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# The acquisition of distributivity and collectivity in child language

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**Abstract:**

This thesis investigates the understanding of distributivity and collectivity in child language acquisition, focusing on sentences with quantifiers and modifiers that semantically encode these concepts. Distributivity involves interpreting actions or properties as applying to each individual within a group (e.g., "Each boy lifts a rock"), whereas collectivity refers to interpreting actions or properties as applying to the group as a whole (e.g., "The boys carry a gift together"). The aim of this study is to investigate the interpretation of sentences containing the floated quantifier *cadascun* (each) and the modifier *junts* (together) by preschool children.

The research employs an act-out task conducted in Catalan. Children were asked to represent their interpretation of target sentences using dolls and objects. This allows to access all possible interpretations accessed by children, differently from other methodologies, such as the Truth-Value Judgment Task, which restrict the interpretation children are asked to evaluate. Participants included 87 children, aged 55 to 100 months, and 20 adults serving as a control group.

Results reveal that younger children, particularly those around 65 months old, show a strong understanding of sentences that lexically encode a distributive reading, but exhibit a lower level of comprehension of sentences that lexically encode a collective reading. By 95 months, children demonstrate a more balanced understanding of both distributive and collective readings, being able to represent the target sentences in an adult-like way. Furthermore, quantifier spreading —where children extend the quantifier beyond the intended scope— was observed, indicating an overextension of distributive concepts.

**Keywords:** distributivity, collectivity, floated constructions, act-out task, child language acquisition, Catalan

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## 1 Introduction

Sentences with a plural definite subject have been widely investigated due to the numerous ways that they can be interpreted. However, some of the sentences that follow this structure seem to only give rise to either collective or distributive readings. In this paper, we focus on the ways in which children interpret such sentences, specifically when they include a floated lexical item that encodes distributivity or a floated lexical item that encodes collectivity.

Distributivity is a property that predicates can hold in which the sentences with plural subjects are interpreted as applying the action to each individual within the group. For instance, sentence (1) is interpreted as distributive and therefore if in our scenario there are three boys and three rocks, we understand that each of the boys lifts his own rock.

- (1) Els nens      aixequen      cadascun      una pedra.  
The boys      lift. PRS.3PL      each      a rock  
'The boys each lift a rock.'

In contrast, collectivity is a property of predicates in which sentences with plural subjects are interpreted as applying the action to the group of subjects as a whole. If we consider sentence (2), we will likely attribute it the collective interpretation, in which in a scenario where there are three boys, they all work jointly to carry out the action of carrying one single gift all together, and therefore, there is only one event of carrying a gift.

- (2) Els nens      porten                      junts              un regal.  
The boys      carry.PRS.3PL              together              a gift  
'The boys carry a gift together.'

Most formal theories of language suggest that, to get the distributive reading of a mixed predicate, an additional Distributivity operator (*D* or *Dist*) needs to be present in the syntactic and/or semantic structure, the purpose of which is to function over individual entities or singletons (Brisson, 1998; 2003; Link, 1983; Schwarzschild 1994).

The primary goal of this thesis is to investigate whether children assign the same interpretation as adults to sentences such as (1) and (2) that is a distributive interpretation to the former and a collective interpretation to the latter, by means of an act-out task. Furthermore, this research also aims to study whether using a floated construction of the

form of (1) where the quantifier *cadascun* appears in a floated position favours an adult-like of such sentences. Our stimuli are minimal pairs, since they only differ in one item allowing for a controlled comparison between the interpretations children might assign to each target sentence. Therefore, we aim to investigate whether children from four to eight years of age are able to recruit lexical semantic information provided by *cadascun* and *junts* and assign the target sentences either a collective or a distributive interpretation, depending on the lexical item.

The present thesis begins with a comprehensive literature review, providing an overview of existing research, key theories and findings in the field. Chapter 2 details the methodology, including research design and procedure, participants, along with the rationale behind the chosen methods. Chapter 3 presents findings on the developmental stages at which children start to understand distributive and collective constructions and the discussion of such findings. Finally, Chapter 4 provides a conclusion, summarizing the main findings, the limitations of this work, and suggesting directions for future research.

