The problem of pseudoclefts in French: intersection configurations and intervention in language acquisition

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Abstract

Intervention effects have been explored in the domain of language acquisition, suggesting that feature similarity between a moved element and an intervening constituent determines the occurrence of processing difficulties. A graded differentiation scale hierarchizing the different possible relations between feature sets

defining the moved and the intervening constituents was suggested: disjunction>intersection>inclusion>identity (Belletti, Friedmann, Brunato & Rizzi 2012; Durrleman & Bentea 2021). It is a well-known fact that young children, unlike adults, have difficulties dealing with inclusion relations. In this article, we compare the comprehension of standard clefts and pseudoclefts by French monolingual children and argue that object pseudoclefts in French give rise to an intersection configuration, which we claim to be at the origin of milder difficulties for children. The paper provides additional empirical evidence in favour of the feature-based intervention theory of locality.

1. Introduction

Intervention effects in language acquisition have been widely attested in many languages and in different syntactic structures, in particular headed object relative clauses (e.g. Friedmann, Belletti & Rizzi 2009; Adani, van der Lely, Forgiari & Guasti 2010; Costa, Lobo & Silva 2011; Belletti, Friedmann, Brunato & Rizzi 2012; Contemori & Belletti 2014; Hamann & Tuller 2015; Bentea 2016; Bentea & Durrleman 2017; a.o.) and D-linked[1] object wh-questions (e.g. Cerejeira 2009; Friedmann & Novogrodsky 2011; Baião 2014; Bentea, Durrleman & Rizzi 2016; Bentea 2017; a.o.). This previous research defined intervention effects in terms of featural similarity between the moved element and the intervening element (see Rizzi 2018): it has been suggested that feature identity corresponds to a configuration which is rejected by both children and adults and feature disjunction (as in the case of non-D-linked wh-questions and free relatives) is accepted and easily processed by both children and adults; in contrast, feature inclusion, as in D-linked wh-questions and headed relative clauses, is avoided by children, even though it is a possibility in the adult grammar (see the summary and general proposal in Friedmann, Belletti & Rizzi, 2009).

Recent research is dedicated to investigating in more detail the different possible relations between featural sets defining moved and intervening elements, with a focus on a definition of a gradient scale of intervention effects, observable in children's comprehension. This research necessarily needs to expand the set of structures that have been considered. In the present paper, we explore clefts, particularly French clefts, to pursue this research goal.

Few studies have dealt with intervention effects in the acquisition of clefts (Lobo, Santos & Soares-Jesel 2016; Aravind, Hackl & Wexler 2017; Lobo, Santos, Soares-Jesel & Vaz 2019). In the present study, we consider the effects of the syntactic

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[1]   Pesetsky (1987) introduced the term D(iscourse)-linking for *wh*-phrases of the form *which N*, as in (i):
(i) Which book did you read?
The *wh*-determiner ranges over elements which are already established in the discourse. The interrogative phrase *which book* implies the existence of a context set of familiar entities of the type denoted by the nominal. It contrasts with non-Discourse linked interrogative words such as *who*, which do not carry a necessary implication about familiar discourse entities.

structure on the comprehension of French clefts, by considering the interaction between cleft type (standard cleft vs. pseudocleft) and the syntactic function of the clefted constituent (subject vs. object). In particular, our study intends to contribute to the discussion on the gradience of intervention effects depending on the featural relation between the moved element and the intervener. Following the scale proposed in Belletti, Friedmann, Brunato & Rizzi (2012) and Durrleman & Bentea (2021), we investigate the different effects of structures with intersection relations (French pseudoclefts) compared to structures with inclusion relations (French standard clefts) on the comprehension of clefts.

      Our paper is organized as follows: in section 2., we briefly summarize the literature on intervention effects in language acquisition; in section 3., we revise previous studies on the acquisition of clefts, considering in particular the studies with a focus on asymmetries that are relatable to intervention effects; in section 4., we describe the two French clefts that we consider in our study and we formulate the research questions that guided the study; in section 5., we present our study on the comprehension of French standard clefts and pseudoclefts, including the method and participants (5.1.) and the results (5.2.); in section 6., we discuss our findings, and we present our main conclusions in section 7.

2. Intervention effects in language acquisition

A very significant body of research has shown that intervention plays a role in language acquisition. It is a well-known fact that children aged 1;2 to 6;2 (ages based on the studies available) show difficulties in producing and comprehending object A-bar[2] dependencies in D-linked wh-questions, headed relatives and certain types of clefts (Friedman, Belletti & Rizzi 2009; Belletti & Contemori 2010, 2012; Lobo, Santos & Soares-Jesel 2016, a.o.); even the older children in this age range (aged 5–6) do not perform as well as adults. In contrast, older children (8-11 years) can show target performance in some tasks testing comprehension of object relatives and D-linked object wh-questions (Martins 2022).

      The dependencies are characterised by the existence of a fronted moved element that targets an A-bar position and which is related to a position where it was first merged:

      Object relative
(1)   Show me **the elephant** [that the lion is washing ~~the elephant~~].

      Which object question
(2)   Which animal is the lion washing ~~which animal~~?

      Object standard cleft
(3)   It is **the elephant** [that the lion is washing ~~the elephant~~].

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[2]   An A-bar position is a position that is not occupied by an argument. A-bar positions usually correspond to peripheral positions.

Importantly, subject relatives, subject interrogatives and subject clefts (4)-(6) are produced and comprehended more easily by children and there is a consensus that they are acquired earlier:

Subject relative
(4)   Show me **the elephant** [that ~~the elephant~~ pushes the lion].

Which subject question
(5)   Which animal ~~which animal~~ pushes the lion?

