Comprehending *and*: The Acquisition of English Conjunction in Child Language

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1. Introduction

The acquisition of conjunction can be seen as an ideal case study of the development of abstract, combinatorial concepts. Unlike the vast majority of content words such as nouns or verbs, conjunctives do not refer to objects or actions in the real world. Rather, their meanings come about solely on the basis of how they manipulate the meaning of their arguments. Yet, despite their abstractness, it has been reported that children before two years old already begin to produce conjunctives such as *and* (Brown, 1973; Lust & Mervis, 1980; Tager-Flusberg et al., 1982; a.o.). However, does early production entail early understanding? If so, how do children come to understand conjunction so early, at a point when they still struggle to comprehend other similarly abstract operators, such as negation (e.g. Feiman et al., 2017)?

Besides this apparent challenge, another difficulty that underlies the acquisition of conjunction comes from its *cross-categorial nature*: as shown in (1), English *and* can be used to conjoin phrases of various syntactic and semantic categories, which include but are not restricted to (1a-b) nominals (type e or $\langle\langle e,t\rangle,t\rangle$), (1c) predicates/properties (type $\langle e,t\rangle$), and (1d) sentences (type t).

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(1) a. Anna$_{e}$ and Bill$_{e}$ laughed.
b. Every student$_{<<e,t>,t>}$ and every professor$_{<<e,t>,t>}$ laughed.
c. Anna jumped$_{<e,t>}$ and laughed$_{<e,t>}$.
d. Anna jumped$_{t}$ and Bill laughed$_{t}$.

This broad distribution of *and* raises a challenge for theories of the syntax-semantics interface, and given that the vast majority of words do not have this wide syntactic distribution, the cross-categorial nature of *and* may also pose a challenge for the learner. To see this, consider the following line of reasoning: Under standard assumptions, linguistic expressions are assigned an unambiguous meaning and meaning composition is governed by function-argument application. From this, it follows that an expression's meaning severely constrains its syntactic distribution. For example, *and* is often taken to be the natural language counterpart of propositional logic conjunction ('∧'), a function of type $<t,<t,t>>$. But this alone would wrongly predict that *and* can only conjoin objects of type t -- a meaning of type $<t,<t,t>>$ cannot combine with one of type $<<e,t>,t>$, for example. There are two kinds of theoretical approaches to this issue: either one assumes a transparent syntax and a flexible semantics for *and*, (Partee & Rooth 1983, Keenan & Faltz 1985), or an inflexible semantics for *and* with a non-transparent syntax (Hirsch, 2017; Schein, 2017). These approaches differ with respect to whether one particular occurrence of *and* is basic or not: while Keenan & Faltz (1985) assign *and* a meaning that is general enough to cover all of its occurrences, Partee & Rooth (1983), Hirsch (2017), and Schein (2017) all take S-*and* to be basic.[1] This latter view, in particular, seems to be compatible with the following prediction: given the premise that derived meanings cannot be acquired before their basic meaning, nominal conjunction (NP-*and*) for example, should not precede sentential conjunction (S-*and*) developmentally.

The question that arises, then, is whether there is any evidence for such a developmental path in child grammar. Answering this question requires a way to tease apart how NP-*and* and S-*and* affect the meaning of the sentences they are in. But this is not a trivial task: a minimal pair of sentences that differ in whether they have NP- or S-*and* are often equivalent. For example, an NP-*and* sentence like *Ann ate* [*a cake*] *and* [*a pie*] is equivalent to the S-*and* sentence [*Ann ate a cake*] *and* [*Ann ate a pie*]); no scenario will verify one but falsify the other.

However, adding another logical operator to these sentences offers a way to help us track down the differences between these two occurrences of *and*. For this reason, we turn to sentences where each sentence has an indefinite subject:

(2) a. Somebody has a helicopter and somebody has a car. (S-*and*)
b. Somebody has a helicopter and a car. (NP-*and*)

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[1] But see Krifka (1990), who derives all occurrences of *and* from individual conjunction.