## 1.1 State of the art

Previous research has shown that when adults are presented with sentences that include a plural definite subject as in (3), they fully accept the collective reading, but find the distributive reading marginal (de Koster et al., 2017; Dotlačil, 2010). For instance, in sentences like (3), adults typically understand this to mean that all of the boys that construct the subject collectively push a single box. In order to explain such preference for collective readings in adult language, researchers have adopted a scalar implicature account (Dotlačil, 2010; Pagliarini, et al. 2012).

Contrary to adults, children exhibit a divergent pattern of interpretation for this type of sentences until late in their language development. Previous studies suggest that young children exhibit variability in their interpretations, often permitting both distributive and collective readings for sentences like (3), demonstrating a broader range of acceptable interpretations, where adults would predominantly favour collective readings (Brooks & Braine, 1996; de Koster, 2021; Dotlačil and Brasoveanu, 2021; Frazier et al., 1999; Padilla-Reyes, 2018; Pagliarini, et al., 2012; Syrett & Musolino, 2013).

(3) The boys push a box.

Concerning past studies on the ability that have children to recruit lexical semantic information provided by *each*, it has been showed that children often permit both distributive and collective readings for sentences including *each*, unlike adults who show a clear preference for distributive readings. In previous works, *each* has been mainly investigated in subject position, as in Musolino's study (2009) "*Each boy gave a gift to Mary*" (Brooks & Braine, 1996; Brooks & Sekerina, 2005; 2006; Ferenz & Prasada, 2001; Hanlon, 1986; Musolino, 2009; Syrett & Musolino, 2013).

On the acquisition of the Catalan *each*, Gavarró and Lite (2015) conducted a study to discern whether the acceptance of cumulative interpretations stated by Drozd, Musolino and van der Lely (2017) with sentences such as "Every girl is standing on two tables" was accepted by children in a context where one girl was standing on two tables, but two other girls were standing on one table each. Gavarró and Lite (2015) conducted a truth value judgment task to compare children's and adults' judgments of sentences with *each* and sentences with a numerical NP as descriptions of pictures depicting distributive and cumulative contexts. The results of the study showed that children aged between 5 and 7 seem to assign *cada*, 'each', a collective reading in sentences like "Cada dona tira dos cavalls", 'Each woman pulls two horses', having only 39% of correct answers on the cumulative condition at age 5 and 35% at age 7 (Gavarró & Lite, 2015), understanding the cumulative interpretation of the previous sentence as if each woman is pulling at least one horse and each horse is being pulled by at least one woman.

Another study on this field run in Catalan explored the interpretation of the universal quantifier *tots* in Catalan for 35 children aged 3 to 7 (Gavarró & Escobar, 2011). The experiment was a truth condition task in which children were asked to answer a yes/no question with the universal quantifier either in subject or object position about a picture they were presented with as in "Una girafa porta tots els globus?" ('Is a giraffe carrying all the balloons?') or "Tots els elefants porten un globus?" ('Are all the elephants carrying a balloon?'). The results showed that children had a preference for the symmetrical responses when the quantifier was in subject position, and almost an adult-like behaviour when the quantifier was in object position, with at least 94% of correct answers (Gavarró & Escobar, 2011).

Studies on children's interpretation of sentences containing the modifier *together* reveal that children, unlike adults, allow both collective and distributive readings. Adults restrict their interpretation to these sentences to the collective reading (Syrett & Musolino, 2013). One of the experiments presented in Syrett and Musolino's work (2013), run with children aged between 52 and 63 months and a group of adults, revealed that when participants were presented with sentences with the modifier *together* in postverbal position like (4) and a plural numerical expression as a subject, and sentences with the same subject but with the quantifier *each* in a preverbal position as in (5), children were prone to accept the test sentence in both a collective scenario or a distributive one no matter what the lexical item added was. More specifically, when children were presented with sentences containing *each*, the percentage of acceptance of the target sentence in the distributive experimental context was a 100% and in the collective experimental context was an 86.7%. However, with sentences containing *together*, they were slightly more inclined to accept the sentences in the collective context (98.3% of acceptance) than in the distributive context (83% of acceptance).

(4) Two boys pushed a car together.

(5) Two boys each pushed a car.

