Motivating a symmetric *be* in attitude reports

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Overview: In this abstract, I show that different from asymmetric *be*, symmetric *be* blocks the generation of *de re* readings in attitude reports. To account for this, I propose that while asymmetric *be* relates an individual variable and a descriptive property, symmetric *be* relates two individual variables, which would be each type-shifted (coerced) into a descriptive property.

Background I: The *de re* reading derivation mechanism I adopt here is shown in (1) (Sudo 2013) – a *de re* reading is derived from a *de dicto* attitude report via this substitution rule:

(1) **De re substitution rule of Sudo 2013**: if there is a function ξ of type $\langle s, \gamma \rangle$ that is contextually equivalent to $[\![E]\!]$, then $[\![E]\!]$ can optionally be interpreted as ξ.
(E.g., if $[\![\text{the unknown girl}]\!]^{w_0} = [\![\text{Mary}]\!]^{w_0}$, then from the *de dicto* sentence '*John thinks the unknown girl is nice.*', we can derive the *de re* sentence '*John thinks Mary is nice.*')

Background II: To account for (2) (see Cumming 2008), Percus & Sharvit 2014 proposed (3) to analyze asymmetric *be*: (3a) means that be_{asym} relates an individual x_e and an individual concept $k_{\langle s,e \rangle}$; (3b) means that when an inherently individual-denoting expression Z_e appears in the concept-argument position of asymmetric *be*, Z_e can be coerced into a concept by a contextually-salient type-shifting function $g_{\langle e,se \rangle}$. Thus, the belief report (2) means that in each $w' \in \text{Dox}_{w_0}(\text{Mary})$, the individual Jess has the properties Sam has in w' (e.g., be a doctor).

(2) CONTEXT: There is a party in honor of Sam who has just got his PhD. When Jess arrives, Mary, who is already tipsy, says to Jess 'you must be proud to be a doctor'.
Mary thinks Jess is Sam ($\checkmark$ *de re*), **but she doesn't think Sam is Jess**.

(3) a. $[\![be_{asym}]\!]^i =_{def} \lambda k_{\langle s,e \rangle}.\lambda x_e.x = k(i)$; b. $[\![be_{asym}\ Z]\!]^i =_{def} \lambda x_e.x = g([\![Z]\!])(i)$ (P&S14)

Empirical evidence: Based on the *de re* rule of Sudo 2013, here I use *think* and *dream* as illustrations to show that the *de re* blocking effect of symmetric *be* generally exists for various kinds of attitude reporting predicates.

As attitude reporting predicates, *think* and *dream* were claimed to be different (Percus & Sauerland 2003, Sudo 2013): in the context that Mary anonymously reviewed John's paper, the sentence '*John **thought** that Mary was a bald man*' has a *de re* reading if John thought the reviewer was a bald man, while if John had a dream that the reviewer was a bald man, no *de re* reading is available for '*John **dreamt** that Mary was a bald man*'. I argue against this claim by further specifying the contexts in (4): I show that the availability of a *de re* reading does not depend on choosing *dream* or *think*, but on how to interpret the *de dicto* sentence.

Sentence (5) is *de-dicto-ly* true through the contexts C1-C4. However, under the contexts C1 and C3, *de re* reading is available for (4a) and (4c); but under the contexts C2 and C4, no *de re* reading is available for (4b) or (4d). Thus the behaviors of *think* and *dream* are similar.

Since $[\![\text{Mary}]\!]^{w_0} = [\![\text{the reviewer}]\!]^{w_0}$ is valid through C1-C4, the contrast between (4a/c) and (4b/d) can only be due to the potential constraints in applying the *de re* substitution rule (1).

Under C1 and C3, John has no specific bald man in his thought/dream and has access to only one individual (*res*) via the acquaintance relation *the person who wrote the review*. Thus the use of *be* in the *de dicto* sentence (5) is essentially asymmetric: under C1/C3, the sentence (5) does not share the same meaning as the sentence (6), because no particular bald man exists in John's mind to be related to the reviewer; (5) only means that in John's thought/dream, the reviewer has the property of being a bald man. Since a felicitous *de re* reading is available for (4a/c), evidently, the *de re* reading derivation from (5) to (4a/c) is possible.

In contrast, under C2 and C4, John does have a specific bald man in his thought/dream and has in effect access to two individuals (i.e., two *res*) via two acquaintance relations respectively – *the author of the review* and *the bald man he saw in the reality / dream*. Thus, the *de dicto* sentence (5) has the same meaning as the sentence (6), indicating that under C2/C4, the use of *be* is symmetric: in John's thought/dream, he recognized that there is an equivalence relationship between the two individuals. The unavailability of *de re* readings for (4b/d) indicates that the *de re* reading derivation is blocked.

