Bareness in Wh-Operators and Syntactic Intervention: Evidence from Sluicing in Child Italian

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1. Introduction

This study investigates the role of bareness, i.e. absence of the lexical NP restriction, in the computation of featural Relativized Minimality (fRM; Rizzi 2004; 2013; 2018), a formal locality principle argued to operate in the syntax. According to this principle, a local relation between X and Y may be disrupted when an element Z occurs in between, provided that (i) Z structurally intervenes between X and Y, i.e., Z c-commands Y but does not c-command X, and (ii) Z shares relevant syntactic features with X, i.e. features which define syntactic positions by licensing applications of external and internal merge (Rizzi 2018: 347). Crucially, local relations involving an intervention configuration are penalized as a function of the featural distinctness between the target X and the intervener Z. The greater overlap, the stronger the penalty: inclusion configurations (i.e., when the features specified on Z constitute a proper subset of those on X) are more penalized than disjunction configurations (i.e., when no features are shared between X and Z). Disjunction can be obtained by introducing a mismatch in the lexical NP restriction between X and Z, as in configurations involving a pronominal X and a lexically restricted Z. In previous studies (Friedmann, Belletti & Rizzi 2009; Bentea, Durlemann & Rizzi 2016, a.o.), the absence of lexical restriction on X was structural: being a pronoun, X was inherently bare, syntactically lacking the NP projection, as is the case of *chi* 'who' in Italian. However, constituents can also become bare at Phonetic Form (PF). Elliptical DPs are standardly assumed to project an NP in the syntax, which undergoes PF-deletion (e.g., Merchant 2001; Ntelitheos 2004; Cinque 2012). Accordingly, wh-elements such as *quale/quali* 'which one/ones' start syntactically as *quale/quali+NP* and becomes bare at PF (see Section 2).

This paper asks whether syntactic of phonological bareness counts for fRM in A-bar dependencies, and in turn seeks to verify to what extent the locality principle is independent of pronunciation. Italian offers an ideal testing ground to

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address this question. By comparing the syntactically bare wh-pronoun *chi* 'who' with the PF-bare *quale* 'which one' and the overtly lexically restricted *quale+NP* 'which+NP', we can directly test whether amelioration effects arise only with syntactic bareness or also with PF-bareness, thereby determining whether fRM is sensitive to surface PF-properties or strictly operates over syntactic representations. The empirical lens through which we investigate these contrasts is constituted by Italian sluicing, i.e., elliptical indirect wh-questions, which is traditionally argued to involve wh-movement followed by TP-ellipsis (e.g., Merchant 2001) and constitutes a domain where locality effects have been previously documented independently in this language (Pettenon, Sanfelici & Mateu 2026).

The paper is structured as follows. Section 2 provides an overview of the lexical NP restriction feature within the theoretical framework of featural Relativized Minimality, discusses related results in language acquisition, and details the difference between syntactic and PF-bareness. Section 3 describes our study and, lastly, Section 4 discusses the results and concludes the paper.

2. Featural Relativized Minimality and NP restriction: bareness in wh-operators

Among the syntactic features that enter in the computation of intervention, lexical NP restriction has been argued to be relevant for the calculation of fRM configurations. Indeed, although [+NP] does not trigger movement *per se*, it is crucially involved in determining the landing site of wh-elements as well as of DPs (Cardinaletti & Starke 1994; Munaro 1999; Rizzi 2018; Poletto 2021). Consistent with this view, the presence of a lexical NP restriction systematically ameliorates weak island violations in adult grammar: extraction of a lexically restricted wh-phrase like *what book* [+Q, +NP] over a bare wh-element [+Q] (i.e., inclusion configuration) (1b) is perceived as less degraded than extraction of a bare wh-element like *what* [+Q] (i.e., identity configuration) (1a) (Villata, Rizzi & Frack 2016; Rizzi 2018).

