Overview: We argue for a relational treatment of reciprocity and reciprocal scope in Mandarin, following Haug & Dalrymple (2020), over quantificational or operator-based approaches (Dalrymple et al., 1998; Heim et al., 1991). Mandarin has a wider range and distribution of reciprocals than English, including adverbial reciprocals that can appear in either the main or embedded clause of biclausal sentences. Examples (3-4) have both wide and narrow scope readings. The availability of a narrow-scope reading for example (4) is unexpected on an operator-based analysis without lowering. We show that Haug & Dalrymple’s approach to reciprocity in English extends unproblematically to Mandarin, including an account of scope ambiguity.

Data: Mandarin has two types of reciprocal expressions, pronominal reciprocals duìf¯ang/bˇıcˇı appearing in argument position (1), and adverbial reciprocal hùxi¯ang (2).

(1) Luómì¯ou Romeo and Zh¯ulìyè Juliet like {duìf¯ang/bˇıcˇı}.

(2) Luómì¯ou Romeo and Zh¯ulìyè Juliet hùxi¯ang huxiang like

In biclausal structures, adverbial reciprocals can appear in the matrix or embedded clause. If they appear in the matrix clause, the embedded clause must contain another (typically pronominal) reciprocal, as shown in (4). Previous work on reciprocal scope in Mandarin is scant, and reports contradictory judgements: while Ping (1996) briefly acknowledges the existence of scope ambiguities, Xu (2008) claims that only narrow scope readings are available (though without providing any examples), and Kobayashi (2020) claims that wide scope readings are available only for pronominal reciprocals. Speakers we consulted thought both narrow and wide scope readings are possible for both (3–4) (the latter being more salient if the subordinate predicate produces a contradiction as with dˇabài ‘defeat’), although some speakers disprefer the co-occurrence of a reciprocal in the higher clause and one in the lower clause. According to the narrow scope reading, Romeo thinks: We like each other, and Juliet thinks the same; according to the wide scope reading, Romeo thinks that he likes Juliet, and Juliet thinks that she likes Romeo, but neither of them has a belief involving mutual liking.

(3) Luómì¯ou Romeo and Zh¯ulìyè Juliet rènwéi t¯amen think they hùxi¯ang like huxiang xǐhuān (duìf¯ang/bˇıcˇı).

(4) Luómì¯ou Romeo and Zh¯ulìyè Juliet hùxi¯ang huxiang rènwéi t¯amen think they like like xǐhuān (duìf¯ang/bˇıcˇı).

Our analysis of reciprocal scope ambiguity in Mandarin extends Haug & Dalrymple’s (2020) analysis of reciprocity in a Partial Plural Compositional DRT setting, predicting the attested scoping possibilities without requiring additional assumptions or
machinery, or an operation lowering the main-clause reciprocal to the subordinate clause. As shown in (5), the reciprocal behaves like a plural anaphor in requiring cumulative identity between the reciprocal and its antecedent across information states (the arrow represents coreference: \( \cup u_2 \rightarrow \cup u_1 \)), while also imposing a noncoreference requirement within each information state (\( \partial(u_1 \neq u_2) \), using Beaver’s (1992) presupposition operator \( \partial \)).

(5) DRS for (1) and (2)
\[
[u_1 \ u_2 \ \cup u_1 = \{Romeo, Juliet\}, \cup u_2 \rightarrow \cup u_1, \ \partial(u_2 \neq u_1), \ \text{like}(u_1, u_2) ]
\]

(6) shows the narrow scope reading of (3): \( u_1 \) ranges over the individuals Romeo and Juliet in each information state, and each of Romeo and Juliet bears the think relation to some set of belief worlds in which there are two individuals, \( u_2 \) and \( u_3 \); \( u_2 \) ranges over the same individuals as \( u_1 \), namely Romeo and Juliet; \( u_3 \) ranges over the same individuals as \( u_2 \); in each information state, \( u_3 \) is different from \( u_2 \), and \( u_2 \) likes \( u_3 \).

(6) Narrow scope reading of (3)
\[
[u_1 \ \cup u_1 = \{Romeo, Juliet\},
\begin{align*}
\text{think}(u_1, \ [u_2 \ u_3 \ \cup u_2 \rightarrow \cup u_1, \ \cup u_3 \rightarrow \cup u_2, \ \partial(u_3 \neq u_2), \ \text{like}(u_2, u_3) ])
\end{align*}
\]

The corresponding wide scope reading of (3) is obtained by lifting the reciprocal meaning to the main clause, as for the corresponding English wide-scope examples (Haug & Dalrymple, 2020). In (7), \( u_1 \) ranges over the individuals Romeo and Juliet in each information state; in each information state, \( u_2 \) is coreferent with \( u_1 \); \( u_3 \) ranges over the same individuals as \( u_2 \); in each information state, \( u_3 \) is noncoreferent with \( u_2 \); in each information state, \( u_1 \) has a belief that \( u_2 \) likes \( u_3 \). Since \( u_2 \) is coreferent with \( u_1 \) in each information state, this means that \( u_1 \) has this belief about him/herself. (Similarly, lifting the reciprocal meaning in (4) gives the wide scope reading.)

(7) Wide scope reading of (3) and (4)
\[
[u_1 \ u_2 \ u_3 \ \cup u_1 = \{Romeo, Juliet\}, \ u_2 \rightarrow u_1, \ \cup u_3 \rightarrow \cup u_2, \ \partial(u_3 \neq u_2), \ \text{like}(u_2, u_3) ]
\]

In (8), the reciprocal material contributed by the pronominal reciprocal in the lower DRS effectively gives rise to a narrow scope reading (modulo intensionality).

(8) “Narrow” scope reading of (4)
\[
[u_1 \ u_2 \ u_3 \ \cup u_1 = \{Romeo, Juliet\}, \ \cup u_2 \rightarrow \cup u_1, \ \cup u_3 \rightarrow \cup u_2, \ \partial(u_3 \neq u_2), \ \text{like}(u_2, u_3) ]
\]

The duplication of coreference and noncoreference requirements in both DRS crucially does not give rise to a wide scope reading; \( \cup u_3 \rightarrow \cup u_2 \) in the lower DRS ensures that \( u_2 \) and \( u_3 \) ranges over the same individuals in each belief world, which means that \( u_2 \) denotes a plurality and cannot be bound by \( u_1 \), unlike in (7).

**Implications:** Mandarin is among a group of languages that has a strategy for the expression of reciprocity in the form of an adverbial, in contrast to the more well-studied languages like English, where reciprocity is expressed with a pronoun. The above discussion shows that the Partial Plural CDRT analysis within the relational view can similarly be successful in capturing reciprocal scope facts in a language with a different strategy for expressing reciprocity.

**References:**