The interpretation of Mandarin Bare Numeral Phrases

some thoughts and questions

Zeqi Zhao

University of Göttingen

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Bare Numeral Phrases

The interpretation of Bare Numeral Phrases (BNP) is ambiguous between the **quantity(q)-denoting** and **individual (i)-denoting** (terminology in Li 1998).

(1) Two people can complete the task.

a. *q-denoting:*

The task requires at least two people to be completed.

b. *i-denoting:*

There are two people (e.g., John and Mary) such that they are able to complete the task.

Inference of existence

The distinction between the two readings of BNPs:
only *i-denoting* BNPs bring about the inference that **there exists two individuals that satisfy the description**.

(2) a. Two people are required to complete the task, (but sadly we don't have two people).

b. Two people (John and Mary) can complete the task, #(but sadly we don't have two people).

The puzzling Mandarin BNPs

The contrast above is further complicated when the Mandarin data is concerned.

(3) Mandarin noun phrase schema:
(DEM) (ADJ/RC) (NUM) (CLF) N

I use BNP to refer to [NUM–CLF–N] expressions in Mandarin as in (4).

(4) *liang *(ge) haizi*
two CLF child
'2 children'

Puzzle 1: restricted distribution of BNPs in *i-denoting* environments

In episodic contexts, a well-known generalization about Mandarin BNPs is that they are generally **banned from matrix subject positions**.

(5) ?? *yi ge haizi ku-le*
one CLF child cry-PERF
Intd.: 'A child cried.'

(6) ?? *liang ge xuesheng tonguo-le kaoshi*
two CLF student pass-PERF exam
Intd.: 'Two students passed the exam.'

you can license subject BNPs

To render such sentences grammatical, *you* (which literally means 'have/exist') must be inserted, bringing out an indefinite reading of BNPs.

(7) ***you* introduces indefiniteness**:

(you**) liang ge haizi ku-le*
YOU two CLF child cry-PERF
'Two children cried (when there is more than two children in the context).'

contextual anti-uniqueness

(Hawkins 2015 a.o.)

dou can also license subject BNPs

The insertion of *dou*, a mysterious morpheme, can also render subject BNPs grammatical, bringing out a definite reading (Cheng 2009 a.o).

(8) ***dou* introduces definiteness**:

*liang ge haizi *(**dou**) ku-le*
two CLF children DOU cry-PERF
'(There are exactly two children and) the two children cried'

contextual uniqueness

(Hawkins 2015 a.o.)

Subject/Object asymmetry

But BNPs are perfectly fine in object positions of episodic sentences; note that they can only be interpreted as **indefinites**.

(9) *Lisi mai-le liang ben shu*
Lisi buy-PRF two CLF book
'Lisi bought two books.'

contextual anti-uniqueness

you-marking for object BNPs?

Mandarin is SVO by default, but easily accommodates OSV (topicalization).

(10) *Lisi mai-le (?you) liang ben shu*
Lisi buy-PRF YOU two CLF book
'Lisi bought two books.'

contextual anti-uniqueness

(11) **(you) liang ben shu, Lisi mai-le*
YOU two CLF book Lisi buy-PRF
'There are two books that Lisi bought.'

contextual anti-uniqueness

A primer on *dou*-marking

Other orders like SOV are possible with additional morphology.

dou-marking for subjects:

(12) S – DOU – V – O

dou-marking for fronted objects:

(13) S – O – DOU – V – _

dou-marking for object BNPs

With *dou*-marking, the fronted object BNP only receives a definite interpretation.

(14) *Lisi liang ben shu dou mai-le*
Lisi two CLF book DOU buy-PRF
'Lisi bought (both of) the two books.'

contextual uniqueness

Interim summary: BNPs in i-denoting environments

	Subject	Postverbal Object	Preverbal Object
BNP	*	✓	
you-marked BNP	✓	?✓	✓
dou-marked BNP	✓		✓

- *you*-marked BNPs: indefinites.
- *dou*-marked BNPs: definites.

Puzzle 2: BNPs in environments that allow both *i-* and *q-denoting* reading

Recall: English BNP is ambiguous between the q-denoting and i-denoting interpretation.

(15) Two people can complete the task.

a. *q-denoting:*

The task requires at least two people to be completed.

b. *i-denoting:*

There are two people (e.g., John and Mary) such that they are able to complete the task.