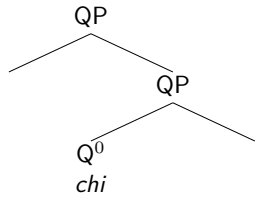
(1) a. * What do you wonder who could buy __ ?
b. ?? What book do you wonder who could buy __ ?

Being initially formulated to capture adults' judgments on weak islands, the locality principle of fRM has later been extended to child language acquisition, where it has proven successful in accounting two core related findings. First, children across languages exhibit a robust subject>object asymmetry in both comprehension and production of A-bar dependencies, e.g. wh-questions (De Vincenzi 1999; Friedmann, Belletti & Rizzi 2009; Bentea, Durrleman & Rizzi 2016), relative clauses (Friedmann & Novogrodsky 2004; Friedmann, Belletti & Rizzi 2009, Belletti et al. 2012), sluicing (Mateu & Hyams 2021; Liu, Hyams & Mateu 2020; Mateu & Hyams 2025): subject A-bar dependencies are easier than object A-bar dependencies for children, as in the former no intervention arises,

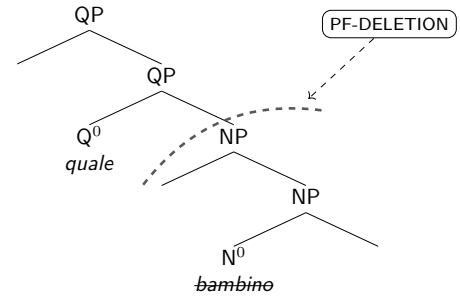
while in the latter the DP subject intervenes in the chain of the moved object. Second, and crucially for the present study, children's performance on object A-bar dependencies shows systematic amelioration effects when relevant featural mismatches are introduced between the target and the intervener, whose strength correlates with the ranking of the emerging set-theoretic relation between X and Z along the distinctness hierarchy. The usual mismatch usually investigated in previous research involved the presence *vs*. absence of the lexical NP restriction, thereby yielding to lexically restricted DPs and bare DPs, respectively. For instance, Friedmann, Belletti & Rizzi (2009) showed that Hebrew-speaking children perform at chance on object relative clauses involving an inclusion configuration obtained by using lexically restricted targets and interveners, but their accuracy improved when the configuration was turned into disjunction, either by pronominalizing the intervener or by removing the nominal restriction from the relative head. Parallel evidence comes from Italian: De Vincenzi et al. (1999) tested children's comprehension of wh-questions manipulating the lexical specification of the extracted wh-phrase (*chi* 'who' *vs*. *quale+NP* 'which+NP'), while the intervening subject was a lexically restricted DP. Interestingly, as expected, object questions with lexically restricted wh-phrases (i.e., inclusion configuration) were significantly more difficult than those with bare wh-elements (i.e., disjunction configuration) up to 6 years.

Notice, however, that, if the absence of the overt lexical NP restriction qualifies bare elements in general, two types of bareness must be distinguished along the level of where in the grammar the absence of lexical NP restriction is determined: (i) syntactic bareness, which has been the focus of previous research, and (ii) PF-bareness, our topic of investigation. Syntactically bare elements, usually labelled pronouns, lack an NP projection at all levels of syntactic representation. This is the case of the wh-operator *chi*, 'who' (2a): this wh-element is inherently pronominal and only carries the [+Q] feature, without projecting an NP layer. Its bareness is thus a property of its syntactic makeup. PF-bare elements, by contrast, are bare only at the surface level, as a consequence of NP ellipsis. NP ellipsis is the linguistic operation whereby a noun (and possibly its modifiers) remains unpronounced, but still interpreted, as its meaning is recoverable under identity from a linguistic antecedent with which an anaphoric dependency is established. Following influential work on ellipsis, the elided NP has a full-fledged structure in the syntax that undergoes deletion at PF. Under this approach, a wh-element like the Italian *quale* 'which one' in (2b) is syntactically equivalent to its overtly lexically restricted counterpart *quale bambino* 'which child', with the NP *bambino* 'child' undergoing PF-deletion. That is, *quale* surface as bare due to NP ellipsis, while the elided NP is structurally present though not pronounced.

