

al., 2016; Friedmann et al., 2009; Hu, 2018; Hyams, 2021; Samo & Merlo, 2021). It has been shown that these fully grammatical long-distance dependencies involving IE pose processing difficulty in children's sentence comprehension as well as production.

The subject-object asymmetry in children's acquisition of wh-argument questions in overt wh-movement languages has been widely studied (e.g., Avrutin, 2000, Ervin-Tripp, 1970, Tyack & Ingram, 1977, Stromswold, 1995, for English; De Vincenzi et al., 1999, Guasti et al., 2012, for Italian; Friedmann et al., 2009, for Hebrew; Metz et al., 2012, for Dutch; Stavrakaki, 2006, for Greek; Torrens, 2021, for Spanish). Some of these studies report that not all wh-argument questions show the identical pattern with regard to the subject-object asymmetry in children's acquisition. The asymmetry in wh-questions with a bare wh-element (e.g., *who*) differs from that in wh-questions with a lexically restricted wh-element (e.g., *which NP*) in subtle ways. For instance, in a character selection task that examined wh-argument questions as shown in (2)-(3), Friedmann et al. (2009) found that Hebrew-speaking children aged 3;7-4;10 showed a subject advantage in the comprehension of *which*-questions (*which*-subject vs. *which*-object: 75% vs. 58%). However, the subject-object asymmetry wasn't observed in the comprehension of *who*-questions (*who*-subject vs. *who*-object: 81% vs. 78%).¹

- (2) a. *which* subject-question: Which dog ____ bites the cat?
 b. *which* object-question: Which dog does the cat bite ____?
- (3) a. *who* subject-question: Who ____ bites the cat?
 b. *who* object-question: Who does the cat bite ____?

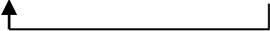
This contrast between *which*-questions and *who*-questions raises a challenge for the traditional account in terms of the movement distance of wh-words or the length of dependency between the moved wh-word and its gap or trace (e.g., De Vincenzi, 1991; O'Grady, 1996), according to which the greater the distance, the more difficult the resulting sentence. The traditional account would predict that children should have more difficulty in acquiring object wh-questions than subject wh-questions for all types of wh-argument questions. However, this prediction isn't in line with the above-mentioned experimental results, where there is a subject-object asymmetry in *which*-questions, but not in *who*-questions.

Different from the traditional account of the asymmetry, Friedmann et al. (2009) proposed that, in addition to the quantificational features, the argumental features (e.g., [+NP] feature) are also expected to play a role in modulating IE for syntactic computations, which has offered a new promising way to capture certain comprehension difficulties in *which* object-questions. The lexically

¹ Wh-argument questions in Hebrew have a similar syntactic operation to their English counterparts that fronts wh-words to the sentence-initial position. For the sake of convenience, we use English examples for illustration.

restricted *which*-phrase bears a [+NP] feature, while the bare *who* doesn't. Thus, the wh-questions in (2)-(3) have syntactic representations as given in (4)-(5):

(4) a. *which* subject-question: **Which dog** ____ bites the cat?
[+Q, +NP]

b. *which* object-question: **Which dog** does the cat bite ____?
[+Q, +NP] [+NP]


(5) a. *who* subject-question: **Who** ____ bites the cat?
[+Q]

b. *who* object-question: **Who** does the cat bite ____?
[+Q] [+NP]


In *which* object-questions like (4b), the object *which*-phrase moves across the intervening subject *the cat* sharing the same [+NP] feature, in which case IE is expected to arise. By contrast, in *who* object-questions like (5b), the intervening subject *the cat* does not have any feature in common with the bare *who*. Although the object bare *who* moves across the subject, no IE is predicted to emerge. In *which* subject-questions like (4a) and *who* subject-questions like (5a), no element intervenes between the wh-element and its gap, and thus no IE is triggered. In terms of the [NP]-induced IE, the fact that the subject-object asymmetry is observed in the comprehension of *which*-questions, but not in the comprehension of *who*-questions is now adequately accounted for.

