The dynamics of relational nouns

Bert Le Bruyn, Henriëtte de Swart & Joost Zwarts (Utrecht Institute of Linguistics OTS)

Relational nouns are typically analyzed as being of type <e,<e,t>> (see Löbner 1985, Barker 1995,...). One notable exception is recent work by Le Bruyn, de Swart & Zwarts (2013) (LS&Z), who explicitly argue for an <e,t> analysis. We argue that both analyses are right and wrong at the same time by providing evidence in favor of the <e,t>/<e,<e,t>> polysemy of relational nouns.

1. The argument

It's not hard to find an argument in favor of an <e,t>/<e,<e,t>> polysemy. Take e.g. *my favorite sister* and assume *sister* is of type <e,<e,t>>. Under these assumptions, the only possible reading should be that *my favorite sister* refers to my favorite biological sister. The other reading, according to which it refers e.g. to my favorite *Pointer Sister*, can in principle not be derived. The problem lies in the fact that the derivation for this second reading would have to include an <e,<e,t>> to <e,t> shift in which the relational argument of *sister* is existentially closed off. This type-shift is however unwarranted in classical type-shifting theory as it can arguably not be triggered by the type requirements of *favorite* nor *my*. Assuming two lexical entries – the classical one and another one with an existentially closed off argument – would get the two readings while at the same time respecting classical constraints on type-shifting theory.

Facts like the above are well-known but most semanticists working on relational nouns have accepted free detransitivization as a quirk in type-shifting theory (Barker 2011). The consensus seems to be that one should be allowed to ignore relational arguments. In (1) to (4) we present new data (partially inspired by LS&Z) that bring the discussion to the next level. They crucially show the need for an <e,<e,t>> and an <e,t> semantics even when we're clearly not ignoring the relational argument. We postpone the discussion of how an <e,t> semantics can deal with the role of the relational argument until section 3.

(1) my brother (2) I have a brother (3) my only sweet brother (4) I have the only sweet brother

(1) and (2) suggest that the semantics of *my* and *have* is related in the sense that *have* plus its subject is nothing more than the spell-out of *my* at the clausal level. The fact that the brother in question is understood to be the brother of the speaker furthermore suggests that *brother* requires a relational argument that can be provided either by *my* or by the subject of *have*. (3) and (4) change the picture. Indeed, even though it's clear that we're not ignoring the relational argument of *brother* – we're still talking about the brother of the speaker – *only* in (3) and (4) applies to two different interpretations of *sweet brother*. Indeed, what seems to happen is that *only* in (3) applies to 'sweet brother of mine' (the <e,<e,t>> version) whereas it applies to 'sweet brother of someone' (the <e,t> version) in (4). What these data show then is that we need both an <e,t> and an <e,<e,t>> entry for relational nouns, independently of the possibility to ignore the relational argument through detransitivization.

In 2. we dismiss an analysis that would derive the difference between (3) and (4) by positing different scope positions for *only*. In 3. we explore the <e,<e,t>> and <e,t> entries *brother* should have to get to the right semantics of (3) and (4).

2. The semantics of *only*

When confronted with (4), a straightforward reaction is to consider the option that *only* is scopally active, much in line with superlatives. In parallel with the analysis Heim (1999) proposes for (5), *viz.* that it means something along the lines of 'John climbed a higher mountain than anyone else', one could suggest that (4) means something along the lines of 'only I have a sweet brother'. We discuss two arguments against such a move: (i) *Only I have a sweet brother* would allow the speaker to have multiple sweet brothers even though (4) is incompatible with this reading, (ii) We would predict *only* to be able to productively scope out, just like superlatives. This prediction is not borne out: (6) doesn't mean that I was the only one who saw a sweet brother even though (7) can mean that I saw a brother that was sweeter than any brother seen by anyone else.

(5) John climbed the highest mountain. (6) I saw the only sweet brother. (7) I saw the sweetest brother.

Based on the preceding, we propose to maintain the basics of the analyses of *only* proposed in the literature (McNally 2008, Coppock & Beaver 2012 (C&B)) with one change, *viz.* that we make it compatible with <e,t> as well <e,<e,t>> expressions:

(8) $\lambda P_{<e,t>/<e,<e,t>>/\ldots}\lambda x_1\ldots\lambda x_n(P(x_1)\ldots(x_n)\&\forall y(P(x_1)\ldots(y)\rightarrow y=x_n))$

3. The two lexical entries for relational nouns

In (9) we spell-out the semantics of *only sweet brother* on a standard <e,<e,t>> analysis and in (10) on a detransitivized – hence <e,t> – analysis. (10) will be the basis for getting at the right <e,t> entry for *brother*.

