The role of incompatible disjuncts in the acquisition of disjunction[1]

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Abstract. Prior studies on disjunctive utterances involving compatible disjuncts (i.e., where replacing the disjunction *or* with *and* would not lead to contradiction) have found that, while adults interpret disjunctive sentences such as *The mouse carried either an apple or an orange* exclusively ('only one, not both'), children often interpret them inclusively ('one, or both') or conjunctively ('both, not just one') (see, for instance, Singh et al., 2016, Tieu et al., 2017 and Bleotu et al., 2024b). Recent studies based on child corpora and experiments with adults suggest that exclusive interpretations are more likely when the two disjuncts in question are incompatible with one another (Jasbi et al., 2018, 2022; Felton and Jasbi, 2025). Building on this observation, our study employed a covered box task to investigate monolingual Romanian five-year-olds' and adults' interpretation of disjunctive utterances involving the complex disjunction *fie...fie* 'either...or' with compatible versus incompatible disjuncts (e.g., *The squirrel was either at the top or at the bottom of the tree*). We aimed to investigate whether incompatibility would lead to a decrease in Romanian-speaking children's conjunctive and inclusive interpretations of disjunction. While some children showed conjunctive interpretations for compatible cases, all patterned with adults on incompatible ones. Their adult-like responses to incompatible disjunctions highlight the role of pragmatic and lexical cues in the early acquisition of disjunction. We discuss the theoretical implications of our findings, arguing that the source of exclusivity may be pragmatic or lexical.

Keywords: disjunction, child language, (in)compatibility, plausibility, exclusivity, implicature.

1. Introduction

The current study investigates how Romanian children interpret disjunctive statements containing incompatible disjuncts (i.e., disjuncts which cannot hold simultaneously, as in (1)) as opposed to compatible disjuncts (i.e., disjuncts which can be true simultaneously, as in (2)), and whether the (in)compatibility of disjuncts plays a role in children's development of the exclusive interpretation of disjunction. Previewing our results, we show that children have a tendency to be more exclusive in the case of incompatible disjuncts compared to compatible ones.

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(1) Veveriţa era **fie** în vârful copacului, **fie** la baza copacului.
squirrel.DEF was either at top.DEF tree.GEN or at bottom.DEF tree.GEN
'The squirrel was either at the top of the tree or at the bottom of the tree.'

(2) Fata s-a jucat **fie** cu un iepuraş, **fie** cu un hamster.
girl.DEF CL.REFL.3-has played either with a bunny or with a hamster
'The girl played either with a bunny or with a hamster.'

1.1. On the interpretation of disjunction involving compatible disjuncts in child language

Previous studies (Chierchia et al., 2001; Guasti et al., 2005; Nicolae and Sauerland, 2016; Nicolae et al., 2023) show that adults interpret disjunctive statements containing simple disjunctions such as (3) exclusively ('only one, not both') or inclusively ('one, possibly both'), while they tend to interpret disjunctive statements containing complex disjunctions such as (4) exclusively. In contrast, children appear to interpret both simple and complex disjunctions not only inclusively or exclusively, but also conjunctively ('both, not just one') (Paris, 1973; Braine and Rumain, 1981; Singh et al., 2016; Tieu et al., 2017; Sauerland and Yatsushiro, 2018; Huang and Crain, 2020; Skordos et al., 2020).

(3) The mouse carried an apple **or** an orange.

(4) The mouse carried **either** an apple **or** an orange.

Recent studies on child Romanian (Bleotu et al., 2024a; Bleotu et al., 2024b) show that, while children are inclusive with *sau*-based disjunctions such as the simple disjunction *sau* 'or' or the complex disjunction *sau* . . . *sau* 'either...or', they tend to be conjunctive and inclusive with the complex disjunction *fie* . . . *fie* 'either...or'.

Children's inclusive interpretations are typically explained by their accessing the logical interpretation of disjunction. However, the source of their conjunctive interpretations remains a source of debate. Singh et al. (2016) suggest that conjunctive interpretations arise as an implicature, with children considering different alternatives than adults (the individual disjuncts, each exhaustified, rather than the conjunctive alternative). Sauerland and Yatsushiro (2018) view conjunctive interpretations as a basic meaning of disjunction, alongside inclusivity. In contrast, Skordos et al. (2020) and Huang and Crain (2020) argue that conjunctive readings are experimental artifacts. More specifically, they arise when the disjunctive statement is uninformative, as it exhaustively mentions all the visually available alternatives (e.g., saying the hen will push the train or the boat in a context that contains only a train and a boat). They propose that adding more objects (e.g., adding a bicycle alongside the train and the boat) would make disjunction more felicitous and informative, reducing conjunctive responses from children.