Mandarin Chinese is a wh-in-situ language, and wh-questions have the same SVO word order as the declarative counterparts. Specifically, the wh-element remains in its canonical argument position rather than moves to the edge of the clause for object wh-questions, as illustrated in *shui* 'who'-questions like (6a) and (6b):

(6) a. *shui* 'who' subject-question: shui zai tui xiao-yang ne?
who ASP push little-sheep SFP
'Who is pushing the little sheep?'

b. *shui* 'who' object-question: xiao-yang zai tui shui ne?
little-sheep ASP push who SFP
'Who is the little sheep pushing?'

Furthermore, we also note that Mandarin Chinese, different from other wh-in-situ languages like Korean and Japanese, lacks morphological case markers (e.g., nominative case, accusative case) which may be at play in syntactic

computations.² Considering wh-argument questions from a cross-linguistic perspective, then the natural question to ask is whether there is a subject-object asymmetry in Chinese-speaking children's acquisition.

Earlier observational and experimental studies on wh-argument questions in Chinese (e.g., Mandarin, Cantonese) have reported mixed results, some arguing for a subject advantage, some for an object preference, and others for no subject-object asymmetry. Lee (1989) analyzed the longitudinal speech data from a Mandarin-speaking child aged 1;7-2;9, and found that the first use of *shui* 'who' subject-questions (2;8;1) and *shui* 'who' object-questions (2;8;0) occurred almost simultaneously, suggesting that there is no subject-object asymmetry in the acquisition of *who*-questions. However, in a recent study that analyzed the spontaneous production of three Mandarin-speaking children aged 1;3-3;3, Guo (2016) reported different results. Regarding *shui* 'who'-questions, two of the children first produced subject-questions (*who*-subject vs. *who*-object: child 1, 2;6;15 vs. 2;9;9; child 2, 2;0;7 vs. 2;0;14), whereas another one first uttered object-questions (*who*-subject vs. *who*-object: 2;1;13 vs. 1;9;15). Regarding *na-yi-ge* 'which one'-questions, object-questions emerged earlier than subject-questions in children's spontaneous utterances (*which*-subject vs. *which*-object: child 1, 2;2;4 vs. 2;0;3; child 2, 2;5;24 vs. 2;5;5; child 3, 2;9;29 vs. 2;6;22). Cheung and Lee (1993) tested children's comprehension of various types of wh-questions, including *shui* 'who' subject-questions and *shui* 'who' object-questions. In the task, 30 Cantonese-speaking children aged 2;6-5;0 were tested. They found that overall children had a tendency to better comprehend *shui* 'who' object-questions (90%) than *shui* 'who' subject-questions (76%). Fahn (2003) conducted an elicited production task using pictures and questions to elicit *na-yi-ge* 'which one'-questions from 43 Mandarin-speaking children aged 4;6-6;0 (e.g., *A pig is pulling the car. The puppet knows which one. Could you ask him?*). The results showed that the children performed quite well on *na-yi-ge* 'which one' subject-questions (97%), but poorly on *na-yi-ge* 'which one' object-questions (60%).

While previous acquisition studies have provided basic information about Chinese-speaking children's comprehension and production of wh-questions, there is not yet a consensus concerning the subject-object asymmetry in Mandarin-speaking children's acquisition. The results obtained so far are difficult to compare and evaluate because they used different methodologies and experimental materials, involved children across different ages, and also presented limitations for some of experimental designs. For instance, the

² Note that no subject-object asymmetry in the acquisition of wh-questions has been found in Korean (e.g., Kim, 1995) and Japanese (e.g., Yoshinaga, 1996), but it is unclear whether morphological case markers attached to wh-arguments may be a contributing factor for children to assign theta-roles of wh-arguments, to overcome potential IE and to process wh-questions more easily. In overt wh-movement languages like Greek, case markers, being part of the computation of IE, have been taken into consideration to explain why children do not display a subject-object asymmetry in the comprehension of wh-argument questions (e.g., Guasti, 2016).

animacy feature on arguments in the scenario used to elicit wh-questions is not strictly controlled in Fahn (2003)'s experiment. In light of recent developments in theoretical analyses of wh-questions and other structures such as IE, our study further discusses this issue by probing into children's comprehension of two types of wh-argument questions, using a character selection task for a direct comparison with acquisition studies in overt wh-movement languages, which is reported in the following section.

2. Current research

The current study explores the subject-object asymmetry in Mandarin-speaking children's comprehension of wh-argument questions. To be specific, we are interested in how Mandarin-speaking children interpret wh-questions with a bare *shui* 'who' and wh-questions with a lexically restricted *na-yi-ge* 'which one'-phrase.

