

## Non-de dicto construals as a uniform phenomenon

(Clemens Mayr & Viola Schmitt)

**Summary:** The literature identifies several phenomena where an expression  $\alpha$  embedded under an intensional operator OP is evaluated transparently relative to OP (non-de dicto construals, ‘NDD’). Contrary to existing accounts and based on novel data, we argue that (i) a generalized analysis of all NDD-cases is needed, (ii) all NDD-cases are derived by the same mechanism involving replacement of  $[\alpha]$  by other concepts, and (iii) the replacement option is not tied to a separate structure: there is no ambiguity between NDD- and *de dicto*-cases. We propose a new, generalized analysis: each expression comes with a set of alternatives, intensional operators quantify existentially over such sets and quantification is restricted *qua* the QUD.

**Point of departure: *de re* construals** (1-b) is true in scenario (1-a) under its *de re* construal ([12] a.m.o). Many theories assume that *de re* involves a concept ‘replacing’ the res for the subject ([12, 3, 5] a.o.):  $[[Ann]]$  may be replaced by  $[\lambda w. \text{the person dancing with Eve at the party in } w]$  in (1-b), so that Joe believes the proposition  $[\lambda w. \text{the person dancing with Eve at the party in } w \text{ is involved with Eve in } w]$ .

(1)a. SCENARIO: Joe went to a party. He thought all guests were professors. Except for 3 students called Ann, Bea, and Cate this was the case. Joe doesn’t know their names. As he saw Ann dancing with Eve and didn’t see Eve dancing with anyone else, he thinks Eve and the person he saw her dancing with are lovers. Eve is single.

b. *Joe thinks that Ann is involved with Eve.*

**Two novel properties of *de re* construals (i) QUD-dependence:** *The de re construal must address a QUD salient in the context in the same way that the de dicto construal would if it were true:* The *de dicto* construal of (1-b), if true, would address QUD<sub>1</sub>: Does Joe believe Eve is single? With the concept salient in (1-a) mentioned above, the *de re* construal of (1-b) is that Joe believes the person dancing with Eve at the party is involved with Eve. This is true in (1-a) and addresses QUD<sub>1</sub> in the same way the *de dicto* construal of (1-b) would. For (2), the *de dicto* construal would address QUD<sub>2</sub>, if it were true: Does Joe believe Ann was at the party? With the concept salient in (1-a), the *de re* construal of (2) would say that Joe believes the person dancing with Eve at the party was at the party. This is true in (1-a), but does not address QUD<sub>2</sub>. And as the *de dicto* construal of (2) is false in (1-a), (2) is unacceptable in (1-a).

(2) *#Joe thinks/knows that Ann was at the party.*

**(ii) Parallelism:** *The truth-conditions for the de re construal of a sentence include the de dicto construal.* (3-a) makes the same concept salient for replacement of  $[[Ann]]$  as (1-a). With it, the positive components of the sentences in (3-b) are true on the *de re* construal: there is a guest (Joe) who believes that Eve is involved with the person dancing with Eve at the party. The sentences should thus be true if they only entailed that no other guest has that belief. But their unacceptability indicates they also entail that no guest believes *de dicto* that Eve is involved with Ann, (this condition is violated by Bill). Likewise, the truth of (3-c) only follows if the argument of *two guests* can be *de re* and *de dicto* “at the same time”.

(3)a. SCENARIO: Joe went to a party. He saw two people dancing with each other. One of them was Ann, and the other was Eve. Joe doesn’t know Ann’s name but is familiar with Eve. So he thinks Eve and the person he saw her dancing with are lovers. Bill was also at the party. He is familiar with both Ann and Eve. He didn’t see them together at the party, but he is convinced because of something that Eve said that she is in a relationship with Ann. No other guest has a belief about whether Eve might be in a relationship with someone at all.

