

Generalizing Concept Generators

Introduction: In this talk, I argue for a generalization of Percus & Sauerland's (2003) notion of a 'concept generator' (CG), under which CGs take as argument any object of intensional type. I show that the resulting theory can elegantly incorporate both Schwager's (2011) analysis of 'third readings' and Sudo's (2014) analysis of *de re* predicates.

Concept Generators: Percus & Sauerland's (2003) concept generator (CG) theory of *de re* attitude ascriptions is an elegant method of deriving the correct truth conditions for sentences like (1a) below with respect to contexts like (1b).

1. a) Peter thinks Mary is happy.
b) Peter is at the store, and sees a woman at the end of the aisle smiling and laughing. We know that this woman is Mary. Peter thinks to himself, "That woman over there is happy!"

Percus & Sauerland's (2003) analysis postulates silent pronouns ranging over 'concept generators' (CGs) which are one-to-one functions mapping entities to the individual concepts by which an attitude holder identifies those entities (i.e., functions of type $\langle e, se \rangle$). Within the CG framework we can assign the LF in (2a) to (1a), and derive the truth conditions in (2b).

2. a) [Peter [thinks [λG_1 [λw_1 [[[G_1 Mary] w_1] [is happy]]]]]]
b) $\exists G$ for Peter in w_0 such that: $\forall w' \in \text{Beliefs}(\text{Peter}, w) . G(\text{Mary})(w')$ is happy in w' .

$G(\text{Mary})$ will return the individual concept by which Peter knows Mary—and in the context in (1a), it will be the individual concept [$\lambda w'$. The woman at the end of the aisle in w']. Thus, we do not ascribe to Peter the belief *Mary is happy*, but rather, that *the individual concept by which he knows Mary is happy*. Deriving the truth conditions of the *de dicto* reading requires that we permit some vacuous binding—the lambda binders over concept generators will not bind any such pronouns. The *de dicto* LF and truth conditions are given in (3a-b).

3. a) [Peter [thinks [λG_1 [λw_1 [[Mary] [is happy]]]]]]
b) $\exists G$ for Peter in w_0 such that: $\forall w' \in \text{Beliefs}(\text{Peter}, w) . \text{Mary is happy in } w'$

'Double vision' problems are thus resolved in the CG framework.

Problems: Despite the elegance of Percus & Sauerland's theory, there are two main issues that need to be dealt with. As it stands, the theory cannot handle *de re* expressions that are not type e , like quantifiers and properties (*de re* readings of which have been argued for by Sudo (2014), among others). Consider (4a) below with respect to the context in (4b).

4. a) John thinks that Mary is Catholic.
b) John knows that his friend Bob is dating Mary. Furthermore, John holds the belief that Bob would never date anyone outside his religion. Despite this, he does not know what religion Bob belongs to. We know that Bob is Catholic.

(4a) is not a *de dicto* belief in this context—Mary needn't be Catholic in all of John's belief worlds for (4a) to be true. Rather, this is a *de re* belief towards a property—John believes there to be some property that Mary has (i.e. that she is the same religion as Bob), and because at the actual world those two properties are equivalent, we can report his belief as in (4a). The central problem such readings pose for the CG framework is that concept generators are only capable of taking as argument expressions of type e ; properties, however, are of functions of type $\langle s, et \rangle$. A second problem the CG theory faces concerns so-called 'third readings,' first discussed by Fodor (1970). Consider (5a) below, under its reading where it is true in context (5b) (example and context taken from Schwager 2011).

5. a) Mary wants to buy a building with at least 192 floors.
b) Mary is looking at the Burj Dubai, which has 191 floors and is currently the highest building in the world. Also, no other building has more floors. Mary doesn't know this. She also doesn't know how many floors Burj Dubai has. She thinks, 'Wow, I want to buy a building that's even one floor higher.'

Sentence (5a) in context (5b) does not report a *de dicto* attitude—Mary doesn't know how many floors the building she's pointing at has. Neither is this a *de re* attitude—there is no specific building that Mary wants to buy. This distinct reading is called the 'third reading.' The CG theory, however, doesn't presently derive such 'third readings'; indeed, the theory is entirely silent on the matter.

Dealing with *de re* Properties: The solution to the problems discussed above can be resolved by generalizing concept generators, capitalizing on insights developed by Sudo (2014) and Schwager (2011). Given in (6) below is the definition of an (acquaintance-based) CG given by Percus & Sauerland.

