Quantifier Scope and Topicality in Mandarin

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Mandarin has been widely considered a "scope rigid language" (Huang 1982) based on simple transitive examples like (1), which allow only a surface scope reading. Compare English (2), which is scopally ambiguous:

(1) 三个学生学过每种语言。
   San-ge xuesheng xue-guo **mei-zhong yuyan**.
   three-CL student   learn-ASP **every-CL   language**
   3 > ∀: 'There are three students x such that x learned every language.'
   *∀ > 3: 'For every language y, y is learned by three possibly different students.'

(2) **Three students** learned **every language**.   3 > ∀; ∀ > 3

But in fact in a variety of other syntactic contexts, observed over the years, Mandarin displays scope ambiguity comparable to that found in English.

Here we argue that Mandarin scope interpretation can be unified across a variety of syntactic environments under the theory of Fox (2000) and under the view that in (non-thetic) Mandarin matrix clauses the subject is a syntactic topic.

1.0 Scope Ambiguities Noted in Previous Literature

- PP Datives (Huang 1982: p.179)

(3) 张三买了两本书给每个人。
   Zhangsan mai-le **liang-ben shu**   gei **mei-ge   ren**.
   Zhangsan buy-ASP **two-CL   book** for **every-CL man**
   2 > ∀: 'There were two particular books that Zhangsan bought for everyone.'
   ∀ > 2: 'For every person x, Zhangsan bought two possibly different books for x.'

- PP Locatives (Liu and Wu 2016)

(4) 老师写了一句话在每个黑板上。
   Laoshi   xie-le   **yi-ju   hua**   zai **mei-ge   heiban**   shang.
   teacher   write-ASP **one-CL sentence** on   **every-CL blackboard** on
   ∃ > ∀: 'The teacher wrote a (particular) sentence on every blackboard.'
   ∀ > ∃: 'For every blackboard x, the teacher wrote a (different) sentence on it.'

- Relative clauses (Huang 1982: p.214)

(5) 我买了三个人写的每本书。
   Wo mai-le   **san-ge   ren** xie de **mei-ben shu**.
   I   buy-ASP   **three-CL man** write DE **every-CL book**
   3 > ∀: 'There three persons x such that I bought every book that x wrote.'
   ∀ > 3: 'I bought every three-authored book.'

- Passives (Aoun and Li 1989: ex.4b)

(6) 要是两个线索被每个人找到 …
   Yaoshi **liang-ge xiansuo** bei **mei-ge   ren**   zhaodao …
   if   **two-CL clues**   by   **every-CL person** found
   2 > ∀: 'if there are two (particular clues) such that everyone found these two, …'
   ∀ > 2: 'if for every person x, x found two (possibly different) clues, ...'

- Embedded Clauses (Lin 2013: ex.14)

(7) 张三要某个男生帮助每个女生。
   Zhangsan yao **mou-ge nansheng** bangzhu **mei-ge nüsheng**.
   Zhangsan want some-CL boy   help   every- CL girl
   ∃ > ∀: 'Zhangsan wants some particular boy to assist every girl.'
   ∀ > ∃: 'Zhangsan wants every girl to receive some boy's assistance.'

**- Duration-Frequency Phrases**

(8) a. 我请过全部的学生两次。(Soh 1998: p.37)
     Wo qing-guo   **quanbu de xuesheng liang ci**.
     I   invite-PERF **all   DE student   two time**
     ∀ > 2: 'For every student x, I have invited x twice.'
     2 > ∀: 'On two occasions I have invited all students.'
   b. 我请过两个学生很多次。
     Wo qing-guo   **liang-ge xuesheng henduo ci**.
     I   invite-PERF **two-CL   student   many   time**
     2 > many: 'For two particular student x, I have invited x many times.'
     many > 2: 'On many occasions, I have invited two (possibly different) students.'