Subject standard cleft
(6)   It is **the elephant** [that ~~the elephant~~ pushes the lion].

In fact, preposing a subject and preposing an object create configurations that present a fundamental difference: when an object is fronted, as in (1)-(3), it crosses an intervening constituent, the subject (*the lion*), with which it shares a nominal feature. The fact that the two constituents have similar properties is a difficulty for the child, who must perform a more costly computation, though the same operation remains accessible for adults. Friedman, Belletti & Rizzi (2009) examined children aged 3;7– 5;0 and explained subject-object asymmetries observed in sentence production and comprehension in terms of intervention (Grillo 2008; Friedman, Belletti & Rizzi 2009) along the lines of Rizzi's Relativized Minimality (RM) (Rizzi 1990, 2004), a locality principle which operates in adult grammar. The ungrammatical question in (7) illustrates a typical relativized minimality effect: the relation between the fronted *wh*-word and the position where it was originally merged is barred by the embedded subject. Both elements are of the same type, since they are both question operators.

(7)   *What do you wonder [**who** bought ~~what~~]?

In recent years, a fine-grained formulation of RM was proposed by Villata, Rizzi & Franck (2016) and by Rizzi (2018), who emphasize the role of morphosyntactic features in triggering intervention:

(8)   Featural Relativized Minimality
       In ... X ... Z ... Y ... a local relation between X and Y is disrupted when
       1. Z c-commands Y and Z does not c-command X (intervention configuration).
       2. Z matches X in terms of Relevant Syntactic Features (RSF).
       3. The degree of disruption is a function of the featural distinctness of X with respect to Z, in accordance with the distinctness hierarchy.
                                                                    (Rizzi 2018: 347)

The relevant features are the morphosyntactic features that trigger movement to a specific position and that define that position. If Z, the intervening element, matches the relevant specification of X, the relation between X and Y is disrupted (Villatta, Rizzi & Franck 2016). Three types of relation, with which children and adults deal differently, were first defined: disjunction, inclusion and identity (Friedman, Belletti & Rizzi 2009). Disjunction covers cases where the target and the intervener have no relevant feature in common. Both the children tested and adults perfectly accept

disjunction configurations. Identity arises when the target and the intervener share all the relevant features. Such a configuration can only be discarded (by both adults and children). A third type of relation highlights fundamental differences between adults and the children tested by Friedman, Belletti & Rizzi (2009): inclusion. Inclusion is a kind of intermediate relation to the extent that the target has some features in common with the intervener as well as certain features which distinguish it. Inclusion configurations are accepted in the adult grammar, but cause difficulties to children (Friedman, Belletti & Rizzi 2009). A central idea is that adult and child systems share an identical locality principle. However, children use the principle in a narrower manner, excluding inclusion relations (Rizzi 2018). Inclusion configurations, which create well-known subject-object asymmetry effects (Friedmann, Belletti & Rizzi 2009 and subsequent work) are illustrated by headed object relatives, in which the intervener subject blocks the relation between the moved relative head and its copy since they both share a [+NP] feature (Friedmann, Belletti & Rizzi 2009) – an example is presented in (9). We will assume that the [NP] feature expresses the lexically restricted character of the noun phrase (Rizzi 2018). It has been identified as a fundamental element playing a role in modulating intervention locality. So, it is difficult for children to deal with configurations in which the target and the intervener are both characterized by a lexical (nominal) restriction:

		[+R, +NP]		[+NP]	
(9)	Show me	the dog	[that	**the boy**	washes ~~the dog~~].

Belletti, Friedmann, Brunato & Rizzi (2012) nevertheless found that comprehension of object headed relatives by Hebrew children aged 3;9–5;5 improves considerably if the relative head and the intervener have distinct gender features. But a gender mismatch in Italian had no impact in the comprehension of object headed relatives. These findings led them to propose that there is another set-theoretic relation that is relevant to understand intervention configurations: intersection, which arises when only some of the relevant features are shared, and both the moved and the intervening element carry a subset of distinctly specified features. In the case of Hebrew headed object relatives, the [+NP] feature is shared but the [+R] feature is not shared. In addition, the gender features are also different in the target and in the intervener. Since the morphosyntactic gender feature in Hebrew is an inflectional feature that plays a role as a trigger for movement (contrary to what happens in Italian), it enters in the computation for intervention, and an intersection pattern occurs.

This configuration is characterized by the fact that one relevant feature in the target and in the intervener is shared (in (10), the [+NP] feature) but the values of other relevant features are distinct in the intervener and in the target (in (10), the values of gender features):

			[+R, +NP, +FEM]	[+NP, +MASC]
(10)	Tare li	et	ha-yalda	[she- ha-rofe
	show to-me	ACC	the girl-F	that- the-doctor-MASC
	mecayer ~~ha-yalda~~].			
	draws-MASC			

<div align="right">(Belletti, Friedmann, Brunato & Rizzi 2012:1063(15))</div>

Intersection configurations, as disjunction configurations, are accepted in child grammar. Belletti, Friedmann, Brunato & Rizzi (2012) put forward two major results: i) features that are relevant for intervention may vary crosslinguistically, since their relevance depends on their morphosyntactic status (i.e. a feature involved in triggering movement is relevant); ii) as far as the child grammar is concerned, there is a crucial opposition between disjunction and intersection relations, on the one hand, and relations of identity and inclusion on the other (see also Durrleman & Bentea 2021, who also develop this idea). The child tolerates only the first two. In (11) we present the relevant set-theoretic relations, proposed by Belletti, Friedmann, Brunato & Rizzi (2012: 1063):

(11)

	X	Z	Y	Adults	Children
Identity	+A….	+A….	<+A>	*	*
Inclusion	+A, +B….	+B….	<+A, +B>	ok	*
Intersection	+A, +C….	+C, +D….	<+A, +C>	ok	ok
Disjunction	+A….	+B….	<+A>	ok	ok