Mandarin subject BNPs are unambiguously *q-denoting*

Unlike in English, sentence (16) with a BNP in the subject position only has a *q-denoting* reading.

(16) *liang ge ren keyi wancheng renwu*
two CLF person can complete task
'Two people are required to complete the task.'

NOT: 'There are two people who can complete the task.'

you/dou-marking revives the *i-denoting* reading

(17) *(you) liang ge ren keyi wancheng renwu*
YOU two CLF person can complete task
'(Among all the people,) there are two people who can complete the task.'

contextual anti-uniqueness

(18) *liang ge ren (dou) keyi wancheng renwu*
two CLF person DOU can complete task
'The two people both can complete the task.'

contextual uniqueness

Subject/Object asymmetry

In environments that allow both *i- and q-denoting reading*, both readings are available with objects BNPs.

(19) *liang ge baomu neng zhaogu 3 ge haizi*
two CLF babysitter can take-care-of three CLF child

- ‘(Generally speaking), two babysitters are able to take care of 3 children.’ [*subject: q-denoting; object: q-denoting*]
- ‘Two babysitters (generally speaking) are able to take care of John’s 3 children.’ [*subject: q-denoting; object: i-denoting*]

you/dou-marking ensures the *i-denoting* reading of fronted object BNPs

(20) *[*(you) 3 ge haizi], liang ge baomu neng zhaogu*
YOU three CLF child, two CLF babysitter can take-care-of
2 babysitters .' [*subject: q-denoting; object: i-denoting indefinite*]

(21) *liang ge baomu 3 ge haizi *(dou) neng zhaogu*
two CLF babysitter three CLF child DOU can take-care-of
'Two babysitters (generally speaking) can take care of all of the 3 children.' [*subject: q-denoting; object: i-denoting definite*]

you-marking not allowed for postverbal object BNPs

Interestingly, *you*-marking on object BNPs seems incompatible under the scope of the abilitative modal.

(22) *liang ge baomu neng zhaogu (??you) 3 ge haizi*
two CLF babysitter can take-care-of YOU three CLF child
Intd.: 2 babysitters can take care of 3 (of John's) kids.'

[*subject: q-denoting; object: # i-denoting indefinite*]

Interim summary: the (in)ambiguity of BNPs in modal environments

	Subject	Postverbal Object	Preverbal Object
BNP	*q-denoting*	*q/i*	
you-marked BNP	*i-denoting*	??	*i-denoting*
dou-marked BNP	*i-denoting*		*i-denoting*

- *you*-marked BNPs: indefinites.
- *dou*-marked BNPs: definites.

To recapitulate:

- In subject positions, both the distribution and the interpretation of BNPs are highly restricted. In episodic contexts, *i-denoting* BNPs subjects are generally prohibited; in (abilitative) modal contexts, BNPs subjects can only be *q-denoting*.

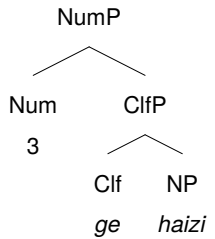
- *you/dou* marking seems to contribute/revive the i-denoting reading of BNPs; in addition, (in)definiteness is introduced.

- The distribution and the interpretation BNPs in (postverbal) object positions are less restricted.

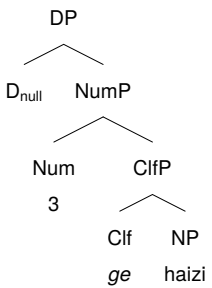
The source of *q-* vs. *i-reading*?

Li (1998): the *q-/i-denoting* distinction = referentiality; DPs are referential expressions, NumPs are not.

(23) a. q-denoting BNPs:



b. i-denoting BNPs:



A problem

Recall that in environments that allow both readings, objects BNPs are ambiguous.

(24) *liang ge baomu neng zhaogu 3 ge haizi*
two CLF babysitter can take-care-of three CLF child

- ‘(Generally speaking), two babysitters are able to take care of 3 children.’ [*subject: q-denoting;* ***object: q-denoting***]
- ‘Two babysitters (generally speaking) are able to take care of John’s 3 children.’ [*subject: q-denoting;* ***object: i-denoting***]

A problem: Strict locality of selection

Although the same verb is involved, BNPs can still be either DP or NumP; whatever constitutes the *q/i-denoting* context must be **non-local**.

Since projection (under the *projection by selection* approach) is often assumed to be in a strictly local fashion (first argued in Grimshaw 1979).