2.1. Participants

A total of 90 native Mandarin-speaking children aged 3;2-5;11 participated in the experiment, divided across three age groups: age 3 ($N = 30$, aged: 3;2-3;11, $M = 3;7$), age 4 ($N = 30$, aged: 4;0-4;11, $M = 4;7$) and age 5 ($N = 30$, aged: 5;0-5;11, $M = 5;6$). All children were recruited from Penghui Kindergarten and Xingfu Kindergarten in Dalian, Liaoning, China. They were typically developing children without language impairment or hearing deficits. In addition, 30 adults were also tested as controls.

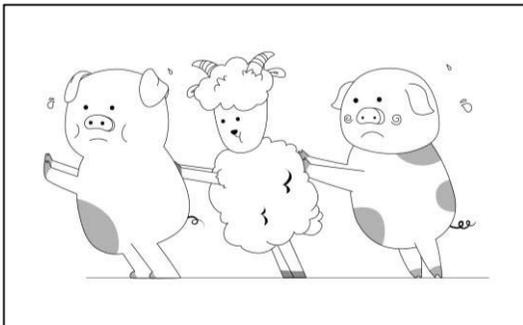
2.2. Materials and procedure

The experiment had 40 wh-questions, divided across a two-by-two design with [\pm NP] Feature on wh-words (*shui* 'who'_[-NP], *na-yi-ge* 'which one'_[+NP]) and Syntactic Position of wh-words (subject, object) as independent factors, with 10 sentences in each of the four conditions. The test sentences used animal names (e.g., *gou* 'dog', *yang* 'sheep', *mao* 'cat', *xiong* 'bear', *niu* 'cow', *houzi* 'monkey', *tuzi* 'rabbit', *xiang* 'elephant', *laohu* 'tiger', *shizi* 'lion', *lu* 'deer', *laoshu* 'mouse', *qingwa* 'frog', *ciwei* 'hedgehog', *yazi* 'duck', *zhu* 'pig'), and transitive verbs (e.g., *la* 'pull', *tui* 'push', *ti* 'kick', *yao* 'bite', *wei* 'feed', *da* 'hit') that are very familiar to young children. The test sentences also contained the progressive aspect marker *zai* and the interrogative force marker *ne*. All wh-questions were semantically reversible so that the sentence could not be understood on the basis of the meaning of words (e.g., animacy) or the world-knowledge. Four conditions and examples of test sentences involving the verb *tui* 'push' are shown in Table 1.

Table 1. Four conditions and examples of test sentences

Wh-word: [\pm NP]	Subj/ Obj	Examples of test sentences (<i>tui</i> ‘push’)
<i>shui</i> ‘who’: [-NP]	Subj	(7) shui zai tui xiao-yang ne? who ASP push little-sheep SFP ‘Who is pushing the little sheep?’
	Obj	(8) xiao-yang zai tui shui ne? little-sheep ASP push who SFP ‘Who is the little sheep pushing?’
<i>na-yi-ge</i> ‘which one’: [+NP]	Subj	(9) na-yi-ge xiaozhu zai tui xiao-yang ne? which-one-CL little-pig ASP push little-sheep SFP ‘Which little pig is pushing the little sheep?’
	Obj	(10) xiaoyang zai tui na-yi-ge xiaozhu ne? little-sheep ASP push which-one-CL little-pig SFP ‘Which little pig is the little sheep pushing?’

Children’s comprehension of wh-questions was assessed using a character-selection task modeled after De Vincenzi et al. (1999) and Friedmann et al. (2009). In the task, children were shown a picture with three characters and required to point to one character in the picture to match the wh-question asked by the experimenter. All pictures were black and white drawings. Figure 1 is the sample picture for wh-questions involving the verb *tui* ‘push’ in the experiment. As Figure 1 indicates, in the picture, two characters are of the same type (i.e., the two little pigs) with one acting as the agent and the other acting as the patient. The third character is a different animal (i.e., the little sheep).

