Second-order context-dependency in attitude reports.

Introduction. [2] observed that sentence (1a) has besides the de-dicto reading in (1b) and the de-re reading in (1c) a third reading.

(1) a. Adrian wants to buy a jacket like Malte’s.
   b. wants(Adrian, (∃x)(jacket(x) & like-Malte’s-jacket(x) & buy(Adrian,x)))
   c. (∃x)(jacket(x) & like-Malte’s-jacket(x) & wants(Adrian, buy(Adrian,x)))

A situation in which (1a) gives rise to the third reading is the following: Malte has a Burberry jacket, Adrian has seen a Burberry jacket in a shop window and formed the desire to buy such a jacket, Adrian doesn’t know either Malte or his jacket, but you know Malte and have seen his jacket, and I say (1a) to you. There is a natural interpretation of this utterance that neither (1b) nor (1c) render correctly. (1c) is wrong for this reading because the quantifier (∃x) entails that that there is some particular Burberry jacket of which it is true that Adrian wants to buy it. And (1b) is wrong because it represents the description ‘like Malte’s jacket’ as part of the content of Adrian’s desire, which in the given scenario it is not. Fodor identified the problem presented by her third reading as a paradox of scope: given her assumptions about logical form there is nowhere where the variable x can be bound that does justice to this reading. The phenomenon of narrow scope transparent interpretation exemplified by Fodor’s third reading has been and is still subject to lively debate (e.g. [9, 10, 8, 11]), where the discussions typically take the form of focusing on some particular scenario which forces a reading distinct from (1b) and (1c) upon (1a) and then tying the solution to this scenario. I argue that Fodor’s third reading is not a uniform phenomenon but that there is a range of third readings, which differ from each other in the ways in which the existential phrase ‘a jacket like Malte’s’ interacts with causal, epistemological and attitudinal factors that such third readings may involve. A systematization of these factors has led to a new scenario, which gives rise to a reading of Fodor’s third reading that is not covered by any of the solutions in the literature with which I am familiar (see (4) below). It also points to a notion of logical form in which the relevant factors can be adequately represented and that is more differentiated than those implicitly or explicitly assumed in the literature cited in this paper. The logical form formalism I propose to make use of to represent the different readings my analysis distinguishes is an extension of Discourse Representation Theory (DRT) for the representation of attitudinal states [7].

The range of third readings in the literature. Contexts that support a third reading of (1a) range from a de-re interpretation to a de-dicto interpretation of narrow scope transparency. (2a)-(2c) present some paradigmatic examples that differ in the amount and type of existence presuppositions introduced by context.

(2) a. A store sells some coats that all look like Malte’s and Adrian does not know anything about Malte. Assume further that Adrian wants one of those coats and any of them is an option. [9, cf. p. 427]
   b. Adrian’s desire is to buy some jacket or other, and the only important thing is that it be a Burberry jacket. Unbeknownst to him, Malte’s jacket is one of those as well. [1, cf. p. 100]
   c. Malte and Adrian do not know each other. Adrian has seen a green Burberry jacket
in a catalogue and wants to buy one. Malte happens to own precisely such a green Burberry jacket. [10, cf. p. 395]

The difference between those contexts is in particular prominent in the status of the entities that are drawn upon by the speaker in her judgment of likeliness of Adrian’s object of desire with Malte’s jacket. (2a): like compares existing jackets; so Adrian wants to buy a jacket like Malte’s (object of desire and objects of comparison de-re). (2b): in the salient reading that Adrian has seen a Burberry jacket and wants to buy a similar one, like compares Malte’s jacket with the jacket Adrian has seen with properties of jackets Adrian has in mind; Adrian wants to buy a jacket like a jacket like Malte’s (object of desire de-dicto, objects of comparison de-re). (2c): like compares properties of jackets with properties of jackets; Adrian wants to buy a jacket that has properties which are also properties of Malte’s jacket (object of desire and comparison de-dicto). Based on the amount and type of existence presuppositions, each of the contexts (2a)-(2c) supports a different formal semantics for the third reading of (1a).

(3) a. De-Re Narrow Scope Transparency (ad. 2a): \( \exists X : \text{coats} \sim \text{like} \sim \text{malte's}(X) \) and Adrian wants to buy one of \( X \)

b. Hybrid Narrow Scope Transparency (ad. 2b): Adrian wants \( w_0 \) \( [\lambda w' [a \sim \text{jacket} \sim \text{like} \sim \text{maltes}] \sim w_0] [\lambda x_1 [\text{PRO to buy}] \sim w_0 : x_1] \)

c. De-Dicto Narrow Scope Transparency (ad. 2c): \( \text{Attitude}_w(x, \langle P, Q \rangle) \) iff \( \exists Q' \) (the reported property) s.t. at the \( w \)-closest worlds \( w' \) where \( Q(w') \neq \emptyset \) (the reporting property): \( Q'(w') \neq \emptyset \) and \( Q'(w') \subseteq Q(w') \) and \( \text{Attitude}_w(x, \lambda w' P_w(Q')) \) is true.