In a graded differentiation scale, intersection situates naturally between inclusion and disjunction: disjunction>intersection>inclusion>identity (Belletti, Friedmann, Brunato & Rizzi 2012; Rizzi 2018; Durrleman & Bentea 2021). Identity configurations are excluded in the adult grammar (and also in child grammar) and inclusion configurations are excluded by children, the latter creating well-known subject-object asymmetry effects (Friedmann, Belletti & Rizzi 2009 and subsequent work). In contrast, according to Belletti, Friedmann, Brunato & Rizzi (2012), children are able to compute intersection configurations. However, as Bentea, Durrleman & Rizzi (2016) suggested, intersection, such as inclusion, requires a comparison between sets of features and should therefore be harder to compute than disjunction (see also Durrleman & Bentea 2021).

3. Previous results on the acquisition of clefts

Clefts are one of the several syntactic structures that can lead to intervention effects, even though they have not been explored as extensively as relatives and interrogatives. Interestingly, different cleft types, associated to different syntactic configurations, are predicted to give rise to intervention effects to different extents.

In elicited production studies, as in relative clauses and lexically restricted wh-questions, asymmetries between subject and object extraction have been found in clefts in French-speaking children (Hupet & Tilmant 1989; Hamann & Tuller 2014[3]),

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[3]   As far as French is concerned, Hupet & Tilmant (1989) conducted an elicited production task. They show that children aged 4-10 produce significantly more clefts in the subject condition than in the object condition. Hamann & Tuller (2014) collected spontaneous language samples of the production of typically developing children and teenagers aged 6-14 and of the production of SLI children aged 10-12. Although this study focuses on the acquisition of relative clauses, they present a table on clefts (Table 3) that shows an asymmetry between subject and object clefts – subject clefts are more frequent, in the production of younger children (aged 6-8) and of SLI children.

Italian-speaking children (Del Puppo, Pivi & Cardinaletti 2015) and Portuguese-speaking children (Lobo, Santos & Soares-Jesel 2016): in all these languages, children produce higher rates of subject clefts.

As for comprehension, asymmetries between subject and object standard clefts have been found in the acquisition of English (Bever 1970; Lempert & Kinsbourne 1978; Dick, Wulfeck, Krupa-Kwiatkowski & Bates 2004). These authors investigated the comprehension of subject and object standard clefts (*It's the horse that the cow kisses* vs. *It's the horse that kisses the cow*) among other structures with non-canonical word orders. In all the studies, children obtained better results in subject clefts (and other sentences with canonical word order) than in object clefts.

More recently, Aravind, Hackl & Wexler (2017) argued that subject-object asymmetries in children's comprehension of clefts reflect an interaction of syntactic and pragmatic factors. The authors manipulated the pragmatic conditions of their experiments and claimed that children only have problems in infelicitous conditions. Furthermore, to determine whether a word-order-based interpretative strategy explains children's interpretation of clefts in infelicitous contexts, they compared children's comprehension of standard clefts and pseudoclefts. According to the authors, word-order difficulties are expected in object standard clefts (12b) and subject pseudoclefts (13a), and not in subject standard clefts and object pseudoclefts:

(12)   a. It's **a cat** that is **chasing the dog**.   Subject standard cleft
                 S   V   O
         b. It's **a cat** that **the dog** is **chasing**.   Object standard cleft
                 O   S   V

(13)   a. What is **chasing the cat** is **a dog**.   Subject pseudocleft
                      V   O   S
         b. What **the dog** is **chasing** is **a cat**.   Object pseudocleft
                 S   V   O

Note that both in subject standard clefts (12a) and in object pseudoclefts (13b), the lexical elements conform to the canonical SVO order and could be amenable to interpretative strategies based on surface word-order (Aravind, Hackl & Wexler 2017). If children adopt an "agent first" strategy, the sentences conforming to a canonical SVO order should then be easier. In infelicitous contexts, Aravind, Hackl & Wexler (2017) found precisely worse results in object standard clefts and in subject pseudoclefts, which do not conform to canonical SVO order.

The effect of cleft structure on children's comprehension of clefts was also investigated by Lobo, Santos, Soares-Jesel & Vaz (2019) for European Portuguese. The authors manipulated the syntactic function of the clefted constituent (subject vs. object) and the type of cleft structure, considering three different types of clefts: standard clefts (14); *é que* clefts (15); and pseudoclefts (16).

(14) a. Foi   a   vaca [que ~~a vaca~~ mordeu   a   zebra].
         be-PFR.3SG   the   cow   that   bite-PFR.3SG the   zebra
         'It was the cow that bit the zebra.'
      b. Foi   a   vaca [que a   zebra mordeu   ~~a vaca~~].
         be- PFR.3SG   the   cow   that the zebra bite- PFR.3SG
         'It was the cow that the zebra bit.'

(15) a. A   vaca [é   que ~~a vaca~~ mordeu   a   zebra].
        the   cow   be-PRS.3SG   that   bite-PFR.3SG the   zebra
        'It was the cow that bit the zebra.'
     b. A   vaca [é   que a   zebra mordeu   ~~a vaca~~].
        the   cow   be- PRS.3SG   that the zebra bite-PFR.3SG
        'It was the cow that the zebra bit.'

(16) a. [Quem ~~quem~~ mordeu   a   zebra] foi   a   vaca.
        who   bite- PFR.3SG the   zebra be- PFR.3SG the   cow
        'Who bit the zebra was the cow.'
     b. [Quem a   vaca mordeu ~~quem~~] foi   a   zebra.
        who   the cow bite- PFR.3SG   be- PFR.3SG the   zebra
        'Who the cow bit was the zebra.'