It has also been stated that, in English, the ambiguity that the adverbial modifier *together* carries might have been a setback in studies whose aim was to see if children were able to distinguish the possible readings behind the pragmatics between *each* and *together*, such as Syrett and Musolino's (2013), since children can also interpret the modifier *together* in sentences like (4) as a temporal adverb (Syrett & Musolino, 2016). In this last paper, Syrett and Musolino conducted a study with children aged between 45 months and 63 months in order to determine whether children's acceptance of sentences with the modifier *together* in English in distributive contexts is related to the ambiguity of this modifier, being able to be interpreted as a temporal adverb. In this experiment, participants were shown a series of 13 short events, each involving one to three agents performing a child-friendly action. Four events were in distributive contexts and four other events in collective contexts. In the collective context, two participants performed one action jointly as shown in Figure 1. On the other hand, in the distributive contexts there were two possible events, one in which two participants carried out the action simultaneously as shown in Figure 2, and the other in which there was not a temporal overlap of the two



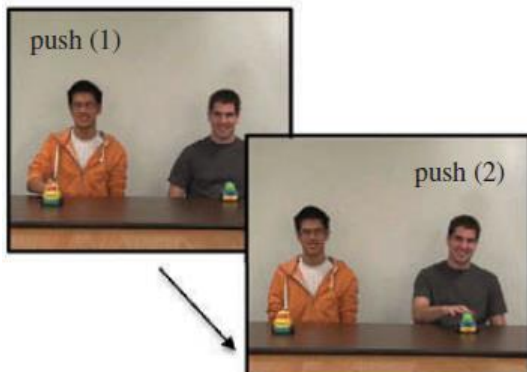
subevents, but they were sequential as represented in Figure 3 (first the action push (1) was carried out and as soon as this action ended, the action push (2) was also carried out).



**Figure 1.** Frame of the collective context (from Syrett & Musolino, 2016).



**Figure 2.** Frame of the distributive context with simultaneous events (from Syrett & Musolino, 2016).



**Figure 3.** Frame of the distributive context with sequential events (from Syrett & Musolino, 2016).

Through the experiment described, Syrett and Musolino (2016) found that when the distributive context was manipulated in order to separate the timing of the subevents as in Figure 3, children were less likely to accept the target sentence containing *together* in the distributive context as they did in Syrett and Musolino (2013).

As for floated constructions, particularly floated quantifiers, refer to linguistic constructions where quantifiers appear in a position within the sentence separated from the noun phrase that they logically quantify. These constructions have been studied together with the study of scope interpretation (Dowty & Brodie, 1984). In an unmarked

position, a quantifier applies individually to each member of the noun phrase that is quantifying, and floated quantifiers often signal such readings by emphasizing the individual application of the quantifier. Conversely, in collective readings, the quantifier in an unmarked position applies to the group as a whole, but, when floated, it can shift interpretation towards distributivity, highlighting that the action applies to each individual separately instead of to the group as a single entity (Sportiche, 1988). Thus, floated constructions play a significant role in resolving ambiguities between distributive and collective readings, providing syntactic and semantic cues that influence the perceived focus and scope of quantifiers (Dowty & Brodie, 1984).

## 2 Methodology

The vast majority of the studies mentioned in the previous chapter employed a Truth-value Judgment Task (TVJT), one of the most employed methods for assessing children's interpretation. This method requires children to decide whether a sentence or a statement accurately describes a given situation referenced in a certain context (Crain & Thornton, 1998). The TVJT is particularly effective in evaluating children's understanding of various linguistic constructs by presenting them with specific scenarios and asking for judgments on the truthfulness of associated statements.

However, it is important to note that the reliance on TVJT inherently means that children's responses are often influenced by prior adult representations of sentence meanings. In other words, the interpretations presented to children in tasks of this kind are pre-determined by adult linguistic norms, limiting the scope of insights into children's own interpretations. This reliance has prompted some researchers to explore alternative methods that might offer a more direct window into children's linguistic intuitions and preferences.