Example (2a) involving S-*and* is typically interpreted as describing a situation with two different individuals, one having a helicopter and the other a car. This distinctness inference is due to Heim's (1982) Novelty Condition: indefinites introduce new discourse referents, and, as a result, two different occurrences of an indefinite trigger the inference that they refer to different entities. Meanwhile, the sentence in (2b), with the occurrence of an NP-*and*, can only be understood as describing a situation where a single individual has both items. Essentially, then, identifying which interpretation of the conjunction is being accessed boils down to determining the scope relation between conjunction and the indefinite subject. We will elaborate on this when we discuss our experiments in the next section.

Previous research addressing similar questions have yielded very mixed results, rendering these questions largely unanswered. First, several developmental studies since the 1980s have used corpus analyses, to test the predictions of the hypothesis that all non-sentential *and*s are transformationally derived from S-*and*. Bloom et al. (1980) found in their production data set that predicate conjunction, NP-*and* and S-*and* occurred roughly at the same time, finding no developmental asymmetry for the most part. Lust & Mervis (1980), also through a corpus study, argued instead that S-*and* is produced earlier than NP-*and* and predicate conjunction, although their data shows that the frequencies of these categories are very similar at the early stages. Additionally, Tager-Flusberg et al. (1982), who used Brown's 1973 corpus, concluded that S-*and* appears after predicate conjunction. However, in a more recent study using the same corpus, Haslinger & Schmitt (2017) reported that while individual children may have acquired conjunctions of one category before another, the asymmetries vary a lot across these children. Furthermore, for all three children in the corpus, different conjunctions appeared within a few months.

Early experimental studies do not provide a definitive answer to the question of whether there is also an asymmetry in development between different categories of *and*. Motivated by the *Conjunction Reduction* debate at the time, Ardery (1980) and Tager-Flusberg et al (1982) reported several experiments investigating children's comprehension of conjunctions of different categories. In Ardery's study, English-speaking children had to act out simple SVO sentences involving different types of conjunction. Their results do not provide evidence for an asymmetry in children's acquisition of the conjunction of these semantic types. Similarly, Tager-Flusberg et al. (1982) conducted an elicited production study where English-speaking children were asked to describe pictures, and also found no developmental asymmetry between different types of *and*. However, Feiman et al (2017) notes that while children start producing negation very early in development, they show a production-comprehension asymmetry during the first few years, with comprehension lagging behind production. Such a production-comprehension asymmetry provides reasons to look into the comprehension of conjunction in child grammar.

In more recent work, researchers have examined children's comprehension of the interaction between conjunction and other logical operators in various languages (Goro 2007, Crain 2012, Notley et al. 2016, Geçkin et al. 2016, a.o.). The conjunctives in these studies are either type *e* expressions, or expressions that could be interpreted as being of type *e* or <<*e,t*>,*t*>. Results from these experiments are compatible with the idea that the child participants have adult-like knowledge of the lexical meaning of type *e* conjunction, but it must be noted that the children who participated in these experiments were typically older than the children in corpus-based work (mean age > 4;0, vs. mean age 2~3). As a result, these studies do not provide insight to the possibility of a developmental asymmetry at earlier stages of acquisition.

In sum, previous work on the acquisition of *and* using corpus and production data have yielded no conclusive outcome, and do not provide clear answers to our research question outlined above. The present study attempts to address these questions through a more direct investigation of children's comprehension of conjunction. Specifically, we conducted a series of experiments looking at children's interpretations of sentences containing NP-*and* and S-*and*. We will present three comprehension studies: two with child participants (Sec 2 - Sec 3) and one with adult participants (Sec 4).

2. Experiment 1
2.1. Participants

Forty-five 3- to 5-year-old English-speaking children participated in Experiment 1, including 15 3-year-olds (range: 3;0 – 3;11; mean: 3;6), 15 4-year-olds (range: 4;0 – 4;11; mean: 4;5), and 15 5-year-olds (range: 5;0 - 5;6; mean: 5;3). Children were tested either at the Language Acquisition Lab at Macquarie University, or at their day-care.