The results revealed subject-object asymmetries only with *é que* clefts and standard clefts, subject clefts being easier than object clefts, but no significant differences were found between subject pseudoclefts and object pseudoclefts. Note that a preference for an "agent first" strategy would entail an asymmetry between subject and object pseudoclefts (16a, b) and, specifically, worse results on subject pseudoclefts (16a) than object pseudoclefts, contrary to what has been found. Therefore, according to the authors, the results conform to the predictions of featural relativized minimality and favour a featural relativized minimality approach over a plain "agent first" strategy. Whereas standard clefts and *é que* clefts display intervention configurations – in object clefts, an object DP with a lexical restriction is moved across an intervening DP subject (as shown in 14b), this does not happen in pseudoclefts, a case in which a wh- constituent without a lexical restriction (*quem* 'who' in (16)) is extracted. Indeed, no intervention effects are expected either in object or in subject Portuguese pseudocletfs: in object pseudoclefts, there is no intervention configuration, since the wh-constituent (*quem,* in (16b)) is not lexically restricted; in subject pseudoclefts (16a) an intervention configuration does not arise either, since the final DP (*a vaca*, 'the cow') that refers to the subject has not been extracted and there is no movement configuration where the subject crosses the object.

4. French clefts: research questions

As defined in the previous sections, some types of clefts are constructions that entail derivations in which intervention effects are expected to arise. In the present study, we consider standard clefts (17) and pseudoclefts (18) in French.

(17) a. C' est   la   vache [qui ~~la vache~~ lèche   la   girafe].
        it be-PRS.3SG   the   cow   that   lick- PRS.3SG the   giraffe
        'It's the cow that licks the giraffe.'
     b. C'est   la   vache [que **la   girafe**   lèche   ~~la vache~~].
        It be- PRS.3SG the   cow   that the   giraffe   lick- PRS.3SG
        'It's the cow that the giraffe licks.'

(18) a. [Celle   [qui ~~celle~~ lèche   la   girafe]] [c' est   la
         DEM   that   lick- PRS.3SG   the   giraffe it be- PRS.3SG the
         vache].
         cow
         'The one that licks the giraffe is the cow.'
     b. [Celle [que **la girafe** lèche ~~celle~~]] [c' est   la vache].
         DEM   that the giraffe   lick- PRS.3SG it be- PRS.3SG   the cow
         'The one that the giraffe licks is the cow.'

In (17b), the subject of the embedded clause bears a [+NP] feature, since it is a definite description with a lexical (i.e. nominal) restriction. The clefted constituent is an object DP which is also lexically restricted (therefore, [+NP]) and which must carry a distinct feature, probably Focus, playing a role parallel to the feature [+R] in (9): when moved to the left periphery, the object crosses the intervening subject, which coincides with the moved element in the [+NP] feature. This corresponds to an inclusion configuration similar to the one existing in object headed relatives (9, above). In the subject cleft (17a), however, no intervention effects are expected to arise. We therefore anticipate subject-object asymmetries in the comprehension of standard French clefts by children.

In contrast, object pseudoclefts (18b) do not entail a typical intervention configuration. French pseudoclefts may be analyzed as identity constructions presenting a left-dislocated constituent which includes a demonstrative pronoun (not lexically restricted) modified by a relative clause[4] (Roubaud 2000). If the featural configurations are crucial in determining intervention, it is essential to establish what the properties of the demonstrative in (18b) are. If the demonstrative is a pronominal element lacking a lexical restriction, no intervention arises, since the moved demonstrative and the lexically restricted subject do not share any relevant features, therefore no differences between subject and object pseudoclefts are expected in language acquisition. Nevertheless, Bentea, Durrleman & Rizzi (2016) found that French object relatives headed by *celui* and *celle* (19a) were significantly more difficult for children than relatives with the inanimate demonstrative pronoun *ce* (19b). Apparently, in (19a), *la fille* ('the girl') disrupts the chain relation headed by the demonstrative.

(19) a. Montre-moi   celle [que **la   fille** embrasse   ~~celle~~].
         show.IMP-me DEM that the   girl   kiss- PRS.3SG
         'Show me the one that the girl kisses.'
     b. Montre-moi ce [que **la   fille** tape   ~~ce~~].
         Show.IMP-me DEM that the   girl   hit- PRS.3SG
         'Show me the thing that the girl hits.'

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[4]   These relatives are introduced by *que* and *qui*, which are the complementizers that express relativization in French subject and object relatives. In the generative tradition, it is assumed that, in the case of subject relatives, a specifier-head agreement relation yields nominative *qui* (Kayne 1975; Pesetsky 1982; Rizzi 1982). Note that the same alternance appears in clefts. Note also that unlike French interrogative pronouns – (in the case of interrogative pronouns, *qui* is [+animate] and *que* is [-animate]), subordinators introducing relatives / clefts are not constrained with respect to animacy.

Bentea, Durrleman & Rizzi (2016) suggest that *celle* / *celui*, unlike *ce*, are pronouns that present an internal complex structure which corresponds to a determiner *ce* plus a pronominal form (*lui* / *elle*) and on this basis they argue that the demonstrative is in fact an element that also carries a [+NP] feature and is consequently lexically restricted. They thus consider that relatives presenting *celle* / *celui* (19a) instantiate an inclusion relation holding between the sets of features present in the target and those present in the embedded subject, contrary to *ce* relatives (19b), which instantiate disjunction configurations, since the moved object and the intervening subject in (19b) do not share any feature.