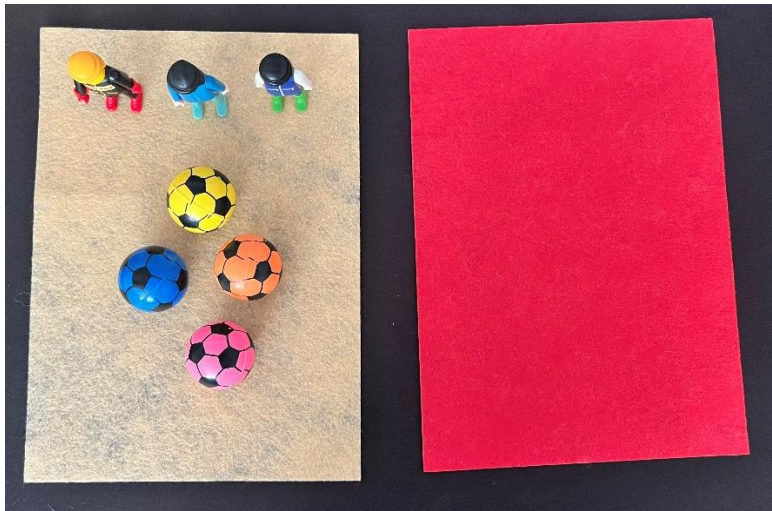
Recent studies have begun to diversify methodological approaches by incorporating act-out tasks, though typically with different objectives than our current research. For instance, Bosnic and Spenader (2019) employed an act-out task to explore children's interpretations of distributivity markers and to understand their reasoning in a comprehension exercise. Their study, conducted with participants aged from 7 to 10 in Serbian and Dutch contexts, aimed to discern how linguistic markers influence children's

understanding of distributivity. The results showed that Serbian children have a better understanding of sentences with distributive markers in a way that matches the adult-like distributive interpretation of such sentences. On the other hand, Dutch children displayed more variability in their understanding and interpretation of sentences with distributive markers, indicating a later acquisition compared to Serbian children, who had adult-like responses at age 9.

In our study, we have adopted an act-out task to investigate children's comprehension and preferred interpretations of sentences containing the quantifier *cadascun* and the modifier *junts* in Catalan. This methodological choice allows us to observe children's natural interactions with these linguistic elements, providing a richer and potentially more nuanced understanding of their semantic intuitions. By allowing participants to demonstrate their understanding of the target sentences, the act-out task offers a more interactive and engaging way to assess linguistic competence, potentially revealing insights that more static methods like TVJT might miss.

## 2.1 Design and procedure

As mentioned in the previous section, the experiment was an act-out task which was run in Catalan. In this task, the subjects were given a set of three dolls, which in our case were Playmobil figures, and a set of four objects that were placed on a rectangular cardboard of a particular colour, as shown in Figure 4. The researcher then narrated a short story containing the target sentence, after which the participant was asked to recreate the scene on another rectangular cardboard of a different colour, red in the example in Figure 4, in order for the researcher to distinguish accurately their choice and interpretation of the target sentence.



**Figure 4.** Display of given subjects and objects to the participants

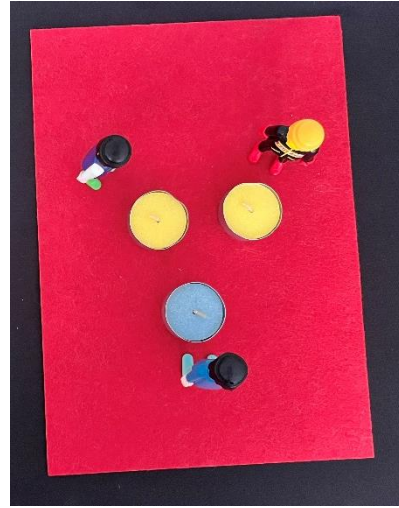
The target sentences were all transitive sentences following the structure Subject – Verb – Quantifier/modifier – Indefinite object. The subject was always the definite plural *els nens* in masculine or *les nenes* in feminine, ‘the boys’ or ‘the girls’, respectively, which is a non-quantificational NP, while the indefinite object was always singular. Target sentences such as (6) where the distributive quantifier *cadascun* ‘each’ was included should be interpreted as distributive (we will refer to this as Condition D). Target sentences such as (7) containing the modifier *junts* ‘together’ should be interpreted as collective (we will refer to this as Condition C) as in (7).