**Figure 1. A sample of experiment pictures**

In addition, there were 15 fillers involving actional irreversible transitive verbs (e.g., *Who is riding a bike?*) or intransitive verbs (e.g., *Who is jumping?*). Two of them were used as practice trials to familiarize children with the experimental procedure. Others were interspersed with the test sentences in order to maintain children’s interest and ensure that they remained attentive through the task. Consequently, the entire experiment contained 55 sentences and lasted approximately 15 minutes.

The test sentences of four conditions and the fillers were presented to each participant in a pseudo-randomized order so that there were no more than two consecutive test sentences in the same condition. Besides, since each picture was presented 4 times through the entire experiment, there were no two consecutive pictures involving the same verb. Additionally, the target character did not appear in the same location in the picture for more than two consecutive sentences.

In the experiment, each of the participants was tested individually in a quiet room in their kindergarten. For each picture, the experimenter first introduced the three animals to the children, and then asked a *wh*-question prompting them to choose a matched character in the picture. No time constraint was imposed during testing, and no response-contingent feedback was given by the experimenter, only general encouragement. The experimenter repeated every sentence as many times as the participants requested. The participants were told that whenever they needed a break, they could stop or take a short break. They were rewarded after completing the task.

2.3. Predictions

Before presenting experimental predictions for Mandarin-speaking children's comprehension, we briefly review prior syntactic analyses of *wh*-questions in Chinese. According to Pesetsky (2000), the feature movement in covert syntax, like the overt feature movement in overt syntax, is also subject to IE. Huang (1982) proposed that *wh*-in-situ questions share the same kinds of interpretative strategies with *wh*-questions in overt *wh*-movement languages, and that the movement operation that constructs a non-local structural dependency between the *wh*-word and its scope position is applied at Logical Form (henceforth, LF) in covert syntax. If we assume that interpreting Chinese in-situ *wh*-questions involves the covert movement of *wh*-words and that the morpho-syntactic features of lexical items also play a role in the computation of covert syntactic dependencies, IE is expected to be at work.

Under these assumptions, we predict that children should have more difficulty in interpreting *na-yi-ge* 'which one' object-questions than other types of *wh*-argument questions. The syntactic representation of (10) in Table 1 is thus (11), after the covert movement at LF:

- (11) LF: **na-yi-ge xiao-zhu** xiao-yang zai tui ____ ne?
 [+Q, +NP] [+NP]
-

The object *na-yi-ge* 'which one'-phrase bearing a [+NP] feature covertly crosses over the intervening subject *xiaoyang* 'little sheep' bearing the same [+NP] feature. If so, we expect IE to be observed in the sentence.

Following the same logic, Table 2 presents the predictions of [NP]-induced IE and subject-object asymmetry in the four conditions, consistent with the

analyses of wh-questions in overt wh-movement languages like Hebrew. As we have seen, the occurrence of IE should be only observed in *na-yi-ge* ‘which one’ object-questions as (15). By contrast, in *shui* ‘who’ object-questions as (13), the bare wh-element *shui* ‘who’ does not carry a [+NP] feature. Although it covertly crosses over the subject bearing a [+NP] feature, no IE is predicted. In *shui* ‘who’ subject-questions as (12) and *na-yi-ge* ‘which one’ subject-questions as (14), no element intervenes between the wh-element and its scope position at LF, and thus no IE is expected to emerge. Based on these predictions, we further infer that the subject-object asymmetry would not be found in the comprehension of *shui* ‘who’-questions, but in the comprehension of *na-yi-ge* ‘which one’-questions.

Table 2. [NP]-induced IE and subject-object asymmetry in four conditions

Wh-word: [±NP]	Subj/ Obj	Examples of test sentences (<i>tui</i> ‘push’)	IE	Subj/ Obj Asymmetry
<i>shui</i> ‘who’: [-NP]	Subj	(12) shui zai tui xiao-yang ne? who ASP push little-sheep SFP ‘Who is pushing the little sheep?’	No	No
	Obj	(13) xiao-yang zai tui shui ne? little-sheep ASP push who SFP ‘Who is the little sheep pushing?’	No	
<i>na-yi-ge</i> ‘which one’: [+NP]	Subj	(14) na-yi-ge xiaozhu zai tui xiao-yang which-one-CL little-pig ASP push little-sheep ne? SFP ‘Which little pig is pushing the little sheep?’	No	Yes
	Obj	(15) xiaoyang zai tui na-yige xiaozhu little-sheep ASP push which-one-CL little-pig ne? SFP ‘Which little pig is the little sheep pushing?’	Yes	

2.4. Results

The dependent variable in our character selection task was the proportion of accurate responses, namely the accuracy in identifying the correct character out of 2 possible options in the picture. When participants did not choose the correct one, the answer was coded as an error.