(2) a.



b.



The distinction between syntactic and PF-bareness has direct theoretical consequences for fRM. Under standard architectural assumptions in generative grammar, syntactic operations precede phonological ones (Chomsky 1995). If fRM computes over syntactic representations -as expected for a principle governing syntactic dependencies- only syntactic bareness should be relevant for the creation of fRM-relevant configurations. In light of this, PF-bare *quale* [+Q, +NP] should pattern with overtly lexically restricted *quale+NP* [+Q, +NP], both creating inclusion configurations when crossing a lexically restricted DP intervener (e.g., a definite description). Only syntactically bare *chi* [+Q], which lacks [+NP] entirely, should create disjunction and ameliorate intervention. Conversely, if PF-properties can influence fRM computation -perhaps through a processing-based implementation that operates over parsed surface forms- then *quale* might pattern with *chi,* both appearing bare at the surface despite their different underlying structures. Testing these contrasting predictions directly addresses whether fRM is sensitive to syntactic or PF-properties, and thus whether features must have correspondent phonological exponents to count as relevant for the computation of locality.

3. Our Study

3.1. Participants

We tested 102 typically developing Italian-speaking children, aged 3;00 to 5;11, recruited in three different kindergartens located in the Veneto region (north-east of Italy). However, twenty children were excluded from the analyses because they did not perform above chance in the control trials, scoring less than 7 out of 10 correct responses, i.e. the threshold established through a binomial test (p = .02). The final sample therefore included 82 children, balanced across the age range: 25 3-year-olds, 29 4-year-olds, 28 5-year-olds.

An additional control group of 24 Italian-speaking adults was also tested. Adult participants were recruited in the same geographical area in which the children were tested.

3.2. Procedure

Participants were individually administered a Yes/No-question task, adapted from Mateu and Hyams (2021) to Italian. Children were presented with visual stimuli on a screen and interacted with a computer-simulated puppet, which asked whether a specific character could be seen in the pictures. Each trial consisted of a sluiced indirect wh-question produced by the puppet, associated with an image depicting three characters arranged in an A-B-C setting, all engaged in the same transitive action toward one another: the leftmost character (i.e., character A) acted upon the middle character (i.e., character B), who, in turn, performed the same action on the rightmost character (i.e., character C). In line with the original procedure described in Mateu & Hyams (2021), children were instructed to wait until the puppet had completed its question before responding, and to provide their answer by pointing to the target character. The task was administered through a PowerPoint presentation. Prior to the experimental phase, participants completed a training session consisting of four warm-up trials, designed to familiarize them with the task. During the main experimental session, test and control items were presented in a pseudo-randomized order, and participants' responses were recorded in writing by the experimenter.

3.3. Design and materials

The experiment comprised 40 trials, including 30 test trials, 10 controls and 4 warm-ups.

As for the test items, we employed elliptical indirect wh-questions (i.e., sluices) arranged in a 2x3 factorial design, manipulating two independent variables: (i) the Extraction Site of the wh-element, which could be either the subject or the direct object of the clause, and (ii) the Type of Wh-Element used as the remnant, which could be syntactically bare (i.e., *chi*, 'who'), PF-bare (i.e., *quale*, 'which'), or lexically restricted (i.e., *quale+NP*, 'which+NP'). None of the stimuli included additional featural mismatches, and all were built using the same nouns, transitive verbs, and images as those employed in Pettenon, Sanfelici & Mateu (2026). Participants were assigned to one of two groups (Group A or Group B) following a counterbalancing procedure, with assignment balanced across age ranges: target characters were alternately fully visible or partially hidden between the two groups, such that an item eliciting a "yes" response in one group (i.e., pointing to a visible target character) elicited a "no" response (i.e., pointing to a partially hidden target character) in the other.