How to overcome the problem?

One potential way of solving the problem

Basic assumption:

Uniformly, all BNPs are treated as XPs which are inherently **non-quantificational**; they must acquire their quantificational force **externally** (Heim 1982, Tsai 2001, a.o.)

In this way, the undesired non-local selection problem becomes irrelevant.

Note: our discussion is orthogonal to the precise syntactic label.

BNPs as alternatives invoking

I further assume that

- Mandarin BNPs denote sets of alternatives (Hamblin 1976).

  (25) $[\![1 \text{ CLF } \textit{child}]\!] = \{x : \text{CHILD}(x) \wedge |x| = 1\}$

- Alternative expansion is just baked into the grammar (binary composition) as a default.

Via Pointwise Function Application, the denotations of BNPs will percolate up.

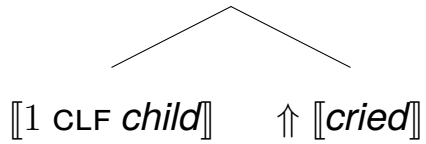
(26) $[\![X\ Y]\!] = \{x(y) : x \in [\![X]\!] \wedge y \in [\![Y]\!]\}$

An example

If a node α dominates an alternative-invoking BNP, the set denotation of β 'projects' up, i.e. α also denotes sets of alternatives.

For example:

(27) $\{f(x) : f \in \textsc{cried} \wedge x \in \textsc{child} \wedge |x| = 1\}$



Taming alternatives: $\exists$

In order for BNPs to be interpreted existentially, existential operators $\exists$ are needed to close the set.

(28) $[\![\exists[1 \text{ CLF } \textit{child cried}]]\!]$

$= \{\exists p.\ p \in [\![1 \text{ CLF } \textit{child cried}]\!] \wedge p = 1\}$

$= \exists x.\text{CHILD}(x) \wedge |x| = 1 \wedge \text{CRIED}(x)$

The conditioned licensing environments of ∃ in Mandarin

As discussed above, the availability of i-denoting/existential BNPs are highly restricted.

Assumption: the environments where the i-denoting reading of BNPs is found reflect the availability of Mandarin existential closure.

Application site of ∃: postverbal objects

Recall: in postverbal object positions, i-denoting BNPs are freely licensed in **episodic contexts**.

Assumption: Aspect markers *le* 'perfective', *guo* 'experiential', zhe 'progressive' can introduce ∃.

Possible explanation: They give rise to the entailment of the actual occurrence of the event (see Klein et al. 2000, Bhatt 2006, a.o.).

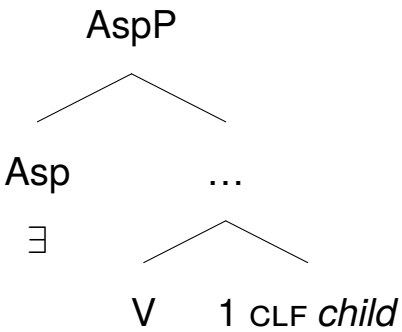
(29) John rewarded 3 students yesterday. #(but there were no students)

Application site of ∃: Asp

Assumption:

Aspect markers *le* ‘perfective’, *guo* ‘experiential’, zhe ‘progressive’ can introduce ∃.

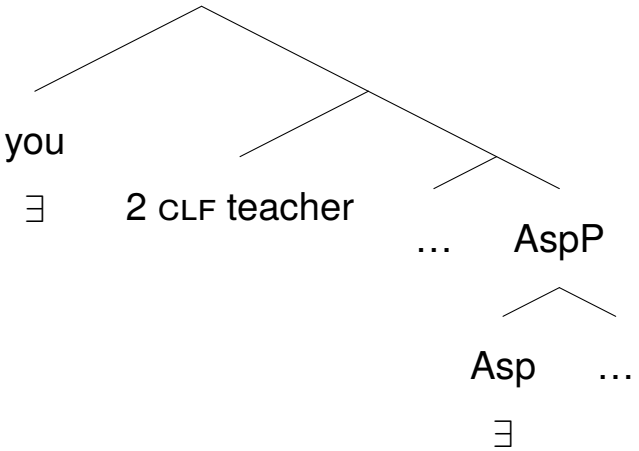
(30)



Subject i-denoting BNPs needs *you*

Assumption: *you* provides ∃.

