

# Two Types of Reciprocals in Mandarin Chinese

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Workshop on Cross-Linguistic Semantics of Reciprocals

## Introduction

- Differences between two reciprocals in Mandarin Chinese are investigated: adverbial **huxiang** and argumental **bici**.
- **Proposal**: differences between **huxiang** and **bici** sentences are due to differences their source of distributivity.

## Two Reciprocals in Mandarin Chinese

- Mandarin Chinese has several strategies for expressing reciprocity (see Hoa et al. 2007 for an overview).
- I focus on only two of these strategies:

- (1) a. Tamen **huxiang** xihuan.      b. Tamen xihuan **bici**.  
 3PL    huxiang like                      3PL    like    bici  
 'They like each other.'                'They like each other.'

## Differences between **huxiang** and **bici**

- **Difference #1: Negative sentences.** Negative **huxiang** sentences are weaker than negative **bici** sentences:
 

(2)a. Zhangsan he Lisi meiyou **huxiang** tida.  
 Zhangsan and Lisi NEG    huxiang kick  
 $\neg \forall x \forall y [x, y \in \{z, l\} \wedge x \neq y \rightarrow \text{kick}(y)(x)]$

b. Zhangsan he Lisi meiyou tida **bici**.  
 Zhangsan and Lisi NEG    kick bici  
 $\neg \exists x \exists y [x, y \in \{z, l\} \wedge x \neq y \wedge \text{kick}(y)(x)]$   
 'Zhangsan and Lisi didn't kick each other'
- **Difference #2: Scopal Ambiguities.** Sentences with **bici** and a verbal classifier allow for an intermediate reading.
 

(3) **Context**: There are three people. Each kicked the other two people one time each.

a. Tamen **huxiang** tida-le yi-xia<sup>T</sup> / liang-xia<sup>F</sup> / liu-xia<sup>T</sup>.  
 3PL    huxiang kick-PFV one-CL two-CL    six-CL

b. Tamen tida-le **bici** yi-xia<sup>T</sup> / liang-xia<sup>T</sup> / liu-xia<sup>T</sup>.  
 3PL    kick-PFV bici one-CL two-CL    six-CL  
 'They kicked each other once / twice / six times.'

- **Difference #3: Wide Scope Readings.** Under an attitude verb, only **bici** shows Higginbotham's (1985) ambiguity.

- (4)a. Tamen xiangyao **huxiang** beipan.  
 3-PL    want    huxiang betray  
 'They want to betray each other'                      **NS: ✓, WS: \***
- b. Tamen xiangyao beipan **bici**.  
 3-PL    want    betray bici  
 'They want to betray each other'                      **NS: ✓, WS: ✓**

**Narrow Scope Reading NS**: 'Each wants reciprocal betrayal.'  
**Wide Scope Reading WS**: 'Each wants one-way betrayal.'

- **Difference #4: Only.** Only **bici** can be associated with 'only'.

- (5)a.\*Tamen zhi **huxiang**<sub>F</sub> xihuan.  
 they    only huxiang like
- b. Tamen zhi xihuan **bici**<sub>F</sub>.  
 they    only like    bici  
 'They only like [each other]<sub>F</sub>.'

## Proposal

- **Heim et al. (1991)**: Reciprocity is decomposed into two operations, distributivity and differentiation.

- (6)a. Dist :=  $\lambda x. \lambda P. \forall x' <_{AT} x [P(x)]$   
 b. Diff :=  $\lambda x. \lambda y. \lambda P. \exists z <_{AT} x [z \neq y \wedge P(z)]$

- **Huxiang** - performs both distributivity and differentiation.

(7)  $\| \text{huxiang} \| = \lambda R. \lambda x. \text{Dist}(x)(\lambda y. \text{Diff}(x)(y)(\lambda z. R(z)(y)))$

- (8)a. Zhangsan&Lisi [ huxiang  $\lambda_x \lambda_y \exists_e [x \text{ likes}(e) y]$  ]  
 b.  $\forall x <_{AT} z+I \exists y <_{AT} z+I [y \neq x \wedge \exists e [ \text{like}(e)(y)(x) ]]$

- **Bici** - only performs differentiation, distributivity is due to the covert distributivity operator **D**.

(9)  $\| \text{bici} \| = \text{Diff}$

- (10)a. Zhangsan&Lisi  $\lambda_z [ \mathbf{D}(z) \lambda_x [ \text{bici}(z)(x) \lambda_y \exists_e [x \text{ likes}(e) y] ] ]$   
 b.  $\forall x <_{AT} z+I \exists y <_{AT} z+I [y \neq x \wedge \exists e [ \text{like}(e)(y)(x) ]]$

## Accounting for the differences

- **Difference #1**: The stronger meaning of sentences with negated **bici** is due to the homogeneity presuppositions of **D**:

(11)  $\| \mathbf{D} \| = \lambda x. \lambda P : \text{Dist}(x)(P) \vee \text{Dist}(x)(\neg P). \text{Dist}(x)(P)$

(12) a. **Assertion of (2a) and (2b)**

$\neg \forall x <_{AT} z+I \exists y <_{AT} z+I [y \neq x \wedge \exists e [ \text{like}(e)(y)(x) ]]$

b. **Presupposition of (2b)**

$\forall x <_{AT} z+I \exists y <_{AT} z+I [y \neq x \wedge \exists e [ \text{like}(e)(y)(x) ]] \vee$   
 $\forall x <_{AT} z+I \neg \exists y <_{AT} z+I [y \neq x \wedge \exists e [ \text{like}(e)(y)(x) ]]$

- The syntax of **bici** sentences allows other items to take scope between Dist and Diff.

(13) **Difference #2**: Dist  $\gg$  twice  $\gg$  Diff

- a.  $\text{they}_1 \lambda_z [ \mathbf{D}(z) \lambda_x [ \text{bici}(z)(x) \lambda_y 2_e [x \text{ likes}(e) y] ] ]$   
 b.  $\forall x <_{AT} g_1 [ | \{ e : \exists y <_{AT} g_1 [y \neq x \wedge \text{kick}(e)(y)(x) ] \} | = 2 ]$

(14) **Difference #3**: Dist  $\gg$  want  $\gg$  Diff

- a.  $\text{they}_1 \lambda_z [ \mathbf{D}(z) \lambda_x [x \text{ wants } x \text{ bici}(z)(x) \lambda_y \exists_e [x \text{ betray}(e) y] ] ]$   
 b.  $\forall x <_{AT} g_1 [ \text{want}(\exists y <_{AT} g_1 [y \neq x \wedge \exists e [ \text{betray}(e)(y)(x) ] ])(x) ]$

(15) **Difference #4**: Dist  $\gg$  only  $\gg$  Diff

- a.  $\| \text{only} \| = \lambda P. \lambda Q. Q \subseteq P$   
 b.  $\text{they}_1 \lambda_z [ \mathbf{D}(z) \lambda_x [ [ \text{only BE}(\text{bici}(x)(z)) ] \lambda_y \exists_e [x \text{ likes } y] ] ]$   
 c.  $\forall x <_{AT} g_1 [ \{ y : \exists e [ \text{like}(e)(y)(x) ] \} \subseteq \{ y : y <_{AT} g_1 \wedge y \neq x \} ]$

## Conclusion

- Argued for a dimension in which reciprocal constructions might diverge: the source of distributivity.
- Further research will attempt to see whether the tests above can be applied to other languages and lead to similar results.

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