The experimental artifact account of conjunctive interpretations has recently been challenged by Bleotu et al. (2024b). These authors compare the interpretation of disjunctive statements such as (5) in '2-object' contexts, where two objects are visually present, and both are mentioned in the disjunctive utterance, and '4-object' contexts where the same objects mentioned in the disjunctive utterance are visually present along with two additional alternatives (e.g., a plum and a cucumber alongside the apple and the orange). Bleotu et al. (2024b) report that, although the number of conjunctive children slightly decreased in the 4-object context compared to the 2-object context, there was nonetheless a non-negligible number of conjunctive children

in the case of the disjunction *fie . . . fie*, both in the 2-object and the 4-object context. This suggests that children's conjunctive interpretation of *fie . . . fie* is not a task effect, but a genuine semantic-pragmatic meaning of disjunction, corresponding either to a semantic default (alongside inclusivity), as discussed in Sauerland and Yatsushiro (2018), Aloni et al. (2024), Bleotu et al. (2024b, 2025), or to an implicature, as discussed in Singh et al. (2016) and Tieu et al. (2017).

(5) Şoricelul a cărat **fie** un măr, **fie** o portocală.
mouse.DEF has carried either an apple or an orange
'The mouse carried either an apple or an orange.'

An important observation is that in all previous experiments conducted with children, the items have generally involved mutually compatible disjuncts, i.e., one could, for example, easily conceive of a situation in which the mouse carries both the apple and the orange.

1.2. On the role of incompatible disjuncts in child language

Recent research suggests that the exclusivity of a disjunction may be influenced by the compatibility of its disjuncts, i.e., the possibility/likelihood of the disjuncts occurring together. Jasbi et al. (2018, 2022) show that children and adults are more likely to understand *or* as expressing one option but not both, if they are exposed to disjuncts that express inconsistent options.

In a corpus study of child-directed speech, Jasbi et al. (2018, 2022) investigate the cues that children may rely on in acquiring the meaning of disjunction. The authors annotated occurrences of disjunction in child-directed speech for various properties that could play a role in children's interpretation of disjunction, including intonation and the logical (in)consistency of the disjuncts. To determine whether two disjuncts were inconsistent, Jasbi et al. (2018, 2022) used a conservative test: they replaced *or* with *and* to see if the sentence would become contradictory. For example, in the sentence *The ball is in my room or in your room*, changing *or* to *and* results in a contradiction, since both cannot be true at the same time. In contrast, the sentence *I'll get tea or coffee* remains plausible even when changed to *I'll get tea and coffee*.

Importantly, exclusive uses of disjunction seem to align with utterances containing inconsistent disjuncts and/or with utterances involving a rise-fall intonation (*Wanna stay or wanna go?*). The authors model how one might learn the exclusive meaning of disjunction using a decision tree model. Within this model, if *or* has neither rise-fall nor inconsistent disjuncts, the learner should understand it inclusively, as allowing both disjuncts. Otherwise, they should interpret it exclusively. Given that this decision-tree model had 80% success, the authors conclude that children can rely on such a decision process to learn the exclusive meaning of *or*, even with limited exposure (notably, *or* is ten times less frequent than the conjunction *and*).

In addition to the corpus study, a recent study by Felton and Jasbi (2025) investigates experimentally how prior beliefs about compatibility influence exclusivity in English-speaking adults. In Experiment 1, Felton and Jasbi (2025) set out to establish a systematic measure of compatibility. On the basis of stimuli from past research, the authors asked participants to assess the compatibility of the coordinated disjuncts. More specifically, participants were presented with two independent disjuncts, and were asked to rate the likelihood of these occurring together, as in (6). The rating of compatibility of disjuncts was done on a scale from 0% (impossible co-occurrence) to 100% (necessary co-occurrence), using a slider scale.

(6) Experiment 1:
John brought pizza to the party.
John brought pasta to the party.
How likely is it that someone brought both pizza and pasta to the party?

In Experiment 2, a different group of participants had to give exclusivity judgments on disjunctive sentences combining the disjuncts that had previously been presented separately in Experiment 1. More specifically, participants were presented with disjunctive statements containing *or*, as in (7), and they had to assess how possible it was for both disjuncts to be true together. The goal of Experiments 1 and 2 was to tease apart the role of exclusivity implicatures and the role of prior compatibility beliefs.