Examples of our experimental sentences are given in (3) and (4), paired with pictures (Figures 1-4) which were designed to elicit a positive or a negative response by pointing either to the visible or to the partially hidden character. For instance, if children were correctly comprehending the subject sluice in (3a), they had to point to the visible child on the left (i.e., character A) in Figure 1 to be target-like, whereas when they heard the object sluice in (4a), associated with Figure 3, they had to point to the partially hidden character on the right (i.e., character C) to answer correctly.

(3) SUBJECT SLUICES

SYNTACTIC BARENESS: CHI ('WHO')

a. Posso vedere che qualcuno colora il signor-e,
can.1SG see that someone color.3SG the-M.SG sir-SG
puoi vedere chi <__ colora il signor-e>?
can.2SG see who color.3SG the.M.SG sir-SG
'I can see that someone is coloring the sir, can you see who <__ is coloring the sir>?'

LEXICALLY RESTRICTED: QUALE+NP ('WHICH+NP')

b. Posso vedere che un bambin-o colora il signor-e,
can.1SG see that a.M.SG child-M.SG color.3SG the-M.SG sir-SG
puoi vedere qual-e bambin-o <__ colora il signor-e>?
can.2SG see which-SG child-M.SG color.3SG the.M.SG sir-SG
'I can see that a boy is coloring the sir, can you see which boy <__ is coloring the sir>?'

PF-BARENESS: QUALE ('WHICH')

c. Posso vedere che un bambin-o colora il signor-e,
can.1SG see that a.M.SG child-M.SG color.3SG the-M.SG sir-SG
puoi vedere qual-e <__ colora il signor-e>?
can.2SG see which-SG color.3SG the.M.SG sir-SG
'I can see that a boy is coloring the sir, can you see which one <__ is coloring the sir>?

(4) OBJECT SLUICES

SYNTACTIC BARENESS: CHI ('WHO')

a. Posso vedere che il bambin-o colora qualcuno,
can.1SG see that the-M.SG child-SG color.3SG someone
puoi vedere chi <il bambin-o colora __ >?
can.2SG see who the-M.SG child-SG color.3SG
'I can see that the boy is coloring someone, can you see who <the boy is coloring __ >?'

LEXICALLY RESTRICTED: QUALE+NP ('WHICH+NP')

b. Posso vedere che il bambin-o colora un signor-e,
can.1SG see that the-M.SG child-SG color.3SG a.M.SG sir-SG
puoi vedere qual-e signor-e <il bambin-o colora __ >?
can.2SG see which-SG sir-M.SG the-M.SG child-SG color.3SG
'I can see that the boy is coloring a sir, can you see which sir <the boy is coloring __ >?'

PF-BARENESS: QUALE ('WHICH')

c. Posso vedere che il bambin-o colora un signor-e,
can.1SG see that the-M.SG child-SG color.3SG a.M.SG sir-SG
puoi vedere qual-e <il bambin-o colora __ >?
can.2SG see which-SG the-M.SG child-SG color.3SG
'I can see that the boy is coloring a sir, can you see which one <the boy is coloring __ >?'

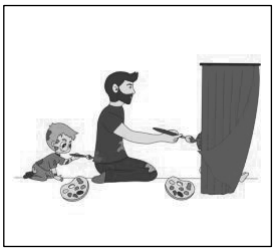


Figure 1. Yes-Scenario for (3a)/(3c).

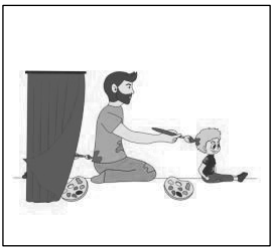


Figure 2. No-Scenario for (3b).