Our overall results are given in Figure 2. The error bars in the figure represent standard errors by subject means. The horizontal dotted line indicates the chance level (50%). This plot shows that the group level performance was notably above chance and even the youngest children in our study easily understood wh-questions, obtaining over 80% correct answers in all conditions.

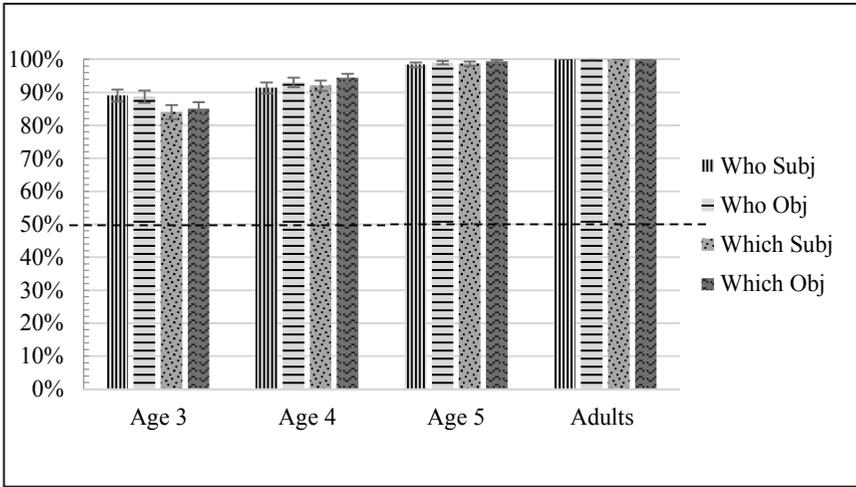


Figure 2. Percentages of correct responses in each group

We further fitted children's data to a generalized linear mixed-effect model which is well suited for the analysis of discrete variables (being either correct or incorrect), with Syntactic Position of wh-words (i.e., subject, object), [\pm NP] Feature on wh-words (i.e., *shui* 'who' [$_{-NP}$], *na-yi-ge* 'which one' [$_{+NP}$]) and Age Group (i.e., age 3, age 4 and age 5) as fixed factors and subjects and items as random factors, using the *lme4* software package in the R environment (Bates et al., 2015; R Core Team, 2021). We found no main effect of Syntactic Position ($\beta = -0.197$, $SE = 0.325$, $z = 0.605$, $p = 0.545$) and [\pm NP] Feature ($\beta = -0.112$, $SE = 0.324$, $z = -0.344$, $p = 0.731$). A significant main effect of Age Group in children's responses was attested, showing that the accuracy rate of three-year-olds was significantly lower than that of four-year-olds ($\beta = -0.776$, $SE = 0.263$, $z = -2.950$, $p < .01$), and the accuracy rate of five-year-olds was significantly higher than that of four-year-olds ($\beta = 1.995$, $SE = 0.375$, $z = 5.319$, $p < .001$). In addition, no interactions were statistically significant to increase the modal fit.

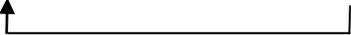
3. Discussion and conclusions

The experimental findings demonstrate that although Mandarin-speaking children become progressively better with age, they display good comprehension of wh-argument questions including *shui* 'who'- and *na-yi-ge* 'which one'-questions by age 3, therefore suggesting that they have possessed the relevant grammatical knowledge of wh-argument questions.

In addition, unlike previous findings on children's comprehension in overt wh-movement languages, our findings reveal that there is no subject-object asymmetry for either *shui* 'who'-questions or *na-yi-ge* 'which one'-questions in Mandarin Chinese. The results that are inconsistent with our predictions

presented above indicate the absence of [+NP]-induced IE in Mandarin-speaking children's computation of wh-argument questions. Three possible explanations for these results are offered as follows.

