A ‘Situated’ Solution to Prior’s Substitution Problem

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1. Introduction. DP/CP-neutral attitude verbs (e.g. remember, fear, imagine, see) exhibit the following phenomena:

1.1. DP/CP substitution behavior. In the complements of most of these verbs, CPs resist the truth-preserving substitution by a DP of the form ‘the proposition [CP]’ (see (1)) (see a.o. Prior, 1971; King, 2002; Moltmann, 2003, 2013):

(1) a. Sherlock remembers (/fears/imagines/sees) [CP that Moriarty has returned].
   ≠ b. Sherlock remembers (/fears/imagines/sees) [DP the proposition [CP that Moriarty has returned]].

Some of the verbs in (1) allow the substitution of their CP complement by some DP of the form ‘[DP [CP]]’. In particular, most factive verbs (incl. remember) allow the substitution of their CP complement by a DP of the form ‘the fact [CP]’ (see (2)); most negative future-oriented verbs allow the substitution of their CP complement by a DP of the form ‘the possibility [CP]’ (see (3)) (cf. Moltmann, 2003):

(2) a. Sherlock remembers [CP that Moriarty has returned].
   ≡ b. Sherlock remembers [DP the fact [CP that Moriarty has returned]].

(3) a. Sherlock fears [CP that Moriarty will return].
   ≡ b. Sherlock fears [DP the possibility [CP that Moriarty will return]].

1.2. The objectivization effect. The truth-conditional difference between (1a) and (1b) is often attributed to a shift in the reading of the attitude verb (see Pietroski, 2000; Moltmann, 2003; Forbes, t.a.). This shift changes the reading of the verb from a reading in which the semantic value of the complement serves as the content of the reported attitude (in (1a); see (4a)) to a reading in which the semantic value of the complement serves as the object towards which the attitude is directed (in (1b); see (4b)):

(4) a. Sherlock’s remembering has as its content (the fact) that Moriarty has returned.
   ≠ b. Sherlock’s remembering has as its object the proposition that Moriarty has returned.

Moltmann (2003) calls the above-described shift in reading the objectivization effect. This effect is typically not exemplified by pairs of sentences like (2) and (3). For example, the salient reading of (2b) is (4a).

2. Challenges and Objectives. Since traditional accounts analyze attitude reports as relations between individuals and propositions – and identify the values of CPs with propositions –, they capture neither the above substitution behavior (s.t. they face Prior’s substitution problem) nor Moltmann’s objectivization effect. Newer relational accounts solve this problem by questioning the interpretation of CPs as propositions (see Parsons, 1993; Moffett, 2003; Pryor, 2007) or by separating DP- from CP-taking occurrences of attitude verbs (see a.o. Pietroski, 2000; King, 2002; Forbes, t.a.). However, none of these accounts simultaneously solves the substitution problem and captures the objectivization effect.

This paper seeks to compensate for the above shortcoming. Specifically, it provides
a uniform account of DP/CP substitution behavior and the objectivization effect that uses the particular pragmatic properties of the situation that serves as the internal argument of the attitude report (cf. Schlenker, 2003; Higginbotham, 2003). The account is inspired by Forbes’ (t.a.) account of the objectivization effect and by Moltmann’s (2003) ‘unique determination’-strategy for the solution of the substitution problem.

3. Proposal: background. On the proposed account, attitude verbs are interpreted as relations to situation-anchored propositions, i.e. a variant of Austrian propositions. Situation-anchored propositions are sets of situations, \( \lambda j [j \leq (w_\sigma, t_\sigma) \land p(j)] \), at which the proposition \( p \) is true, which approximate the information of the temporal world-part, \( (w_\sigma, t_\sigma) \) (with \( w_\sigma \) a world and \( t_\sigma \) a point in time), that is associated with a contextually chosen situation \( \sigma (:= fc(S)) \) (called the anchor of the proposition) (see Liefke and Werning, t.a.). The situation-anchoring of propositions is motivated by the \( \sigma \)-relativity of the truth of \( p \) (s.t. \( p \) may be false at the external situation \( @ \)): consider the case of \( \text{fear} \) and \( \text{imagine} \) and is supported by the situation-semantic analysis of attitude verbs (see Barwise and Perry, 1983; Kratzer, 2002, 2006; Higginbotham, 2003).