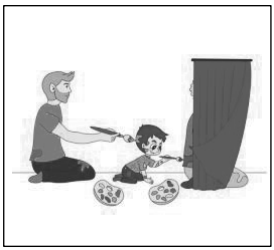


Figure 3. No-Scenario for (4a)/(4c) .

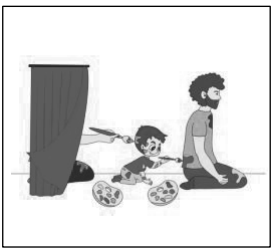


Figure 4. Yes-Scenario for (4b).

As for the controls, we employed non-elliptical indirect wh-questions in which the arguments were reversed relative to the preceding clause, such that the subject of the antecedent sentence became the object of the embedded question, and vice versa (5). This argument reversal ensured that children were also attending to the second clause uttered by the puppet. All control items featured the lexically restricted wh-element *quale+NP* ('which+NP') and involved a number mismatch to allow unambiguous identification of whether the wh-element functioned as the subject or the direct object of the embedded question. The control items were evenly divided with respect to Extraction Site and were further balanced across the two groups for the type of target response, mirroring the counterbalancing used in the test sentences.

(5) a. Posso vedere che i bambin-i colorano un signor-e,
can.1SG see that the-M.PL child-M.PL color.3PL a.M.SG sir-M.SG
puoi vedere qual-e signor-e __ colora i bambin-i?
can.2SG see which-SG sir-M.SG color.3SG the-M.PL child-M.PL
'I can see that the boys are coloring a gentleman, can you see which gentleman is coloring the boys?'

b. Posso vedere che un bambin-o colora i signor-i,
can.1SG see that a-M.SG child-M.SG color.3SG the-M.PL sir-M.PL
puoi vedere qual-e bambin-o i signor-i colorano __?
can.2SG see which-SG child-M.SG the.M.PL lady-M.PL color.3PL
'I can see that a boy is combing the gentlemen, can you see which boy the gentlemen are combing?

3.4. Results
3.4.1. Statistical analyses

Our preliminary results are given in Table 1.[1]

Table 1. Accuracy (%) of responses by condition and age group.

	SUBJECT SLUICES			OBJECT SLUICES		
	CHI	QUALE+NP	QUALE	CHI	QUALE+NP	QUALE
Age 3	70.4%	70.4%	48.8%	61.6%	47.2%	37.6%
Age 4	83.4%	86.9%	66.2%	75.9%	58.6%	39.3%
Age 5	89.3%	92.1%	71.4%	84.3%	67.1%	54.3%
AVG	81.5%	83.7%	62.7%	74.4%	58.0%	43.9%

We analyzed children's accuracy using generalized linear mixed-effects models (GLMMs) with a binomial distribution (*glmer* function, *lme4* package in R; Bates et al. 2015), fitted with the bobyqa optimizer. As for predictors, the models included Extraction Site (2 levels: Subject, Object), Wh_Type (3 levels: Chi, Quale, Quale+NP) and Age (continuous, scaled and mean-centered). We used planned sum-to zero contrasts to compare (i) chi *vs.* quale+NP, and (ii) quale+NP *vs.* quale. We compared nested models using likelihood ratio tests to detect the significance of each fixed effect and interaction, and thus to ultimately determine the best-fitting model to our data. The final model included all main effects and the interaction between Extraction_Site and Wh_Type. The random effect structure included random intercepts for Participant and Item, and random slopes by Participant for Extraction and Wh_Type. Table 2 reports the fixed effects estimates from this model.

[1] For presentation purposes, children are grouped into age categories (3-, 4- and 5-year-olds) in Table 1. These groupings are also used in individual-level and error distribution analyses. In the statistical model, however, Age was treated as a continuous predictor. Statistical analyses were conducted exclusively on the child dataset.

Table 2. Output of the mixed effects logistic regression model (Full Model Summary: AIC=2524.7; BIC=2629.3; LogLik=-1244.4; Dev=2488.7).

