that children who get these answers wrong are giving, as Orfitelli (2012: 16) claims, "a stage level interpretation, in which the [dog] is [purple] under a specific set of circumstances at a particular time."

In the following table, absolute number and percentage of correct answers by group and condition are presented.

Group	Copular	Unraised	Raised
Group 1	284 (95.6%)	100 (33.7%)	149 (50.2%)
Group 2	109 (67.3%)	136 (84%)	129 (79.6%)
Group 3	201 (65.7%)	139 (44.1%)	197 (62.5%)

Table 9. Raw number and percentage correct by group and condition.

As it may be observed, children in group 2 perform quite well in both unraised and raised conditions. Actually, although they perform slightly better in the unraised condition, the difference does not seem to be relevant. Conversely, group 1, despite performing well in the copular condition, shows poor performance in unraised and raised items. In fact, performance is a bit better in the raising condition, since except for two children, they all answer correctly items 15 and 24, which implies they score at least 2 out of 9. (Regardless of whether children give an individual-level interpretation or stage-level interpretation to items 15 and 24, the answer would be the same.) Finally, group 3 does not seem to follow a pattern.

To sum up, although it can be said that 7-year-old-children tend to perform better than 3-year-old children in raising and copular items, age seems not to be a key factor in the success of our task. Second, little difference can be noted between the performance of unraised and raised items. Third, if we look at the answers that children give to the copular items, we see that some children adopt a stage-level interpretation of *ser*, while others do not. Children who adopt the stage-level interpretation of *ser* (group 2) perform better than the others with raised and unraised items. In the case of group 1 and 3, their percentages are considerably lower when the items presented involve the verb *semblar*, regardless of whether they imply raising or not. No matter what the pattern of performance of the children, raised and unraised items pattern in the same way.

4. Discussion and conclusion

The results obtained are unexpectedly different from Jo's (2022). They do not match with Mateu's (2019) results either. In the following tables, a comparison with their results is presented.

	Spanish	**Catalan, all**	**Catalan, target (23) participants**	**New results**
	Parecer	*Semblar*	*Semblar*	*Semblar*
Unraised	93%	78.7%	66.9%	53.21%
Raised	91.6%	80%	66.8%	62.15%

Table 10. Mean percentage correct in the different studies.

Age	**Catalan, all**	**Catalan, target (23) participants**	**New results**
3y/o	58.3%	56%	56.73%
4y/o	74.1%		53.13%
5y/o	81.4%	77.8%	36.16%
6y/o	89.9%		54.41%
7y/o	88.9%		63.64%
Mean	78.7%	66.9%	53.21%
Adults	98.3%	-	91.67%

Table 11. Mean percentage correct, sentences without raisisng, by age. Comparison between Jo (2022) and this study.

Age	Catalan, all	Catalan, target (23) participants.	New results
3y/o	52.8%	51.2%	52.88%
4y/o	75,8%		57,03%
5y/o	87%	82,4%	56,25%
6y/o	92,9%		66,18%
7y/o	91,7%		78,41%
Average	80%	66,8%	62,15%
Adults	90,8%	-	88,89%

Table 12. Mean percentage correct, sentences with raising, by age. Comparison between Jo (2022) and this study.

Our participants perform worse than those of Jo's study, whether the whole group or the group of those who performed well with item 23 in his study. In Jo's study there is also a clear progression that we do not find in the new results.

Our group results do not seem to inform the study of *semblar*. Nevertheless, individual results may suggest three different tendencies. Although percentages in copular items are quite high in general, individual results show there are three noticeable groups: children who interpret the predicate as individual-level (#33) (group 1); children who interpret the predicate as stage-level (#18) (group 2); and children who see to perform at chance (#34) (group 3).

