Covert exhaustifier or not? Child language can help

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Introduction: Mandarin particle *dou* 'all' can license preverbal free choice items (FCIs), like *wh*-phrases and disjunction. For example, (1a) is a *wh*-question, while (1b), with *dou*, is a declarative statement with a universal FC (∀-FC) reading. (2a) has a plain disjunction reading, while (2b), with *dou*, has a ∀-FC reading. Xiang (2020) suggests the ∀-FC reading of both (1b) and (2b) is attributed to the semantics of *dou* (3).

The ∀-FC reading of disjunction is prohibited in an episodic context (4a) or with a universal modal (4b). This is the Modal Obviation effect. Thus, Xiang (2020) argues for a covert *O*-exhaustifier in 'disjunction + *dou'* (5). However, '*wh*-phrase + *dou'* sometimes (<u>*but not always*</u>) may appear in an episodic context (6). Therefore, Xiang (2020) does not discuss whether there is any *O*-exhaustifier for *wh*-phrases.

In this case, child language can contribute to the theoretical analysis. Since the ∀-FC reading of both '*wh*-phrase + *dou'* and 'disjunction + *dou'* is related to the semantics of *dou*, children in principle should acquire both constructions around the same time. However, if there is a covert *O*-exhaustifier in 'disjunction + *dou*' but not '*wh*-phrase + *dou'*, it is highly possible that children acquire the former later than the latter, because the extra *O*-exhaustifier in 'disjunction + *dou*' may complicate the learning process.

Some studies suggest that 4- and 5-year-old Mandarin-speaking children can get the ∀-FC reading of '*wh*-phrase + *dou*' (e.g., Huang et al. 2017; Zhou 2013). However, few studies have investigated children's interpretation of 'disjunction + *dou*'. This paper aims to fill the gap, by providing <u>*within-subject*</u> data on these two *dou*-constructions.

'Disjunction + *dou'* study: TVJ task was used in prediction mode (Crain & Thornton 1998). Two test constructions: 'disjunction + deontic modal' and 'disjunction + *dou* + deontic modal'. Two different contexts: one disjunct was true or both disjuncts were true. There were 4 items for each of the four conditions (7). 4 fillers were included.

<u>*Results*</u>: 17 Mandarin-speaking children (5-8;04, mean 6;11) and 10 adults were involved. Results are shown in (8). In 1-disjunct-true scenarios, adults *rejected* the *dou*-construction, while children frequently *accepted* it (70.6%). It suggests that children failed to derive the FC reading of 'disjunction + *dou'*.

'*Wh*-phrase + *dou'* study: Laptop-based Question-Statement task (Zhou & Crain 2011). The experimenter narrated a story, and Kermit made an utterance. The child judged whether Kermit had made a statement or asked a question. If it was a statement, the child need judge whether it was right or wrong. If it was a question, the child needed to answer it.

<u>*Materials*</u>: The test sentences include '*wh*-phrase + deontic modal' and '*wh*-phrase + *dou* + deontic modal' (see (1)). 4 items were created for each structure: 2 True, 2 False. 4 fillers were included.

<u>*Results*</u>: It involved the same participants as Experiment 1. Results are given in (9). Both adults and children could distinguish the question/statement difference and got the ∀-FC reading of '*wh*-phrase + *dou*' (100% and 95.59% respectively).

Conclusion: The results showed that Mandarin-speaking children could derive the ∀-FC reading of '*wh*-phrases + *dou'*, but not that of 'disjunction + *dou*'. The results provide support for the proposal that there is a covert *O*-exhaustifier in 'disjunction + *dou'* but not '*wh*-phrases + *dou'*. Under this proposal, it is unsurprising that children acquire the latter earlier than the former, because the former involves a covert *O*-exhaustifier. To sum up, the findings have contributed to our understanding of <u>*language development*</u> as well as the <u>*theoretical framework*</u>.

(1). a. Shei keyi jiao shuxue?
who can teach Math
'Who can teach Math?'

b. Shei dou keyi jiao shuxue.
who all can teach Math
'Everyone can teach Math.'

(2). a. Yuyu huozhe Lisi keyi jiao shuxue.
Yuyu or Lisi can teach Math
'Yuyu or Lisi can teach Math.'

b. Yuyu huozhe Lisi dou keyi jiao shuxue.
Yuyu or Lisi all can teach Math
'Both Yuyu and Lisi can teach Math.'

(3). $[[dou_C]] = \lambda p\, \lambda w$: $\exists q \in \mathrm{SUB}(p, C).\ p(w) = 1 \wedge \forall q \in \mathrm{SUB}(p, C)\ [O_C(q)(w) = 0]$
([[*dou*]] (*p*) is defined only if *p* has at least one sub-alternative; when defined, [[*dou*]] (*p*) is true if and only if *p* is true and the exhaustification of each sub-alternative of *p* is false.)

(4). a. *Yuyu huozhe Lisi dou jiao-le shuxue.
Yuyu or Lisi all teach-ASP Math
Int: 'Both Yuyu and Lisi taught Math.'

b.*Yuyu huozhe Lisi dou bixu jiao shuxue.
Yuyu or Lisi all must teach Math
Int: 'Both Yuyu and Lisi must teach Math.'

(5). John or Mary **dou** can teach Chinese.
a. LF: $\boldsymbol{dou_C}$ [S [John or Mary] λx can [$\boldsymbol{O_{C'}}$ [VP *x* teach Chinese]]]
b. $[[S]] = \Diamond O_{C'}\phi_j \vee \Diamond O_{C'}\phi_m$, where $\phi_x = x$ teach Intro Chinese
c. $[[\mathrm{dou_C}\ (S)]] = [\Diamond O_{C'}\phi_j \vee \Diamond O_{C'}\phi_m] \wedge \neg O_C \Diamond O_{C'}\phi_j \wedge \neg O_C \Diamond O_{C'}\phi_m$
$= \Diamond O_{C'}\phi_j \wedge \Diamond O_{C'}\phi_m$ (Adopted from Xiang 2020)

(6). Shei dou jiao-guo hanyu.
who all teach-EXP Chinese
'Everyone has taught Chinese.'

(7). The four conditions of 'disjunction + *dou'* study:

	One disjunct was true	Two disjuncts were true
'disjunction+ modal'	Condition 1	Condition 2
'disjunction + *dou* + modal'	**Condition 3 (Critical)**	Condition 4

(8). Acceptance rate of four conditions (Experiment 1):

	Condition 1	Condition 2	**Condition 3**	Condition 4
Children (n=17)	100%	100%	**70.6%**	100%
Adults (n=10)	100%	40%	**0%**	100%

(9). Accuracy of each construction (Experiment 2):

	'*wh*-phrase + modal'	**'*wh*-phrase + *dou* + modal'**
Children (n=17)	100%	**95.59%**
Adults (n=10)	100%	**100%**

Selected references: Huang, Haiquan, Zhou, Peng and Crain, Stephen. (2017). *Wh*-Questions, Universal Statements and Free Choice Inferences in Child Mandarin. *J Psycholinguist Res*. Xiang, Yimei. (2020). Function alternations of the Mandarin particle dou: Distributor, free choice licensor, and 'even'. *Journal of Semantics*.