Predictors	β	SE	z value	*p*
Intercept	-2.694	0.747	-3.607	<.001
Age	0.820	0.160	5.115	<.001
Extraction Site	-1.104	0.190	-5.808	<.001
Wh_Type (chi *vs.* quale+NP)	-2.080	0.370	-5.629	<.001
Wh_Type (quale+NP *vs.* quale)	-2.693	0.344	-7.826	<.001
Extraction * Wh_Type (chi *vs.* quale+NP)	-1.574	0.652	-2.416	.016
Extraction * Wh_Type (quale+NP *vs.* quale)	0.119	0.628	0.190	.850

As expected, we found a significant effect of Age (β = 0.820, SE = 0.160, z = 5.115, $p < .001$), indicating that children's accuracy progressively increased as they grew older. The model also showed a significant effect of Extraction Site (β = -1.104, SE = 0.190, z = -5.808, $p < .001$), with subject sluices being overall easier than object sluices. Additionally, a main effect of Wh_Type indicates that *chi*-sluices were significantly more accurate than *quale+NP*-sluices which, in turn, were significantly more accurate than *quale*-sluices (chi *vs*. quale+NP: β = -2.080, SE = 0.370, z = -5.629, p < .001; quale+NP *vs*. quale: β = -2.693, SE = 0.344, z = -7.826, $p < .001$).

Crucially, the effect of Wh_Type was modulated by Extraction_Site, as suggested by the significant interaction emerged for the contrast *chi* vs. *quale+NP* (β = -1.574, SE = 0.652, z = -2.416, $p = .016$), indicating that an amelioration effect due to a lexical restriction mismatch arises in object sluices but not in subject ones, as expected under fRM. By contrast, no significant interaction emerged for the contrast *quale+NP* vs. *quale* (β = 0.119, SE = 0.628, z = 0.190, $p = .850$), suggesting that the greater difficulty associated with *quale*-sluices was consistent across subject and object sluices.

3.4.2. Individual analysis

We then descriptively examined children's performance at the individual level to assess acquisition of *quale*-sluices relative to their lexicalized counterparts, i.e. *quale+NP*-sluices, a difference already captured at the group level by our statistical model.

To conduct the individual analyses, we first created two subsets of children: one including only those who had acquired subject sluices, and another including only those who had acquired object sluices. Acquisition of a structure type was defined as achieving at least 9 out of 15 correct responses in the given structure (binomial test, $p = .03$).[2] Within each subset of children, we then compared *quale+NP*-sluices and *quale*-sluices, to assess whether acquisition of the latter was contingent on acquisition of the former. For the specific wh-type within each

[2] Following this criterion, no child comprehended object sluices without also comprehending subject ones, consistently with the subject>object asymmetry detected by the statistical model.

structure, a threshold of at least 4 out of 5 correct responses was set to indicate acquisition (binomial test, p = .045). From this comparison, four possible outcomes could emerge for each child: (i) No acquisition of either *quale+NP*-sluices or *quale*-sluices (i.e., fewer than 4 correct responses for both wh-types); (ii) Acquisition of *quale+NP*-sluices but not *quale*-sluices (i.e., at least 4 correct responses in *quale+NP*-sluices but fewer than 4 in *quale*-sluices); (iii) Acquisition of quale-sluices but not *quale+NP*-sluices (i.e. at least 4 correct responses in quale-sluices but fewer than 4 in *quale+NP*-sluices); and (iv) Acquisition of both *quale+NP*-sluices and *quale*-sluices (i.e. at least 4 correct responses in both wh-types). Table 3 reports the results of the individual counts.

Table 3. Results of the individual analyses.