b. (i) *#Exactly one guest thinks that Eve is involved with Ann.*

(ii) *#Only { one guest/Joe } thinks that Eve is involved with Ann.*

c. *Two guests think that Eve is involved with Ann.*

**Narrow-scope transparent construals** Regarding the interpretation of *a student*, (4-b) is standardly taken to be ambiguous. Reading R1 says that in all of Joe’s doxastic alternatives  $w$  there is someone who is a student in  $w$  who is involved with Eve in  $w$ ; reading R2 says that in all of Joe’s doxastic alternatives  $w$  there is someone who is a student in the world of evaluation  $w^*$  and is involved with Eve in  $w$ . In both cases the indefinite takes narrow-scope w.r.t. *believe*, but in R1 *student* is evaluated opaquely, (in Joe’s doxastic alternatives), while in R2 it is interpreted transparently (in  $w^*$ ). R1 is thus narrow-scope opaque (N-O); R2, narrow-scope transparent (N-T). (4-b) is false on its N-O construal in

(4-a), but true on its N-T construal, supporting the assumed ambiguity. It is standardly assumed that the N-O and N-T construals are derived from distinct syntactic representations ([2, 1, 10, 4, 15] a.o.). Crucially, none of these approaches appeal to replacement of concepts.

(4)a. SCENARIO: Joe went to a party. He thought all guests were professors. Except for three students called Ann, Bea, and Cate, this was the case. Joe doesn't know their names. As he saw Ann, Bea, and Cate dancing with Eve and didn't see Eve dancing with anyone else, he thinks Eve and one of them are lovers but is not sure which of them it is.

b. *Joe thinks a student is involved with Eve.*

**Point 1: generalized analysis necessary** N-T exhibits the same behavior wrt. QUD-dependence and parallelism as *de re*. (i) **QUD-dependence**: *The N-T construal must address a QUD salient in the context in the same way that the N-O construal would if it were true.* The contrast between (5) and (4-b) seems fully parallel to the one between (2) and (1-b). This does not follow straightforwardly, as the existing approaches to N-T do not share technical similarities to approaches to *de re*. But if N-T involved replacement of properties, one could make sense of the similarities: The N-O construal of (4-b), if true, would address QUD<sub>1</sub> (Does Joe believe that Eve is single?). The property  $[\lambda w.\lambda x. x \text{ is dancing with Eve at the party in } w]$  is salient in (4-a) as a replacement for  $[[\text{student}]]$ . This property yields the N-T construal of (4-b) that Joe believes that someone dancing with Eve at the party is involved with Eve. This is true in (4-a) and addresses QUD<sub>1</sub> in the same way the N-O construal of (4-b) would. The N-O construal of (5), if it were true, would address QUD<sub>3</sub>: Does Joe believe that a student was at the party? With the property salient for replacement in (4-a), the N-T construal of (5) would say that Joe believes someone dancing with Eve at the party was at the party. This is true in (4-a), but does not address QUD<sub>3</sub>. The N-O construal of (5) is moreover false in (4-a), so (5) comes out unacceptable.

(5) *#Joe thinks/knows that a student was at the party.*

**Point 2: no ambiguity** Like *de re*, N-T exhibits (ii) **Parallelism**: *The truth-conditions for the N-T construal of a sentence include the N-O construal.* The unacceptability of (6-b) in (6-a) is fully analogous to that of (3-b) in (3-a): The positive components of the sentences in (6-b) are true on the N-T construal of *a student*. As Joe is the only guest with that belief, the sentences as a whole should be true in (6-a), if no entailment about the N-O construal were present. But just like the negation of the *de re* entails the negation of the *de dicto* construal, the negation of the N-T seems to entail that of the N-O construal. This would correctly render the sentences unacceptable in (6-a). Moreover, (6-c) is analogous to (3-c).

(6)a. SCENARIO: Joe went to a party. He thought all guests were professors. Except for three students called Ann, Bea, and Cate, this was the case. Joe doesn't know their names. Joe saw each of Ann, Bea, and Cate dancing with Eve. So he thinks Eve and one of them are lovers but is not sure which of them it is. Bill was also at the party. He has no idea whether there were any students at the party, but for some reason he is convinced that Eve is in a relationship with a student. No other guest has a belief about whether Eve might be in a relationship with someone at all.

b. (i) *#Exactly one guest thought that Eve is involved with a student.*

(ii) *#Only { one guest/Joe } thought that Eve is involved with a student.*

c. *Two guests thought that Eve is involved with a student.*

Parallelism for N-T and N-O is unexpected on existing views, where N-T and N-O are due to distinct syntactic representations. Yet, parallelism for *de re* can be captured if the truth-conditions of a sentence like (1-b) are weak by entailing the disjunction of the *de re* and the *de dicto* construals (e.g. [5, 11]), i.e., descriptively, involve existential quantification, as paraphrased in (7-a). The data thus suggest a similar treatment for N-T, (7-b). (Both would have to be supplemented by the QUD-constraint, see below.)