- |     |                                    |               |          |              |
|-----|------------------------------------|---------------|----------|--------------|
| (6) | Els nens                           | bufen         | cadascun | una espelma. |
|     | The boys                           | blow. PRS.3PL | each     | a candle     |
|     | ‘The boys each blow a candle.’     |               |          |              |
| (7) | Els nens                           | bufen         | junts    | una espelma. |
|     | The boys                           | blow. PRS.3PL | together | a candle     |
|     | ‘The boys blow a candle together.’ |               |          |              |

In Condition D, participants were given a set of three dolls and four objects, along with a story introducing the subjects and the objects and that contained the target sentence of the form of (6). The story described by the researcher was the same for experimental items and filler items, and it was as it follows:

“Ara, a aquest parc de color beige hi ha algunes espelmes i ara venen uns nens. Anem a veure què passa. Els nens bufen cadascun una espelma. A veure com ho representaries tu?”

The expected representation of a target sentence such as (6) (Condition D) is given in Figure 6, whereas in Figure 5 there is the expected remaining object not used by the participants.



**Figure 5.** Expected remaining object during the representation of a target sentence of Condition D. **Figure 6.** Expected representation of a target sentence of Condition D.

In Condition C, participants received the exact same number of dolls as in Condition D, and the target sentence, of the type of (7), was also accompanied by a story of the same structure. Figure 8 shows the expected representation of sentences such as (7).



**Figure 7.** Expected remaining objects during the representation of a target sentence of Condition C. **Figure 8.** Expected representation of a target sentence of Condition C.

The drawback mentioned in a previous section about the ambiguity of *together* in English will not be encountered in this study, since the experiment was run in Catalan, a language in which there is a specific word for the English temporal adverb *together*, ‘*alhora*’. This distinction is expected to reduce ambiguity and provide clearer insights into children’s understanding of sentences containing a lexical item that encodes collectivity such as *junts* in Catalan, not giving rise to a possible distributive interpretation where the actions carried out could be simultaneous.

The present experiment included a total of eight experimental items, four of each of the two conditions, as well as four fillers. The items were presented in a pseudo-randomized order to ensure that no two consecutive items belonged to the same condition and that no two fillers followed one another.

Prior to the main experiment, three training items were used to familiarize children with the task. These training items demonstrated that the children need not literally act-out the scenarios, but should instead represent the actions by placing the dolls in front of the objects as shown in Figure 6 and Figure 8.

Both the fillers and the training items were carefully designed to avoid any bias towards distributive or collective interpretations, nor they were ambiguous. They were structured as transitive sentences of the form Subject – Verb – Indefinite object, but instead of the subject being a definite plural, they were indefinite singulars, as illustrated in (8).

- (8) Un nen            xuta                    una pilota.  
A boy                kick.PRS.3SG            a ball  
‘A boy kicks a ball.’

To prevent any potential bias from the order of the experimental items, two different versions of the experiment were used. Each participant only did one version of the experiment. These versions varied in the sequence of item presentation and the condition assigned to each verb-object pair. The order of items in each version is shown in Table 1, as well as the verbs chosen for the experiment, which are all mixed predicates that can be interpreted as distributive or collective depending on the action.

Version 1		Version 2	
Verb - object pair	Condition	Verb - object pair	Condition
Empènyer - bloc	D	Aixecar – pedra	C
Portar – regal	C	Aguantar – tambor	Filler
Aguantar – tambor	Filler	Empènyer – cotxe	D
Empènyer – bloc	D	Acariciar – pollet	Filler
Netejar – cullera	Filler	Portar – regal	D
Portar – ou	D	Regar – flor	C
Bufar – espelma	Filler	Netejar – cullera	Filler
Regar – flor	D	Empènyer – bloc	C
Regar – llavor	C	Aixecar – branca	D
Aixecar – pedra	D	Bufar – espelma	Filler
Acariciar – pollet	Filler	Portar – ou	C
Aixecar – branca	C	Regar – llavor	D

**Table 1.** Order of experimental items and fillers in Version 1 and Version 2 of the experiment

## 2.2 Participants

The participants that took part in this experiment were eighty-seven children aged between 55 and 100 months old and twenty adults who served as the control group. The child participants were divided into four groups based on their school grade. All 107 participants, both children and adults, were neurotypical individuals with Catalan as their native language. The main features of child groups are summarized in Table 2.