One possible explanation is that interpreting in-situ wh-argument questions in Chinese may not involve the covert movement of the [+NP] feature on wh-words, and therefore IE is not triggered. Some previous studies (e.g., Soh, 2005; Tsai, 2008; Yang, 2012) suggest that wh-adjuncts undergo feature movement covertly while wh-arguments do not. One piece of strong evidence is that wh-adjuncts are subject to IE induced by the quantificational feature [+Q], but wh-arguments are not. Compare sentences in (16a) and (16b) (examples from Yang, 2012):

- (16) a. * mei-ge-ren dou **weishenme** cizhi?
 every-CL-person all why resign
 'Why did everyone resign?'
LF: weishenme mei-ge-ren dou ____ cizhi?
 [+Q] [+Q, +N]
- 
- b. mei-ge-ren dou mai-le **shenme**?
 every-CL-person all buy-ASP what
 'What did everyone buy?'

The ungrammaticality of (16a) may be due to the occurrence of IE: the wh-adjunct *weishenme* 'why' bearing a quantificational feature [+Q] covertly crosses the intervening subject *mei-ge-ren* 'everyone' bearing the same [+Q] feature. In contrast, (16b) is grammatical, and no IE arises. This means that the [+Q] feature on the wh-argument *shenme* 'what' doesn't move across the subject *mei-ge-ren* 'everyone' bearing the same [+Q] feature in covert syntax. Along the same line, we may expect that the [+NP] feature on wh-arguments, like the [+Q] feature on wh-arguments, doesn't undergo the covert movement at LF. As a result of this mechanism, [+NP]-induced IE is not applicable.

Another possibility is that LF is not sensitive to IE induced by the covert movement of [+NP] feature on wh-arguments, and thus there might be a weaker IE at LF, or even no IE. Rizzi (1997, 2004, 2018) suggests distinguishing two types of features that would play a different role in syntactic computations. The criterial feature is able to trigger movement on its own (e.g., [+Q], [+Rel], [+Top], [+Foc]), while the non-criterial feature does not trigger movement autonomously and contributes to the identification of the landing site of movement only if accompanied by a criterial feature. In his view, the [+NP] feature belongs to the non-criterial feature. These two types of features would determine the strength of IE. The criterial feature is supposed to generate stronger IE than the non-criterial feature. Following this proposal, we infer that for the covert movement, the non-criterial feature, like the [+NP] feature, creates an even weaker IE, which may not be troublesome for 3-year-olds to overcome.

A third possibility is that Mandarin-speaking children may already have a stable state of grammatical knowledge of wh-argument questions by age 3. This is possible as evidence shows that children first begin to produce wh-argument questions from about 2 years of age (e.g., Guo, 2016; Lee, 1989; Li & Chen, 1997). A recent study by Xiao, Su and Naigles (2021) provides further evidence for this. They found that younger children in Mandarin aged 1;8-3;0 ($M = 2;8$, $N = 28$) did not show a subject-object asymmetry in the comprehension of *shenme* ‘what’-questions, using the intermodal preferential looking paradigm.

In conclusion, our study has provided an insight into the processing of wh-argument questions in Mandarin-speaking preschoolers: although children become progressively better as they get older, their comprehension does not exhibit a subject-object asymmetry in either *shui* ‘who’- or *na-yi-ge* ‘which one’-questions. Such a pattern indicates that the [+NP] feature on lexical items does lead to a weaker IE or even no IE at LF in syntactic computations of wh-argument questions, therefore explaining why children do not have more difficulty in processing *na-yi-ge* ‘which one’ object-questions. Further research is needed to reveal about whether the quantificational feature [+Q] gives rise to IE in children’s comprehension of wh-argument questions and wh-adjunct questions. Another line of potential research concerns whether infants younger than 1;8 exhibit the [+NP]-induced IE/subject-object asymmetry in the comprehension of wh-argument questions, including *shui* ‘who’-questions, *na-yi-ge* ‘which one’-questions and *shenme* ‘what’-questions.