According to Hirsch et al. (2007, 2008, 2011), the major shortcoming of Becker (2006) is to assume that children do not interpret sentences such as (52) as being correct in the scenario in (53). While Becker (2006) assumes children can use a copular strategy to overcome difficulties in understanding sentences with *seem,* she also considers that, if it was the case, children would answer "false" to (52). Nevertheless, results in Hirsch et al. show that these items may be interpreted as "at some point, the dog was purple because of the effects of the light". According to Hirsch, this should be solved by adding *really* and presenting the verb in present tense in order to force the individual-level interpretation.

(52) The dog was purple.

(53)

Becker (2006) and Hirsch et al. (2007, 2008, 2011) agree that the copular strategy is a possibility, and results may be altered by it. Nevertheless, while Becker does not take into account that children may give a stage-level interpretation to certain predicates, Hirsch claims it is the reason why Becker's children answer correctly to raised items. In this sense, it seems that our results are not reliable for the same reason Hirsch criticises in Becker (2006): some answers may be counted as correct when, actually, children were ignoring the verb. This false sense of comprehension should have been avoided by the introduction of *de veritat* "really" in our copular sentences. However, in our case, it does not always seem to force the individual-level reading as in Hirsch (2011). Results seem to suggest that, while children understand the verb *ser* "to be", they ignore the verb *semblar* "to seem". Furthermore, comments such as *una mica lila i una mica blanc, mira la cua (*"a bit purple and a bit white, look at the tail") and *clar que SÓN grans, perquè hi ha la lupa* ("of course they ARE big, because there is a magnifying glass") for images (56) and (57) and items 18 (54) and 29 (55) show that, apart from interpreting these items as copular, they still give a stage-level interpretation to some of them.

(54) Sembla que els gossos siguin blancs.
seem-3sg that the dog-pl be-subj white-pl
"(It) seems that dogs are white."

(55) Els ratolins semblen ser grossos.
the mouse-pl seem-3pl be big-pl
"The mice seem to be big."

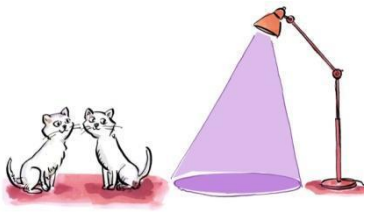
(56)

(57)

Pursuing this idea, three main patterns would be expected:

- Group 1 would get every item with the verb *semblar* wrong, except for items 15 and 24. Items 15 and 24 are the only items in which the answer would be the same independently of whether they are given an individual- or stage-level interpretation. That is to say, in image (58) cats are white in the image, but they are also white in reality. Therefore, to item (59), the answer would always be "false".

(58)



(59) Els gats semblen ser liles.
the cats seem-3pl be purple
"The cats seem to be purple."

- Group 2 would answer correctly every item with the verb *semblar* for two reasons: (i) they are using the copular strategy, so they are interpreting the item as X is Y and (ii) they give a stage-level interpretation, which means they assume the answer to (60) is "true" because, in such scenario, dogs are purple.

(60) Els gossos de veritat són liles.
the dogs really be-3pl purple
"The dogs really are purple."

- Group 3 conforms to no patterns, as far as we can see.

As we may observe in table 9 (repeated for convenience), percentages seem to confirm this interpretation of the results.

Group	Copular	Unraised	Raised
Group 1	284 (95.6%)	100 (33.7%)	149 (50.2%)
Group 2	109 (67.3%)	136 (84%)	129 (79.6%)
Group 3	201 (65.7%)	139 (44.1%)	197 (62.5%)

Table 9. Raw number and percentage correct by group and condition.

