Quantified indicative conditionals and the relative reading of "most"

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Quantified indicative conditionals (QICs) constitute a challenge to semantic compositionality (Higginbotham 1986): while the interpretations of (1a) and (1b) are intuitively equivalent, there is no consensus as to how, or even whether, this can be compositionally derived.

(1) a. Everyone failed if they goofed off. b. No one passed if they goofed off.

The most straightforward approach to this problem is built on what von von Fintel and Iatridou (2002) dub the 'folkloric' solution (von Fintel 1998): assuming that **if**-clauses can semantically restrict nominal quantifiers, just as they restrict modals and quantificational adverbs on Kratzer's (1986) influential analysis. The 'restrictor analysis' assigns equivalent semantic content to the sentences (1a,b) but has been argued to produce unsatisfactory results in several other cases (von Fintel and Iatridou 2002, Higginbotham 2003, Huitink 2009). Leslie (2009), however, has revived the restrictor analysis, defending a version where the problematic cases are resolved by postulating a modal quantifier taking wide scope over a nominal quantifier restricted by **if**.

The inverse reading of *most*-QICs. Kratzer (in press) points out a surprising reading for QICs under **most**. Out of context, (2) receives the 'vanilla' interpretation paraphrased in (2a), but in the right context, and with the right focus marking (as given in (3)), it can be interpreted as (2b). Observe that the continuation in (3) is incompatible with the 'vanilla' reading.

(2) Most kids used calculators if they had to do long divisions.
  a. The majority of kids who had to do long divisions asked for calculators.
  b. The majority of kids who asked for calculators were ones who had to do long division.

(3) *You:* Did you see kids using calculators when you volunteered in your son's school yesterday? What did they use the calculators for?
  Me: **Most kids asked for calculators if they had to do [long divisions]$_F$.** But I am pleased to report that most kids in my son's school do long divisions by hand.

Prima vista, the existence of 'reverse' readings makes a strong case against a restrictor analysis of QICs (folkloric, Leslie-style, or otherwise). These accounts only predict the reading (3a), where the **if**-clause indeed appears to enter into the restriction of **most**, and the matrix VP provides nuclear scope. On the 'reversed' (2b), however, it appears as if the *matrix VP* enters the restriction of **most**, while the **if**-clause provides the scope!

Kratzer (in press) uses the existence of (2b)-type readings to support the startling conclusion that the perceived interpretation of QICs arises non-compositionally. She proposes that in the logical form of QICs, a (material) conditional operator is embedded under the quantifier (as in (4)). This gives the patently wrong truth conditions in (4b) for (1b). Kratzer remedies this by appeal to *pragmatic* domain restriction. In vanilla readings of (1a,b), the upstairs quantifiers happens to get restricted to individuals verfiying the antecedent of the embedded conditional (yielding an interpretation equivalent to (5a,b)). For **most**, Kratzer's approach must additionally assume that the conditional is interpreted biconditionally, via embedded *conditional perfection* (Geis and Zwicky 1971).

(4) a. $\text{All}_x[\text{pers}(x)][\text{goof}(x) \supset \text{fail}(x)]$
b. $\text{No}_x[\text{pers}(x)][\text{goof}(x) \supset \text{pass}(x)]$

(5) a. $\text{All}_x[\text{pers}(x) \wedge \text{goof}(x)][\text{goof}(x) \supset \text{fail}(x)]$
b. $\text{No}_x[\text{pers}(x) \wedge \text{goof}(x)][\text{goof}(x) \supset \text{pass}(x)]$

The 'reverse' reading (2b) can then be construed as a case where the pragmatic domain restriction proceeds differently: in particular, where the domain of the quantifier is restricted to those individuals satisfying the conditional consequent. Problematically, this predicts that the 'reverse' reading is available for *all* QICs, not just those involving **most**. But (1a,b) have no such readings.

We argue that the 'reverse' reading of **most**-QICs does not motivate abandoning compositionality, and show that it is easily accounted for on a restrictor analysis. Our proposal predicts that QICs with **most** (and **many**) have 'reverse' readings, while those with, e.g., **every** do not.

Proposal. Given a restrictor analysis, we show that the 'reverse' reading is simply an instance of the 'relative' reading of **most**. For concreteness, we analyze **most** à la Hackl (2009), as modified by Romero (2015). **Most** decomposes into the cardinal quantifier MANY (6a) and the focus-sensitive superlative morpheme **-est**, which can scope independently of its host (Heim 1999, (6b)). On the relative reading, (3) is assigned the logical form sketched in (7a). With focus on **long divisions**, the comparison class for **-est** can be assumed to be the one in (7b). This produces the desired interpretation (7c).

(6) a. $[\![\text{MANY}_{\text{card}}]\!] = \lambda d_n \lambda P_{et} \lambda Q_{et}.\exists x : P(x)[Q(x)\ \&\ |x| \geq d]$, where n is the degree type
b. $[\![\text{-est}]\!] = \lambda \mathbf{C}_{dt,t} \lambda P_{dt}.\exists d[P(d)\ \&\ \forall C \in \mathbf{C}[C \neq P \rightarrow \neg Q(d)]]$
where **C** is a comparison class

(7) a. $[[\text{-est } C][1[t_1\text{-many kids [used calcs if they had long-div}_F]] \sim C]$
b. *Alts:* $[\![\mathbb{C}]\!] \subseteq \{\lambda d'.d'\text{-many kids used calcs if they had long-div},$
$\lambda d'.d'\text{-many kids used calcs if they had decimals}, \ldots\}$
c. $\exists d[\exists x : (\text{kid}(x)\ \&\ \text{long-div}(x))[\text{calc}(x)\ \&\ |x| \geq d]\ \&$
$\forall C \in [\![\mathbb{C}]\!][C \neq \lambda d'.\exists x : (\text{kid}(x)\ \&\ \text{long-div}(x))[\text{calc}(x)\ \&\ |x| \geq d'] \rightarrow \neg C(d)]]$
$\rightsquigarrow$ *# calculator-using long-div kids > # calculator-using kids doing other problem types*

Notably, 'reverse' readings do not arise when **most** is restricted by a relative clause instead of a conditional. We suggest that the reverse reading of (8) is blocked by an independently-motivated constraint on the relative reading of **most**: the focus associate of (English) **-est** cannot be internal to the DP headed by **most**. Pancheva and Tomaszewicz (2012) trace this effect to the presence of the definite determiner in definite NPs with **most** (**the most albums by U2**), but it is needed for bare **most** on any theory that allows for relative readings: else, (9a) is predicted to have the non-existent reading (9b).

(8) Most students who had to do long divisions asked for calculators.

(9) a. Most [Scandinavians]$_F$ won the Nobel prize in literature.
b. More people from Scandinavia won the Nobel prize than from any other region.

Conclusion. We show that the 'reverse' reading of **most**-QICs is not a counter-argument to the restrictor analysis of QICs; moreover, a compositional analysis of this reading falls out directly on a restrictor view by building on independent evidence for LF (7a), focus-sensitive comparison class construction (7b) and the lexical entries in (6). Analoguous readings are correctly predicted only for quantifiers that are focus-sensitive in the right way (*e.g.*, **many** and **few**, according to the analysis of Romero 2015), but not for other quantifiers—in particular **every**, **all** or **no**. Additionally, importing Leslie's (extended) restrictor analysis solves the equivalence problem for QICs like (1a,b), and, moving forward, allows us to handle apparent scope ambiguities in indicative conditionals involving multiple quantifier types (e.g. **No one always passes if they goof off**).

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