Group	Number of subjects	Gender	Group mean age in months (with standard deviations)
i4	23	11 M; 12 F	60 (2,84)
i5	21	14 M; 7 F	71 (3,23)
1r	22	9 M; 13 F	81 (3,68)
2n	21	8 M; 13 F	95 (3,86)

**Table 2.** Demographic information of the children tested, divided by group.

The control group was formed of twenty adults of a mean age of 31 years, nine of which were males and eleven were females.

The children were recruited from Les Pinediques, a preschool and elementary school located in Taradell, a small town in the province of Barcelona. This ensured a homogeneous linguistic background, as all child participants shared the same educational environment and were native Catalan speakers. The adult control group was composed of individuals from the researcher's immediate environment, including family members and friends, all of whom were also native speakers of Catalan.

All the participants signed the consent form, or in the case of children their tutors, which was approved, together with the present research, by the Comitè d'Ètica en la Recerca (CERec) of the Universitat Autònoma de Barcelona (reference number CEEAH6603M4).

### 3 Results and discussion

#### 3.1 Coding

The representations acted out by participants of the experimental items were considered correct when done as Figure 6 in the previous chapter in the case of experimental items of Condition D and as Figure 8 in the case of experimental items of Condition C.

In a few cases, participants have used two toy props as subjects of the sentence (instead of 3), yet they correctly interpreted the distributive or the collective readings. Such responses were considered as correct in the main analysis. This type of answer will be discussed in further detail later in this thesis.



Moreover, we have encountered children's representations where they would use all of the objects when they were representing a distributive reading of the target sentence, therefore using the remaining object with one of the pair of toy prop as subject and object.

### 3.2 Results and discussion

All the subjects that were tested were able to complete the experiment. However, we excluded those participants who did not answer correctly to at least 75% of the filler items. Five of these were from the group i4, one from the group i5 and two from the group 2n. Table 3 reports the demographic information of participants included in the data analyses. Table 4 reports the percentage of correct filler items per group (after having excluded the 8 participants as described above).

Group	Number of subjects	Gender	Group mean age in months (with standard deviations)
i4	18	11 M; 11 F	60 (2,71)
i5	20	14 M; 6 F	71 (3,02)
1r	22	9 M; 13 F	81 (3,67)
2n	19	6 M; 13 F	95 (3,94)

**Table 3.** Demographic information of the children included in the data analyses.

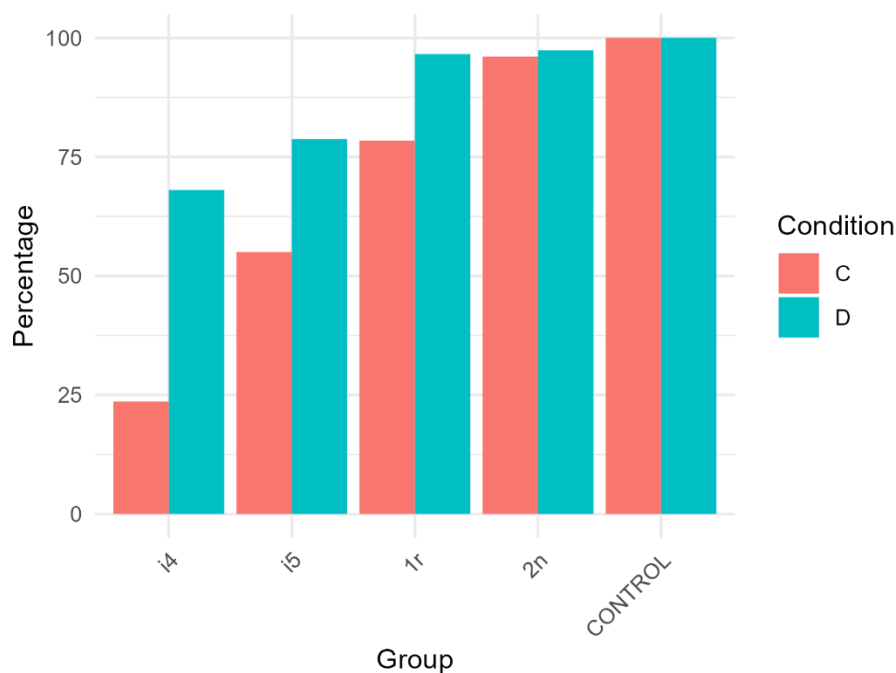
Group	Percentage of correct fillers
i4	97,22 %
i5	98,75 %
1r	97,73 %
2n	100 %
CONTROL	100 %