The results of the present study indicate miscomprehension of the verb *semblar*, which is overcome by means of a copular strategy, as suggested by Hirsch and Becker. As the results show, the percentages are higher for those children who give a stage-level interpretation, since items are assumed to be "true" independently of whether X really is what is claimed or it just seems to be. Nevertheless, children who interpret *seem* as *be* and give an individual-level interpretation to the predicate do not answer correctly in sentences with *seem,* since images only show appearance. In this case, raised items seem to be better understood, this is due to the fact that they all, except for two children, answer at least two items correctly (item 15 and 24). These results are in line with the interpretation of some scholars (Becker, 2006; Hirsch et al. 2007, 2008, 2011 and Mateu & Hyams, 2020), who suggest that children need to find strategies to understand certain sentences when they face problematic structures such as raising. While a *think*-analysis is given when an experiencer is selected, a copular strategy is used when the verb does not select an experiencer.

Our results go in line with the idea of *semblar* not selecting an experiencer argument. Nevertheless, it would not explain why what is called unraised *semblar* "seem" is not understood either. Furthermore, what may be controversial about this analysis is the fact that, according to Torrego (1996) and Ausín & Depiante (2002), not even the items classified as exemplifying raising should pose difficulty if such difficulty had to do with raising. This is due to the fact that these authors suggest that *parece* does not always behave as a raising verb[4]. Especially, when they do not select an experiencer, they seem to behave as modal verbs. Thus, misinterpretation would not be expected. Ausín (2001) suggests the following structure for this type of sentences:

(61) El gos sembla [$_{VP}$ ser lila].
the dog seem-3sg be purple
"The dog seems to be purple."

Probably, further research should also focus on the characterisation of *semblar* in adults. That way, it could be clarified whether *semblar* should be late acquired by children or not. In this sense, while our study indicates certain difficulties to understand the verb, Jo's (2022) does not. Accordingly, we should point out, as Jo & Gavarró (to appear) do that probably labels such as "unraised" and "raised" are not appropriate when used for Catalan *semblar*.

To summarise, whereas our study's results are unexpectedly different from those of Jo (2022) and Mateu (2019) as far as performance is concerned, some similar conclusions can be drawn. What we call unraised and raised items do not seem to be acquired at different times. That is to say, whether they are understood -or not-, one does not seem to be better understood than the other. Our study shows that both conditions seem to pose a difficulty to children. Moreover, our study suggests that

[4] Hirsch (2011) may suggest the same for some uses of English *seem* when he claims the following: "adjectival-seem is syntactically very similar to the copula. Crucially, there is no defective *v* involved, in fact no raising of the argument at all, thus no violation on UPR". The following examples illustrate two different constructions that seem to be virtually the same:

(i) John seems sad.
(ii) John is sad

In a similar vein, Ausín (2001: 75) claims that "Spanish lacks ECM constructions that involve infinitival complements". However, an ECM subject with an adjectival Small Clause is possible in Spanish.

children use a copular strategy, as suggested by Hirsch et al. (2007, 2008, 2011), when the verb is not understood. Within this copular strategy, we may find two different groups: children who give a stage-level interpretation to the predicate and children who give an individual-level interpretation to the predicate (as adults do). Accordingly, those children who rely on stage-level interpretation would perform better in *seem* sentences. It would be interesting to analyse the factors that make our children use a copular strategy in order to process *seem* whereas children in Jo (2022) seem to easily understand them. Only then, we would be able to find a good explanation for the results.

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APPENDIX

APPENDIX 1. Test items

1. Els ocells semblen ser liles. “The birds seem to be purple.”	TRUE
2. Sembla que les ovelles siguin petites. “(It) seems that the sheep are small.”	FALSE
3. Els gats de veritat són blancs. “The cats are definitely white.”	TRUE
4. Sembla que els conills siguin liles. “(It) seems that the rabbits are purple.”	TRUE
5. Les papallones semblen ser grosses. “The butterflies seem to be big.”	TRUE
6. Sembla que els ratolins siguin liles. “(It) seems that the mice are purple.”	TRUE
7. La nena corre darrere la mare. “The girl chases the mum.”	TRUE
8. Els pardals de veritat són grossos “The sparrows are definitely big.”	FALSE
9. Sembla que els cargols siguin petits. “(It) seems that the snail is small.”	FALSE
10. Els conills semblen ser grossos. “The rabbits seem to be big.”	TRUE
11. Les papallones de veritat són blanques. “The butterflies are definitely white.”	TRUE
12. Els ocells semblen ser blancs “The birds seem to be white.”	FALSE
13. La mare dibuixa l’àvia. “The mother draws the grandmother.”	FALSE
14. Sembla que les granotes siguin grosses. “(It) seems the frogs are big.”	TRUE