(7) Experiment 2:
John brought pizza or pasta to the party.
Based on the sentence, how possible is it that John brought both?

The results show a strong correlation between prior beliefs about disjunct compatibility and exclusive interpretations, suggesting that our prior beliefs about the compatibility of two disjuncts significantly influences our interpretation of the disjunction. The less likely two disjuncts are, the higher the probability of an exclusivity implicature. Nevertheless, prior compatibility alone could not explain all variance, suggesting a role for an exclusivity implicature beyond prior beliefs about compatibility.

2. Theoretical insights into the sources of exclusivity

The question of whether exclusivity has an implicature as its source or rather is rooted in world knowledge (or both) is important for our understanding of disjunction and deserves a more elaborate discussion.

In *Methods of Logic*, Quine (1950: 4) raises the issue of whether exclusivity is generated by the operator or the disjunct. According to him, if the disjuncts are "of such a nature as to exclude each other, it is immaterial whether we understand *or* as repeating this exclusion or not". Thus, it is more parsimonious to assume that an exclusive meaning of disjunction is needed only if the disjuncts do not already exclude each other.

A similar viewpoint has more recently been put forth by Geurts (2006) when discussing adults' exclusive interpretations of disjunctive statements. Geurts (2006) notes that in extreme cases, such as *The ball is on the table or on the floor*, exclusivity arises from world knowledge alone, without requiring scalar reasoning.

Thus, the exclusive interpretation of disjunction may arise through different mechanisms. One possibility involves implicature derivation, wherein the hearer strengthens the disjunctive utterance by negating its stronger conjunctive alternative. For instance, for a sentence such as *The mouse carried the apple or the orange*, the implicature will be that it is not the case that the mouse carried both the apple and the orange. This follows the general principle that speakers tend to convey the most informative and relevant meaning without asserting something obviously false or redundant. Formally, this can be represented as in (8).

(8) $(p \vee q) \wedge \neg(p \wedge q)$

Another source of exclusivity can be the knowledge that the conjunction $p \wedge q$ is impossible or implausible (Geurts, 2006). Let's take, for instance, a sentence such as *The mouse is inside or outside the shop*. If we assume that it is interpreted inclusively ($p \vee q \vee (p \wedge q)$), then part of its inclusive meaning would be implausible, given that p is understood as entailing $\neg q$ ('the mouse is not outside the shop'). As a result, the disjunction is naturally interpreted exclusively.

Implicature derivation and world knowledge highlight different pathways through which exclusivity can arise. The picture is further complicated by complex disjunctions, which additionally raise the question of whether exclusivity involves a (lexicalized) obligatory exclusivity implicature. According to Spector (2014), the complex disjunction *soit ... soit* in French involves obligatory exhaustification, and according to Szabolcsi (2015), this is also the case for other complex disjunctions, such as French *ou ... ou*, Russian *ili ... ili*, and Hungarian *vagy ... vagy*. In recent work, Nicolae et al. (2024) investigate the robustness of the exclusive interpretation associated with different disjunctions in five languages (English, French, Romanian, Russian, and Greek). They find that while complex disjunctions are more strongly associated with an exclusive interpretation than simple ones, complex disjunctions remain nonetheless ambiguous between an inclusive and an exclusive interpretation. Under this view, complex disjunctions are not exclusive disjunctions, but merely involve a more likely exclusivity implicature.

Interestingly, the question of whether exclusivity has an implicature source or a lexical/world knowledge source has mostly been discussed for adult language. However, this question is also of importance for child language. Given that children are known to experience challenges with implicatures when the disjuncts are compatible, a more adult-like exclusive behaviour with disjunction when the disjuncts are incompatible could perhaps be taken to suggest that children would, in this case, rely on a different exclusivity source than implicatures, namely lexical and world knowledge of what items may go together.

3. Current experiment

3.1. Research questions

The present study aims to shed light on the role of (in)compatibility of disjuncts in deriving exclusive interpretations. On the empirical side, we know that with compatible disjuncts, children are reportedly inclusive and conjunctive, but rarely exclusive (see, for instance, Paris, 1973; Tieu et al., 2017; Skordos et al., 2020; Huang and Crain, 2020; Bleotu et al., 2023). Our study asks whether children are less inclusive and conjunctive, and more exclusive, with incompatible disjuncts compared to compatible ones. If they are exclusive with incompatible disjuncts but not with compatible disjuncts, this could suggest that incompatibility plays an important role in the derivation of exclusivity.

