

Summary We present an experiment testing Mandarin-speaking six-year-olds' understanding of exhaustive inference (the reading that “No one else was late” in *Only Sue was late*, henceforth **EI**) in **pseudo-cleft sentence (PC)**, e.g. *Chidao de (ren) shi Sue* “The one who was late is Sue”) as compared to **plain focus sentence (PF)**, e.g. [*Sue*]_F *chidaole* “Sue was late” in answer to “who was late”) and restrictive particle **zhiyou “only” sentence (ZY)**, *Zhiyou Sue chidaole* “Only Sue was late”). By using a Truth-Value Judgment Task, we found that (i) overall, six-year-olds pattern like adults when interpreting EI across the three types of sentences, (ii) a small number of six-year-olds have trouble identifying the right focused element with ZY as well as PC, and (iii) participants are more sensitive to EI in ZY than PC, and more sensitive to EI in PC than PF. These findings suggest that marking focus with a structure like PC does not make the job of focus assignment easier for children. Also, our results shed light on the nature of PC's EI in adult grammar: participants' different levels of sensitivity to EI in these three constructions are in favor of an analysis that does not allocate PC's EI to assertion like ZY or to conversational implicature like PF.

Background One recurring pattern in the acquisition of restrictive particle is that children assign the same meaning to pre-subject *only*-sentences (*Only Sue ate an apple*) and pre-verbal *only*-sentences (*Sue only ate an apple*, referred to as “VP scope reading” in Crain et al. 1994; similar results are found in Yang 2002, Notley et al. 2009, Zhou and Crain 2010, Müller et al. 2010). According to Zhou and Crain (2010, henceforth Z&C), children's non-adult VP-scope interpretation is not due to their lack of EI (contra Paterson et al. 2003), but because they initially analyze focus operators *zhiyou* “only” as adverbs taking a sentential scope. It would then be interesting to know if PC, which involves structural focus, would still be interpreted in the same way by children.

As shown in (1), although both ZY and PC focus on “Sue”, one mark the focus in object position (1a), one in subject (1b). In PC the focused element is marked by structure *de...shi* as in (1a), instead of associating focus with a particle like *zhiyou* (1b) (Lee 2005, see Liu 2015 for a recent review). Since the two structures mark focus with two syntactic devices, though children may assign VP scope reading (2b) to *zhiyou*, they may not associate this reading with PC. This study then sets out to investigate children's acquisition pattern of EI in PC.

- (1) a. Chi pingguo de (ren) shi [Sue]_F
 eat apple DE-particle (person) is Sue
 “The one who ate an apple is Sue.”
 b. *Zhiyou* [Sue]_F *chi (de) pingguo*
 Only Sue eat DE apple
 “Only Sue ate an apple”
- (2) a. EI: Beside Sue, nobody ate an apple.
 b. non-adult VP scope reading: Beside an apple, Sue didn't eat anything else.”

Previously, the nature of EI in PC is less discussed. Scholars generally agree that the exhaustivity of exclusives is asserted (e.g. Horn 1969), while that of PF is conversationally derived (Onea & Beaver 2011), but little is known about which layer of meaning PC encodes EI. Therefore, we also wish this study could offer some empirical evidence regarding on the analysis of PC's EI in adult grammar.

Experiment Following Zhou and Crain (2010), we designed a Truth Value Judgment task (Crain & Thornton 1998) testing the three types of constructions. In this task, participants first listened to a story acted out by the experimenter with toy characters and props. Following each story, a toy robot was asked a question about the story, and the participants' task was to judge whether the robot's answers is correct. To avoid potential interactions among constructions, we adopted a between-subject design such that each subject will be tested on one type of sentence only (Tab. 1). Two testing conditions presented as two types of stories were paired with each type of sentence: an exhaustive condition (EC, Z&C's “adult-true” condition), and a non-exhaustive condition (NC, Z&C's “adult-

false” condition). Each condition had four trials, yielding eight different testing items. **Exhaustive condition** (EC, Fig. 1): In a typical EC story like Fig.1, Monkey King moves a boulder and a house, while Piggy only moves a boulder. **Non-Exhaustive condition** (NC, Fig. 2): In a typical NC story like Fig.2, Little Blue first had a banana, and Little Gray had an apple. Little Blue wants another banana only to find that he is too stuffed, so Little Gray had another banana. Besides 8 testing sentences, each participant was also given eight control items and four practice items; only participants who passed eight of the twelve control/practice items were included in the analysis. As a result, 47 Mandarin-speaking children from Beijing (age: 6;08-7;06, mean 6;10, no age difference among groups) and 32 adults (age: 18-53, mean 32.8) entered the final count.