15. Els gats semblen ser liles. FALSE
“The cats seem to be purple.”

16. Les granotes de veritat són petites. TRUE
“The frogs are definitely small.”

17. Els ratolins de veritat són blancs. TRUE
“The mice are definitely white.”

18. Sembla que els gossos siguin blancs. FALSE
“(It) seems that dogs are white.”

19. L’àvia i les nenes estan assegudes. TRUE
“The grandmother and the girls are sitting.”

20. Els porcs semblen ser petits. FALSE
“The pigs seem to be small.”

21. Sembla que els ocells siguin blancs. FALSE
“(It) seems that the birds are white.”

22. Els gossos de veritat són blaus. FALSE
“The dogs are definitely blue.”

23. El nen pica el seu cosí amb una pala. TRUE
“The boy hits his cousin with a shovel.”

24. Les papallones semblen ser liles. FALSE
“The butterflies seem to be purple.”

25. El nen va a coll de l’avi. FALSE
“The boy rides piggyback on his grandpa.”

26. Els hàmsters semblen ser blancs. FALSE
“The hamsters seem to be white.”

27. Els conills de veritat són blaus. FALSE
“The rabbits are definitely blue.”

28. Sembla que els gats siguin liles. TRUE
“(It) seems that the cats are purple.”

29. Els ratolins semblen ser grossos. TRUE
“The mice seem to be big.”

30. Els aneguets semblen ser grossos TRUE
“The duckies seem to be big.”

31. Els coloms de veritat són petits. TRUE

“The pigeons are definitely small.”

32. Sembla que els gats siguin grossos. TRUE
“(It) seem that the cats are big.”

33. Els coloms de veritat són blaus FALSE
“The pigeons are definitely blue.”

34. Sembla que els gossos siguin blancs. FALSE
“(It) seems that the dogs are white.”

35. Les papallones de veritat són petites TRUE
“The butterflies are definitely small.”

APPENDIX 2. Letter sent to the schools

Universitat Autònoma de Barcelona

A l'atenció de la direcció de l'Escola Bufalà

Sóc la directora del treball de fi de grau de Mònica Martínez Villodres, estudiant del màster en Ciència Cognitiva i Llenguatge. Com a treball de final de màster, l'estudiant està fent un estudi sobre l'adquisició de la sintaxi (en concret, sobre la comprensió d'un tipus de frase del català) amb nens d'entre 3 i 6 anys. Em dirigeixo a vosaltres per formalitzar la petició de la vostra col·laboració en el nostre estudi.

L'estudi consisteix en una tasca que sembla un joc, en què s'ensenyen unes imatges als nens i ells han de respondre preguntes sobre les imatges. No cal dir que la seva participació és voluntària (fins i tot, un cop han acceptat, poden deixar-la a mig fer). A més, prèviament els seus pares hauran de signar el consentiment, atès que l'alumnat és menor d'edat. Pel que fa a les dades requerides, el seu tractament és confidencial i només d'ús científic i, en el document escrit de l'estudi, el tractament de dades les anonimitzarem.

Per qualsevol aclariment, no dubteu a contactar amb mi (a anna.gavarro@uab.cat). A més, la Mònica respondrà qualsevol dubte que pugui sorgir.
Esperem poder comptar amb la vostra col·laboració, sense la qual aquest tipus d'estudis no serien possibles. Moltes gràcies.