6. G is an acquaintance-based concept generator for x in w iff:
 - i. G is a function from entities to individual concepts (i.e. of type $\langle e, \langle se \rangle \rangle$)
 - ii. $\text{Dom}(G) = \{z: x \text{ is acquainted with } z \text{ in } w\}$
 - iii. The concepts G yields are acquaintance-based in the sense that:
 - iv. For all z in $\text{Dom}(G)$, there is some acquaintance relation R such that x bears R uniquely to z in w, and $\forall w' \in \text{Beliefs}(x, w)$, x bears R uniquely to $G(z)(w')$ in w' .
 - v. $\forall y \in D_e, G(y)(w_0) = y$.

To begin, we will generalize concept generators to accommodate *de re* readings of properties. Recall the reading of (4a) true in (4b) this is a *de re* attitude towards a property, of type $\langle s, et \rangle$. If we make the non-controversial move of intensionalizing proper names (such that $[[\text{Mary}]] = [\lambda w'. \text{Mary}]$, we must revise (6i) such that CGs are functions of type $\langle se, se \rangle$. With this change in type, we can now imagine that a CG over properties would be of type $\langle \langle s, et \rangle, \langle s, et \rangle \rangle$. With this in mind, we could make the generalization that CGs are functions from an intensional type τ to that same type τ . We can thus generalize our definition of a concept generator from (6) to (7).

7. G is a concept generator for x in w iff (REVISED CONDITIONS)
 - i. G is a function that takes as argument a function of type τ , where τ is an arbitrary intensional type, and returns a function of that same intensional type τ (i.e., G is a function of type $\langle \tau, \tau \rangle$)
 - v. $\forall y \in D_{\langle \tau \rangle}, G(y)(w_0) = y(w_0)$.

With this new definition, we can derive the right truth conditions of (4a) with the CG theory, since it applies to any function of an arbitrary intensional type τ , and properties are such a type, $\langle s, et \rangle$.

'Third Readings' Resolved: The second problem the CG theory faces is dealing with third readings. To begin, Schwager (2011) observes that the true reading of (5a) in context (5b) raises insuperable problems for accounts based upon the 'transparent evaluation' of NPs, such as Keshet (2010). In light of this, Schwager proposes the Replacement Principle (RP) below.

8. For the sake of reporting an attitude, a property that is involved in the content of the attitude that is to be reported (the reported property) can be replaced by a different property (the reporting property) as long as the reported property is a subset of the reporting property at all worlds metaphysically closest to the actual world where the reported property is nonempty.

Note that in the metaphysically closest worlds where the property '*is a building one floor taller than that one (pointing at the Burj Dubai)*' is non-empty, the buildings satisfying that property are a subset of those satisfying the property '*is a building with at least 192 floors*'. Consequently, the RP in (8) allows us to substitute the latter for the former in sentence (5a) (given context (5b)).

Our generalization of CGs in (7) allows us to capture the key insights of Schwager's (2011) account. All we need do is revised the condition in (7v) as follows:

9. $\forall y \in D_{\tau}, \forall w' : w'$ is the 'metaphysically closest' world to w_0 where $y(w') \neq \emptyset, G(y)(w') = y(w')$. With the now fully generalized definition of a concept generator incorporating (9), we can derive truth conditions of (5a) that hold in (5b); they are given in (10).

10. $\exists G$ for Mary in w_0 such that: $\forall w' \in \text{Desires}(\text{Mary}, w_0), \exists x. G([\lambda w \lambda y. y \text{ is a building with } 192 \text{ floors in } w])(w')(x) \ \& \ \text{Mary buys } x \text{ in } w'$.

Final Discussion: The Generalized Concept Generator theory presented here can handle *de re*, *de dicto*, and 'third reading' attitude ascriptions; minor changes to the theory will allow us to derive *de se* attitudes in the same manner as Percus & Sauerland (2003). It is also important to note that we are unifying *de re* properties and 'third readings', in exactly the way advocated by Schwager (2011).

Selected References: *Linguistics and Philosophy* 33: 251-283.; Percus, Orin and Uli Sauerland. 2003. "On the LFs of Attitude Reports." In Weisgerber, M. (ed) *Proceedings of the Conference SUB7 – Sinn und Bedeutung*; Schwager, Magdalena. 2011. "Speaking of Qualities." *Proceedings of Semantics and Linguistic Theory* 19. eLanguage; Sudo, Yasutada. 2014. "On *De Re* Predicates." *Proceedings of WCCFL* 31.