2.2. Design, materials, and procedure

The child participants were presented with target sentences as in (3).

(3) a. Somebody has a car and somebody has a helicopter. (S-*and*)
b. Somebody has a car and a helicopter. (NP-*and*)

The target sentences were presented by the experimenter as instructions to a puppet, Mr. Dog, about how to set up scenes behind a curtain, using toys and props (see Fig.1). On each trial, Mr. Dog was given three characters (three boys or three girls), and two objects (e.g. a helicopter and a car for sentences as in (3)), and was directed to try and set up a scene that matched the target sentence. When handing the toys to Mr. Dog, the child was asked to name the objects. The experimenter would then produce a target sentence using the names for the objects as produced by the child (in the form "*Mr. Dog, can you show us…*"). Mr. Dog would then set up the scene behind the curtains. After Mr. Dog completed each scene, the experimenter repeated the target sentence and opened the curtains. The child participant was asked whether or not the scene matched the experimenter's sentence. If the child participants indicated that the scene did not match the sentence, they were asked to rearrange the toys to match the sentence (see Fig. 2).

The experiment contained six NP-*and* (two *match*, and four *mismatch* items), six S-*and* (two *match*, and four *mismatch* items), four fillers (two *match*, two *mismatch* items), and two *each*-items (both *match*), the latter two to generate a more balanced distribution of *match* and *mismatch* items. Each experimental session started with two practice items (one *match*, one *mismatch*) on which the child participants received help if necessary. Particularly, children were trained to understand that not every character or object on stage has to be mentioned, and that not every character needs to have an object. That is, a set-up can be correct, even if there are characters without objects, and/or if there are objects that have not been mentioned.

Figure 1: Set-up in *mismatch* condition for (3a) and *match* condition for (3b)

Figure 2: Child moves toys such that set-up matches target sentence (3a)

2.3. Results

One 3-year-old, and one 4-year-old were excluded from data analysis for answering fewer than 3 out of 4 fillers correctly, leaving 43 participants for data analysis.

S-*and* sentences like (3a) contain two occurrences of *somebody*. In principle, both occurrences could refer to the same individual. However, the Novelty Condition dictates that the second occurrence of *somebody* refers to a different (novel) individual than the first, which makes (3a) acceptable if one person has a car and someone else has a helicopter. The child participants in the present study consistently obeyed the Novelty Condition, rejecting scenes in which the two occurrences of *somebody* referred to the same individual (91%) and accepting scenes in which they referred to different individuals (99%) in response to sentences like (3a) (see Fig. 3).

In contrast to the adult-like performance on S-*and* sentences, the child participants exhibited non-adult-like behaviour in response to NP-*and* sentences like (3b). Adults accept such sentences in contexts in which one individual has both items (SOMEBODY > AND). By contrast, the child participants consistently rejected this interpretation (on 68% of the trials), whereas they accepted (3b) as a description of a scene in which one individual had a car and another individual had a helicopter (AND > SOMEBODY) (on 81% of the trials).

Data were analysed using mixed effects logistic regression (e.g. Baayen et al. 2008). The binomial dependent variable was response accuracy. Age, ConjunctionType (S-*and* vs. NP-*and*), Set-up (*match* or *mismatch*), and the interaction between ConjunctionType and Set-up were included as predictors. Furthermore, by-subject random slopes, and a random intercept for item were included in the model. The model converged when the maximum number of iterations was increased and revealed a significant main effect of ConjunctionType (b = 12.84, p < .0001), and a significant main effect of Set-up (b = 5.04, p < .05), but no significant interaction between them (b = -0.11, p = .97). That is, there was a significant difference in children's adult-like responses to sentences like (3a), as compared to their responses to ones like (3b). Furthermore, *match* items were overall easier than *mismatch* items.