Durrleman & Bentea (2021) present a slightly different view of the characterization of French relative clauses headed by the demonstrative pronoun *celle* / *celui*. They assume that the demonstrative is specified for phi-features (gender, number and animacy) but does not include a lexical restriction. Since they also found difficulties in the comprehension of object relatives headed by *celle* / *celui* by children, they propose that matching phi-features can also be a source of intervention effects[5]. Moreover, the authors found that number mismatch in *celle* / *celui* object relative clauses favors comprehension of these structures by children. This result led them to propose that an intersection configuration arises when we can identify a difference in the set of phi-features (number mismatch for instance). Conversely, inclusion occurs when there is a complete overlap in phi-features, with the moved element carrying [+R]. They argue then that *celle* / *celui* object relatives may in fact correspond to different configurations, inclusion or intersection. The set-theoretic relation which is associated with this specific construction depends in each case on the existence of a phi-feature mismatch.

Therefore, and coming back to clefts, the analysis of French object standard clefts points to a configuration in which featural inclusion is observed, in parallel with what was found for Italian and Portuguese standard clefts, as well as English it-clefts. We therefore expect that children's comprehension of standard clefts in French shows a subject-object asymmetry, with difficulties in the comprehension of object clefts, but not in the comprehension of subject clefts.

The predictions concerning French pseudoclefts are not equally clear. If *celle* / *celui* indeed correspond to a D +NP (Bentea, Durrleman & Rizzi 2016), we should expect to find in French pseudoclefts the same contrast we expect to find in standard clefts, since in that case a featural inclusion configuration is equally created (*celle* / *celui* would carry a [+NP] feature). If instead *celle* / *celui* do not include a [+NP] feature, we should expect the performance of children with French pseudoclefts to be parallel to the performance reported by Lobo, Santos, Soares-Jesel & Vaz (2019) for Portuguese pseudoclefts, i.e., no subject-object asymmetry should be observed in this case. However, a relevant difference exists between French and Portuguese pseudoclefts: whereas in Portuguese an invariable wh-element (*quem*, 'who') is extracted (see 16), in the case of French the left dislocated element is a demonstrative with morphologically overt number features, as well as gender features ($celui_{sg, masc}$, $celle_{sg, fem}$, $ceux_{pl, masc}$, $celles_{pl, fem}$). We do not expect gender features to play a role in

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[5]   As far as spontaneous production is concerned, Hamann & Tuller (2015) examined the production of relative clauses by typically developing French speaking children (aged 6-14) and by French children with specific language impairment (aged 10-12). They found that all children also produced relatives headed by *celui* / *celle* / *ceux*, or by indefinite pronouns or quantifiers (*une*, *plein*, *tellement*…), but they didn't suggest an analysis of those elements.

movement in Romance languages (see Belletti, Friedmann, Brunato & Rizzi 2012); however, number features play a role in different morphosyntactic processes in Romance languages, namely, subject-verb agreement. In this case, and if the number feature is a relevant feature when it comes to determine intervention configurations, French pseudoclefts should give rise to an intersection configuration in sentences such as (20): in this case, in object pseudoclefts, the demonstrative head, which corresponds to the head of a relative clause, carries a set of relevant features [+R, +sg] which are in an intersection relation with the set of features defining the subject of the embedded clause. Even though this intersection configuration is not expected to justify the same type of difficulties in comprehension as inclusion configurations, we may suppose that it could be the cause of some processing difficulties, namely milder comprehension difficulties than the type of difficulties expected in object standard clefts.

(20)

	[+R, +sg]		[+NP, +sg]					
	[Celle	[que	**la**	**girafe**	lèche ~~celle~~]]	[c' est		la vache].
	DEM	that	the	giraffe	lick- PRS.3SG	it be- PRS.3SG	the	cow

Finally, if children are guided by some "agent first" strategy in the comprehension of clefts, and considering that the first NP (in (20) *la girafe*) is associated to an agent role, we would not predict difficulties in French object pseudoclefts; instead, we would expect difficulties in the case of subject pseudoclefts (see 18a).

Therefore, our study examines the comprehension of French subject and object standard clefts and subject and object pseudoclefts by two groups of children (4- and 5-year-olds) and is guided by the following questions:

(i) are subject – object asymmetries found in both French standard clefts and French pseudoclefts?

(ii) if these asymmetries are found in the two cases, are they similar in terms of direction (i.e. weaker performance with object clefts than with subject clefts)?

(iii) if (i) and (ii) receive a positive answer, are the difficulties found in object standard clefts as pronounced as in the case of object pseudoclefts?

(iv) are there differences between 4- and 5-year-olds in the comprehension of the different types of clefts under consideration?

5. The present study

This section presents the comprehension task designed to assess children's interpretation of standard clefts and pseudoclefts and summarizes the results that were obtained.

5.1. Method and participants

Forty-seven children (aged 4;2–6;2) were invited to participate in the comprehension task. Seven children were not included in the study. These children were not looking at the pictures or not paying attention, e.g. they wanted to do something else (to stroke the puppet and to chat with it, to press the computer keys or to play with a personal object). All children were French monolingual speakers with no former diagnosis of language delay or impairment, living in Le Creusot, in the region of Bourgogne

Franche-Comté (see Table 1 for more detailed participant information). The children were tested in a quiet room in the public kindergarten they attended. The children's participation in the study was voluntary and parental written consent was obtained prior to testing. The protocol was applied to a control group of 20 adults ranging in age from 20 to 30 years, all students at Université Paris Cité. Students did not have a specific linguistics background and were obtaining degrees in other fields (History, Geography, Mathematics and Informatics, Cinema). Half were enrolled in the first year, seven in a master's program and the others in a doctoral program.