## 2.0 Fox (2000) on Scope Interpretation

Fox (2000) adopts a standard view of quantifier phrases (QPs) as operators that combine with phrases of sentential type (<t>). Fox's three main principles:

(A) **Type Disparity**: QPs must occur sister to a node of type <e,t> for interpretation. QPs not sister to a node of type <e,t> (e.g., objects) must undergo Quantifier Raising (QR) to a position sister to a node of type <t>, where an <e,t> can then be formed by lambda abstraction.

(B) **Shortest Move**: QR and Quantifier Lowering (QL) target the <u>closest</u> position where QP will be sister to a node of type <t>.

(C) **Scope Economy**: Non-obligatory QR/QL is available when, and <u>only</u> when, this yields a semantic effect - a truth-conditional difference.

Fox (2000) predicts ambiguity for English transitives via obligatory QR of the object followed by optional object QR or by optional subject QL:

(9)

OBLIGATORY QR – – – – –

OPTIONAL QR/QL · · · · · · · ·
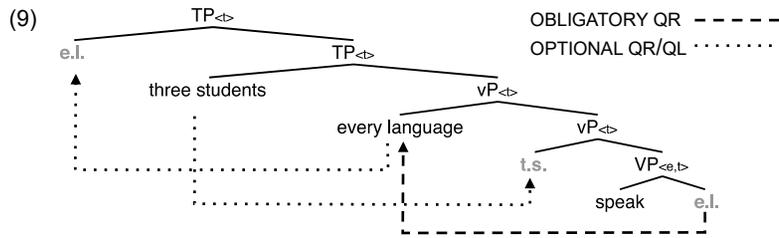
Fox (2000) predicts ambiguity for objects in English PP ditransitives via obligatory QR applied to the QPs in either order:

(10)

$2 > \forall$ – – – – –

$\forall > 2$ · · · · · · · ·
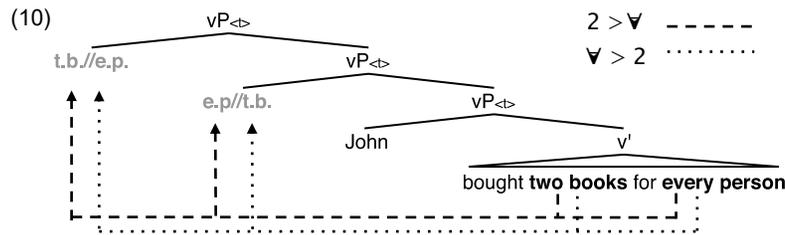
Observations:

➢ Mandarin PP datives and PP locatives pattern <u>the</u> <u>same</u> as English PP datives and PP locatives wrt scope. If we assign them the same structures, we will correctly predict ambiguity for both under Fox (2000).

➢ Mandarin transitives pattern <u>differently</u> than English transitives wrt scope. If we assign them the same structure, we will <u>incorrectly</u> predict ambiguity for Mandarin. Conclusion under Fox (2000): Mandarin transitives must differ structurally from English in a scope-relevant way. How?

3.0 Topicality in Mandarin and Scope Freezing

➢ Syntax is now widely held not only to structure propositional interpretation, but also to effect "information packaging": arrangement of items for construal as topics, foci, presuppositions, etc. Syntax as "Master Chef".

➢ Mandarin is widely described as a "topic-prominent" language vs. a subject-object language (Chao 1968; Li and Thompson 1981; Lyu 1979; LaPolla 2009).

➢ Using feature theory, we might formalize "topic-prominence" syntactically as follows: a topic-prominent language L projects a TopP projection above TP. Constituents α bearing a θ-role can also bear a [TOP] feature; one such α always raises and checks an interpretable [TOP] feature in the Spec TopP position; in that position, α is interpreted informationally as a topic.

Applying this idea to Mandarin would account for common sentence pairs like (11a-b), where subject and object appear in either order, with no apparent difference in truth conditions or thematic relations.