From a theoretical standpoint, the question we are pursuing is whether exclusivity has a different source for children and adults. Previous studies (Geurts, 2006; Felton and Jasbi, 2025) have suggested the availability of two exclusivity sources in adults, but this matter has not been investigated in children. In development, rather than deriving implicatures, children could conceivably rely more on their lexical or world knowledge about whether two disjuncts can go together.

In order to pursue these questions, we investigate how children and adults interpret compatible and incompatible disjuncts. We investigate both lexical incompatibility, driven by the

antonymic nature of the disjuncts (e.g. *at the top/bottom of the tree, above/below the cloud*), and pragmatic incompatibility, driven by world knowledge of the lack of plausibility of two disjuncts occurring together (e.g. *The girl dressed as a fairy or a firefighter*).

We target the complex disjunction *fie . . . fie* in Romanian, since investigating it allows us to see whether there is a decrease in inclusive and conjunctive responses and an increase in exclusivity in children when disjunction involves incompatible disjuncts compared to compatible ones. Previous studies show that at least in the case of compatible disjuncts, adults are exclusive with *fie . . . fie*, while children are inclusive and conjunctive (Bleotu et al., 2023; Bleotu et al., 2024b). Thus, *fie . . . fie* provides an ideal testing ground for examining the effect of (in)compatibility of disjuncts on children's inclusive and conjunctive interpretations of disjunction. In contrast, other disjunctions (*sau*, *sau . . . sau*) can only provide insights into the effect of disjunct (in)compatibility on children's inclusive interpretations of disjunction, as previous studies indicate that children are inclusive with these disjunctions, and very rarely conjunctive (Bleotu et al., 2023; Bleotu et al., 2024a).

3.2. Predictions

Regarding the effect of the incompatibility of disjuncts on the interpretation of disjunction, adults are expected to be exclusive both with compatible and incompatible disjuncts. In contrast, children are expected to be inclusive and conjunctive with compatible disjuncts (as shown in Bleotu et al., 2023 and Bleotu et al., 2024b), but if they are sensitive to the incompatibility of disjuncts, they should be less conjunctive and inclusive, and more exclusive, with incompatible disjuncts compared to compatible disjuncts.

Additionally, regarding the different types of incompatibility (lexical antonymic incompatibility vs. pragmatic incompatibility), we expect adults to treat these alike, but we expect children, who have less world knowledge, to potentially be more exclusive with lexically incompatible items.

3.3. Participants

Data collection for this study was approved by the Research Ethics Committee in Bucharest (89 / 20.03.2023). 25 Romanian monolingual children aged 5 to 6 years (M=5;04) were recruited from kindergartens in Bucharest. In addition, 19 adult native speakers of Romanian were recruited as controls from the undergraduate student population at the University of Bucharest. Participants first completed a compatibility norming task, followed by an interpretive (covered picture) task two weeks later.

3.4. Compatibility Norming Task

We first conducted a norming task for the (in)compatibility of the disjuncts being tested. Adult and child participants were asked to imagine two compatible, or two lexically or pragmatically incompatible disjuncts holding at the same time, and to rate this likelihood on a three-point smiley scale (sad face, neutral face, happy face).

Overall, participants generally gave happy faces for compatible disjuncts, sad faces for lexically incompatible disjuncts, and sad and neutral faces for pragmatically incompatible disjuncts. The norming task ensured that the test items were adequate for the covered picture task. The

Table 1. Example test items from Compatibility Norming Task (translated into English).

Category	**Example Test Item**
Compatible disjuncts	Imagine that a girl is playing with both a bunny and a hamster at the same time. Can that be?
Lexically incompatible items	Imagine that a squirrel is both at the top and the bottom of the same tree at the same time. Can that be?
Pragmatically incompatible items	Imagine that a girl is dressing as both a fairy and a firefighter at the same time. Can that be?

materials are presented in the following subsection.

3.5. Covered Picture Task: Methodology and materials

Two weeks after the norming pretest, participants completed a covered picture task (Huang et al., 2013), where they had to decide which of three pictures (two visible, one occluded by a curtain) matched a sentence, and explain their choice. They were instructed that if neither visible picture matched, they should choose the curtain. The task has the important advantage of accommodating cases involving incompatible disjuncts, which cannot be visually depicted together. Given the nature of the task (a preference task), it was not possible to add extra objects in the target pictures or they would have become non-target.

