

## Severing the degree argument from the adjective: Evidence from Mandarin transitive comparatives

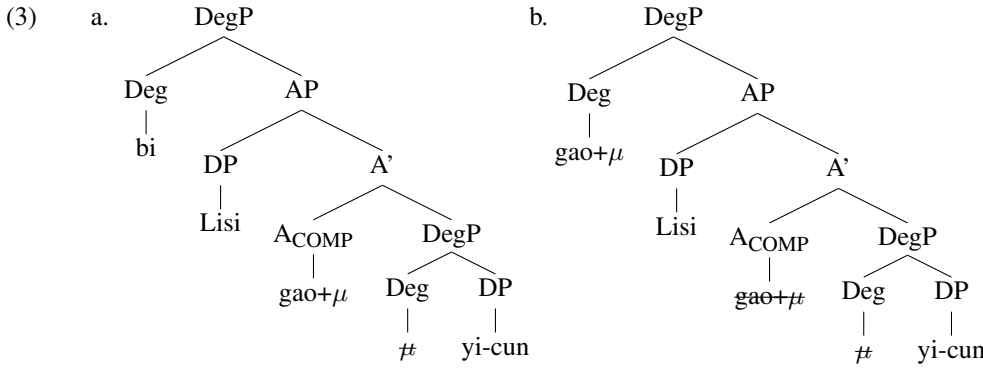
**Introduction:** The distribution of measure phrases (MPs) as arguments of scalar predicates shows two major points of cross-linguistic variation. The first is whether MPs are acceptable with the positive (unmarked) form of the adjective (as in *2 meters tall*) or only with the comparative form (*2 meters taller*): as documented by Schwarzschild (2005), every language that has the former option has the latter, but not vice-versa. The second point of variation for languages of the first type concerns the membership of the positive predicates that allow MPs. For example, Norwegian *tung* ‘heavy’ and *dyr* ‘expensive’ allow MPs, but the English variants do not; German *schnell* ‘fast’ allows MPs but the English variant does not; etc. Two recent papers provide alternative accounts of this variation. Starting from the first point of variation, Schwarzschild (2005) argues that comparative and positive gradable predicates differ in semantic type, such that only the former can compose with MPs. In order for a positive predicate to combine with a MP, it must undergo a special type-shifting rule; whether this rule applies, and which predicates it applies to, is a matter of cross-linguistic variation. In contrast, Svenonius and Kennedy (2006) (see also Sawada and Grano 2011) argue that MPs are introduced by a special functional head  $\mu$ , which selects generally for comparative predicates and in a lexically-encoded, language-specific way for non-comparative predicates. This paper provides further support for the syntactic approach based on the syntax of Mandarin Chinese comparatives.

**Data:** In Mandarin “*bi*-comparatives” like (1a–b), the standard of comparison is introduced by *bi*; in “transitive comparatives” like (2a), the standard of comparison directly follows the gradable predicate. As noted by Xiang (2005) and Liu (2007), transitive comparatives are subject to two special restrictions: they require an overt MP, as indicated in (2a); and they are incompatible with gradable predicates such as *happy* for which no measurement system is defined, as shown in (2b).

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|-----|----|---|-----|----|--|
| (1) | a. | zhangsan bi lisi gao (yi-cun).<br>Zhangsan SM Lisi tall one-inch<br>‘Zhangsan is (an inch) taller than Lisi.’   | (2) | a. | zhangsan gao lisi *(yi-cun).<br>Zhangsan tall Lisi one-inch<br>‘Zhangsan is an inch taller than Lisi.’ |
|     | b. | zhangsan bi lisi gaoxing (yi-dian).<br>Zhangsan SM Lisi happy a-little<br>‘Z. is (a little) happier than Lisi.’ |     | b. | *zhangsan gaoxing lisi (yi-dian).<br>Zhangsan happy Lisi a-little                                      |

This patterning is not unique to Mandarin but is found as well in Cantonese (Mok 1998), many other Chinese varieties (Ansaldo 1999) and in the Kam-Sui group of Tai-Kadai (Morev 1999). Mandarin and these other varieties thus provide a clear example of a context in which the acceptability of a particular syntactic form (the transitive comparative) is dependent on whether or not a predicate allows for a MP. It is unclear how this sort of alternation could be explained in a semantic account of the distribution of MPs like Schwarzschild’s. On the other hand, it can be straightforwardly accounted for within a framework in which MPs are introduced by a special functional head.

**Analysis:** We take MPs to be introduced by a functional head  $\mu$  (Svenonius and Kennedy 2006), and adopt a variant of Xiang’s (2005) DegP shell structure for Mandarin comparatives whereby the gradable predicate is sandwiched between two projections of Deg; our analysis departs slightly from Xiang’s in that the lower projection of Deg is headed by  $\mu$  and therefore projected only in the presence of a MP. Following Xiang, we assume that *bi*-comparatives are derived by inserting *bi* into the higher Deg position (3a) whereas transitive comparatives are derived by raising the gradable predicate into the higher Deg position (3b). The compositional semantics for both varieties is based on pre-movement representations and is as indicated in (4)–(5): we adopt the view that gradable adjectives denote type  $\langle e, d \rangle$  measure functions (4a) (Bartsch and Vennemann 1973; Kennedy 1999) and that comparative semantics (provided in Mandarin by a null morpheme or lexical mapping rule COMP (4b)) works by turning this basic measure function into a ‘difference function’ that maps individuals onto degrees that exceed the standard of comparison (Kennedy and McNally 2005; Kennedy and Levin 2008).