SUBJECT SLUICES (QUALE+NP VS. QUALE)			**OBJECT SLUICES (QUALE+NP VS. QUALE)**		
AGE 3 (N=17)	✓ QUALE+NP	✗ QUALE+NP	**AGE 3** (N=8)	✓ QUALE+NP	✗ QUALE+NP
✓ QUALE	7	0	✓ QUALE	2	0
✗ QUALE	6	4	✗ QUALE	3	3
AGE 4 (N=24)	✓ QUALE+NP	✗ QUALE+NP	**AGE 4** (N=16)	✓ QUALE+NP	✗ QUALE+NP
✓ QUALE	14	0	✓ QUALE	6	0
✗ QUALE	7	3	✗ QUALE	4	6
AGE 5 (N=25)	✓ QUALE+NP	✗ QUALE+NP	**AGE 5** (N=21)	✓ QUALE+NP	✗ QUALE+NP
✓ QUALE	18	0	✓ QUALE	11	0
✗ QUALE	7	8	✗ QUALE	6	4

Descriptively, the individual analysis indicates that the acquisition of both wh-types roughly correlates with age, in line with the results of our statistical model. More importantly, however, individual counts show that no child acquired *quale*-sluices without also acquiring *quale+NP*-sluices. This result, which holds consistently for both subject and object sluices, suggests that the lexically restricted wh-phrase *quale+NP* serves as a prerequisite for the PF-bare wh-element *quale.*

3.4.3. Error analysis

Finally, we examined the distribution of erroneous responses provided by children, defined as selections of a non-target character. In this part of the analysis,

children were divided into three age groups (3-, 4-, and 5-year-olds) to capture age-related differences in error patterns.

Recall that in our test trials the target character could be either the leftmost (i.e. character A) or the rightmost one (i.e. character C), though pictures always included three characters (see Figures 1-4). Hence, when the correct answer was A, errors could involve pointing to either C or B; when the correct answer was C, errors could involve pointing to either A or B. For instance, in a scenario where a child (A) is coloring a man (B), who in turn is coloring another child (C), if the target was the leftmost child (A), pointing to either the wrong child (C) or the man (B) was coded as an error. Likewise, given a scenario where a man (A) is coloring a child (B), who in turn is coloring another man (C), if the target was the rightmost man (C), pointing to either the wrong man (A) or the child (B) was coded as an error. Crucially, selections of B reflect a failure in identifying the antecedent NP of the remnant, whereas selections of A or C indicate an incorrect referent choice despite correctly identifying the antecedent NP. A breakdown of error types across age groups is reported in Table 4.

Table 4. Distribution of errors by age group and wh-type.

	CHI		QUALE+NP		QUALE	
	A/C	**B**	**A/C**	**B**	**A/C**	**B**
Age 3	91.8% (78/85)	8.2% (7/85)	89.3% (92/103)	10.7% (11/103)	30.3% (43/142)	69.7% (99/142)
Age 4	100.0% (59/59)	0.0% (0/59)	97.5% (77/79)	2.5% (2/79)	55.5% (76/137)	44.53% (61/137)
Age 5	91.9% (34/37)	8.1% (3/37)	91.2% (52/57)	8.8% (5/57)	74.0% (77/104)	26.0% (27/104)

Clear differences emerge across sluice types and age groups. In both *chi*-sluices and *quale+NP*-sluices, erroneous responses overwhelmingly involved selections of A or C at all ages, with selections of B remaining consistently rare (below 11% across all age groups).

By contrast, *quale*-sluices showed a markedly different profile: at age 3, the majority of erroneous responses involved selection of B (69.7%), reflecting substantial difficulty in identifying the antecedent NP of the elliptical wh-element. This proportion decreased with age, dropping to 44.5% at age 4 and 26.0% at age 5, when errors mainly involved selections of A or C. These patterns suggest that, although comprehension of *quale*-sluices remains challenging, by age 5 children are generally able to identify the antecedent NP correctly, with remaining errors primarily reflecting referent selection.

4. Discussion and final remarks

In this study we examined the role of bareness in the computation of featural Relativized Minimality by comparing Italian children's comprehension of sluices involving three types of wh-remnants: the syntactically bare *chi* ('who'), the PF-

bare *quale* ('which one'), and the lexically restricted *quale+NP* ('which+NP'). Several findings emerge from our experimental work.