We tested two conditions (1-disjunct-true vs. 2-disjunct-true) separated by one month. In the 1-disjunct-true (1DT) condition, target sentences were presented alongside a distractor image, the curtain image, and a picture verifying one disjunct. The order of the pictures was randomized, so that the target picture, the distractor, and the curtain did not always appear in the same position. Participants received a total of 3 warm-up items, 18 disjunctive targets, 6 fillers, and 6 conjunctive controls (presented at the end). The targets corresponded to: 6 items containing compatible disjuncts (involving the predicates *to steal either a hen or an egg*, *to play either with a teddy or with a bone*, *to receive either a soup or a cake*, *to play either with a bunny or with a hamster*, *to bring either lemonade or milk*, *to pick either mushrooms or berries*), 6 items with lexically incompatible disjuncts (involving the predicates *to be either at the beginning of the book or at the end of the book*, *to be either above the cloud or below the cloud*, *to sleep either during the day or during the night*, *to be inside the shop or outside the shop*, *to be either in front of the gate or behind the gate*, *to be either at the top of the tree or at the bottom of the tree*), and 6 items with pragmatically incompatible disjuncts (involving the predicates *to dress either as a fairy or as a fireman*, *to hide the notebook either under the table or in the closet*, *to eat either from the bowl or from the plate*, *to eat either at home or at the restaurant*, *to put on either shoes or sandals*, *to put the book either on the table or on the chair*). The 6 fillers did not include disjunction (e.g., *The woman bought a loaf of bread.*)

An example of a target item involving compatible disjuncts is provided in (9), which was presented alongside Figure 1.

(9) Fata s-a jucat **fie** cu un iepuraş, **fie** cu un hamster.
girl.DEF CL.REFL.3-has played either with a bunny or with a hamster
'The girl played either with a bunny or with a hamster.'

Figure 1. Example of pictures employed in the 1DT compatible condition (paired with (9)).

An example of a target item involving lexically incompatible disjuncts is provided in (10), which was presented alongside Figure 2.

(10) Veveriţa era **fie** în vârful copacului, **fie** la baza copacului.
squirrel.DEF was either at top.DEF tree.GEN or at bottom.DEF tree.GEN
'The squirrel was either at the top of the tree or at the bottom of the tree.'

Figure 2. Example of pictures employed in the 1DT incompatible condition, involving lexically incompatible disjuncts (paired with (10)).

An example of a target item involving pragmatically incompatible disjuncts is provided in (11), which was presented alongside Figure 3.

(11) Fata s-a îmbrăcat **fie** în dovleac, **fie** în zână.
girl.DEF CL.REFL.3-has dressed or in pumpkin or in fairy
'The girl dressed either as a pumpkin or as a fairy.'

Figure 3. Example of pictures employed in the 1DT incompatible condition, involving pragmatically incompatible disjuncts (paired with (11)).

An example of a control item involving conjunction is provided in (12), which was presented alongside Figure 4.

(12) Femeia a adus limonadă **şi** lapte.
woman.DEF has brought lemonade and milk
'The woman brought lemonade and milk.'

In the 2-disjunct-true (2DT) condition, target sentences were presented alongside a distractor image, the curtain, and a picture verifying two disjuncts. The order of the pictures was randomized. Participants received 3 warm-up items, 6 disjunctive targets with compatible disjuncts (*The hen stole either a hen or an egg*, *The dog played either with a teddy or with a bone*, *The girl received either a soup or a cake*, *The girl played either with a bunny or with a hamster*, *The woman brought either lemonade or milk*, *The bear picked either mushrooms or berries*),

Figure 4. Example of pictures employed in the conjunctive control condition (paired with (12)).

and 6 fillers. An example of a target item involving compatible disjuncts is provided in (13), which was presented alongside Figure 5.

(13) Fata s-a jucat **fie** cu un iepuraş, **fie** cu un hamster.
girl.DEF CL.REFL.3-has played either with a bunny or with a hamster
'The girl played either with a bunny or with a hamster.'

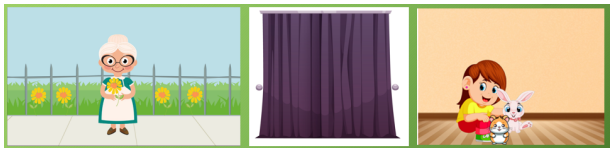

Figure 5. Example of pictures employed in the 2DT condition (paired with (13)).