In sum, the (un)availability of a *de re* reading is not correlated with the choice of attitude reporting predicates, but with the different uses of *be* in a *de dicto* sentence.

(4) Context: Mary anonymously reviewed John's paper (i.e., $[\![\text{Mary}]\!]^{w_0} = [\![\text{the reviewer}]\!]^{w_0}$).
   C1: John read the review and thought whoever wrote it must be a bald man.
   a. **John *thought* that Mary was a bald man.** ✓ *de re* (due to asymmetric *be* in (5))
   C2: John saw a bald man talking about his paper and thought this was the reviewer.
   b. # **John *thought* that Mary was a bald man.** **no** *de re* reading (symmetric *be* in (5))
   C3: John read the review and dreamt that whoever wrote it must be a bald man.
   c. **John *dreamt* that Mary was a bald man.** ✓ *de re* (due to asymmetric *be* in (5))
   C4: John dreamt of a bald man talking about his paper and took him as the reviewer.
   d. # **John *dreamt* that Mary was a bald man.** **no** *de re* reading (symmetric *be* in (5))

(5) *De dicto*: **John thought/dreamt that the reviewer *was* a bald man.** ambiguous *be*

(6) J. thought/dreamt the reviewer and a (certain) bald man are the same one. ✓ C2/C4, # C1/C3

The meaning of *be*: First I make a distinction between two uses of the symbol '=': (i) '$x = 3$' means that the variable x has the value (or property) of 3, and I write this relationship as $P(x)$, meaning the property P holds for the variable x; (ii) 'x = y' means that x and y are two interchangeable variable names in a certain context (see also Fine 2009)[1]. Thus, I rewrite P&S14's lexical entry of asymmetric *be* as (7): in (7b), the contextually-salient function k coerces the individual Z into certain properties. Based on (7), I propose (8) as the lexical entry of symmetric *be*: symmetric *be* relates two individuals x and y – each of them can be coerced into properties; thus x has the contextually salient properties of y, and vice versa.

(7) a. $[\![\text{be}_{asym}]\!]^i =_{def} \lambda P_{\langle set \rangle}.\lambda x_e.P(i)(x)$; b. $[\![\text{be}_{asym}\ Z]\!]^i =_{def} \lambda x_e.[k_{\langle e,set \rangle}(Z_e^i)](i)(x)$

(8) $[\![\text{be}_{sym}]\!]^i =_{def} \lambda y_e.\lambda x_e.[[k_1(y^i)](i)(x) \wedge [k_2(x^i)](i)(y)]$ (based on (7))

The *de re* blocking effect of symmetric *be* is accounted for in (9).

(9) Suppose $[\![\text{the reviewer}]\!]^{c,i} = R_e$, $[\![\text{a (certain) bald man}]\!]^{c,i} = f_{choice\langle set,e \rangle}(\text{bald-man})^{c,i} = B_e$
   $[\![\text{R is}_{sym}\ B]\!]_{de\ dicto}^i = [k_1(B)^{c,i}](i)(R) \wedge [k_2(R)^{c,i}](i)(B)$, i.e., for all $w' \in \text{Dox}_{w_0}(\text{John})$, the *res* R has the contextually salient properties of B in w', and vice versa.
   On the left of $\wedge$, ∵ $[\![\text{Mary}]\!]^{w_0} = [\![\text{the reviewer}]\!]^{w_0}$, ∴ we can *de re* replace the variable name **R** by **Mary** and derive the *de re* reading $[k_1(B)^{c,i}](i)(\text{Mary})$ (i.e., John believes the property $[k_1(B)^{c,i}](i)$ of Mary); however, on the right of $\wedge$, there's no way to remove the variable name B, and thus no *de re* replacement could happen.

Notes: The current analysis of *be* suggests that in such a sentence as '*Tully is$_{sym}$ Cicero*', proper names contribute both as descriptions and as variable names, and that the mutuality involved in the semantics makes '*Tully is$_{sym}$ Cicero*' more informative than '*Tully is Tully*'.

References: Cumming. 2008. Variabilism. *Philosophical Review.* | **Fine. 2007.** *Semantic relativism.* | **Percus & Sauerland. 2003.** On the LFs of attitude reports. *SuB.* | **Percus & Sharvit. 2014.** Copular asymmetries in belief reports. *SALT.* | **Sudo. 2013.** On *de re* predicates. *WCCFL.*

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[1]The 'equivalent' relationship mentioned in Sudo 2013's *de re* rule should be this interchangeable relationship between variable names in a context.