(11) a. 窗户已经糊了纸。 (Lyu 1979: p.73)
Chuanghu yijing hu-le zhi.
Window already paste-ASP paper
'The window has already been pasted with paper.'
b. 纸已经糊了窗户。 (Lyu 1979: p.73)
Zhi yijing hu-le chuanghu.
Paper already paste-ASP window
'The paper has already been pasted on the window.'

We might analyze these in terms of alternative movements to TopP. Note that in the case of subject topics, movement is string vacuous and hence "invisible".

Our Proposal:

➢ Mandarin is "topic-prominent" in the sense described; its matrix clause structure is identical to English up to TP, but it contains **a higher TopP projection** to which Mandarin subjects typically raise. Top itself has no truth-conditional content; it represents "info packaging," not info content.

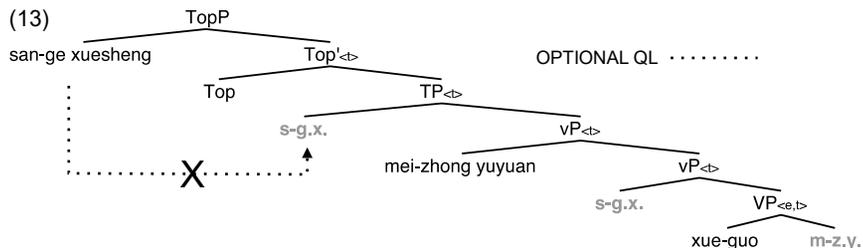➢ Presence of TopP yields scope-frozenness in Mandarin matrix transitives.

<u>Example</u>: The Mandarin transitive (1) (repeated below) will receive the LF in (12), where the subject has raised to TopP, and the object has raised by obligatory QR to vP-sister position.

(1) 三个学生学过每种语言。
San-ge **xuesheng** xue-guo **mei-zhong** **yuyan**. $3 > \forall$; *$\forall > 3$
three-CL **student** learn-ASP **every-CL** **language**

(12)

OBLIGATORY QR – – – – –
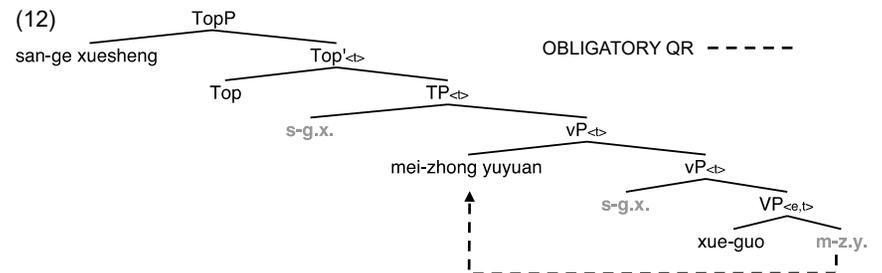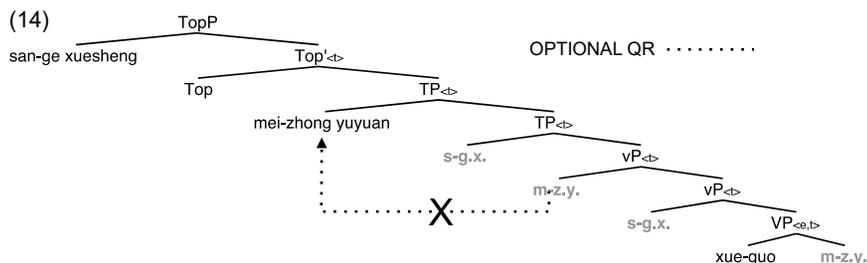
Optional Quantifier Lowering of the subject back to TP spec position is unavailable since Top is truth-conditionally inert (13). <u>Scope</u> <u>Economy</u> <u>Violation</u>.

(13)

```
                    TopP
san-ge xuesheng          Top'<t>              OPTIONAL QL ·········
              Top              TP<t>
              s-g.x.                vP<t>
                    mei-zhong yuyuan      vP<t>
                                  s-g.x.      VP<e,t>
                                       xue-guo    m-z.y.
```

Optional Quantifier Raising of the object to TP-adjoined position - its shortest move - is unavailable since this operation is truth-conditionally inert (14).