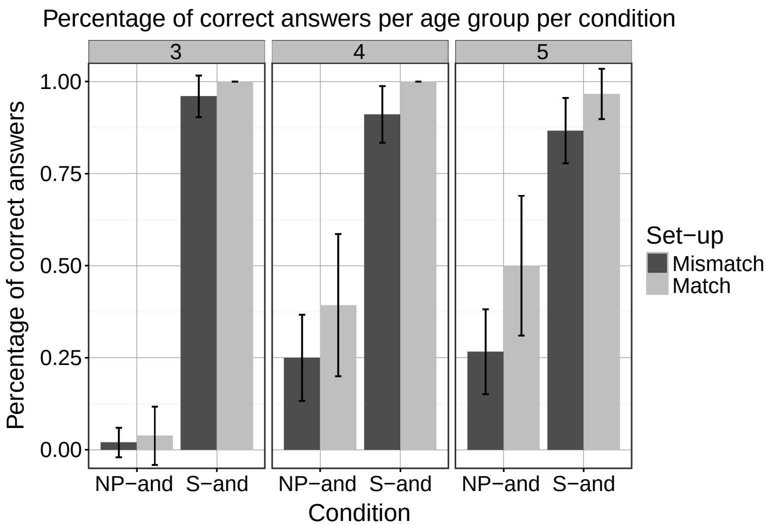

Figure 3: Results from Experiment 1

2.4. Discussion

The findings of Experiment 1 demonstrate that children adhere to the Novelty Condition by computing distinctness inferences in the S-*and* condition. This differentiates such inferences from scalar inferences, which are difficult for children up till 5 or 6 years of age (e.g. Chierchia et al. 2001, Noveck 2001).

Furthermore, the contrast in performance between S-*and* vs. NP-*and* suggests that conjunction might not be acquired as a cross-categorical operator: children seem to interpret NP-*and* sentences with *and* taking scope over *somebody*, as in the S-*and* condition. This raises the possibility that children have full competence for S-*and*, but they differ from adults in their analysis of NP-*and* sentences, ultimately resulting in an S-*and* interpretation for NP-*and* sentences.

There may, however, be an alternative interpretation of these data. On each trial, Mr. Dog puts three characters on stage, and distributes two objects among those characters. S-*and* trials were correct if two of the characters had one object each, and one of the characters had no objects. NP-*and* trials, however, were correct if both objects belonged to one single character, and the two remaining characters had no objects. Now suppose children have an adult-like grammar, but observe a non-linguistic principle called *Be Fair!*. This principle requires the child participants to distribute objects as evenly as possible among characters on the stage. Even though the child participants were trained that not every character needs to have an object, *Be Fair!* still tells them that the objects on stage should be fairly distributed. For this to work, two assumptions need to be made: (i) The non-linguistic *Be Fair*! principle overrules children's grammars, (ii) *Be Fair!* is not a binary principle (*fair* vs. *not-fair*), but gradable, so set-ups can be *more* or *less fair*: one character with two objects, and two without any objects is less fair than two characters with an object each, and a third one without any.

Experiment 1 then, leaves us with two alternative interpretations of the data: (i) children's grammars differ from adult grammars, or (ii) children's grammar is adult-like, yet the non-linguistic principle *Be Fair!* gives rise to the observed response pattern. In order to tease apart these two interpretations, we designed a second experiment, which aims to side-step the effects of *Be Fair!* by creating items that could not be rearranged such that one set-up is fairer than an alternative.

3. Experiment 2
3.1. Participants

Sixty-five 3- to 6-year-old English-speaking children participated in Experiment 2, including 19 3-year-olds (range: 3;0 – 3;11; mean: 3;7), 29 4-year-olds (range: 4;0 – 4;10; mean: 4;5), 16 5-year-olds (range: 5;0 - 5;10; mean: 5;4), and one 6-year-old (6;0). Children were tested either at the Language Acquisition Lab at MIT, or at their day-care/preschool.