- (4) a.  $\llbracket \text{gao} \rrbracket = \lambda x. \text{height}(x)$   
 b.  $\llbracket \text{gao}_{\text{COMP}} \rrbracket = \lambda y \lambda x. \text{height}_y^\uparrow(x)$
- (5) a.  $\llbracket \mu \rrbracket = \lambda d \lambda g_{\langle e, \langle e, d \rangle \rangle} \lambda y \lambda x. g(y)(x) \succeq d$   
 b.  $\llbracket \mu \text{ yi-cun} \rrbracket = \lambda g_{\langle e, \langle e, d \rangle \rangle} \lambda y \lambda x. g(y)(x) \succeq \mathbf{1in}$   
 c.  $\llbracket \text{gao}_{\text{COMP}} \mu \text{ yi-cun} \rrbracket = \lambda y \lambda x. \text{height}_y^\uparrow(x) \succeq \mathbf{1in}$   
 d.  $\llbracket \text{Lisi gao}_{\text{COMP}} \mu \text{ yi-cun} \rrbracket = \lambda x. \text{height}_{\text{Lisi}}^\uparrow(x) \succeq \mathbf{1in}$

To explain the patterning in (1)–(2), we follow Li (2008) and Huang, Li and Li (2009) in assuming that argument DPs in Mandarin need Case and that adjectives are not Case assigners, and we propose that in Mandarin comparatives, available Case assigners for the standard of comparison (which in Mandarin is always a DP; see Xiang 2003, 2005) include *bi* and  $\mu$ . Consequently, when the transitive comparative is used, a measure phrase must be present so that  $\mu$  projects and assigns Case to the standard of comparison. And because only gradable predicates associated with measurable scales allow  $\mu$ , other gradable predicates are ungrammatical in the transitive comparative. This account, which explains the full range of facts in (1)–(2) above, is summarized in (6)–(7).

- (6) *Adjectives with measurable scales* (e.g., *gao* ‘tall’, *ai* ‘short’, *zhong* ‘heavy’, *zao* ‘early’)
- |  |   |
|--|---|
| a. $\text{bi DP}_{\text{stnd}} \text{A}_{[\text{COMP}]}(+\mu \text{DP}_{\text{meas}})$ | <i>bi</i> assigns Case to $\text{DP}_{\text{stnd}}$ |
| b. $\text{A}_{[\text{COMP}]}+\mu \text{DP}_{\text{stnd}} \text{DP}_{\text{meas}}$      | $\mu$ assigns Case to $\text{DP}_{\text{stnd}}$     |
| c. $*\text{A}_{[\text{COMP}]} \text{DP}_{\text{stnd}}$                                 | $\text{DP}_{\text{stnd}}$ does not get Case         |
- (7) *Adjectives without measurable scales* (e.g., *gaoxing* ‘happy’, *ganjing* ‘clean’, *xixing* ‘careful’)
- |  |   |
|--|---|
| a. $\text{bi DP}_{\text{stnd}} \text{A}_{[\text{COMP}]}$                           | <i>bi</i> assigns Case to $\text{DP}_{\text{stnd}}$ |
| b. $*\text{A}_{[\text{COMP}]}+\mu \text{DP}_{\text{stnd}} \text{DP}_{\text{meas}}$ | $\mu$ cannot combine with A                         |
| c. $*\text{A}_{[\text{COMP}]} \text{DP}_{\text{stnd}}$                             | $\text{DP}_{\text{stnd}}$ does not get Case         |

**Additional support:** Independent evidence that transitive comparatives involve a functional head that is linked to the distribution of MPs comes from the behavior of the particle *chu* ‘exit’/‘go beyond’. This affix may combine with a gradable adjective in both the *bi*-comparative (8a) and the transitive comparative (9a), but only when a measure phrase is also projected (cf. (8b)/(9b)):

- |   |  |
|---|--|
| (8) a. Zhangsan <i>bi</i> Lisi gao <b>chu</b> yi cun.<br>Zhangsan SM Lisi tall CHU one inch<br>‘Zhangsan is one inch taller than Lisi.’ | (9) a. Zhangsan gao <b>chu</b> lisi yi cun.<br>Zhangsan tall CHU Lisi one inch<br>‘Zhangsan is one inch taller than Lisi.’ |
| b. *Zhangsan <i>bi</i> Lisi gao <b>chu</b> .<br>Zhangsan SM Lisi tall CHU   | b. *Zhangsan gao <b>chu</b> lisi.<br>Zhangsan tall CHU Lisi  |

The ungrammaticality of (8b)/(9b) shows that *chu* is disallowed when there is no MP, just like the hypothesized null morpheme  $\mu$ . We can thus easily account for the distribution of *chu* by analyzing it as an overt counterpart of  $\mu$ .