The Adidas Case. The following scenario (4) induces an intentional narrow scope transparent analysis of ‘a jacket like Malte’s’ by removing the remaining existence presupposition of a reported property from context (2c).

(4) Adrian has seen a jacket which has three stripes on its sleeves and wants to buy such a jacket. However, he read that Adidas supports child labour in the production of its jackets, so the additional condition for his buy is that the jacket is not from Adidas. Adrian does not know that Adidas is the brand with the three stripes, so he has a desire that he would paraphrase as “I want to buy a jacket from the brand with the three stripes but not from Adidas.” Fritz has seen Malte’s jacket which has three stripes and as Fritz also knows about the problem with child labour and Adidas he believes that Malte would never buy a jacket which is made by children. Fritz also doesn’t know that Adidas is the brand with the three stripes. Fritz heard about Adrian’s desire and reports Adrian’s attitude with (1a).

Certainly, Fritz’ report is true with respect to Adrian’s desire and Fritz’ belief about Malte’s jacket whereas (3a)-(3c) would predict that the report is false. While the approach in (3c) seems to provide a general semantics for ‘like’, the account suffers from the problem of logical omniscience. Adidas is the brand with three stripes in the actual world so the property of being a jacket from the brand with the three stripes but not from Adidas does exist only in Adrian’s desire worlds and (coincidentally) in Fritz’ belief worlds. The type of likeliness that is involved in (4) involves the sharing of discourse referents across agents without any mediating de-re entity and thus concerns the intentionality of attitudes themselves.

DRT with attitudes and anchors. Disentangling the relation between context and attitude reports [5] and avoiding the problem of logical omniscience [4] was one of the main motivations for the development of an extension of the core language of Discourse Represen-
tation Theory to the representation of propositional attitudes with a three-place predicate $\text{Att}$ [7]. The first argument of $\text{Att}$ represents the bearer of the attitude that $\text{Att}$ is used to describe, the second argument is for descriptions of the attitudinal state that the $\text{Att}$-predicate assigns to the bearer and the third argument is for “external anchors” of discourse referents. The descriptions occupying the second argument slot of $\text{Att}$ consist of pairs $\langle \text{MOD}, K \rangle$, where $\text{MOD}$ is an attitudinal mode indicator (whether the attitude represented by the pair $\langle \text{MOD}, K \rangle$ is e.g. a belief, desire or intention) and $K$ is a representation of the content of the attitude. An external anchor $\langle x, b \rangle$ fixes the reference of a discourse referent $x$ to the model-theoretic entity $b \in \text{Discourse} - \text{Universe}$ (direct reference). An “internal anchor” $\langle \langle \text{ANCH}, x \rangle, K \rangle$ represents an agent’s relation of her acquaintance with an externally anchored discourse referent $x$ and is thus a constituent of $K$ in the second argument slot of $\text{Att}$. The paper shows that with the help of these fine-grained instruments it is possible to make formally precise the differences and similarities in the causal, epistemological and attitudinal status of entities and their properties involved in (1a) that are distinctive for the contexts (2a)-(2c). E.g., while the discourse referent for a jacket involved in Adrian’s attitude in (2a) is externally anchored, this is not the case for Adrian’s attitude in (2c). Or, while Adrian has exactly the same attitude in (2a) and (2b), the context makes all the difference here. Either the external anchor for a jacket he wants to buy points to a jacket like Malte’s (2a) or it points to a jacket like a jacket like Malte’s (2b). Besides a systematization of the relation between context and third readings via the application of principles from dynamic semantics, the paper also provides a representation of (4) with the help of “vicarious anchors” that model referent and reference sharing across agents [6].

**The semantics of attitudes below scope.** The differences between the variants of Fodor’s third reading - and this abstract presented only some of the possible variants - are hard to capture within the established terminology of scope-based de-re and de-dicto attitudes. Instead, this paper argues that a more fine-grained semantics of attitude reports in terms of external and internal anchors is required that allows to explicitly represent the differences in the causal, epistemological and attitudinal status of referents and conditions that manifest at a level of meaning below the structures that are accessible to scope relationships and possible worlds. Finally, the argument of this paper implies two questions: (1) How much of the structure and semantics of attitudes do we want to import into the structure and semantics of their reports? (2) Given the variety of contexts that can induce different truth conditions for the same report, does it make sense to model the semantics of attitude reports as if they could appear on their own or do we need a dynamic semantics for attitude reports that takes the role of context explicitly into account? While this paper does not provide definite answers to those questions it provides the formal means to make explicit their motivation and highlights their relevance to the formal semantics of attitude reports.

**References**