3.6. Results

Two children out of 25 and three adults out of 19 were excluded for poor accuracy (i.e., accuracy below 50%) on the fillers and controls.

Overall, we observe that regardless of the compatibility of the disjuncts, adults chose the 1DT picture in the 1DT condition and the curtain in the 2DT condition. In contrast, children's performance was sensitive to the compatibility of the disjuncts. If the disjuncts were compatible, they chose either the 1DT picture or the curtain in the 1DT condition (see Figure 6), and they tended to choose the 2DT picture in the 2DT condition. If the disjuncts were incompatible (either lexically or pragmatically), they behaved similarly to adults, i.e., they chose the 1DT picture in the 1DT condition and the curtain in the 2DT condition.

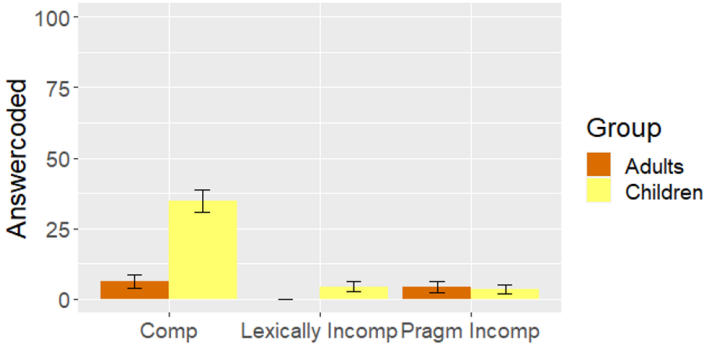

Figure 6. Rate of curtain responses by children in the 1DT condition.

Based on participants' responses to the 1DT and 2DT targets, we categorized them as inclusive, exclusive, or conjunctive responders (see Table 2). Participants were deemed to make a

certain choice for disjunctive statements in a certain condition if more than half of their choices corresponded to the expected choice for that condition.

Table 2. Categorization of participants based on their choices in the 1DT and 2DT conditions.

Interpretation of disjunction	**1DT condition**	**2DT condition**
Inclusive (literal)	1DT-picture	2DT-picture
Exclusive	1DT-picture	Curtain
Conjunctive	Curtain	2DT-picture

Our findings (see Table 3) show that adults were exclusive with both compatible and incompatible disjuncts. In contrast, children differed in how they handled compatible and incompatible disjuncts. For compatible disjuncts, 13 children were inclusive, 8 were conjunctive, and only 2 children were exclusive. For incompatible items, all children were adult-like (exclusive), explaining that both disjuncts could not hold simultaneously. Fisher's exact tests revealed a significant difference in the distribution of exclusive, inclusive, and conjunctive participants in the compatible vs. the incompatible condition ($p < .01$), i.e., there was more exclusivity, and less inclusivity and conjunctivity in the case of incompatible disjuncts.

Interestingly, just like adults, children treated lexically and pragmatically incompatible disjuncts alike (89.2% vs. 89.4% 1DT answers).

Table 3. Count of participants in each category by compatibility condition.

	Adults (n=16)			**Children (n=23)**		
Disjuncts	**Inclusive**	**Exclusive**	**Conjunctive**	**Inclusive**	**Exclusive**	**Conjunctive**
Compatible	0	16	0	13	2	8
Incompatible	0	16	0	0	23	0

3.7. Main findings

Our findings reveal that children, who typically exhibit conjunctive or inclusive interpretations of the disjunction *fie . . . fie* with compatible disjuncts, selected the 1DT option when faced with incompatible disjuncts. The incompatibility of the disjuncts thus led to a decrease in conjunctive and inclusive interpretations, while leading to an increase in exclusive interpretations of disjunction. These experimental results align with the predictions we laid out and are consistent with the corpus findings of Jasbi et al. (2018, 2022).

On the other hand, contrary to our expectations, there seemed to be no difference between lexical and pragmatic incompatibility in children – they treated both types alike. This suggests that by the age of five, children are capable of handling various types of incompatibility in their interpretations of disjunction.

4. Discussion

In terms of their interpretive preferences, children show a tendency to be less conjunctive, less inclusive, and more exclusive, when interpreting incompatible items coordinated by the disjunction *fie...fie*, compared to their interpretation of compatible disjuncts. The observed availability of the exclusive interpretation in the incompatible condition raises several questions

about the underlying mechanisms driving children's understanding of disjunction in such contexts. We discuss three possible explanations for this behaviour: a task effect, an implicature (exhaustification) account, and a lexical/world knowledge account.