3.2. Design, materials, and procedure

Experiment 2 uses the same paradigm as Experiment 1 with different lexical items, but NP-*and* sentences now take the form in (4b):

(4) a. Somebody has a chip and somebody has a comb. (S-*and*)
b. Somebody has a chip and a comb, and somebody has a horse. (NP-*and*)

The new scenario involves three objects, to be distributed among two characters, such that every character has at least one object at any given time, neutralizing *Be Fair!* to the extent that it is possible. This allowed us to tease apart the two possible interpretations of Experiment 1: if no effects of *Be Fair!* underlay the results from Experiment 1 and they indeed reflected an asymmetry between S- and NP-*and* in child grammar, then we expect the results of Experiment 2 to be the same as Experiment 1. However, if the role of *Be Fair!* dominates, the asymmetry between the two types of *and* should be much ameliorated or even disappear.

As in Experiment 1, the scenarios are either matching or mismatching given the instruction involving S-*and* or NP-*and* (which is itself part of an S-*and* construction) (Fig. 4). The experimental procedure was carried out in the same way as Experiment 1.

Figure 4: Set-up in *match* S-*and* for (4a) and *mismatch* NP-*and* for (4b)

3.3. Results

A total of 23 participants were excluded from analysis for consistently exhibiting the following behaviors throughout the entire experiment, including 11 3-year-olds, 7 4-year-olds, and 5 5-year-olds: (i) they are "yes sayers", responding positively regardless of the condition, (ii) they engaged with the task minimally, always moving at least one (mentioned) object around for less than an inch without effectively changing the scene, (iii) they are "sharers" who always responded "no" and changed the scene by moving all objects to somewhere between the two characters; (iv) they are "swappers" who always move all objects that belonged to one character to the other character, and vice versa, which effectively does not change the truth of the scene.[2] Since these behaviors were consistent across all trials, we take (i-iv) to indicate that the participants were struggling to understand the instructions or that they were unwilling to participate. This leaves us with 42 participants for data analysis.

As in Experiment 1, the child participants in Experiment 2 also showed adult-like performance on S-*and* sentences, rejecting scenes in which the two occurrences of *somebody* referred to the same individual (70%), and accepting scenes in which they referred to different individuals (92%) in response to sentences like (4a) (see Fig. 5). The overall lower accuracy for S-*and* sentences in Experiment 2 compared to Experiment 1 could indicate that the present task is overall more difficult for children -- the presence of an unmentioned item in the scene may have complexified the task, as moving around this item would not

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[2] The swapping in (iv) may be worth-noting as it could be the result of neutralizing *Be Fair!* in the new design, especially if we take the sharing in (iii) into consideration: in both cases, the child participant could be trying to make sure that each of the characters has the object simultaneously, or has possessed the object at one point (hence being "fair" in a sense). Overall, Experiment 2 appeared to be more difficult, especially for the young 3-year-olds, as the exclusion rate in Experiment 1 was not nearly as high.

affect the truth of the target sentence relative to the scene.[3] Although the child participants in Experiment 2 still exhibited non-adult-like behaviour in response to NP-*and* sentences like (4b), with a single occurrence of *somebody*, their overall performance on NP-*and* improved considerably compared to Experiment 1: in response to sentences like (4b), the child participants correctly rejected scenes in the *mismatch* condition at 41% out of all trials, and they correctly accepted scenes in the *match* condition 79% of the time.

Results from Experiment 2 were analysed using mixed effects logistic regression (Baayen et al. 2008), with the same model specification as Experiment 1. The model revealed, like in Experiment 1, a significant main effect of ConjunctionType (b = 3.623, p < .01) and a main effect of Set-up (b = 3.224, p < .01), but no main effect of age, and no significant interactions between Set-up and ConjunctionType (b = 0.351, p = .753). There was a significant difference in children's responses to sentences like (4a) as compared to their responses to ones like (4b), but children's performance NP-*and* improved in Experiment 2 compared to Experiment 1.