Table 1. Participant information

	Total No.	Age range (in years)	Age range (in months)
4 year-olds	18 (10 M, 8 F)	4;1 – 4;11	49 – 59 (M = 53.7; SD 3.4)
5 year-olds	22 (14 M, 8 F)	5;0 – 6;2	60 – 74 (M = 67.8; SD 4.7)

We adapted to French the experimental design used by Lobo, Santos, Soares-Jesel & Vaz (2019) to test children's comprehension of standard clefts and pseudoclefts. In the task, the child saw two pictures with reversible situations. Each picture was described by a simple transitive sentence. A donkey (a hand puppet) was also looking at the pictures. After hearing the description, the donkey pointed to one of the pictures, describing it by using a cleft. The focus of the cleft, expressed through prosodic prominence, always fell in the clefted constituent. The child was then asked to say whether the donkey's description was correct. Before starting, each child was told that the donkey was talkative and that it liked to talk about things it sees but sometimes it could be distracted. The child's task was to accept or reject the donkey's description (the experimental item). The children's responses were recorded and the researcher also wrote them on a record sheet that presented all the test items. In Figure 1, we present an example of an experimental item with a standard cleft.[6]

Figure 1. A standard cleft experimental item

Picture 1
Researcher:
Ici, le singe serre le garçon.
'Here, the monkey is hugging the boy.'

Picture 2
Researcher:
Ici, le garçon serre le singe.
Here, the boy is hugging the monkey.'

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[6]   The pictures originally belong to a study by Naama Friedmann, who gently authorized their use.
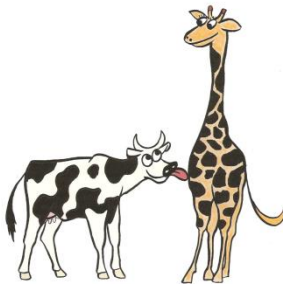
Picture 1
The puppet:
Ici, c'est le garçon qui serre le singe.
'Here, it's the boy that is hugging the monkey.'

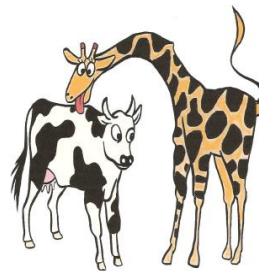In Figure 2, we present an example of a test item with an object pseudocleft.

Figure 2. A pseudocleft experimental item

Picture 1
The researcher:
Ici, la vache lèche la girafe.
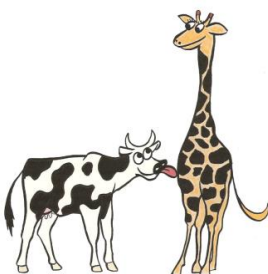'Here, the cow is licking the giraffe.'

Picture 2
The researcher:
Ici, la girafe lèche la vache.
'Here, the giraffe is licking the cow.'

Picture 1
The puppet:
Ici, celle que la girafe lèche c'est la vache.
'Here, the one that the giraffe licks is the cow.'

We manipulated two linguistic variables with two levels each in a 2x2 design – type of cleft (standard cleft vs. pseudocleft) and grammatical relation of the clefted constituent (subject vs. object) – resulting in 4 conditions, for a total of 24 test sentences. The task included for each condition 4 false items and 2 true items. All the items contained transitive verbs and also two noun phrases matching for number (always singular) and for gender[7]. The 24 test sentences were pseudo-randomized, so that the same sentence type did not appear in more than two consecutive items, and were interspersed with 12 fillers (declarative sentences with a canonical SVO order), to maintain the child's attention level. Each child listened to a total of 36 sentences which were preceded by two training items (declarative sentences with a canonical SVO order) whose aim was to check whether the child understood the task.

No time limit was imposed during testing and no feedback was given by the experimenter. The sentences were repeated when the child requested it. Each meeting started with a casual conversation with the researcher and served to get to know the hand puppet. The children received stickers as a reward after completing the task.

5.2. Results

All adults in the control group provided 100% correct answers. In what follows, we present and analyse the results obtained by the child groups in the different conditions. Fig. 3 summarizes the proportions of correct answers obtained by each group defined by age: the answers to all test items are represented here, both those expecting acceptance as true and those expecting rejection as false. This difference will be accommodated in the analysis.

Figure 3. Overall proportion of correct answers for subject standard clefts (SC Subject), object standard clefts (SC Object), subject pseudoclefts (PC Subject) and object pseudoclefts (PC Object) in the different child groups
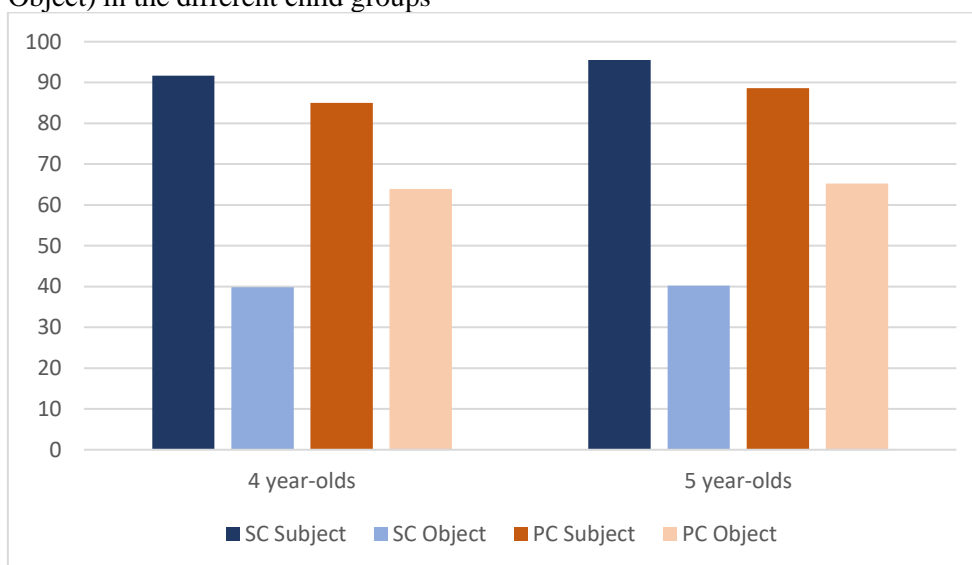
As shown in Figure 3, a high proportion of correct answers was obtained in the case of both subject standard clefts and subject pseudoclefts, a fact which attests the