4.1. A task effect

Children who interpreted disjunction conjunctively in the Compatible condition tended to have an exclusive interpretation of disjunctive utterances in the Incompatible condition. This could suggest that in the Incompatible condition, children may have defaulted to selecting a picture that included at least one of the disjuncts mentioned in the statement, rather than adhering strictly to the conjunctive interpretation. However, data from the conjunctive control condition involving incompatible items cast doubt on this interpretation. In the conjunctive control condition, where children heard statements like *The squirrel is at the top and the bottom of the tree*, 86.46% of the responses involved selecting the curtain option, rather than the picture consistent with an exclusive interpretation. This pattern of responses suggests that children did not exhibit exclusivity in this context, which challenges the idea that the observed exclusivity in the Incompatible condition is simply the result of a task effect.

4.2. Exclusivity via implicature

A second possible explanation for children's tendency to interpret disjunctions exclusively in the Incompatible condition relies on the hypothesis that exclusivity arises through the generation of implicatures. Specifically, children might derive an exclusive interpretation of disjunction ($(p \vee q) \wedge \neg(p \wedge q)$) when they understand one disjunct (e.g., p) as entailing the negation of the other (e.g., $\neg q$), but only in situations where p and q are mutually exclusive. In contrast, when p and q are mutually compatible, children might not generate the exclusivity implicature.

This view posits that exclusivity emerges when children infer that the two alternatives are not just different but are moreover incompatible – suggesting that if one disjunct is true, the other must be false. For example, in cases where the disjunction involves two possibilities that are contradictory or highly unlikely to co-occur, children might interpret the statement as asserting that *either p or q is true, but not both*.

The critical difference between children and adults lies in their world knowledge and plausibility judgments. While adults, based on their richer world knowledge and experiences, may be more likely to infer that certain disjuncts are incompatible (leading to an exclusive interpretation), children's world knowledge is still developing. Consequently, children may not automatically make the same inferences about incompatibility, particularly when the disjuncts in question seem plausibly compatible. This divergence in world knowledge or plausibility probabilities could explain why children might interpret disjunctions exclusively in certain cases, but not in others, depending on how they assess the likelihood of the disjuncts being compatible or incompatible.

On this account, then, children would not differ from adults in their ability to generate exclusivity implicatures. But they would only generate such implicatures in cases where the disjuncts are perceived as mutually exclusive, based on their developing understanding of the world. The crucial difference between children and adults would be their world knowledge, which influences how each group derives exclusivity in their interpretation of disjunction.

4.3. Exclusivity via lexical/world knowledge

A third possible account is that in adults, exclusivity can arise via two distinct sources: implicatures and world or lexical knowledge. According to Geurts (2006), implicatures can contribute to the exclusive interpretation of disjunction, particularly when the context suggests that one disjunct entails the negation of the other. For instance, when presented with the disjunction $p \vee q$, if one of the disjuncts is known to be incompatible with the other, an implicature might be generated that excludes the possibility of both being true simultaneously.

However, exclusivity can also stem from a more direct source, namely world knowledge or lexical knowledge. Geurts (2006) argues that if it is common knowledge that the conjunction of the two disjuncts cannot be true, then there is no need to generate an implicature to 'confirm' this conclusion. For example, consider the disjunctive utterance *Jill is in Amsterdam or Berlin*. Given the world knowledge that Jill cannot be in both cities at once, it is unnecessary to derive an implicature; the speaker's world knowledge directly leads to the exclusive interpretation. This highlights the role of world knowledge in establishing the exclusive interpretation of disjunction in adult grammar.

However, Romanian *fie…fie* constructions provide an interesting case. Adults' responses in Bleotu et al. (2023) and Bleotu et al. (2024b) may be taken to suggest that in Romanian, *fie …fie* may be obligatorily exhaustive, meaning that it requires an exclusive interpretation by default. In certain languages, then, exclusivity might be grammatically encoded rather than derived via an optional implicature or world knowledge alone.[2]

In contrast to adults, one could hypothesize that exclusivity in children arises from a single source: world knowledge or lexical knowledge, rather than implicature. This hypothesis would suggest that children primarily rely on their understanding of the world and their lexical knowledge to derive exclusive interpretations of disjunctive utterances.