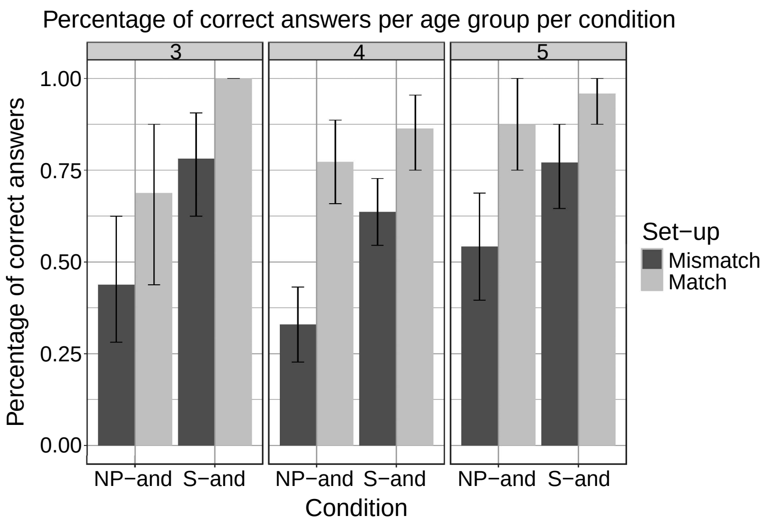

Figure 5: Results from Experiment 2

3.4. Discussion

As discussed before, Experiment 1 left open the possibility that children's grammar is adult-like, and that *Be Fair!* is responsible for the observed pattern.

[3] Note that this should not be taken to indicate that the child participants in Experiment 2 exhibited more tolerance for violating the Novelty Condition: for S-*and* in the *match* condition, out of the responses that are coded as "non-adult-like", 59% were due to children rejecting the target sentence (but failing to fix the scene in an adult-like manner).

Experiment 2 revealed a difference between S-*and* and NP-*and* sentences as in Experiment 1. One could take this as evidence that there is indeed a developmental asymmetry between S-*and* and NP-*and* sentences. However, since children's overall performance on NP-*and* sentences increased considerably in Experiment 2, it remains possible that children in fact have full competence for NP-*and*, and the lower accuracy rates are caused by the complex nature of the NP-*and* condition. We return to this point in Sec 5.

4. Experiment 3

Since we are interested in how "adult-like" the children's responses are, we also conducted a third experiment with adult English speakers, whose results provide a baseline for the child experiments.

Experiment 3 was hosted on Ibex Farm using sentences identical to Experiment 2, and the procedure was designed to mimic the child experiment as closely as possible. Adult participants recruited via Amazon Mechanical Turk (N=28) were first presented with an initial scene for five seconds, where Wilbur the Pig introduced three items and the instruction sentence appeared on top of the screen (Fig 6a). They were then shown the second scene, where the three objects were distributed among the two characters, and participants were instructed to respond Right or Silly based on the instruction sentence (which remained at the top of the screen) (Fig 6b). After the response was recorded, if the participants decided that Wilbur was being silly, they were then allowed to drag and drop the objects either to a different character or to an empty "plate" in the middle of the two characters, which would indicate that the object belonged to neither character.

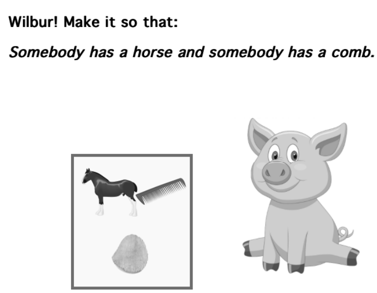

Figure 6a: initial scene with Wilbur

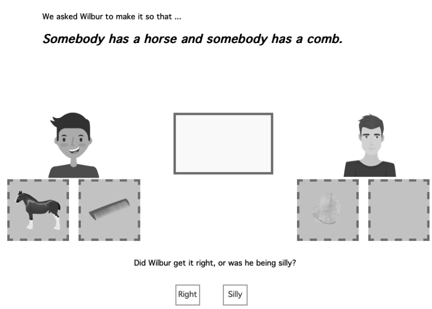

Figure 6b: Second scene for judgment

Results from Experiment 3 were analysed using mixed effects logistic regression (e.g. Baayen et al. 2008). The binomial dependent variable was response accuracy. ConjunctionType (S-*and* vs. NP-*and*), Set-up (*match* or *mismatch*), and their interaction were included as predictors. By-subject random slopes and a random intercept for item were included in the model. The model revealed a main effect of ConjunctionType ($b = -6.697$, $p < .05$), where scores on NP-*and* sentences were higher than on S-*and* sentences (different from the child results) and a significant interaction between ConjunctionType and Truth (b =

-10.38, p < .005), driven by the relatively low accuracy in the *mismatch* condition of S-*and*. Accuracies in all other conditions are at ceiling.