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[7]   In each condition, there is a variable number of items for masculine and feminine. However, in all test items the gender of both characters was the same.

adequacy of the experiment to test the interpretation of these types of clefts with children. In addition, the general observation of the results also shows that items presenting object clefts always elicited lower rates of correct answers, both in the case of standard clefts and in the case of pseudoclefts. However, the proportion of correct answers to items presenting object pseudoclefts is higher than when the item presented an object standard cleft.

A generalized linear mixed model (GLMM) was used to analyse the data. We wanted to verify the effect of the within subjects' independent variables (Cleft type and Grammatical relation) and their interaction, as well as a possible effect of age as between subject factor. Finally, we also needed to accommodate the effects of a possible "yes-bias" effect affecting the judgment of children and which could differently affect children in the different age groups – this justified that we test the effects of Expected Answer and an Age by Expected answer (True vs. False) interaction.

Therefore, fixed effects entered into the model were Age_Group (4 years, 5 years), Cleft type (Standard Cleft, Pseudocleft), Grammatical relation (Subject vs. Object), the possible two-way interactions of these factors, as well as a three-way interaction Age_Group by Cleft type by Grammatical relation interaction. In addition, we also entered the fixed effect of Expected Answer (True vs. False items) and a two-way interaction Age_Group by Expected_Answer. The random effect structure included by-participant and by-item random intercepts.

The model showed significant effects of Grammatical relation ($\chi^2(1)$ = 78.03, $p < .001$), Expected Answer ($\chi^2(1) = 19.80, p < .001$), of the Cleft type by Grammatical relation interaction ($\chi^2(1) = 13.28, p < .001$), and also of the Group by Expected Answer interaction ($\chi^2(1) = 6.64, p = .010$). Bonferroni-corrected pairwise comparisons were explored and are reported when relevant.

First, and as expected, there was a difference between items expecting rejection and items expecting acceptance (a "yes-bias" effect), with false items significantly receiving less correct answers than true items. There was also an interaction with age, with significantly more correct answers to true than false items in the youngest group ($\exp(\beta) = 6.55, SE = 2.57, z = 4.8, p<.001$)[8] – the difference did not reach significance in the case of the oldest child group. This yes-bias effect was therefore accommodated by the model.

We should now look at other effects identified in the model. No effects of age group were identified, and no interactions were identified between age group and Grammatical relation or Cleft type. Even though a general effect of the type of cleft was not found, a general effect of the grammatical function of the clefted element (Grammatical relation) was identified. In general, object clefts elicited less correct answers than subject clefts: a subject-object asymmetry was identified in the data. In addition, a significant effect of the interaction Cleft type by Grammatical Relation was found in the results. Given our initial research questions, we are interested in understanding whether there are significant differences between object standard clefts and object pseudoclefts. These differences were confirmed: object standard clefts obtained significantly lower results than object pseudoclefts ($\exp(\beta) = 0.32, SE = 0.10, z = -3.54, p = .002$). This means that even though object clefts were generally

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[8]   *SE* refers to $\exp(\beta)$, but the value of *z* results from the estimate in logit scale.

more difficult than subject clefts, the difficulty with object pseudoclefts is milder than the difficulty with object standard clefts.

6. Discussion

Given that clefts are structures that typically entail intervention configurations, one of our central goals was to find out whether a detailed analysis of children's performance during the experimental task could provide elements contributing to the understanding of the different types of featural relations that may emerge while children are dealing with a specific construction involving extracting a constituent across a potential intervener: disjunction>intersection>inclusion>identity (Belletti, Friedmann, Brunato & Rizzi 2012; Rizzi 2018; Durrleman & Bentea 2021).

The main result of the experiment is the existence of a generalized asymmetry in the comprehension of French standard clefts and pseudoclefts: items with a clefted object elicited lower rates of correct answers in items presenting both types of clefts. This result confirms the fact that intervention is a factor that has an impact in the development of cleft sentences in language acquisition, but also adds the information that both standard clefts and pseudoclefts in French create intervention configurations.[9] The relevance of intervention in children's comprehension has been highlighted building on the development of A-bar dependencies in different languages but data from the acquisition of French clefts brings a new contribution to the topic, especially because they differ from other previous results concerning clefts in the acquisition of another Romance language, European Portuguese. We will return to this difference later.

The generalized subject-object asymmetry found in French clefts is not surprising as far as standard clefts are concerned. Object standard clefts create a clear inclusion configuration so, considering the typical difficulties that children experience when dealing with inclusion, a subject-object asymmetry characterized by a weaker performance with object clefts is naturally expected in the comprehension of these constructions. Such an asymmetry was found for European Portuguese (Lobo, Santos, Soares-Jesel & Vaz 2019) and is confirmed by our results on French. However, the results concerning pseudoclefts call for a reflection on the syntactic differences between standard clefts and pseudoclefts, on the one hand, and on the properties that characterize a seemingly identical construction, pseudoclefts, in two different Romance languages, French and European Portuguese, on the other hand.

