

## POS and the relative proportional reading of *many*

**INTRODUCTION.** Besides the cardinal and proportional reading of *many* in (1a,b) (Partee 1988), Westerståhl (1985) famously noted that an additional, seemingly non-conservative reading of *many* exists: the so-called relative proportional reading exemplified in (2) and intuitively schematized in (1c). In scenario (3), (2) is judged true because, even though the cardinal and the proportional readings in (1a,b) make the sentence false, the relative proportional reading is available. (A parallel argument holds for *few*). Efforts have been made in the literature to derive the relative proportional reading of *many* in a principled way (de Hoop & Solà 1996, Herburger 1997, Cohen 2001), the key issue being whether, in such a principled derivation, the determiner remains conservative or challenges the conservativity universal.

- (1) Many Ps are Q.
- a. ABSOLUTE reading:  $|P \cap Q| = n$ , where  $n$  is a large natural number.
- b. PROPORTIONAL reading:  $|P \cap Q| : |P| = \rho$ , where  $\rho$  is a large number.
- c. RELATIVE PROPORTIONAL reading:  $|Q \cap P| : |Q| = \rho$ , where  $\rho$  is a large number.
- (2) Many SCANDINAVIANS have won the Nobel Prize in literature.  
Paraphrase: "Many of the N(obel) P(prize) winners are Scandinavians."
- (3) Scenario: Of a total of 81 Nobel Prize winners in literature, 14 come from Scandinavia.

**GOAL.** The goal of this paper is to derive the correct truth conditions and distribution of the relative proportional reading (unlike Herburger 1997) while maintaining conservativity (unlike Cohen 2001). We will use two independently motivated premises to motivate our key idea. **Premise ①:** The superlative morpheme *-est* can be interpreted locally or non-locally, the latter possibility producing focus-sensitive readings. These two options are available both in adjectives like *highest* (Heim 2001) and in determiners like *most* (=MANY+*est*) (Hackl 2009). **Premise ②:** The (phonologically null) positive degree head *POS* gives rise to parallel local and non-local readings in adjectives like *high(-POS)* (Schwarz 2010). **Key idea:** The determiner *many* spells out *MANY+POS* and, just like *POS* in adjectives, *POS* in *many* allows for local and non-local readings. The resulting analysis will be a unified lexical entry for *MANY<sub>proportional</sub>* where the difference between readings (1b) and (1c) lies solely on the scope of *POS* and the location of focus.

**PREMISE ①: LOCAL AND NON-LOCAL READINGS OF -EST.** Sentence (4), with a superlative adjective, allows for the absolute and relative readings in (4a,b) (Szabolcsi 1986, Heim 1999). Heim (1999) uses the lexical entry for *-est* in (5), whose first argument needs to be filled up by a comparison class *C*. The Deg(ree)P [*-est C*] can then scope locally within the host NP, as in (6a), or it can scope non-locally outside the NP, as in (7a). The comparison class *C* is retrieved (partly) from the focal structure of the LF sister of [*-est C*], as in (6b,c) and (7b,c). Composing *-est* in (5) with the comparison class *C* and LF in (6), we obtain the absolute reading. Composing *-est* the comparison class *C* and LF in (7) produces the relative reading. Finally, that focus plays a role in determining the final relative reading is shown in (8).

- (4) John climbed the highest mountain.
- a. Absolute reading: "John climbed a mountain higher than any other (relevant) mountain".
- b. Relative reading: "John climbed a higher mountain than anybody else (relevant) climbed".
- (5)  $\llbracket -est \rrbracket = \lambda Q_{\langle dt, \rangle} . \lambda P_{\langle d, \rangle} . \exists d [ P(d) \ \& \ \forall Q \in Q [ Q \neq P \rightarrow \neg(Q(d)) ] ]$  (Heim 1999)
- (6) a. LF: John climbed the 2 [ [**-est C**] [1[  $t_{2,F}$   $t_1$ -high mountain]]  $\sim C$  ] ABSOLUTE READING
- b.  $\llbracket 1[t_2 \ t_1\text{-high mountain}] \rrbracket = \lambda d' . g(2)$  is a  $d'$ -high mountain
- c.  $\llbracket C \rrbracket \subseteq \{ \lambda d' . \text{Everest is a } d'\text{-high mountain, } \lambda d' . \text{Kilimanjaro is a } d'\text{-high mountain, ...} \}$
- (7) a. LF: [ [**-est C**] [1[ $\text{JOHN}_F$  climbed A  $t_1$ -high mountain]]  $\sim C$  ] RELATIVE READING
- b.  $\llbracket 1[\text{John climbed a } t_1\text{-high mountain}] \rrbracket = \lambda d' . \text{John climbed a } d'\text{-high mountain}$
- c.  $\llbracket C \rrbracket \subseteq \{ \lambda d' . \text{John climbed a } d'\text{-high mountain, } \lambda d' . \text{Bill climbed a } d'\text{-high mountain, ...} \}$
- (8) a. John wrote the longest letter to MARY.  $\Leftrightarrow$  compares *recipients* of John's letters
- b. JOHN wrote the longest letter to Mary.  $\Leftrightarrow$  compares *senders* of letters to Mary

Parallel local and non-local readings are derived for the determiner *most* in Hackl (2009) by decomposing *most* into *MANY+est*.

**PREMISE ②: LOCAL AND NON-LOCAL READINGS OF POS.** Schwarz (2010) argues that a parallel ambiguity is detectable when the adjective is in positive form. (9) affords a reading according to which Mia has a hat that is expensive for a hat. This is the absolute reading arising from the structure in (10). Additionally, (9) has a reading according to which Mia has a hat that is expensive for somebody like Mia to have (e.g., for a three-year old). This is the relative reading, derived from the structure in (11). The lexical entry for *POS* in (12) states that the degree of expensiveness of Mia's hat is above the standard or threshold  $\theta$  established by the comparison class *C* (10b)/(11b).