The findings of Experiment 3 provide a baseline for the child participants' performance on different types of conjunctions: our results for Experiments 1-2 based on the "adult-likeness" of children's responses is reliable for the most part. Additionally, we observed a considerable amount of Novelty Condition violations among the adult speakers,[4] which were present among the child participants, consolidating the conclusion that 3 to 5 year old children have full grammatical competence for S-*and*.

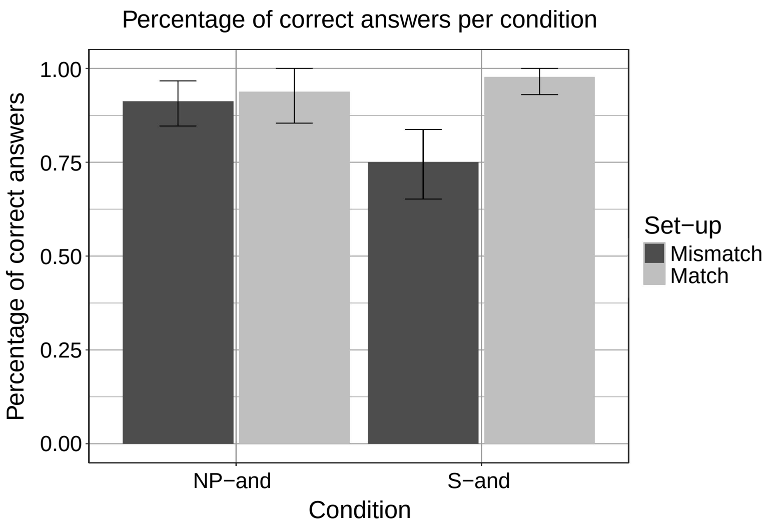

Figure 7: Results from Experiment 3

5. Discussion

In this study, we have investigated the acquisition of the cross-categorial nature of the English conjunctive *and* through a series of comprehension experiments. We focused on two types of conjunction, NP-*and* and S-*and*, probing into children's comprehension by using sentences in which each of these occurrences of *and* yields different truth conditions. The driving question of the present work is whether there is a developmental asymmetry detectable in child grammar, where S-*and* precedes NP-*and*, in accordance with the semantic theory that postulates the propositional conjunct (i.e. S-*and*) as the basic one.

[4] It may be worth noting that the S-*and* condition is "pragmatically odd" in this experiment due to an unmentioned object. We speculate that the presence of this oddness of the S-*and* condition may have led the participants to relax other pragmatic constraints, including the Novelty Condition.

In our studies, we exploited the interaction between *and* and an indefinite subject, where the relative scope between the two operators indicated which type of conjunction was being used. Experiment 1 found that, across all age groups, children's performance for S-*and* sentences was fully adult-like, but their performance for NP-*and* sentences yielded very low accuracies in both *match* and *mismatch* conditions. At first glance, these results seem to corroborate the hypothesis that there is a developmental asymmetry between these two conjunction types. Specifically, this could indicate that children between 3 and 5 years old actually interpret NP-*and* as S-*and* at an early stage, which, as discussed in Section 1, would be compatible with semantic theories that assume S-*and* to be basic, while the other types of *and* are derived.