(7)a.  $[[\text{(1-b)}]]^w = \exists f_{\langle s,e \rangle}. \forall w' \in \text{DOX}_{\text{Joe},w}(f(w') \text{ is involved with Eve in } w')$

b.  $[[\text{(4-b)}]]^w = \exists f_{\langle s,et \rangle}. \forall w' \in \text{DOX}_{\text{Joe},w}(\exists x[f(w')(x) \text{ is involved with Eve in } w'])$

**Point 3: replacement not due to LF** The LF for (7-a) has been argued to involve a concept generator  $G$  attached to the res *Ann* as in (8-a) ([11, 8, 9] a.o.).  $G$  is existentially quantified over and maps *Ann* to a replacement concept. For (7-b) the LF would be like (8-b).

(8)a.  $[ \text{Joe thinks } [ \lambda_2 [ \text{that } [ G_2 \text{ Ann } ] \text{ is involved with a teenager } ] ] ]$

b. [ Joe thinks [  $\lambda_2$  [ that [ a [  $G_2$  student ] ] is involved with a teenager ] ] ]

As  $G$  is not needed for *de dicto*/N-O-construals, (9-a,b) should be acceptable in scenarios (3-a) and (6-a), respectively: for the positive components to be true, the *de dicto*/N-O LF without  $G$  would suffice. The negative component would thus not entail that the *de re*/N-T construals are false for Joe. But as (9-a,b) are unacceptable in the scenarios, there must be entailments to that effect. One could of course assume that  $G$  must also be present in (9). In fact, for this to make sense  $G$  would have to be attached to at least any DP and any NP. But why should this be the case?

(9)a.#Only Bill thinks that Eve is involved with Ann.

b.#Only Bill thinks that a student is involved with Ann.

**Proposal** NDD-construals arise from general properties of lexical meaning, its composition, and the semantics of intensional operators. (i) All expressions introduce sets of alternatives: the interpretation function  $\mathcal{F}^{c,Q}$  (relativized to a context  $c$  and a QUD  $Q$ ) maps expressions  $\alpha$  to pairs of ordinary (o) semantic value and transparency (t) semantic value; the t-value is the set of salient alternatives in  $c$  of the o-value of the same type, exemplified in (10-a). In the semantic derivation, o- and t-values combine in parallel (the latter via pointwise functional application, e.g. [13]). If the t-value of the VP in (4-b) is the singleton containing the o-value, combination with (10-a) yields (10-b) as the meaning of the embedded clause  $S$  in (4-b). The o-value of intensional operators like *believe* targets the t-value of their complements and existentially quantifies over those elements of the set, that, when used as the content of the subject's belief, will yield the same answer to  $Q$  as ascribing the o-value of the complement to the subject would, as sketched in (10-c) (we omit potential alternatives of the subject). The t-value of such operators is the same as the o-value, thus stopping projection of alternatives from the embedded clause.

(10a).  $\mathcal{F}^{c,Q}(student) = \langle \lambda w. \lambda x. student(w)(x), \{ \lambda w. \lambda x. student(w)(x), \lambda w. \lambda x. p\text{-dancing-w-E}(w)(x), \dots \} \rangle$

b.  $\langle \llbracket S \rrbracket^o, \llbracket S \rrbracket^t \rangle = \langle \lambda w. \exists x [st.(w)(x) \wedge involved\text{-w-E}(w)(x)], \{ \lambda w. \exists x [st.(w)(x) \wedge involved\text{-w-E}(w)(x)], \lambda w. \exists x [p\text{-dancing-w-E}(w)(x) \wedge involved\text{-w-E}(w)(x)], \dots \} \rangle$

c.  $\mathcal{F}^{c,Q}(Joe [believe S]) = \langle \lambda w. \exists p [DOX_{j,w} \subseteq p \wedge p \in \llbracket S \rrbracket^t \wedge [\lambda w'. DOX_{j,w'} \subseteq p]] \text{ addresses } Q \text{ in the same way as } [\lambda w'. DOX_{j,w'} \subseteq \llbracket S \rrbracket^o], \{ \llbracket Joe [believe S] \rrbracket^o \} \rangle$