For children, the process may unfold in the following way: when presented with a disjunction, children are likely to interpret it inclusively or conjunctively at first. However, if their world/lexical knowledge allows them to recognize that the conjunction of the two alternatives ($p \wedge q$) is impossible, they may adjust their interpretation and settle on the separate alternatives p and q instead. This reasoning is particularly evident when children encounter disjunctions where it is implausible that the two alternatives are true simultaneously. For example, when hearing a statement like *The squirrel is at the top or at the bottom of the tree*, children might conclude that both possibilities cannot be true at once, leading them to select an exclusive interpretation.

On this account, children's ability to access exclusive interpretations is more dependent on their growing world knowledge than on pragmatic mechanisms like implicature. As they develop a more sophisticated understanding of how the world works, children come to recognize when disjunctions involve alternatives that are mutually exclusive, such as the impossibility of being in two places at once. This world knowledge allows them to adopt an exclusive interpretation, even if they do not yet have the full set of linguistic tools or pragmatic strategies that adults use to derive exclusivity from implicatures.

[2]But see Nicolae et al. (2024) for a view where, cross-linguistically, complex disjunctions do not encode exclusivity, but rather remain ambiguous between an inclusive and an exclusive interpretation.

In sum, the key difference between the adult and the child grammar with respect to exclusivity would lie in the sources from which exclusivity is derived. While adults can draw on both implicatures and world knowledge, children would rely primarily on world knowledge and lexical understanding of incompatibility to derive exclusive interpretations of disjunctions. This distinction highlights the developmental nature of language comprehension, where children's grammatical interpretations evolve as their understanding of the world expands.

While under an implicature account, children who are exclusive strengthen disjunction by negating the stronger conjunctive alternative, under a non-implicature lexical/world knowledge account, children are by default inclusive or conjunctive, but end up in a situation where they simply cannot realize the conjunctive meaning. If they are semantically inclusive, failure to realize the conjunctive part of the inclusive meaning results in the elimination of this ($p \wedge q$) component, and, consequently, in exclusivity. If they are conjunctive, they can only generate an absurd meaning. In this case, one might assume, in line with previous claims by Bleotu et al. (2023) and Bleotu et al. (2024b), that the disjunction *fie . . . fie* is ambiguous between conjunction and inclusive disjunction. Failing to realize the conjunctive meaning, children could fall back on the inclusive meaning. Once inclusive, children would again be unable to realize the conjunctive meaning component and end up with an exclusive interpretation.

4.4. Implications for a theory of acquisition

The present findings show that when faced with compatible disjuncts, 5-year-olds are typically either inclusive or conjunctive, but rarely exclusive. However, with incompatible disjuncts, children are more likely to adopt exclusive interpretations.

This raises the question of why children are exclusive with incompatible disjuncts. Two explanations are possible. Under an implicature account, children might find it easier to derive implicatures from incompatible disjuncts because the implausibility of the alternatives makes exclusivity more obvious. With plausible, compatible disjuncts, children may require additional context or world knowledge to arrive at an exclusive interpretation. Under a non-implicature account, children may initially derive exclusivity from their lexical/world knowledge, as suggested by Geurts (2006). In cases of incompatible disjuncts, children might use their developing understanding of world knowledge to infer that both alternatives cannot be true simultaneously.

Together, these explanations suggest that children's exclusive interpretations are influenced by both lexical knowledge and the implausibility of incompatible disjuncts occurring together. This highlights the role of both world knowledge and pragmatic reasoning in shaping children's interpretations of disjunction.

5. Conclusion

The findings presented here reveal that children, who are typically not reported to be exclusive with compatible disjuncts, can adopt exclusive interpretations when faced with incompatible items. This suggests that children's interpretations of disjunction are influenced by the lexical and pragmatic properties of the disjuncts. Specifically, the incompatibility of the disjuncts appears to influence how children understand disjunction. This in turn could indicate that (in)compatibility plays a key role in acquisition, allowing children to derive exclusive readings more readily when the alternatives are contradictory or implausible.

These results underscore the importance of both lexical knowledge and pragmatic reasoning in shaping children's grammatical interpretations. As children's world knowledge and cognitive abilities develop, they become more adept at recognizing when disjunctions involve incompatible alternatives, leading them to adopt more exclusive interpretations. Whether their exclusive interpretations are the result of an implicature or lexical/world knowledge remains an open question for future investigation.

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