Cordialment,
Anna

Anna Gavarró Algueró
Catedràtica de Lingüística General
Departament de Filologia Catalana

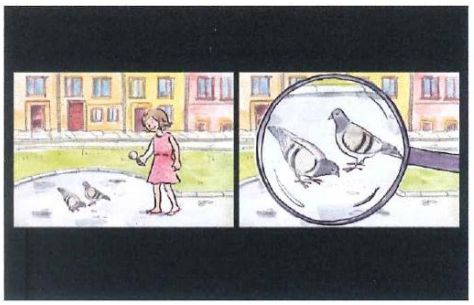
APPENDIX 3. Authorisation for the families

UAB Universitat Autònoma de Barcelona

Bellaterra, abril del 2023

Benvolguda família,

En aquest moment, el grup de recerca que dirigeixo a la UAB investiga l'adquisició del verb *semblar* en infants que tenen el català com a primera llengua. L'estudi es duu a terme amb l'ajuda d'unes imatges i uns àudios que els infants veuen i escolten a través d'un portàtil. Els materials són del tipus que il·lustrem aquí:



És per això que us demano la vostra col·laboració, mitjançant l'autorització perquè el vostre fill o filla prengui part a l'estudi. La tasca que hem elaborat té una duració de més o menys 10 minuts per nen – i d'acord amb la Convenció de Hèlsinki, els infants poden deixar de fer la prova en qualsevol moment si així ho volen. A més, les dades resultants seran confidencials. Necessitem, com és usual, el consentiment exprés de les famílies perquè els infants hi participin, tot i que la tasca no és gens invasiva.

No cal dir que ajuda com la que us demanem és imprescindible per poder dur a terme aquest tipus d'estudis, raó per la qual us agrairíem molt la vostra col·laboració. Moltes gràcies.

Cordialment,

Anna Gavarró
Catedràtica en Lingüística

Jo, ..., amb DNI .....,

Mare/pare de ....., autoritzo la participació del meu fill/filla a l'estudi.

Llengua o llengües de comunicació en l'àmbit familiar:

Signat a ....., ... 2023

APPENDIX 4. Individual answers

3 Years

Age	1. raised	2. unraised	3. copular	4. Unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
3;8,3	0	0	1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1	1	1	1	0	1	0	1	1	1	1	0	0	0	1	1	1
3;9,15	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1	0	0	0	1	0	0	1	0	0	0	0	1	1	1	1	0
3;6,11	0	1	0	1	1	1	1	0	1	1	1	1	0	1	1	0	0	0	1	1	1	0	1	1	1	1	1	0	0	1	0	0	1	1	0
3;6,11	0	0	1	1	1	1	1	0	0	1	1	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	1	1	1	1	1	0	0	0
3;1,0	1	1	1	0	0	0	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	0	1	0	0	0	1	1	1	1	1	0	0	0	0
3;11,8	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	0	0	1	0	0	1	1
3;9,1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	0	1	0	0	1	0	1	1	1	1	1	0	1	1	0	1
3;10,15	0	0	1	1	1	1	1	0	0	1	1	0	0	1	1	1	0	1	1	0	1	0	1	0	0	0	1	1	1	1	1	1	0	0	1
3;6,9	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	1	1	0	1	0	1	1	1	1	1	0	1
3;10,18	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	1	0	0	1	1	1	0	0	1	0	0	0	1	0	1	0	1
3;10,8	0	1	0	0	0	0	1	1	1	0	1	0	0	0	0	1	1	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	1	0	1
3;0,29	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1
3;3,8	1	0	1	1	0	1	1	1	0	1	1	0	0	1	0	1	1	0	1	0	0	0	1	0	0	0	1	1	1	1	1	1	0	0	1

