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INTENSIONALITY, n-COMPOSITIONALITY AND SEMANTIC PHASES

The following claim has by now acquired the status of a textbook wisdom (see e.g. [2]): First, one can do intensional semantics (a) by relativising the interpretation function $[\![\cdot]\!]$ to possible worlds (or other reference points of sorts), or (b) by increasing the adicity of predicates to make values they yield relative to the world. Second, the way (b) brings with itself additional expressive power, which allows to express the perceived truth-conditions of e.g. (1), where *semanticist* is interpreted relative to the actual world (and **not** to the worlds quantified over by *if*), which would require an extraordinary LF movement under the (a)-type account [4].

(1) If every semanticist owned a villa in Tuscany, there would be no field at all.

Given this received view, an issue widely discussed is how to make the (b)-type, extensional approach restrictive enough in order not to overgenerate, predicting nonexistent readings of modalised sentences (e.g. in [6]). Overgeneration issues have even led Santorio [5] to propose a two-level system where one of the levels works intensionally, i.e. in the style of (a).

The present paper challenges the received view in a way. The argument starts from the observation that an intensional analysis is not essentially committed to the modest expressive power it is normally taken to have. A way is then sketched to deal with the empirically observed restrictions on *de re* readings.

n-compositionality. In a standard intensional semantics, the subformula ϕ in $\Box_1 \dots \Box_n \phi$ is by necessity interpreted within the scope of all modal operators $\Box_1 \dots \Box_n$. This is because the composition of meaning, while working inside out, first computes $[\![\phi]\!]$ as the set of worlds w where ϕ holds, then computes $[\![\Box_n \phi]\!]$ as the set $\{v \mid \forall w : vR_n w \Rightarrow w \in [\![\phi]\!]\}$, and so on.

This is so, however, only given the most restrictive version of compositionality, which is of course also the most familiar one. One dimension across which different notions of compositionality vary is how "deep" into the previous steps of computation the interpretation function is allowed to see [3]. The usual notion presupposes that only the current step can be seen (2a), but it can be weakened as to allow the previous step (i.e. the meanings of the immediate constituents of the expressions currently combined and the syntactic rule by which they are conjoined) to be visible to the interpetation function (2b). (I take α to be simplex, for the sake of brevity.)

(2) a. $[\![[\alpha\ [\beta\ \gamma]]]\!] = f^0([\![\alpha]\!], [\![[\beta\ \gamma]]\!])$
b. $[\![[\alpha\ [\beta\ \gamma]]]\!] = f^1([\![\alpha]\!], [\![[\beta\ \gamma]]\!], [\![\beta]\!], [\![\gamma]\!])$

The 1-compositionality of (2a) may be weakened further, e.g. to any finite n in place of 1.

Now take α to stand for $\Box_1$, β for $\Box_2$ and γ for ϕ. 1-compositionality allows us to require no more than that, for some f_i,

(3) $[\![\Box_1 \Box_2 \phi]\!] = f_i([\![\Box_1]\!], [\![\Box_2 \phi]\!], [\![\Box_2]\!], [\![\phi]\!])$

The valued yielded by a particular f_i may depend on some of its arguments only trivially, so nothing precludes the existence of a certain f_{75} s.t.

(4) $[\![\Box_1 \Box_2 \phi]\!] = f_{75}([\![\Box_1]\!], [\![\Box_2 \phi]\!], [\![\Box_2]\!], [\![\phi]\!]) = [\![\Box_1]\!]([\![\phi]\!]) = [\![\Box_1 \phi]\!]$,

where the presence of $\Box_2$ is completely ignored. The whole of ϕ is interpreted "*de re*" w.r.t. $\Box_2$; if ϕ is itself complex and 2, 3, ...-compositionality is allowed, it may be not the whole of ϕ but a certain subpart of it that is interpreted *de re* w.r.t. some of the modal operators scoping over ϕ—the situation quite familiar from the author of *Waverley* up to the present day. In other words, n-compositionality yields a way to obtain different sorts of *de re* readings—assuming that different f_i are available to the interpreter within the same semantics.

Semantic phases. The main challenges for weaker notions of compositionality are combinatorial explosion and (potential) overgeneration. As for the former, one may respond that all syntactic structures we have to interpet in practice are not only finitely deep but also relatively small. However, overgeneration should be addressed anyway, and it turns out that a satisfactory response to overgeneration will also to a considerable extent reduce the combinatorial load.

Let us take the so-called "Generalisation X" [4], which disallows the predicate *Canadian* in (5) to be interpreted as 'the actual Canadians', in contrast to 'those who are Canadians in the worlds compatible with what Mary (actually) believes'. At the same time, *my brother* allows both the *de dicto* and the *de re* reading.

(5) Mary believes that my brother is Canadian.

The informal suggestion of the present paper is that the n in "n-compositionality" should not count the instances of concatenation (or other syntactic rules) but rather something like Chomsky's [1] **phases**, i.e. constituents that are in some sense impenetrable to syntactic and semantic operations. DPs like *my brother* are phases, so they can serve as separate arguments for f_{75}, but predicates as such cannot, hence the contrasts in (5). There are usually less phases in a sentence than there are words, so the threat of explosion becomes less ominous.

I conjecture that the further examination of other constraints on *de re* interpetation will reveal that they all have to do with the constituent incapable of *de re* being **incomplete** in some formalisable sense, similar to that of $\overline{\text{X}}$-theory or phase theory.

Everything said above does not mean that world pronouns in the style of Percus [4] necessarily have to be abandoned. Sure, they are dubious entities not known to be overt in any natural language, but in the light of certain data (somewhat dubious itself) their presence may even be deemed likely as they seem to behave like normal pronouns under ellipsis [7].

References

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