However, we noted that there was a possible alternative explanation for these results: the scenarios that children favored were ones in which the objects were more fairly distributed. This leads us to consider the possibility that children's behaviors in Experiment 1 may have been influenced by a non-linguistic principle, *Be Fair!*. Such a principle may have prompted participants to distribute objects as evenly as possible and overruled their grammaticality judgements. Note that this principle would have to be gradable in nature, since children would be fixing an unfair situation (one out of three characters with two items) to a more fair situation (two out of three characters with one item each), which, nonetheless, is still not completely fair. Furthermore, due to the lack of any age effects in the results, it would have to be the case that *Be Fair!* consistently overrules grammatical judgements across all collected age groups.

In order to pinpoint the source of the difference in performance between S-*and* vs. NP-*and* sentences (developmental asymmetry vs. *Be Fair!*), Experiment 2 was conducted. The scenarios, as well as target sentences, were modified in order to weaken the effect that *Be Fair!* might play in the task. The results showed that, across all ages, children's performance for S-*and* continued to be adult-like (compared to the adult interpretations reported in Experiment 3), but the accuracy for NP-*and* considerably improved in both *match* and *mismatch* conditions compared to Experiment 1. This improvement is expected if *Be Fair!* contributed to the asymmetry between the two types of *and* in Experiment 1.

More importantly, the two main effects found in Experiment 2, one of ConjunctionType and the other of Set-up, can potentially be accounted for without reference to a difference between NP- and S-*and* in children's grammar. We suggest that the lower accuracy rates for NP-*and* sentences may be attributed to the complexity of the materials of Experiment 2: in order to side-step *Be Fair!*, these new NP-*and* sentences (5b) were made more complex than S-*and* sentences, and more complex than the NP-*and* sentences in Experiment 1 (5a):

(5) a. Somebody has a car and a helicopter. (Exp 1)
b. Somebody has a chip and a comb, and somebody has a horse. (Exp 2)

Another observation that supports the idea that children's performance was affected by the complexity of the conditions relates to the main effect of Set-up we found, with the *match* condition yielding higher accuracy rates than the *mismatch* condition. We found that among children's non-adult-like responses for NP-*and* in Experiment 2's *mismatch* condition, more than half of the time (59%) children in fact correctly *rejected* the sentence presented to them, but went on to fail in fixing the scene in an adult-like fashion. That is, although the difficulty of fixing is present in the S-*and* Mismatch condition, the NP-*and mismatch* condition in Experiment 2 involves two types of complexity: difficulty of fixing the scene and complexity of the sentences. This additional complexity could in itself give rise to lower accuracy rates in this condition than any other conditions.

Although not the focus of our study, our results also shed light on children's comprehension of indefinites. It is usually the case that two indefinites introduced in a discourse have disjoint reference, a fact derived from Heim's (1982) Novelty Condition. This constraint plays a key role in the interpretation of our S-*and* sentences, where each occurrence of *somebody* is expected to be interpreted as referring to a different individual. In Experiment 3, adult participants complied with the Novelty Condition 75% of the time, and in Experiments 1 and 2, children did so at a rate of 75% or higher. These results suggest that children not only have adult-like competence of S-*and*, but they also have adult-like knowledge of the pragmatic constraint interacting with their grammatical knowledge of S-*and*.

In sum, although an effect of conjunction type was found in both of our experiments, we have suggested that they may be due to the non-linguistic principle *Be Fair!* or the uneven complexity of the target sentences, rather than a developmental asymmetry between S-*and* and NP-*and* (in line with conclusions in Ardery (1980) and Tager-Flusberg (1982)). To settle the remaining issues, in future research we intend to explore other approaches that can side-step *Be Fair!* without creating a complexity asymmetry between the NP- and S-*and* sentences. We suggest one such possibility: rather than using sentences with an indefinite, we may use sentences with *and* and a negative quantifier like *no*. The two sentences in (6) have different truth conditions: if there are two characters, one with a car and the other with a helicopter, (6a) will be true but (6b) will be false.

(6) a. Nobody has a car and nobody has a helicopter (S-*and*)
b. Nobody has a car and a helicopter (NP-*and*)

Be Fair! would not interfere with the judgements in such an setup, since in the target cases, the two characters would either have each one item or no item at all. We leave this for future investigation.

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