- (9) Mia has an expensive hat (for a hat / for a three-year old).  
 (10) a. LF: Mia has a 2 [ **[POS C]** [1[  $t_{2,F}$   $t_1$ -expensive hat]]  $\sim C$  ] ABSOLUTE READING  
 b.  $\llbracket C \rrbracket \subseteq \{ \lambda d'. h_1 \text{ is a } d'\text{-expensive hat, } \lambda d'. h_2 \text{ is a } d'\text{-expensive hat, ... } \}$   
 (11) a. LF: [ **[POS C]** [1[MIA<sub>F</sub> has a  $t_1$ -expensive hat]]  $\sim C$  ] RELATIVE READING  
 b.  $\llbracket C \rrbracket \subseteq \{ \lambda d'. \text{Mia has a } d'\text{-expensive hat, } \lambda d'. \text{Katie has a } d'\text{-expensive hat, ... } \}$   
 (12)  $\llbracket POS \rrbracket = \lambda Q_{\langle dt, t \rangle}. \lambda P_{\langle d, t \rangle}. \exists d [ P(d) \ \& \ d > \theta(Q) ]$

**PROPOSAL.** Extending Hackl (2009), we decompose the determiner *many* into the (parametrized) determiner *MANY* plus the positive degree head *POS* in (12). Extending Schwarz (2010), we allow *POS* to scope locally or non-locally not just with adjectives but also with determiners. The relative proportional reading arises when three factors co-occur: (i) the parametrized determiner used is proportional *MANY<sub>proportional</sub>*, defined in (13), (ii) *POS* scopes non-locally, as in (14a), and (iii) focus falls within the restrictor of *MANY<sub>proportional</sub>*, as in (2). In such configuration, the comparison class *C* setting the standard  $\theta(C)$  will have the form in (14b). Composing *POS* with the rest of the structure, we obtain the truth conditions in (14c), which correspond to the relative proportional reading of sentence (2).

- (13)  $\llbracket MANY_{proportional} \rrbracket = \lambda d_d. \lambda P_{\langle e, t \rangle}. Q_{\langle e, t \rangle}. (|P \cap Q| : |P|) \geq d$   
 (14) Relative proportional reading of (2):  
 a. LF: [ **[POS C]** [1[ $t_1$ -*MANY<sub>proportional</sub>* SCANDINAVIANS<sub>F</sub> have won NP in literature]]  $\sim C$  ]  
 b.  $\llbracket C \rrbracket \subseteq \{ \lambda d'. (|\{x: \text{Scandinavian}(x)\} \cap \{x: \text{NP-winner}(x)\}| : |\{x: \text{Scandinavian}(x)\}|) \geq d',$   
 $\lambda d'. (|\{x: \text{Mediterranean}(x)\} \cap \{x: \text{NP-winner}(x)\}| : |\{x: \text{Mediterranean}(x)\}|) \geq d', \dots \}$   
 c.  $\exists d [ (|\{x: \text{Scandinavian}(x)\} \cap \{x: \text{NP-winner}(x)\}| : |\{x: \text{Scandinavian}(x)\}|) \geq d \ \& \ d > \theta(\llbracket C \rrbracket) ]$

We note that, to derive the relative proportional reading, we have used the conservative determiner in (13) plus a configuration relating *POS* and focus that is independently attested for adjectives. More concretely, (15) has a reading that makes it true in scenario (16). This is because the comparison class *C* can be shaped by a focus internal to the original NP: (17).

- (15) (For what he has been giving her so far, this time) Rockefeller gave Kate an inexpensive CAR.  
 (16) Scenario: R. gave K. the most expensive car possible. Still, this present compares poorly to his previous astronomically expensive presents (e.g. apartment in Manhattan, island in Pacific, etc.)  
 (17)  $\llbracket C \rrbracket \subseteq \{ \lambda d'. \text{R gave K a } d'\text{-inexpensive car, } \lambda d'. \text{R gave K a } d'\text{-inexpensive apartment in}$   
 $\text{Manhattan, } \lambda d'. \text{R gave K a } d'\text{-inexpensive island in the Pacific, ... } \}$

**FURTHER PREDICTION.** Besides noting the relative proportional reading of *many* in (2), Westerståhl (1985) pointed out that no such reading is possible for *most* in (18):

- (18) Most Scandinavians / SCANDINAVIANS have won the Nobel Prize in literature.

While it is not clear how to rule out this reading, our analysis makes an interesting prediction. Assuming parsimoniously that *many* and *most* share the same parametrized determiners *MANY<sub>proportional</sub>* and *MANY<sub>cardinal</sub>* (i.e., factor (i) could occur in (19)) and since that *-est* can scope non-locally (i.e., factor (ii) can occur too), our analysis locates the source of the missing reading in factor (iii): focus cannot fall within the original NP when the degree operator is *-est*. But, if so, we predict the corresponding reading with adjectives to be missing as well. This prediction is born out: (19a) cannot mean (19b).

- (19) a. John has the cheapest CAR. b. "John has a car that is cheaper than any other (relevant) thing he has."

**Some Refs.** Cohen, A. 2001. Relative readings of *Many*, *Often* and Generics, *NLS* 9. Hackl, M. 2009. On the grammar and processing of proportional quantifiers, *NLS* 17. Herburger, E. 1997. Focus and weak noun phrases, *NLS* 5. Schwarz, B. 2010. A note on *for*-phrases and derived scales, *SuB* 15.