Scope Economy Violation.

(14)

```
                    TopP
san-ge xuesheng          Top'<t>              OPTIONAL QR ·········
              Top              TP<t>
                    mei-zhong yuyuan      TP<t>
                             s-g.x.      vP<t>
                                  m-z.y.      vP<t>
                                       s-g.x.      VP<e,t>
                                            xue-guo    m-z.y.
```

Conclusion: No inversion of the surface QP scope relations is possible with (1). Mandarin matrix transitives are predicted to be scope-frozen under Fox (2000).

Key Prediction of the Proposal

➢ In clausal contexts where (non-contrastive) topicalization is unavailable/less available - i.e., in clauses with a reduced or "truncated" left-periphery - Mandarin should show scope ambiguity.

4.0 Testing the Key Prediction

4.1 Ambiguity in Mandarin Relative Clause

English shows scope ambiguities in RCs like (15):

(15) **The woman** that greeted **every visitor** left the arrival hall.   DEF > ∀; ∀ > DEF

Under a Head Raising Analysis of RCs (Kayne 1994; esp. Bianchi 1999) (16a), ambiguity can be captured by reconstructing the NP head to its source position (16b). Ambiguity in the RC then derives from ambiguity in the underlying transitive clause into which the head lowers.

(16) a. **The woman** [that the woman greeted **every visitor**].
     b. The woman that [**the woman** greeted **every visitor**].   DEF > ∀; ∀ > DEF

Mandarin also shows scope ambiguities in RCs (17) (Huang 1982):

(17) 我见过讲每种语言的三个学生。
     Wo jian-guo   jiang **mei-zhong yuyan**   de **san-ge   xuesheng**.
     I   meet-ASP speak **every-CL language** DE **three-CL student**
     'I have met three students who speak every language.'   3 > ∀; ∀ > 3

Aoun and Li (2003: 132-138), Hsiao (2003:111), Wu (2018) a.o. argue strongly that Mandarin RCs should receive a head raising analysis. But (18), the Mandarin transitive underlying (17), is <u>un</u>ambiguous. How does ambiguity arise here?

(18) 三个学生讲每种语言。
     San-ge   xuesheng jiang **mei-zhong yuyan**.   3 > ∀; *∀ > 3
     three-CL student speak **every-CL language**

Rizzi (1997) proposes that RCs involve a reduced left-periphery. Tsai (1995) notes specifically that non-contrastive topics are unavailable in Mandarin RCs (19a-b):

(19) a. 喜欢阿丘的很多人没来。
        e_k Xihuan Akiu de henduo ren_k   mei lai.
            like   Akiu DE many   people not come
        'Many people who like Akiu did not come.'
     b. *阿丘喜欢的很多人没来。
        ***Akiu**_j e_k xihuan e_j de henduo ren_k   mei lai.
         Akiu   like   DE many people not come

Suppose that TopP is unavailable in the left-periphery of Mandarin RCs. Plausibly the clause into which an RC head lowers should be the next smaller projection in the Rizzi (1997) hierarchy, viz., TP/FinP (20).

(20) [DP [CP **[TP san-ge xuesheng** jiang mei-zhong yuyan] de [DP **san-ge xuesheng**]]]

If so, the scope possibilities for *san-ge xuesheng* 'three students' and *mei-zhong yuyan* 'every language' should now converge with those of English (9). That is, we expect predict scope ambiguity for (17), correctly.

4.2 Ambiguity in Mandarin Passives

Aoun and Li (1989, 1993) assert that Mandarin passive examples like (21) are scopally ambiguous.

