Mandarin verb doubling clefts as contrastive topic constructions
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Introduction: Verb doubling clefts (VDCs) in Mandarin are associated with a sense of "incompleteness," "unresolvedness," or "uncertainty." For instance, (1) strongly infers there is a continuation, which could be a remark on certain aspect of the event denoted by the initial verb (e.g., 'but he didn't eat much') or speaker ignorance (e.g., 'but I don't know how much he ate'). By contrast, the non-VDC (2) resolves the question completely without additional inferences.

(1)   (Lisi chi le   ma?) Chi, Lisi shi chi le   …
        Lisi eat ASP Q   eat Lisi COP eat ASP
        '(Has Lisi eaten?) As for eating, Lisi has eaten…'

(2)   Lisi chi le.
        Lisi eat ASP
        'Lisi has eaten.'

Previous studies (Cheng & Vicente 2013, Zhong 2016, Yang & Wu 2017) have examined the syntactic nature of VDCs, but little is known regarding why VDCs are semantically "incomplete" and why they convey what Cheng & Vicente call "adversative implicatures." This paper proposes that VDCs are essentially a variant of *contrastive topic* (CT) constructions where the initial verb copy is a CT and the associated inference is an implicature that can be derived through the denotations of the CT and of the copular clause, together with pragmatic reasoning.

Contrastive topics: The English CT construction (3a) involves a fall-rise intonation on the F-marked phrase (*beans*) and conveys (3b). The latter has been claimed to be a conversational implicature (Krifka 1998, Büring 1997, 2003): given that the CT triggers the set of (sub)questions in (4) (Büring 1997, 2003), if the (well-informed) speaker only utters (3a), it must be that she is not aware whether anyone else ate the beans.

(3)   a. (What about the BEANS? Who ate THEM?) FRED$_{CT}$ ate the BEANS$_F$.
        b. $\rightsquigarrow$ At least someone other than Fred ate something other than beans.

(4)   {What did Fred eat?, What did Sue eat?, What did Mary eat?, … }

SOV in Mandarin: SOV sentences in Mandarin, e.g., (5), have been referred to as CT constructions (Paul 2006, Badan 2007, Tsai 2015). (5) is akin to (3a) in that the first clause clearly indicates an incompleteness if without a continuation. But unlike English, this pattern only obtains with overt object preposing, as (6) is not incomplete in the same way as (5). This establishes a strong connection between (5) and VDCs, the latter having been argued to involve overt (verb) movement as well (Cheng & Vicente 2013).

(5)   Wo Akiu taoyan # (Xiaodi bu taoyan).
        I   Akiu dislike   Xiaodi not dislike
        'I dislike Akiu #(but not Xiaodi).'

(6)   Wo taoyan Akiu.
        I   dislike Akiu
        'I dislike Akiu.'

Proposal: First, I argue that the initial verb copy in (1) is a CT, as in (7), which has the propositional content in (8).

(7)   [$_{CT}$ chi] [$_{copular\ clause}$ Lisi shi chi le]

(8) $[\![_{CT} \text{ chi}]\!] = \lambda w.$ Lisi ate in w

Second, and crucially, I propose that the function of the copular clause is to introduce the set of yes/no-question meanings in (9) (i.e., the *CT-value* of (1), à la Büring 2003), assuming a simple model where only two questions are relevant. This means (1) itself is a partial response to a complex discourse structure or "strategy" (Roberts 1996). This strategy includes a main question, e.g., *What did Lisi do?*, which embodies the two subquestions in (9).

(9) $[\![_{CT} \text{ chi}]^{ct}]\!] = \{\text{Did Lisi eat?}, \text{Did Lisi eat a lot?}\}$ CT-value of (1)

Since the speaker explicitly introduces a strategy but asserts only the CT, namely the response to the subquestion *Did Lisi eat?*, we are left with an unanswered subquestion (i.e., *Did Lisi eat a lot?*). The fact that the speaker has not resolved the entire set of subquestions that has been evoked explains why (1) sounds incomplete/unresolved. Moreover, given that the (cooperative)

speaker is aware of the strategy but only utters (1), we can deduce by Gricean reasoning that she is not certain about the answer *A* to the other subquestion, where *A* is not entailed by the CT. In other words, the CT conveys *exhaustivity* (van Rooij & Schulz 2017): With respect to the answers to all subquestions, the speaker is *only* certain about the CT.