Consistent with the extensive literature on the acquisition of A-bar dependencies, we first observed the well documented subject>object asymmetry: children systematically experienced greater difficulty with object sluices than with subject sluices. This asymmetry straightforwardly follows from fRM: in object sluices, the lexically restricted subject DP intervenes in the chain of the moved wh-object, creating an intervention configuration; by contrast, no such intervener is present in subject sluices, which are thus easier for children.

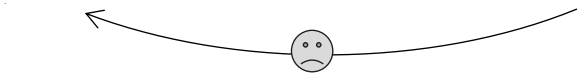
More crucially, our results show that intervention effects that arise in object sluices are not uniform across all wh-types, but their strength vary systematically as a function of the structural properties of the wh-operator. Specifically, we found that object sluices with the syntactically bare wh-element *chi* were significantly more accurate than those with the lexically restricted *quale+NP*. This amelioration is again expected under fRM: when *chi* [+Q] crosses a lexically restricted subject DP [+NP], a disjunction configuration arises, as no relevant feature is shared between the two (6a). Conversely, when *quale+NP* [+Q, +NP] crosses the same intervener, featural overlap obtains, yielding an inclusion configuration which, in turn, is more penalized for children (6b).

(6) a. … X … Z … <Y> …
chi il bambino <chi>
[+Q] [+NP] [+Q]

b. … X … Z … <Y> …
quale signore il bambino <quale signore>
[+Q; +NP] [+NP] [+Q; +NP]

Strikingly, the PF-bare wh-element *quale* exhibits a distinct pattern from both the syntactically bare *chi* and the lexically restricted *quale+NP*. Crucially, *quale* does not trigger the amelioration effect observed with *chi* in object sluices, indicating that it fails to create a disjunction configuration. This suggests that, despite its surface bareness, *quale* does not count as bare for fRM: it projects an NP layer in the syntax and thus carries the featural specification [+Q, +NP]. Consequently, when *quale* crosses a lexically restricted subject DP [+Q, +NP], the featural overlap creates an inclusion configuration, just as with *quale+NP* (7). Hence, from a fRM perspective, *quale* patterns with *quale+NP*, demonstrating that the locality principle is purely structural, blind to PF-properties and sensitive to the internal architecture of wh-elements.

(7) … X … Z … <Y> …
quale ~~signore~~ il bambino <quale ~~signore~~>
[+Q; +NP] [+NP] [+Q; +NP]



Yet, however, children's performance on *quale*-sluices does not fully mirror that on *quale*+NP-sluices, being consistently lower in the former across both subject and object sluices. The fact that performance on *quale*-sluices remains lower even in subject sluices without intervention, where *chi* and *quale+NP* achieve comparable accuracy, suggests that the difficulty with *quale* extends beyond locality effects. Particularly insightful, in this respect, are the patterns reveled by the individual analysis and the distribution of errors. Crucially, the lexically restricted wh-element *quale+NP* seems to serve as a prerequisite for the acquisition of its elliptical counterpart, i.e. PF-bare *quale.* Additionally, the nature of errors in *quale*-sluices differs fundamentally from those observed in *quale+NP* and *chi*-sluices. Among younger children, difficulties with *quale*-sluices primarily involve failures in identifying the antecedent of the elided NP, whereas with the other two wh-types, errors mainly reflect incorrect referent selection. As children grow older, their errors with *quale*-sluices increasingly resemble those with *chi* and *quale+NP*.

We can thus conclude that *quale*-sluices differ from both *chi* and *quale+NP*-sluices. While the difference between *chi* and *quale* shows that not all bareness is alike, and therefore that fRM is a formal principle strictly operating in the syntax, we argue that the difference between *quale* and *quale+NP* may be due to an additional burden that NP ellipsis introduces in sluicing comprehension.

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