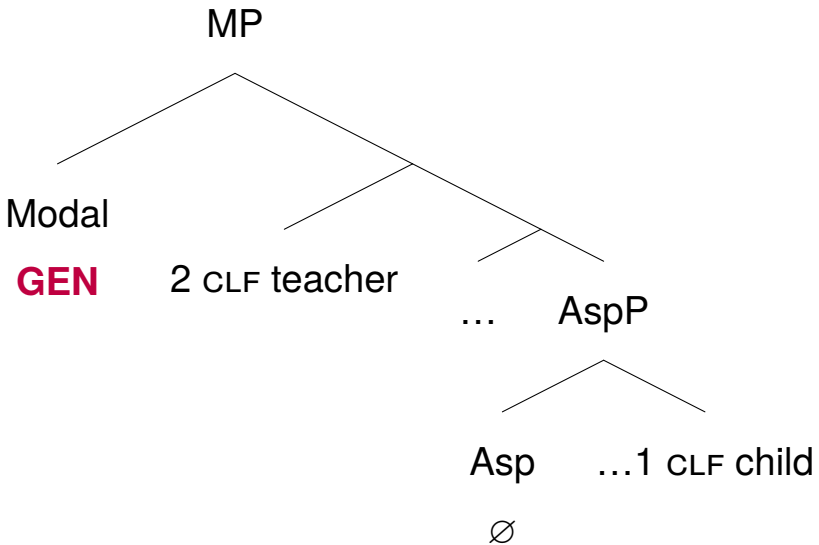
(31)



q-denoting BNPs

The *q-denoting* reading of BNPs is contributed by the modal.

(32)



To wrap up and remaining issues

Aim: to provide a unified analysis of Mandarin BNPs as alternative-invoking elements (like *wh*-phrases).

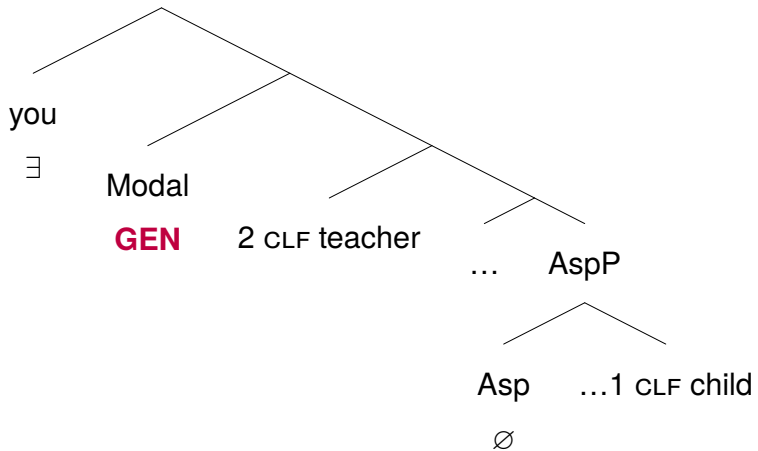
The *i-denoting* reading of BNPs arises by virtue of their set denotation being closed by c-commanding operator.

The empirical picture in Mandarin seems to suggest that **such closing operators don't come for free** (overt *you*/*dou*).

Remaining issues

- How can *you*-marking override the q-denoting **GEN** introduced by modality?

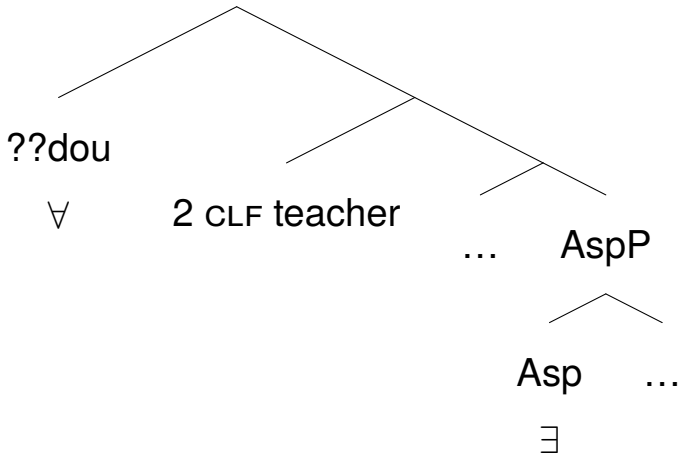
(33)



Remaining issues

- How does definiteness arise with *dou*?

(34)



Thank you!

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