References

- Aoun, Joseph, & Li, Yen-Hui Audrey. (1993). Wh-elements in situ: Syntax or LF. *Linguistic Inquiry*, 24(2), 199–238.
- Avrutin, Sergey. (2000). Comprehension of discourse-linked and non-discourse-linked questions by children and Broca’s aphasics. In Yosef, Grodzinsky, Lewis, P. Shapiro, & David, Swinney (Eds.), *Language and the brain: Representation and processing* (pp. 295–313). Academic Press.
- Bates, Douglas, Maechler, Martin, Bolker, Ben, & Walker, Steven. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48.
- Belletti, Adriana, Friedmann, Naama, Brunato, Dominique, & Rizzi, Luigi. (2012). Does gender make a difference? Comparing the effect of gender on children’s comprehension of relative clauses in Hebrew and Italian. *Lingua*, 122(10), 1053–1069.
- Belletti, Adriana, & Rizzi, Luigi. (2012). Intervention in grammar and processing. In Ivano, Caponigro, & Carlo, Cecchetto (Eds.), *From grammar to meaning* (pp. 294–311). Cambridge University Press.
- Bentea, Adriana, Durrleman, Stephanie, & Rizzi, Luigi. (2016). Refining intervention: The acquisition of featural relations in object A-bar dependencies. *Lingua*, 169(10), 21–41.
- Cheng, Lai-Shen Lisa. (1991). *On the typology of wh-questions*. Ph.D. dissertation, MIT.
- Cheung, Shuk-Yee Alice, & Lee, Hun-Tak Thomas. (1993). Cantonese-speaking children’s comprehension of wh-questions. In Eve V. Clark (Ed.), *The proceedings of the 25th annual child language research forum* (pp. 106–117). Center for the Study of Language and Information.

- De Vincez, Marica. (1991). *Syntactic parsing strategies in Italian: The minimal chain principle*. Kluwer Academic Publishers.
- De Vincenzi, Marica, Arduino, Lisa, Ciccarelli, Laura, & Job, Remo. (1999). Parsing strategies in children comprehension of interrogative sentences. In S. Bagnara (Ed.), *Proceedings of the European conference on cognitive science* (pp. 301–308). Istituto di Psicologia del CNR.
- Ervin-Tripp, Susan. (1970). Discourse agreement: How children answer questions. In J. Hayes (Ed.), *Cognition and the development of language* (pp. 79–107). Wiley.
- Fahn, Rueih-Lirng Sharon. (2003). Chinese-speaking children's production of wh-Questions. *Concentric Studies in English Literature and Linguistics*, 29(2), 82–117.
- Friedmann, Naama, Belletti, Adriana, & Rizzi, Luigi. (2009). Relativized relatives: Types of intervention in the acquisition of A-bar dependencies. *Lingua*, 119(1), 67–88.
- Friedmann, Naama, Belletti, Adriana, & Rizzi, Luigi. (2021). Growing trees: The acquisition of the left periphery. *Glossa: A Journal of General Linguistics*, 6(1).
- Grillo, Nino. (2008). *Generalized minimality: Syntactic underspecification in Broca's aphasia*. Ph.D. dissertation, University of Utrecht.
- Guasti, Maria Teresa. (2016). *Language acquisition: The growth of grammar* (2nd ed.). MIT.
- Guasti, Maria Teresa, Branchini, Chiara, & Arosio, Fabrizio. (2012). Interference in the production of Italian subject and object wh-questions. *Applied Psycholinguistics*, 33(1), 185–223.
- Guo, Xiuli. (2016). *Hanyu ertong zaoqi yiwennu huode yanjiu* [Investigation of Mandarin-speaking children's early acquisition of interrogative-questions]. Ph.D. dissertation, Chinese Academy of Social Sciences.
- Hanna, Ken, & Wilhelm, Andrea. (1992). On the acquisition of wh-questions. *Calgary Working Papers in Linguistics*, 15(Fall), 89–98.
- Hu, Jianhu. (2019). *Prominence and locality in grammar: The syntax and semantics of wh-questions and reflexives*. Routledge.
- Hu, Shenai, Guasti, Maria Teresa, & Gavarró, Anna. (2018). Chinese children's knowledge of topicalization: Experimental evidence from a comprehension study. *Journal of Psycholinguistic Research*, 47(6), 1279–1300.
- Hua, Dongfan. (2018). *On WH quantification*. The Commercial Press.
- Huang, Cheng-Teh James. (1982). *Logical relations in Chinese and the theory of grammar*. Ph.D. dissertation, MIT.
- Hyams, Nina. (2021). Children's sluices: Intervention and evasion. Talk presented at the Conference on Generative Approaches to Language Acquisition (GALANA-9), University of Iceland.
- Kim, Seongchan. (1995). *The acquisition of wh-questions in English and Korean*. Ph.D. dissertation, University of Hawaii.
- Lee, Hun-Tak Thomas. (1989). Development of a Mandarin-speaking child's comprehension of wh-questions. *Cahiers de Linguistique Asie Orientale*, 18(1), 29–62.
- Li, Yuming, & Chen, Qianrui. (1997). Ertong wenju xitong lijie yu fasheng zhi bijiao [Investigating Mandarin-speaking children's comprehension and production of question systems]. *Shijie Hanyu Jiaoxue* [Chinese Teaching in the World], 4, 90–98.
- Metz, Marijke, van Hout, Angeliek, & van der Lely, Heather. (2012). Subject interpretation of object questions by Dutch 5-year-olds: The role of number agreement in comprehension. *Linguistics in the Netherlands*, 29(1), 97–110.
- O'Grady, William. (1996). *Syntactic development: The acquisition of English*. The University of Chicago Press.
- Pesetsky, David. (2000). *Phrasal movement and its kin*. MIT Press.

