Rhetorical relations in verbal eventual representations?
Evidence from psych verbs

Psych-verbs are a relatively well-studied phenomenon in theoretical linguistics (Belleti and Rizzi 1988, Grimshaw 1990, etc.), but one for which as yet no truly satisfactory analysis has been developed. This paper seeks to provide a new perspective on the semantics of psych-verbs by bringing ideas based on Asher and Pustejovsky (2000) into the discussion, namely that the concept of rhetorical relations can be deployed at the lexical level in order to formulate well-formedness conditions between subevents denoted by a verb. The idea is that psych-verbs have the kind of lexical semantics, which assume a complex subevental structure (i.e., a precondition subevent and a result subevent) and that differences in how these subevents are related to one another via rhetorical relations account for the observed differences in interpretation.

As is well known, psych verbs appear to have their experiencer in either the subject ((1a)) or object ((1b)) position. According to the thematic hierarchy generally assumed, the experiencer is more prominent than the *theme*/*stimulus* and, thus, this should be the order for the surface realization of the arguments. However, this is not true for (1b). Most attempts to explain the mismatch concentrate on assuming a complex causal event structure and are guided by the intuition that *something caused Mary to be afraid (*e.g., Croft 1991, Grimshaw 1990, Pustejovsky 1995). These solutions succeed in accounting for object-experiencer verbs, but they fall short with respect to other classes of psych verbs, which are stative and seem to lack a complex event structure. The underlying assumption of the approach taken here, in contrast, is that in fact what is meant in (1a) is clearly the same as what is meant with (1b).

(1) a. Mary fears snakes. b. Snakes frighten Mary.

The basic idea in our approach is therefore that no real causation is implied in the event structure of the psych verbs. Instead, there is a precondition in the form of a property P, which is more "persistent" than real causes of events. According to the logical proof provided as part of the talk, in the case of (1) being the real cause, namely Mary's fear, should change in case a minimal change of the world happens (cf. Eckardt 1998). Now, take the stimulus "snake". If we assume that this has an inherent property, which causes Mary's fear, then it is not clear how this property is comprehended or expressed as a part of the meaning of "snake" and additionally it is not clear why this property should change in a minimal change of the world. Pustejovsky (1995) claims that such properties can be coded in the telic role of a lexical item; however, it is not clear that the telic role can always account for the properties which influence lexical semantic variation.

Our alternative account also falls back on primitive predicates, but confines itself to the predicates **CAUSE Y** and **EXPOSED to Y** as parameters of the experiencing event and not as sole interpreters of the semantics of these verbs. In the case of psych verbs, these are assigned as bidirectional relations or functions between the arguments of the verb. This happens in a manner orthogonal to the thematic role hierarchy, but does specify the nature of the experiencing event **Y** and reflects the semantics brought in by the thematic roles as defined by Fillmore (1971). **Y** is a default primitive, which encodes the kind of experience occupied by the verb (in (1) FEAR instantiates Y). Both of the predicates encode a bidirectional relation between Y and another argument.

Now, let us further assume the principles of SDRT (Segmented Discourse Representation Theory; Asher (1991)), which allows distinct *segments* or *speech act*

discourse referents to interact with rhetorical relations. In analogy to what happens at the level of discourse, one could also allow rhetorical relations to connect two eventualities (Asher and Pustejovsky 2000). In the case of psych verbs, our account permits the expression of a potentially underspecified property P, which can be taken as a precondition or pseudocausal statement of **FEAR**. By assuming rhetorical relations in the way SDRT does, nonmonotonic inferencing is introduced, but this allows subevents of the complex event structure to interact with information from the context as in (2).

(2) π_1. Mary loves all animals except snakes. π_2. Snakes **frighten** Mary. π_3. Their slow and insidious movements turn her away.

This example illustrates that the precise nature of the underspecified property P (the cause of the default primitive **Y**; instantiated by **FEAR** in our case) can be resolved by clause π3 (where πs are meant to be the *speech act discourse referents* as presented in the framework of SDRT by Asher(1991), Asher and Lascarides(2003)). The verb in clause π2 must be assumed to denote at least two subevents, whereby the first subevent includes the information about the underspecified property P and the second expresses the receipt of the default **Y** (**FEAR**). The primitive predicates CAUSE and EXPOSED_TO assumed above in accordance with relevant information about the aspect of the two subevents lead to the satisfaction of the inference axiom of the rhetorical relation *Result*:

$(?(\alpha, \beta, \lambda) \wedge \mathit{Top}(\sigma, \alpha) \wedge \mathit{causeD}(\sigma, \alpha, \beta) \wedge \mathit{Aspect}(\alpha, \beta)) > \mathit{Result}(\alpha, \beta, \lambda)$.

Where: $\mathrm{Top}(\sigma, \alpha) = \sigma$ *outscopes* α and nothing *outscopes* σ.

$(?(\alpha, \beta, \lambda) \wedge \mathit{Top}$ (σ, y: move_slowly_insidiously(e2', z)) $\wedge$ *causeD* (σ, y: move_slowly_insidiously(e2', z), Exposed_to (e2, z, FEAR)) $\wedge$ *Aspect* (y: move_slowly_insidiously(e2', z), Exposed_to (e2, z, FEAR)) > *Result* (y: move_slowly_insidiously(e2', z), Exposed_to (e2, z, FEAR), λ).

Therefore, π3 provides an explanation about the existence of **FEAR** and can be placed in the first subevent of π2 as a placeholder of the underspecified property P of the snakes. According to the above account, lexical rhetorical relations allow pieces of information of the subevents of a verb to communicate with pieces in the discourse level. The existence of the underspecified property P is thought of as a "persistent" precondition in any change of the world. The thematic role hierarchy is not violated under the current assumptions, whereas the events are treated as active communicative factors in the lexical and discourse interpretation.

The account presented in this talk shows that it is feasible to think of rhetorical relations as applying within the lexicon with respect to psych verbs. Extensions of this approach include testing this approach with respect to other types of lexical semantic variation as well and preliminary results appear to be encouraging.

Selected References

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