4 Years

Age	1. raised	2. unraised	3. copular	4. unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
4;10,24	0	1	1	0	0	0	1	1	0	0	1	0	0	0	1	1	1	0	1	1	0	1	1	1	0	0	1	0	0	1	0	1	1	0	1
4;6,3	0	1	1	0	0	0	1	1	0	1	1	1	1	0	1	0	1	0	1	1	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1
4;7,0	1	1	1	0	1	0	1	1	0	1	1	0	1	0	1	1	1	0	1	1	0	1	0	1	0	0	1	0	0	0	0	1	1	0	1
4;10,6	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0	1	1	1	0	1	1	0	0	1	0	0	0	0	0	1	0	1
4;8,3	1	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	1	1	0	0
4;5,28	0	1	0	0	0	0	1	0	1	0	1	0	0	1	0	1	1	0	1	0	0	0	1	0	0	0	1	1	1	1	1	1	0	0	1
4;10,15	1	1	1	0	0	0	1	1	0	0	1	0	0	1	1	0	1	0	1	1	0	1	1	1	1	0	1	0	0	1	1	0	1	0	1
4;0,19	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	0	1	1	1	1	1	0	0	1	1	0	1	1
4;2,19	1	0	1	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	0	1	0	1	0	1	1
4;1,10	0	0	1	1	0	1	1	0	0	1	1	0	1	1	0	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	1
4;3,17	0	1	1	0	0	0	1	1	1	0	1	1	0	0	1	1	1	0	1	1	0	1	1	1	0	1	1	0	0	0	0	0	1	0	1
4;1,6	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1
4;5,3	1	1	1	0	1	0	0	0	1	1	0	1	0	1	1	1	0	1	1	1	1	0	0	1	0	1	1	1	0	1	1	0	0	1	1
4;8,6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1
4;11,24	1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1

5 Years

Age	1. raised	2. unraised	3. copular	4. unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
5;8,24	0	0	1	0	1	0	1	0	0	1	1	0	0	1	0	1	1	0	1	0	0	0	1	0	0	0	1	1	1	1	1	1	0	0	1
5;10,5	0	1	1	0	0	0	1	1	0	1	0	0	1	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1
5;6,1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1
5;9,21	0	1	1	0	0	0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	0	1	0	1	0	0	1	0	0	0	1	0	1	0	1
5;6,5	1	1	1	0	1	0	1	1	0	1	1	0	0	1	1	1	1	0	1	1	0	1	1	1	0	0	1	0	0	1	1	1	1	0	1
5;6,8	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0	1	1
5;4,27	1	1	1	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0	1	1	0	1	1	1	0	0	1	0	0	1	1	1	1	0	1
5;6,5	0	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	1	1
5;10,2	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	1	0	1	1	0	1	0	1	1	0	1	0	0	0	1	0	1	0	1
5;4,0	1	0	1	0	0	0	1	0	0	1	1	0	0	1	1	1	0	0	1	1	0	1	0	1	0	0	0	0	1	1	1	0	1	0	1
5;2,23	0	1	1	1	0	1	1	0	1	1	1	0	0	0	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	1
5;0,0	0	1	1	0	1	0	1	1	1	1	1	0	0	1	1	1	1	0	1	1	0	1	1	1	0	0	1	0	0	1	0	1	1	0	1
5;1,1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	0	1	1
5;3,11	0	1	1	0	0	0	1	1	0	0	1	0	1	1	1	0	1	0	1	1	0	0	0	1	1	0	1	0	0	1	0	1	0	0	0
5;5,13	1	0	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	0	1	0	0	1	0	1	1	0	1	1	0	0	1	1	1	0	1
5;5,12	0	1	0	0	0	0	1	1	1	0	0	0	0	0	1	1	1	0	1	1	0	1	0	1	1	0	1	0	0	0	0	0	1	0	1
5;2,21	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	0	1	0	0	0	0	0	1	0	1
5;1,5	0	0	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	0	1	1	0	0	0	0	1	0	0
5;1,0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	1	0	1	0	0	1	1	1	0	0	1	0	0	0	1	0	1	0	1