- R Core Team (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria.
- Rizzi, Luigi. (1990). *Relativized minimality*. MIT.
- Rizzi, Luigi. (1997). The fine structure of the left periphery. In Liliane, Haegeman (Ed.), *Elements of Grammar* (pp. 281–337). Kluwer Academic Publishers.
- Rizzi, Luigi. (2004). Locality and the left periphery. In Adriana, Belletti (Ed.), *Structures and beyond: The cartography of syntactic structures vol.3* (pp. 223–251). Oxford University Press.
- Rizzi, Luigi. (2013). Locality. *Lingua*, 130(1), 169–186.
- Rizzi, Luigi. (2018). Intervention effects in grammar and language acquisition. *Probus*, 30(2), 339–367.
- Samo, Giuseppe, & Merlo, Paola. (2021). Intervention effects in clefts: A study in quantitative computational syntax. *Glossa: A journal of general linguistics* 6(1).
- Soh, Hooi Ling. (2005). Wh-in-situ in Mandarin Chinese. *Linguistic Inquiry*, 36(1), 143–155.
- Starke, Michal. (2001). *Move dissolves into merge: A theory of locality*. Ph.D. dissertation, University of Geneva.
- Stavarakaki, Stavroula. (2006). Developmental perspectives on Specific Language Impairment: Evidence from the production of wh-questions by Greek SLI children over time. *Advances in Speech Language Pathology*, 8(4), 384–396.
- Stromswold, Karin. (1995). The acquisition of subject and object wh-questions. *Language Acquisition*, 4(1&2), 5–48.
- Szabolcsi, Anna. (2005). Strong vs. weak islands. In Martin, Everaert, & Henk C. Van Riemsdijk (Eds.), *The Blackwell companion to syntax, vol.1* (pp. 479–531). Wiley-Blackwell.
- Torrens, Vincent. (2021). Wh-movement in the acquisition of Spanish as a first language. Poster presented at the Conference on Generative Approaches to Language Acquisition (GALANA-9), University of Iceland.
- Tsai, Wei-Tien Dylan. (1994). *On economizing the theory of A-bar dependencies*. Ph.D. dissertation, MIT.
- Tyack, Dorothy, & Ingram, David. (1977). Children's production and comprehension of questions. *Journal of Child Language*, 4(2), 211–224.
- Xiao, Jie, Su, Yi, & Naigles, Letitia R. (2021). Comprehension of wh-questions in Mandarin-exposed preschool children with autism spectrum disorders: Evidence from intermodal preferential looking. Talk presented at the Congress of the International Association for the Study of Child Language (IASCL-15), Philadelphia.
- Yang, Chung-Yu Barry. (2012). Intervention effects and wh-construals. *Journal of East Asian Linguist*, 21(1), 43–87.
- Yoshinaga, Naoko. (1996). *Wh-questions: A comparative study of their form and acquisition in English and Japanese*. Ph.D. dissertation, University of Hawaii.

Proceedings of the 46th annual Boston University Conference on Language Development

edited by Ying Gong
and Felix Kpogo

Cascadilla Press Somerville, MA 2022

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ISSN 1080-692X
ISBN 978-1-57473-077-7 (2 volume set, paperback)

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