(21) 要是两个线索被每个人找到…
     Yaoshi **liang-ge xiansuo** bei **mei-ge   ren**   zhaodao …
     if   **two-CL clues**   by   **every-CL person** found
     'If two clues were found by everyone...'   2 > ∀; ∀ > 2

Huang (1999, fn. 16) appears to contradict this judgment: "Chinese passives do not exhibit scope ambiguities any more than the actives do," presumably based on simple passive examples like (22), which seem unambiguous.

(22) 两个线索被每个人找到。

    liang-ge xiansuo bei **mei-ge ren** zhaodao
    two-CL clues by every-**CL** person found
    'Two clues were found by everyone.'   2 > ∀; *?∀ > 2

Interestingly, non-contrastive topicalization is strongly disfavored in Mandarin conditional environments like those used by Aoun and Li (23a-b):

(23) a. 要是张三看守那个出口…
       Yaoshi Zhangsan kanshou na-ge chukou, ……
       if Zhangsan guard that-CL exit
       'if Zhangsan guards that exit…'
    b. ??要是那个出口（呢），张三看守…
       ??Yaoshi **na-ge chukou** (ne), Zhangsan kanshou, ……
         if that-CL exit, Zhangsan guard

Suppose conditional clauses are truncated in their left-periphery, with TopP unavailable/less available (Haegeman 2010). Divergence in judgments by Aoun and Li vs. Huang is then explained by the syntactic contexts they examine. Conditionals have a reduced left-periphery <u>without</u> <u>TopP</u>, hence ambiguity is expected. Matrix transitives have a fully projected left-periphery <u>with</u> <u>TopP</u>, hence non-ambiguity is expected.

4.3 Ambiguity in Mandarin Embedded Clauses

Embedded clauses appear to disfavor non-contrastive topicalization (24a,b). This suggests the TopP projection found in matrix clauses is unavailable/less available in embedded clauses.

(24) a. 张三要李四看守那个出口。
       Zhangsan yao Lisi kanshou na-ge chukou.
       Zhangsan want Lisi guard that-CL exit
       'Zhangsan wants Lisi to guard that exit.'
    b. 张三要那个出口李四看守。
       Zhangsan yao **na-ge chukou** Lisi kanshou.
       Zhangsan want **that-CL exit** Lisi guard
       'Zhangsan wants <u>that exit</u> to be guarded by Lisi (not this one)'
       # 'Zhangsan wants Lisi to guard that exit.'

If so, this predicts doubly-quantified embedded clauses like (7) from Lin (2013) should more freely allow scope inversion than the corresponding matrix sentence (25).

(7) 张三要某个男生帮助每个女生。
      Zhangsan yao **mou-ge nansheng** bangzhu **mei-ge nüsheng**.
      Zhangsan want **some-CL boy** help **every- CL girl**
      ∃ > ∀: 'Zhangsan wants some particular boy to assist every girl.'
      ∀ > ∃: 'Zhangsan wants every girl to receive some boy's assistance.'

(25) 某个男生帮助了每个女生。
      Mou-ge nansheng bangzhu-le **mei-ge nüsheng**.
      some-CL boy help-ASP **every-CL girl**
      ∃ > ∀: 'Some one boy assisted every girl.'
      *∀ > ∃: 'Every girl received some boy's assistance.'

This result extends beyond Mandarin embedded clauses corresponding to infinitives like (24) and (7). Complements to *shuo* 'say' show the same distribution and scope possibilities (26)-(27) (c.f. 28):

(26) a. 警长说过张三看守那个出口。
       Jingzhang shuo-guo Zhangsan kanshou na-ge chukou.
       sheriff say-ASP Zhangsan guard that-CL exit
       'The sheriff says that Zhangsan guards that exit.'
    b. 警长说过那个出口（呢），张三看守。
       Jingzhang shuo-guo **na-ge chukou** (ne), Zhangsan kanshou.
       sheriff say-ASP **that-CL exit** Zhangsan guard
           (contrastive reading only)