Tab. 1 Example testing sentence

ZY	<i>zhiyou</i> [sunwukong] _F banzoule xiaofangzi. "Only Monkey King moved the house."
PC	banzoule xiaofangzi <i>de shi</i> [sunwukong] _F . "The one moved the house is Monkey King."
PF	[Sunwukong] _F banzoule xiaofangzi. "Monkey King moved the house."



Fig. 1 The final presentation of toys in one of the EC stories (Z&C's adult-true condition); the PC variation of the testing sentence is *banzou xiaofangzi de shi sunwukong* "The one who moved the house is Monkey King."



Fig. 2 The final presentation of toys in one of the NC stories (Z&C's adult-false condition); the PC variation of the testing sentence is *chile xiangjiao de shi Xiaohui*. "The one who ate a banana is Little Gray."

Predictions If a participant has adult-like EI, they will accept the testing sentences in EC stories while reject them in NC; if he/she has non-adult EI, they will reject the sentence in both conditions; they will accept testing sentences in both conditions, if the testing sentence does not have exhaustive reading.

Results Fig. 3 displays the proportion of “yes” responses in different conditions. A statistically significant difference was found between EC/NC conditions ($B=-3.82$, $SE=0.3.96$, $p=0.000$) and between PC and the other two constructions (PC vs ZY: $B=-1.46$, $SE=0.40$, $p=0.000$; PC vs PF: $B=-2.448$, $SE=0.42$, $p=0.000$), while there is no statistically significant difference between adults and children ($p>0.05$), as revealed by a multinomial logistic regression. Then we categorized the participants into three groups:

“Subject focus” group, i.e. those who give over 50% “yes” response to EC and less than 50% “yes” response to NC; “VP focus” group that gives less than 50% “yes” response to both conditions, and “No EI” group that give over 50% “yes” response to both conditions. The proportion of participants in each group is shown in Fig.4. Overall, more subjects in ZY group than PC and PF group have EI reading. Additionally, children assign VP scope reading to both ZY and PC constructions: 3 children in ZY condition and 1 child in PC condition are found with this non-adult reading.

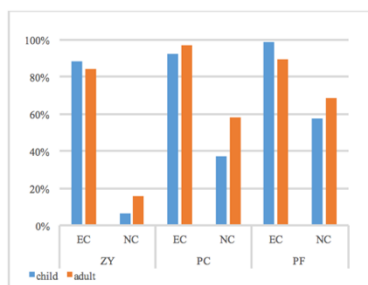


Fig.3 Proportion of "Yes" response across sentence types, condition types and age

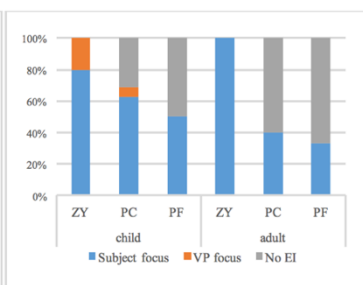


Fig. 4 Proportion of participants of three EI patterns across sentence types and age

Discussion Overall, we find that children assign VP-scope reading to both PC and ZY, demonstrating that structural focus also elicits this non-adult reading. As children and adults’ interpretation pattern of PC differs from both ZY and PF, our study poses challenge to an assertion or conversational implicature analysis to PC’s. As the next step, we will use different experimental methods assessing children’s non-at-issue EI to delineate the time course of acquisition.

Selected Reference: Zhou, Peng and Stephen Crain. 2010. “Focus identification in child Mandarin”, *Journal of child Language* 37(5): 965-1005.