**Table 4.** Percentage of correct filler items per group.

The results of the experiment are reported in Figure 9, which illustrates the percentage of correct answers across five groups: i4, i5, 1r, 2n and the Control group, and for two conditions C and D, represented by red and cyan bars respectively. In group i4, the

number of correct answers for those target sentences within Condition C, collective readings, is lower than 25 %, whereas the number of correct answers that fall into Condition D, distributive readings, double this last percentage. This shows that young children tend to represent correctly to a greater degree sentences marked with a particle that encodes distributivity in a floated position as distributive than sentences marked with a modifier that encodes collectivity as collective.

Moreover, as initially thought, the younger the children, the least amount of correct representation of the target sentences. From grade 1r, children seem to exhibit a grasp of both distributivity and collectivity in sentences containing *cadascun* and *junts*, but they reach an adult-like performance only in grade 2n.



**Figure 9.** Grouped bar plot of the percentage of correct answers per condition and group.

It is important noting that when children did not represent correctly the target sentences with respect to Condition C it is because they did as if they belonged to Condition D, therefore showing a lack of understanding of the particle that lexically encodes collectivity in Catalan *junts*. In the case of the group i5, where 55% of the children's answers were correct, we can state that there were two populations within the participants, a group which always, or almost always (i.e., failed only to represent correctly one of the

target sentences with respect to Condition C), represented correctly sentences with the particle that lexically encodes collectivity in Catalan, and another group which always represented such sentences either as distributive or as if they were of the same form as the filler items.

In the case of the Condition D, children who failed to give a correct representation mainly used only one subject and one object (i.e., they represented a single event)<sup>1</sup>.

As it was stated before in the present paper, a very interesting phenomenon was encountered while doing this experiment, where children would use for both representing distributive and collective readings only two subjects instead of using the three of them as expected. In Figure 9, such phenomena is considered a correct answer, however, it is interesting examining the results shown in Table 5 if we do not consider such answers as correct. Note that the columns titled *Phenomena considered correct* align with the results shown in Figure 9, and in the columns titled *Phenomena considered incorrect*, those situations in which the subject used only two subjects, the answer is now considered incorrect.

Group	Percentage of correct answers Condition D		Percentage of correct answers Condition C	
	Phenomena considered correct	Phenomena considered incorrect	Phenomena considered correct	Phenomena considered incorrect
i4	68,06 %	63,89 %	23,61 %	22,22 %
i5	78,75 %	73,75 %	55%	53,75 %
1r	96,59 %	95,45 %	78,41 %	78,41 %
2n	97,37 %	97,37 %	96,05 %	96,05 %
CONTROL	100 %	100 %	100 %	100 %

**Table 5.** Comparison of percentages of correct answers taking into account the maximal and non-maximal interpretations of the subject of the target sentences.

This behaviour corresponds to the non-maximal interpretations of the definite plural *els nens* or *les nenes* that we used as subject for the experimental items. In a maximal interpretation, the plural noun phrase refers to all the member of the group collectively.

<sup>1</sup> This was the case for all mistaken items in Condition D but 4.

If we take the sentence example from Schwarz (2013) *The boys left* implies that every boy in this specific context participated in the action of leaving. In contrast, a non-maximal interpretation allows for some flexibility, meaning that the previous sentence might only imply that some or most of the boys left, but not necessarily every single one. This distinction has important implications for understanding the preference for distributive and collective readings in language. Children often show a preference for non-maximal interpretations suggesting a more flexible understanding of plural references that evolves with age slowly (Caponigro et al., 2012).

During this experiment, we encountered an intriguing phenomenon related to quantifier spreading, in which in a situation where there is an extra agent or subject left without an object, for example three subjects holding a balloon each and four objects, therefore one without being held, when children are asked “Is an agent holding every object?” they deny that because of the presence of this isolated and unused object (Philip, 1991). In our experiment, some children used all of the objects when acting out a distributive sentence with the quantifier *cadascun*, thereby breaking the one-to-one relationship between subject and objects. This behavior suggests an overextension of the quantifier, as they might mistakenly understand that “each boy is lifting a rock” to mean that every boy is lifting every rock, rather than each boy is lifting one rock (Roeper et al., 2011). Table 6 reports the number of occurrences per group and condition of the quantifier spreading phenomenon. It is important noting that when we encountered children that represented sentences with *cadascun* as distributive and they acted as the phenomenon described, their answers were considered correct in the main analysis.