(27) a. 警长说过三名警察看守每个出口。
       Jingzhang shuo-guo **san-ming jingcha** kanshou **mei-ge chukou**.
       sheriff say-ASP **three-CL policeman** guard **every-CL exit**
       3 > ∀: 'The sheriff says three particular policemen are guarding every exit.'
       ∀ > 3: 'The sheriff sys for every exit there are three policemen guarding it.'
    b. 三名警察看守每个出口。
      San-ming jingcha kanshou **mei-ge chukou**.
      three-CL policeman guard **every-CL exit**
      'Three particular policemen guard every exit'.   3 > ∀; *∀ > 3

(28) a. 警长说过三名警察会看守每个出口。
       Jingzhang shuo-guo **san-ming jingcha** hui kanshou **mei-ge chukou**.
       sheriff say-ASP **three-CL policeman** will guard **every-CL exit**
       'The sheriff says three particular policemen will guard every exit.'
                    3 > ∀; *∀ > 3
    b. 三名警察会看守每个出口。
      San-ming jingcha hui kanshou **mei-ge chukou**.
      three-CL policeman will guard every-CL exit
      'Three particular policemen will guard every exit.'   3 > ∀; *∀ > 3

4.4 Mandarin Transitives Again: Ambiguity in Thetic Sentences

Kuroda (1972) (following Brentano) proposes that sentences can be understood **categorically** or **thetically**. Categorical predications attribute properties to individuals, typically subjects. Thetic predications assert general regularities or the existence of events. Understood categorically, (29) predicates running of some dog.

(29)   A dog is running.

Understood thetically, (29) describes an event of running whose agent is recognized as a dog, but whose identity is neither established in previous contexts nor at issue. Thetic sentences do not involve topics; they are not "about" individuals.

Understood thetically, (30) asserts a quantificational regularity to exist or to be required. This interpretation is enhanced by a parenthetical like *anzhao falü guiding* 'as required by law'. Although a matrix clause, (30) admits an inverse scope construal:

(30)   （按照法律规定）三名警察看守每个出口。
      (Anzhao falü guding) **san-ming jingcha**   kanshou **mei-ge   chukou**.
      (As   law demand)**three-CL   policeman** guard   **every-CL exit**
      3 > ∀: 'By law, there should be three policemen guarding every exit.'
      ∀ > 3: 'By law, every exit should have three policemen guarding it.'

Suppose thetic sentences are non-topical in the sense of not having a TopP projection. Then scope ambiguity is expected in (30); its derivation is the same as for the embedded clause in (27a).

5.0 Shared "Scope Freezing" in English and Mandarin

On our approach, ambiguity vs. freezing results from specific constructional factors. Mandarin & English main clauses differ in scope possibilities because they differ in syntax. But Mandarin and English appear to <u>share</u> freezing environments as well, presumably the product of shared syntax:

Soh (1998) notes the scope contrast in constructions like (31a-b), where (31b) is frozen.

(31) a. 我请过两个学生很多次。
      Wo qing-guo   **liang-ge xuesheng henduo ci**.
      I   invite-PERF **two- CL student   many   time**
      'I have invited all students twice.'   2 > many; many > 2

     b. 我请过两次很多学生。
      Wo qing-guo   **liang ci   henduo xuesheng**.
      I   invite-PERF **two   time many   student**
      'I have twice invited all students.'   2 > many; *many > 2

English exhibits similar facts. (32a) is ambiguous, but (32b) shows surface scope:

(32) a.   I have invited **all students twice**.   ∀ > 2; 2 > ∀
     b.   I have **twice** invited **all students**.   2 > ∀; *∀ > 2

Huang (1994a,1994b,1997) proposes (33a) for (31a). Larson (2004) proposes (33b) for (32a). Both have the structure of ditransitives. Under Fox (2000), both are predicted to be ambiguous in parallel to ditransitives (34) (cf. 10).

(33) a.

   b.