A pair  $\langle p_{\langle s,t \rangle}, S \subseteq D_{\langle st \rangle} \rangle$  is true in  $w$  if  $p(w) = 1$ , so (4-b) is true if Joe believes an alternative  $q$  of a **student is involved with Eve** and ascribing him belief of the latter answers the QUD in the same way as ascribing him belief of  $q$ . As embedding under intensional operators involves existential quantification over alternatives and the latter is restricted by the QUD, QUD-sensitivity and parallelism follow.

**Predictions** We predict that *transparent construals should not be restricted syntactically* (contra [10] a.o.). This seems correct: The motivating data extend to transparent construals of determiners ([18], omitted here), moreover, the asymmetry between nominal and verbal predicates observed by [10] is not categorial (cf. [14, 17]): (11-b) can be true in scenario (11-a), so the VP can be construed transparently.

(11a). SCENARIO: The staff complains how the management spends all their time on hobbies. Bea and Joe went skiing. Ann, taking them to be in management, saw them leave and falsely concluded they went hiking. Eve: *Trust has eroded...*

b. *Ann even believes that the bosses went skiing for several hours!*

Note also that the system involves no reference to an acquaintance relation in constraining replacement (assumed for *de re* by [16, 11, 7, 8, 6] a.o.). It is unclear (a) whether acquaintance is still needed, since the QUD-constraint can account for the examples that originally motivated acquaintance ('shortest spy', [3]) and (b) how it would extend to N-T.

[1] M. J. Cresswell. *Entities and indices*. Kluwer, Dordrecht, 1990. [2] H. Kamp. Formal properties of *now*. *Theoria*, 37:227–273, 1971. [3] D. Kaplan. Quantifying in. *Synthese*, 19:168–214, 1968. [4] E. Keshet. Split intensionality: a new scope theory of *de re* and *de dicto*. *Linguistics and Philosophy*, 33:251–283, 2011. [5] D. Lewis. Attitudes *de dicto* and *de se*. *The Philosophical Review*, 88(4):151–271, 1979. [6] E. Maier. Presupposing acquaintance: a unified semantics for *de dicto*, *de re* and *de se* belief reports. *Linguistics and Philosophy*, 32(5):429–474, 2009. [7] D. Ninan. *Imagination, content and the self*. PhD thesis, MIT, 2008. [8] D. Ninan. Counterfactual attitudes and multi-centered worlds. *Semantics and Pragmatics*, 5(5):1–57, 2012. [9] H. Pearson. The interpretation of the logophoric pronoun in Ewe. *Natural Language Semantics*, pages 77–118, 2015. [10] O. Percus. Constraints on some other variables in syntax. *Natural Language Semantics*, 8(3):173–229, 2000. [11] O. Percus and U. Sauerland. On the LFs of attitude reports. In *Proceedings of Sinn und Bedeutung 7*, 2003. [12] W. v. O. Quine. Quantifiers and propositional attitudes. *Journal of Philosophy*, 53:177–187, 1956. [13] M. E. Rooth. *Association with Focus*. PhD thesis, University of Massachusetts, Amherst, 1985. [14] M. Schwager. Speaking of qualities. In *Proceedings of SALT 19*, pages 395–412, 2011. [15] F. Schwarz. Situation pronouns in determiner phrases. *Natural Language Semantics*, 20(4):431–475, 2012. [16] Y. Sharvit. Individual concepts and attitude reports. In *Proceedings of SALT 8*, pages 233–248, Ithaca, NY, 1998. [17] Y. Sudo. On *de re* predicates. In *Proceedings of WCCFL 31*, pages 447–456, 2014. [18] Z. G. Szabó. Specific, yet opaque. In M. Aloni, H. Bastiaanse, T. de Jager, and K. Schulz, editors, *Logic, Language and Meaning. Lecture Notes in Computer Science*, 2010.