Revision: The above account does not yet explain why only (1) introduces a CT-value but the non-VDC (2) does not. If there is no principled way of relating CT-interpretation exclusively to the VDC, we would predict that (2) may have the same meaning as (1), because the pragmatics-based analysis can also apply to (2) if the latter can trigger a CT-value as well. This problem is significant also because English CT constructions involve no overt V-movement, e.g., (3a). In addressing this problem, I propose the condition in (10) for Mandarin:

(10) In Mandarin, a CT-value (a set of questions) is generated if and only if overt movement occurs.

Thus, (1) differs from (2) in that only (1) activates a CT-value that must be factored into meaning. (10) also provides a semantic motivation for V-movement in VDCs if we take movement to reflect variable-binding by a λ-operator that yields a set expression (Heim & Kratzer 1998). For VDCs, this set is one of subquestions obtainable by substituting the (copied) verb in the yes/no-question created by the copular clause with values of the same type, i.e., (9). This process is similar to Büring's (2003: 519) *CT-value formation* for English, but while English identifies a CT construction with a special intonation, I argue that Mandarin does so with overt movement. Since movement is a syntactic phenomenon, we need a formal account to explain what drives it. I propose that the clausal structure of Mandarin contains a functional category F, which (i) is similar to English C or T in bearing an edge/EPP feature that triggers movement (Chomsky 2008) and (ii) carries an exhaustivity feature [*O*] (mnemonic for *only*) such that it agrees with and attracts an element bearing [*O*] to Spec-FP, as in (11). In semantics, a verb copy carrying [*O*] is interpreted as an exhaustive answer to one of the subquestions in a CT-value.

(11) [$_{FP}$ [$_{CT}$ chi$_{[O]}$] [$_{F'}$ F$_{[O]}$ [$_{copular\ clause}$ Lisi shi chi$_{[O]}$ le]]]

The same FP projects in (5) as well, where it is the object phrase that has [*O*] and the lower copy is not pronounced. Such agreeing mechanism involving focus features is reminiscent of Chierchia's (2013) theory in which a Probe-Goal relation is established by (nominal) polarity items and a covert exhaustivity operator at a c-commanding position. In Mandarin, the exhaustivity component is encoded by a formal feature (with semantic effects) on F, a clausal category.

Finally, this proposal can be extended to the other verb doubling construction discussed by Cheng & Vicente, namely the *lian…dou* focus construction (12). Although (12) also involves verb copying, it differs from (1) in not conveying the *only*-like exhaustivity and in the particle *dou*. I argue that *dou* can be uniformly treated as an allomorphic realization of F, which triggers movement and thus generates a CT-value as well. But unlike (1), the initial verb copy in (12) is *antiexhaustive* in that it implicates the asserted CT is more informative than the answers to all other subquestions. I implement this difference in terms of (13), where the CT agrees with *dou* via the focus feature [*E*] (for *even*). This analysis differs from other [*E*]-based accounts (Liao 2011, Liu 2017) in taking *dou* to activate a set of subquestions and the *lian*-focus to denote the most informative answer which entails all other answers to the subquestions.

(12) (Lian) kan ta dou bu kan.
      LIAN look he DOU not look
      'As for looking, he didn't even look.'

(13) [$_{FP}$ [$_{CT}$ (lian) kan$_{[E]}$] [$_{F'}$ [$_{F}$ dou$_{[E]}$] [ta bu kan$_{[E]}$]]]

Büring, D. 2003. On d-trees, beans, and B-accents. *L&P 26*. **Cheng**, L.-S. L. & L. **Vicente**. 2013. Verb doubling in Mandarin Chinese. *JEAL 22*. **Chierchia**, G. 2013. *Logic in grammar*. **Liu**, M. 2017. Varieties of alternatives. *L&P 40*. **Roberts**, C. 1996. Information structure in discourse: Towards an integrated formal theory of pragmatics. **van Rooij**, R. & K. **Schulz**. 2017. Topic, focus, and exhaustive interpretation.