5 Years

Age	1. raised	2. unraised	3. copular	4. unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
5;3,6	1	0	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	0	0
5;5,15	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	1	1	0	1	1	1	0	0	1	0	0	0	1	0	1	0	1
5;10,23	0	0	1	0	1	0	1	1	1	1	1	0	0	1	1	1	1	0	1	0	0	1	1	1	0	0	1	0	0	1	1	1	1	0	1
5;7,21	0	0	1	0	1	0	1	1	1	1	1	0	0	1	1	1	1	0	1	0	0	1	1	1	0	0	1	0	1	1	1	1	1	0	1
5;9,1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1
5;10,9	0	1	1	0	0	0	1	1	0	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1
5;9,9	0	0	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1
5;10,15	0	1	1	0	1	0	1	1	1	1	1	0	0	1	1	1	1	0	1	0	0	1	1	1	0	0	1	0	1	1	1	1	1	0	1
5;5,13	0	1	1	0	0	0	1	1	0	0	1	1	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1

6 Years

Age	1. raised	2. unraised	3. copular	4. unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
6;8,22	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
6;5,16	0	1	1	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
6;3,16	1	1	1	1	1	1	1	0	1	0	1	1	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1
6;1,18	0	1	1	0	0	0	1	1	0	0	0	0	0	0	1	1	1	0	1	1	0	0	1	0	0	0	1	0	0	0	1	1	1	0	1
6;0,5	0	1	1	0	0	0	1	1	0	0	1	0	0	0	1	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	1	0	1	0	1
6;6,6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
6;8,21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1
6;9,19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	1
6;3,22	1	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	0	1	0	1	0	1	1
6;2,28	0	0	1	0	1	0	1	0	0	0	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	1	1
6;0,17	0	1	1	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0	1	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	1
6;2,2	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	0	1	0	1	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0
6;0,11	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	1	1	0	1	1	1	1	0	1	0	0	0	1	0	1	0	1
6;3,6	1	1	1	0	0	0	1	1	0	0	1	0	1	0	1	1	1	0	1	0	0	1	1	1	1	0	1	0	0	0	1	0	1	0	1
6;0,9	1	0	0	1	1	0	1	0	0	1	1	1	0	0	0	1	1	1	1	1	1	0	1	0	1	1	0	0	1	0	1	0	0	1	1
6;1,8	0	1	1	0	0	0	1	1	1	0	1	1	0	0	1	1	1	0	1	1	0	1	1	1	1	0	1	0	0	0	1	0	1	0	1

7 Years

Age	1. raised	2. unraised	3. copular	4. unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
7;0,18	0	1	1	0	1	0	1	1	0	1	0	1	1	1	0	1	1	0	1	1	0	1	1	1	1	0	1	0	0	0	1	1	1	0	1
7;2,23	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
7;3,23	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
7;1,10	0	1	1	0	1	0	1	1	0	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1
7;1,24	0	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1
7;3,17	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1
7;0,14	0	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	1	1
7;1,3	0	1	0	0	0	0	1	1	1	1	1	0	0	0	1	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	0	1	0	0	1
7;0,13	0	0	1	0	0	0	1	1	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0
7;1,24	0	0	1	0	1	0	1	0	0	0	0	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	0	0	1	1	1

Control Adult

Age	1. raised	2. unraised	3. copular	4. unraised	5. raised	6. unraised	7. filler	8. copular	9. unraised	10. raised	11. copular	12. raised	13. filler	14. unraised	15. raised	16. copular	17. copular	18. unraised	19. filler	20. raised	21. unraised	22. copular	23. filler	24. raised	25. filler	26. raised	27. copular	28. unraised	29. raised	30. raised	31. copular	32. unraised	33. copular	34. unraised	35. copular
21,9	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24,7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21,7	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	0	0	1	1	1
21,04	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	0	1	1	0
59,8	1	0	1	1	1	1	1	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1
60,2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
61,1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1
27,1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
26,6	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
24,5	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
52,7	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1