(9) a. $[[\text{sweet brother}_{<e,<e,t>>}]] = \lambda y\lambda x[\text{sweet\_brother}(y)(x)]$

b. $[[\text{only sweet brother}_{<e,<e,t>}]]= \lambda v\lambda z(\text{sweet\_brother}(v)(z)\&\forall w(\text{sweet\_brother}(v)(w)\rightarrow w=z))$

(10) a. $[[\text{sweet brother}_{<e,t>}]] = \lambda x\exists y[\text{sweet\_brother}(y)(x)]$

b. $[[\text{only sweet brother}_{<e,t>}]]= \lambda z(\exists y[\text{sweet\_brother}(y)(z)]\&\forall v(\exists w[\text{sweet\_brother}(w)(v)]\rightarrow v=z))$

(11) $[[\text{my}]] = \lambda R_{<e,<e,t>>}\iota x(R(\text{speaker})(x))$

The combination of (9b) with *my* – as defined in (11) – straightforwardly leads to the correct semantics of (3). It would however fail to capture the semantics of (4) as the uniqueness is located at the wrong level. (10b) on the other hand seems completely inadequate for getting the standard reading of (3) but fairly well equipped for (4). There's a further challenge though. Indeed, existentially closing off the relational argument of *brother* in (10) makes it impossible to directly relate the brother in question to the subject. LS&Z propose a pragmatic mechanism to take care of this but don't really succeed in properly restricting the predictive power of their proposal. The semantic alternative we propose is to exploit existential disclosure (Dekker 1993), a mechanism designed to access implicit arguments. What this dynamic operation does is – for the purposes of this abstract – mimicked in a static semantics in (12):

(12) $[[\text{brother}]]= \lambda x\exists y(\text{brother}(y)(x)) \xrightarrow{\text{existential disclosure}} \boldsymbol{\lambda z}\lambda x\exists y(\text{brother}(y)(x)\&\mathbf{y=z})$

Existential disclosure crucially allows us to access arguments that have been dynamically existentially closed off. This possibility goes back to the basic definition of dynamic existential quantifiers that – by themselves – never close off anything. Our proposal for the <e,t> entry of *brother* would then be to have a variant of the detransitivized version in which we replace the static existential quantifier by a dynamic one. Building existential disclosure into *have* as in (13) further allows us to account for the intuition proposed a.o. by Partee (1999) that *have* is special in allowing its subject to function as the relational argument of its object noun. A similar analysis is available for a number of verbs targeting implicit arguments of their objects (e.g. their agentive qualia role as for *to build*, *to knit*) but crucially not for verbs like *to see* in (6). We get back to this distinction during the talk, building a.o. on the work of Borthen (2003) on so-called *have*-verbs.

(13) $[[\text{have}]]= \lambda P_{<e,t>}\lambda y[\textsc{Existential Disclosure}(P)(y)]$

All that is left then to get to the analysis of (4) is a semantics of *the*. Even though nothing crucial hinges on this choice, we follow C&B in our worked-out version of *the only sweet brother* in (14) and *have the only sweet brother* in (15). Note that we mimic the effects of a dynamic semantics in a static one and that we spell-out the (equivalent) uniqueness requirements of *only* and *the* only once.

(14) $[[\text{the only sweet brother}]]= \exists x(\exists y[\text{sweet\_brother}(y)(x)]\&\forall v(\exists w[\text{sweet\_brother}(w)(v)]\rightarrow v=x))$

(15) $[[\text{have the only sweet brother}]]=\boldsymbol{\lambda z}\exists x(\exists y[\text{sweet\_brother}(y)(x)\mathbf{\&y=z}]\&\forall v(\exists w[\text{sweet\_brother}(w)(v)]\rightarrow v=x))$

If we combine (15) with *I*, the truth conditions that follow are exactly the ones we want for (4), *viz.* that I have a sweet brother and that he's the only sweet brother around. One aspect of (15) deserves closer attention, *viz.* that we make existential disclosure conveniently target *y*. Two other options would have been *x* and *w*. To exclude *x* we have to assume, with Dekker (1993), that existential disclosure should be restricted – by a meta-rule – to recover implicit arguments only. The exclusion of *w* on the other hand follows straightforwardly from the rules of dynamic semantics. Indeed, given that *w* appears in the scope of a universal quantifier, it's dynamically closed off.

4. Conclusion

Standard wisdom has it that relational nouns are of type <e,<e,t>> and that their relational argument can be ignored through a quirky type-shift known as detransitivization. We have shown that an <e,<e,t>> entry is necessary to account for (3) but also that an <e,t> entry is necessary even if – as in (4) – we don't ignore the relational argument. A nice side-effect of having both entries is that we can also get rid of free detransitivization and restore type-shifting to normalcy.

Selected references Barker (2011). Possessives and relational nouns, *An International Handbook of Natural Language Meaning* | Borthen (2003). *Norwegian bare singulars*. Dissertation Norwegian University of Science and Technology. | Coppock & Beaver (2012). Weak uniqueness: The only difference between definites and indefinites. *Proceedings of SALT 22*. | Dekker, P. (1993). Existential disclosure. *Linguistics and philosophy*, *16*(6), 561-587. | Le Bruyn, de Swart & Zwarts (2013). 'Have', 'with' and 'without'. *Proceedings of SALT 23*. | McNally (2008). DP-internal only, amount relatives, and relatives out of existentials. *Linguistic Inquiry* 39. 161-169.