View-Neutral Mapping Adjuncts as Default Rules in Metaphor Interpretation

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1 Introduction

It is generally accepted that much of everyday language shows evidence of metaphor. We assume a common sense knowledge of the real world in the understanding of metaphorical utterances. We do not address the issue of when an utterance is to be considered metaphorical. Instead, we provide an explanation of how a mtephorical utterance can be processed. Consider the following example:

(1) "In the far reaches of her mind, Anne knew Kyle was having an affair."

The interpretation of this metaphorical utterance may involve talking of IDEAS AS PHYSICAL OBJECTS (A) and MIND AS A PHYSICAL SPACE (B). These two metaphorical views might provide mappings from "physical manipulation" concepts in the source domain to "conscious mental processing" concepts in the target domain. We could use (A) to conclude that "Anne physically manipulating an object" in the source maps into "Anne consciously operating on the idea" in the target. However, (A) and (B) are of no direct use in dealing with the "far reaches" aspect of (1).

Instead of attempting the creation of new mappings to extend an existing metaphorical view (e.g., adding a mapping for "far reaches" to (A)), we employ within-pretence inferencing, which consists largely of reasoning within the terms of the source domain. In our approach, this reasoning takes place in a special, protected computational context that we call the "pretence cocoon". Avoiding map-extension is a good default because in some cases there may well be no plausible correspondences. We use the term 'reality' to refer to the space outside the pretence where propositions are about reality as the understander sees it.

Assuming a commonsensical view of the world, we can reason within the pretence that if some object is difficult to see and/or reach then it is difficult to get hold of it and manipulate it. When a person is physically distant from a physical object then the person usually has only a very low degree of ability to manipulate that object physically. Therefore, assuming that, in the metaphorical conception, Anne is located centrally in her own mind-space, it is possible to reason that Anne has a very low degree of ability to physically manipulate the idea that Kyle was having an affair. We now hope to use the mapping between physical manipulation and conscious mental processing to create the proposition that Anne has only a very low degree of ability to consciously operate on the idea that Kyle was having an affair.

2 VNMAs in ATT-Meta

Note that the metaphorical views involved in our discussion of (1) do not say anything that allows us to map the *degree* of *ability* to physically manipulate an idea to the *degree* of *ability* to mentally operate on the idea. That is, the mapping in the previous paragraph does not address the *degree* and the *ability*. We could invent a new version of the physical-manipulation/mental-operation mapping that does incorporate *degree* and *ability*, but such enrichment of mappings would be needed for many other mappings as well. What we need is a more general and economical approach that allows us, for other metaphorical views too, to map a), physical manipulation to mental operation, b) *ability* to physically manipulate to *ability* to mentally operate, and c) the *degree* of ability to physically manipulate to the *degree* of ability to mentally operate.

In our approach (Wallington et al., 2006), empirical envidence has shown that the mappings of b) and c) are accomplished by a type of default mapping that we specify as VNMAs (in particular, the Causation/Ability and Degree VNMAs, respectively). By using VNMAs and within-pretence inferencing, we do not need to map "far reaches", or to extend the mappings in the metaphorical view to include degrees and abilities. Instead, we propose to use VNMAs that transfer those properties or relations between mappees that are *view-neutral*. The VNMAs are *parasitic* on the metaphorical views in the sense that they depend on some mappings (conditions) to be established for the VNMA to be triggered (adjunct).

ATT-Meta is both a pre-existing approach and an implemented system for metaphorical reasoning. ATT-Meta is query-driven in the sense that we

assume that the surrounding discourse and the context raise the question of to what degree Anne can consciously entertain the "affair idea". Thus, the input is the query (see Barnden and Lee (2002) for formal details of the episode-based formalism employed in the ATT-Meta implementation):

(2) to-degree-exactly(D): can-consciously-mentally-operate-on(anne,the-idea-that(having-affair(kyle))).

Within-pretence reasoning would then follow the procedure described in example (1), in which a conversion rule creates an explicit mapping for *degree* and *ability*. ATT-Meta implements the Degree VNMA by including degrees in such individual rules. The conclusion is a default conclusion since the within-pretence conclusion (ideas being physically inacessible), and the conversion rule used are default rules. Thus, information of the reality context could potentially defeat the conclusion. Instead of creating specific rules about *degree* and *ability*, we plan to handle them by means of separate default production rules.

3 VNMAs as Default Rules

We want to express the idea that a relationship (causation, enablement, ability, etc.) between two events or entities identically transfer from the pretence to the reality. We use the $\mapsto$ symbol to express that this mapping is a default. The Causation/Ability VNMA is used to map *ability* in (1); it expresses the idea that if Anne has the ability to physically manipulate then it has the ability to mentally operate, where *ability* is a quality of Anne. The specific mapping of each event variable does not depend on the VNMA but on the metaphorical view in play.

The metaphorical utterance "McEnroe *starved* Connors to death" can be used to express in the reality that "McEnroe *defeated* Connors in a slow manner" if we view SPORT AS COMBAT. Intuitively, we talk about four different events, two in each context (the causer and the causee). However, this unnecessarily multiplicates the number of entities which can make the implementation of VNMAs a very complex task if we consider not a single utterance but a discourse. It is somehow more consistent with the notion of metaphorical views, where we view a tennis match *as* a combat (SPORT AS COMBAT), to consider only two events:

(Causation) $\forall e_1, e_2(cause(e_1, e_2)_{pret} \mapsto cause(e_1, e_2)_{rlt})$

The event variables in the pretence cocoon do not have denotation in the reality, but they simply are considered to be true to make possible the

within-pretence reasoning. Furthermore, it seems more consistent with the treatment of those terms whose denotations are present both in the pretence and the reality (e.g., Connors and McEnroe).

The Qualitative Degree VNMA is also involved in the interpretation of (1) to map the exact degree of operability from the physical to the mental domain. The logical form of one aspect of this VNMA is formalized as follows:

(Degree) $\forall e, d(degree(e, d)_{pret} \mapsto degree(e, d)_{rlt})$

4 Concluding Remarks

Approaches in the formal semantics tradition (Asher and Lascarides, 1995) do not account for metaphorical utterances including map-transcending entities. Moreover, map-transcending entities pose a problem for analogy-based approaches to metaphor interpretation (Falkenhainer et al., 1989), which usually require a conceptual similarity between the source and the target domains. Map-transcending entities need to be mapped by extending on the fly the metaphorical views with new correspondences. We have argued that this strategy is in some cases plainly impossible.

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