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[9]   A reviewer signals that the results obtained with standard object clefts may also be explained if the clefts that the child judges are interpreted as carrying new information focus. The reviewer signals that this may happen if the child considers that the puppet, who is inattentive, is reporting only on the pictured event and not considering the contrast with the previous picture. If children thus take the sentence as carrying new information focus, they would reject object clefts. In fact, as Belletti (2015) points out, subject clefts can express focus of new information, while object clefts can only express corrective / contrastive focus (see also Belletti 2012 and references cited therein). In our view, it is very unlikely that this is the source of difficulties with (some) object clefts. This type of reasoning would imply that the children (4- and 5-year-olds) systematically prefer to take into account the perspective of the inattentive puppet, which is unlikely given the developing Theory of Mind abilities of children in this age range.

Let us first address the first issue, a comparison between standard clefts and pseudoclefts, regarding the nature of intervention configurations. As we mentioned, Bentea, Durrleman & Rizzi (2016) proposed that *celle / celui*, which may head French relative clauses, bear a [+NP] feature and give rise to inclusion configurations. Note that this analysis brings pseudoclefts closer to standard clefts since the nominal constituents present in the latter typically bear a [+NP] feature. According to this analysis, a subject-object asymmetry of the same strength should be associated to both constructions. However, our results do not confirm this possibility to the extent that we found significant differences between target answers to object standard clefts and to object pseudoclefts. Children clearly achieved higher rates of correct answers in the case of object pseudoclefts. This suggests that difficulties with object pseudoclefts exist, but are weaker. We claim that French object pseudoclefts illustrate the set-theoretic intersection relation, which entails intervention effects that are attenuated, compared to those found in inclusion configurations. If we assume that there are no strong arguments to maintain the idea that *celle / celui* bear a [+NP] feature, since the demonstrative is not a full lexical DP, object pseudoclefts depict a configuration in which the demonstrative carries a set of features [+R, sg] that are in an intersection relation with the features characterizing the subject of the embedded clause [+NP, +sg] (see (20) above). This explains the fact that French children deal better with object pseudoclefts than with object standard clefts – the former create an intersection configuration, whereas the latter create an inclusion configuration. Our results also corroborate the graded differentiation scale proposed by different researchers and which captures the development of children's ability to deal with intervention effects: disjunction>intersection>inclusion>identity (Belletti, Friedmann, Brunato & Rizzi 2012; Rizzi 2018; Durrleman & Bentea 2021). The computation of intersection relations is expected to create difficulties, but it remains more accessible to children than the computation of inclusion relations. Nevertheless, note that the accurate contrast between intersection and inclusion relations only determines children's performance, to the extent that adults, who provided 100% correct answers, confirmed that they are not sensitive to such a distinction. This is an argument to claim that during the process of language acquisition, the different types of intervention relations are reorganized into a setup in which only the opposition between identity relations and non-identity relations (that subsume disjunction, intersection and inclusion) is relevant to determine the acceptability of the structure. In adult grammars, only this opposition holds (Rizzi 2018, a.o.).

The second central issue relates to the properties of pseudoclefts in European Portuguese and in French, more specifically, to the properties of the head of the relative clause that is included in the pseudocleft construction, in both languages. Why are the French results for pseudoclefts not similar to those obtained for European Portuguese pseudoclefts? Remember that Portuguese children do not evince particular difficulties in dealing with object pseudoclefts (Lobo, Santos, Soares-Jesel & Vaz 2019). The absence of a subject-object asymmetry in Portuguese pseudoclefts stems from the properties of the wh-word heading the relative: *quem* ('who') (see (16) above) is invariable and does not bear phi-features, unlike the demonstrative *celle / celui*, which bears a number feature. Therefore, a Portuguese object pseudocleft corresponds to a disjunction configuration, which should not entail a heavier computational weight for children. The fact that French children and Portuguese children behave differently corroborates the idea that the fine-grained definition of intervention effects is

determined by the language specific features that define the different constituents in local configurations generated by movement (Belletti, Friedmann, Brunato & Rizzi 2012; Rizzi 2018; Durrleman & Bentea, 2021).

Our experiment also provided results that show that children master the pragmatic and the syntactic knowledge which enables them to comprehend pseudoclefts, even if it is a construction that is scarce in French spontaneous production (Soares-Jesel & Lobo 2019).

Finally, the results do not support the idea that children's comprehension of clefts could be determined by an "agent first" strategy (contrary to what was suggested by Aravind, Hackl & Wexler 2017). As we pointed out in section 4., such a strategy should lead to increased difficulties in the comprehension of subject pseudoclefts (vs. object pseudoclefts), but the opposite results were obtained.

Table 2 summarizes the results obtained.

Table 2. Summary of structures, intervention configurations and results

Structure	Configuration	Results		
		Adults	4 year-olds	5 year-olds
Standard subject cleft	No intervention	✓	✓	✓
Standard object clefts	Inclusion	✓	stronger difficulties	stronger difficulties
Subject pseudoclefts	No intervention	✓	✓	✓
Object pseudoclefts	Intersection	✓	milder difficulties	milder difficulties

7. Conclusion

To conclude, our study supports a featural intervention approach to comprehension asymmetries found in language acquisition, instead of a plain "agent first" strategy. It shows that the feature composition of the moved element and the intervener play a crucial role in the strength of intervention effects in language acquisition even in the absence of a lexical restriction, as suggested in Costa, Grillo & Lobo (2012) and Bentea & Durrleman (2021). It also supports a graded scale where inclusion relations are harder to process than intersection relations, following Belletti, Friedmann, Brunato & Rizzi (2012), Rizzi (2018), Durrleman & Bentea (2021).

In more general terms, this study shows that research focusing fine-grained distinctions relevant to establish differences between similar structures in related languages, such as Romance languages, can shed light not only on linguistic development, but also on relevant aspects of the syntax of these structures.

Acknowledgments

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