Group	Condition D	Condition C	Filler items
i4	12	12	1
i5	14	6	0
1r	2	1	0
2n	8	0	0
CONTROL	0	0	0

**Table 6.** Number of occurrences per group and condition of the quantifier spreading phenomenon

It is important to note that most of the participants that we consider *spreaders* (those that at least overextended the quantifier once during the experiment), specifically noted that

there was an extra object, and wondered for a few seconds what they were expected or supposed to do with it.

During the act-out task, children frequently made three types of mistakes. First, they misinterpreted collective sentences with the modifier *junts* as distributive (*Mistake 1* in Table 7), applying the action meant for the whole group to each individual separately. Conversely, only a few participants misinterpreted distributive sentences as collective, executing actions intended for each individual as if they were meant for the group as a whole (*Mistake 2* in Table 7). Additionally, when presented with experimental items with a definite plural as a subject, some children erroneously reverted to simple structures from their training items, interpreting the sentences with only one subject and one object (*Mistake 3* in table 7), thereby failing to grasp the intended plural subjects and the lexical items with cues for distributivity or collectivity. Table 7 reports the percentage of the errors mentioned before.

Group	Mistake 1	Mistake 2	Mistake 3 (sentences of Condition D and C)
i4	45,83 %	0 %	31,25 %
i5	25 %	1,25 %	20 %
1r	19,32 %	2,27 %	1,14 %
2n	3,95 %	1,32 %	0,66 %
CONTROL	0 %	0 %	0 %

**Table 7.** Percentages of types of errors by group over the total number of experimental items per condition in *Mistake 1* and *Mistake 2*, and for both conditions in *Mistake 3*.

To sum up, our findings suggest that children demonstrate a grasp of distributivity and collectivity earlier than previously reported in the literature, however at the earliest stages of language development they have a strong preference for distributive readings over collective readings, in line with previous results. This advancement indicates that the use of *each* in a floated construction might facilitate an earlier understanding of distributivity. However, our results also reveal that such floated elements do not fully constrain scope assignment for children. The interpretation of scope remains somewhat ambiguous, and further work should establish this.

## 4 Conclusion

This thesis aimed to investigate how children comprehend the concepts of distributivity and collectivity in language, particularly through sentences containing items that lexically and semantically encode these readings. By using an act-out task conducted in Catalan, we have provided new insights into children's understanding of these linguistic constructs. Our results show that 4-year-old children assign 68% correct interpretations to the distributive quantifier *each* and its comprehension becomes adult-like at the age of 6. Our results also show that children until the age of 7 years are not adult-like in the understanding of *junts* (together), which should unambiguously force a collective interpretation. Our findings indicate that children seem to be able to restrict distributive interpretations to distributive quantifiers such as *cadascun*, yet sometimes they misinterpreted the target sentence as being a single event acted out by a single subject. Importantly, our results show that children as young as 4 do not interpret sentences with the floating quantifier *each* collectively as none of errors found in the Condition D was due to such misrepresentation. As for *junts*, they tend to interpret sentences containing *junts* as distributive instead of assigning them a collective reading. Consequently, the findings of this study diverge from earlier research that employed a TVJT or preferential task, which demonstrated that children are capable of interpreting sentences with *each* collectively (Brooks & Braine, 1996; Pagliarini et al., 2012; Syrett & Musolino, 2013). In addition, in a couple of cases, children displayed non-maximal interpretations of plural noun phrases, showing a flexible understanding that evolves with age. Additionally, the phenomenon of quantifier spreading observed among the children suggests that their comprehension of distributive sentences can sometimes extend beyond the intended one-to-one relationship between subjects and objects.

Future studies should directly compare children's comprehension of *cada* in subject position with their comprehension of *cadascun* in floated constructions using the act-out methodology. This comparison would help determine whether the improved performance observed in this experiment is due to the construction itself or the methodology used.

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