(34)
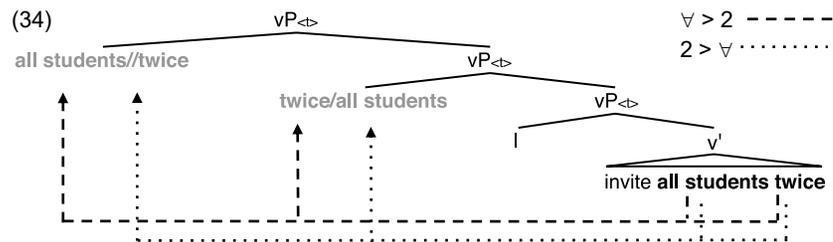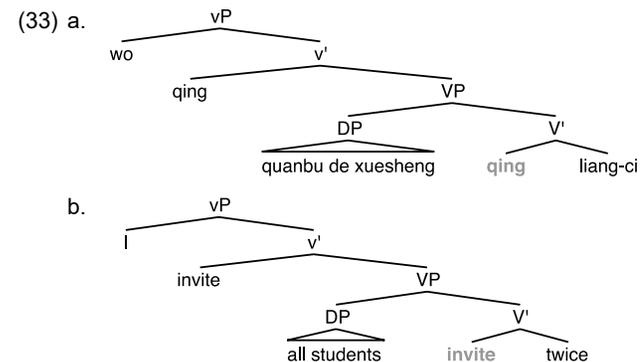
In Mandarin, duration/frequency phrases occur postverbally and pattern like complements, not adjuncts. Inversions like (31)/(32) thus resemble argument/voice alternations. Interestingly Mandarin shows freezing in a familiar voice alternation shared with English: PP Datives/DOCs:

(3) 张三买了两本书给每个人。
     Zhangsan mai-le   **liang-ben shu**   gei   **mei-ge   ren**.
     Zhangsan buy-ASP **two-CL   book**   for   **every-CL man** 2 > ∀; ∀ > 2

(35) 张三买给了两个人每本书。
     Zhangsan mai-gei-le   **liang-ge ren mei-ben shu**.
     Zhangsan buy-for-ASP **two-CL   man every-CL book**   2 > ∀; *∀ > 2
     'Zhangsan bought two persons every book.'

(36) a.   John bought **two gifts** for **every person**.   2 > ∀; ∀ > 2
     b.   John bought **two persons every gift**.   2 > ∀; *∀ > 2

⑤

Our Conjecture: The alternation in (31) noted by Soh (1998) is a **voice alternation**, with (31a) parallel to a PP ditransitive and (31b) parallel to a double object form. Scope ambiguity vs. freezing has the same source in both cases.

Lebeaux's Speculation: Freezing in (36b) results from its being a **derived structure**. Interestingly, (32b) has distinctive prosody in English (accent on *twice*) vs. (32a), which shows normal declination. Thus Lebeaux's speculation seem promising for this case too.

6.0 Conclusion

In this paper we have:

- Proposed that topicality is the source of scope frozenness in Mandarin matrix transitives, assuming a TopP projection to which Mandarin subjects raise and the theory of scope in Fox (2000).

- Examined Mandarin VP constructions in which scope is expected to parallel English.

- Examined various Mandarin clausal constructions that plausibly involve a reduced left-periphery lacking TopP. In these contexts scope ambiguity becomes available in transitives.

- Suggested that certain shared freezing environments in English and Mandarin are the product of shared syntax.

Questions still under pursuit:

- Can this analysis of Mandarin be extended to other languages claimed to be both scope-rigid and topic-prominent; e.g., Japanese, Korean, Hungarian, Persian and Turkish?

- Adverbial clauses have been proposed to differ in regard to the projection of their left-peripheries (Haegeman 2012). Do the corresponding Mandarin adverbials show the expected variation in scope ambiguity?

- Can scope frozenness in Mandarin DOCs and pre-verbal PPs be related to scope frozenness in Mandarin main clauses? (Cépeda and Cyrino 2017)

- What is the source of scope freezing in DOCs/DF inversions?

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