The interpretation of \( \text{remember} \) is given in (5). (The interpretation of the other verbs from (1) is analogous). In this interpretation, \( f \) is a contextually given choice function. This function selects a specific (possibly non-unique) member of the set of situations, \( S \), in dependence on a parameter, \( C \), for the event described by the attitude verb (in (5): \( x \)'s remembering in \( i \) ). \( fc(S) \) is then the particular situation which the agent \( x \) remembers in the external situation \( i \).

(5) \[ \llbracket \text{remember} \rrbracket = \lambda p \lambda x \lambda i \exists f [\text{remember}; (x)(\lambda j. j \leq (w_{fc(S)}, t_{fc(S)}) \land p(j))] \]

4. Proposal, part I: the DP/CP substitution behavior from (1)–(3) is then explained by the lexical/pragmatic constraints on the contextually chosen situation, \( fc(S) \): For the verb \( \text{remember} \), these constraints restrict the candidate anchors of the embedded proposition to situations \( j \) that are located at a part of the world \( w_\sigma \), that is associated with the point of evaluation, \( @ \), of the attitude report (i.e. \( j \leq w_\sigma \)) and that precede the time of \( @ \) (i.e. \( j < @ \)). As a result of this restriction, (5) is equivalent to (6):

(6) \[ \lambda p \lambda x \lambda i \exists f [\text{remember}; (x)(\lambda j. j \leq (w_{fc(S)}, t_{fc(S)}) \land (j \leq w_i \land j < i)) \land p(j))] \]

We assume that the DP shells \( \text{the fact} \) and the \( \text{possibility} \) have the interpretation from (7) and (8), respectively:

(7) \[ \llbracket \text{the fact} \rrbracket = \lambda p \lambda j [p(j) \land j \leq w_@] \]

(8) \[ \llbracket \text{the possibility} \rrbracket = \lambda p \lambda j [p(j) \land @ < j] \]

The compatibility of the constraint-profile of ‘the fact [\( \text{CP} \)]’ (i.e. if \( p \) is a fact, then \( p \) is true of a temporal part of \( @ \)) with the constraint-profile of \( \text{remember} \) then explains the equivalence of (stylized variants of) (2a) and (2b):

(9) \[ \llbracket \text{Sherlock remembers [DP the fact [CP that p]]} \rrbracket \]
\[ = \lambda i \exists f [\text{remember}; (s)(\lambda j. j \leq (w_{fc(S)}, t_{fc(S)}) \land (j \leq w_i \land j < i)) \land (p(j) \land j \leq w_i))] \]
\[ = \lambda i \exists f [\text{remember}; (s)(\lambda j. j \leq (w_{fc(S)}, t_{fc(S)}) \land (j \leq w_i \land j < i)) \land p(j))] \]
\[ = \llbracket \text{Sherlock remembers [CP that p]} \rrbracket \]

Analogous observations hold for the constraint-profiles of the DP ‘the possibility [\( \text{CP} \)]’ (see (8)) and the verb \( \text{fear} \), whose compatibility explains the equivalence of (3a) and (3b). The requirement of maximal generality on the interpretation of the DP shell \( \text{the} \).
proposition – which excludes the restriction to situations with particular temporal or spatial properties – explains the semantic deviance of (the content-reading of) (1b) and the resulting difference between (1a) and (1b).

5. Proposal, part II: the objectivization effect from (1) (see (4)) is explained by assuming that DPs of the form “[DP [CP]]” can only be interpreted as the content of the reported attitude when the constraint-profile of the DP is compatible with the constraint-profile of the verb (e.g. in (2b), (3b)). In this case, the attitude verb (here: remember) saliently receives its interpretation from (5). When the constraint-profile of the DP is not compatible with the verb’s constraint-profile (e.g. in (1b)) – or when the attitude verb receives its alternative interpretation in compatible cases –, the DP is interpreted as the object of the attitude. To make this possible, the verb is coerced into an object-reading along the lines of Ginzburg (1995).

6. Discussion. The full paper gives a detailed semantics for DPs of the form ‘the proposition [CP]’, ‘the fact [CP]’, and ‘the possibility [CP]’ (alongside other examples), compares the proposed account to the accounts from Moltmann (2003), Forbes (t.a.), and Elliott (2016), and defends this account against objections from King (2002) and Moltmann (2013).

References.