Verb Classes and the Ontology of Roots

Introduction: It is widely recognized that verbs can be classified in ways that seem to reflect both semantic and morphosyntactic similarity, as shown in great detail in Levin (1993). In this paper, I argue that some of these correlations can be shown to follow from an articulated theory of semantic root types in combination with a strongly compositional syntactic approach to lexical decomposition. On this view, argument structure is determined by the root in part directly, and in part indirectly due to the constraints that the type puts on the possible structures the root may be inserted into. One consequence of this analysis is that some apparent cases of verb polysemy, such as that seen with *braid* below, should be re-analyzed as polysemy of the root, where root interpretation correlates with differences in structure due to constraints on composition.

Phenomena: There are two types of "creation" verb classes - root creation (1) and object creation (2) which are addressed in the paper (other verb classes are also compared, but omitted here due to space constraints):

(1) a. Karina **braided** her hair. b. Zane **sliced** the bread.

(2) a. Hugh **braided** a necklace. b. Cara **built** a house.

Semantically, root creation verbs entail the creation of an entity denoted by the root of the verb, while object creation verbs entail the creation of the object. In some cases, what appears to be the same verb occurs in both classes, as shown with *braid*. Syntactically, these verb classes differ with respect to "licensing" of pseudo-resultative predicates (Levinson 2007), applicatives, and optionality of the direct object. A pseudo-resultative is exemplified in (3), where *tight* modifies an entity (a braid) which is created by the event, not the DP object:

(3) Mary braided her hair **tight**. (root creation with pseudo-resultative)

Pseudo-resultative predicates only combine with root creation verbs, and not with explicit creation verbs or any other semantic class of verbs. Applicatives (or double objects), on the other hand, occur with explicit creation verbs, but not root creation verbs:

(4) a. * Karina braided Mary the string. (root creation)

b. Hugh baked Mary a cake. (object creation)

In addition, root creation verbs require direct objects, whereas explicit creation verbs don't. This generalization may at first seem incorrect, since the verb *braid*, for example, can occur in some contexts without an object (5). However, this is not possible in the presence of the pseudo-resultative (6):

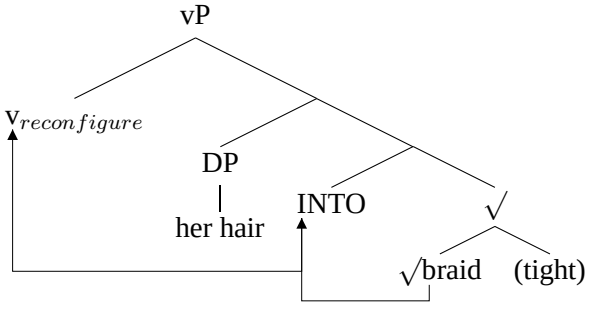
(5) Karina braided.

(6) * Karina braided tight.

I argue that this is not an effect of the pseudo-resultative modifier itself, which does not modify the object in any way. Rather, what this elucidates is that, since pseudo-resultatives only occur with root creation verbs, they disambiguate the verb interpretation, and true root creation verbs require objects.

Proposal: The proposal is that root creation verbs and object creation verbs are structurally distinct, and that this structural distinction can be traced back to different semantic types of the root. Root creation verbs license pseudo-resultative predicates because they are built from roots (of the kind proposed in Pesetsky (1995) and Marantz (1997)) which denote predicates of individuals, type <e,t>. These roots are accessible for predicate modification by the pseudo-resultative, also type <e,t>, which receives its result-oriented interpretation because the root which it modifies is itself interpreted as a result. A slightly simplified version of the analysis is as in (7):

(7) a.



b. $[\![\sqrt{\text{braid}}]\!] = \lambda x.\text{braid}(x)$

c. $[\![\text{tight}]\!] = \lambda x.\text{tight}(x)$

d. $[\![\text{INTO}]\!] = \lambda f_{<e,t>}.\lambda y_e.\lambda s_s.\exists x_e.f(x) \ \&\ \text{being-in}(s)(x) \ \&\ \text{theme}(s,y)$

e. $[\![v_{reconfigure}]\!] = \lambda f_{<s,t>}.\lambda e_s.\exists s_s.f(s) \ \&\ \text{reconfiguration}(e) \ \&\ \text{CAUSE}(s)(e)$

f. $[\![\text{vP}]\!] = \lambda e_s.\exists s_s.\exists x_e.\text{braid}(x) \ \&\ \text{being-in}(s)(x) \ \&\ \text{theme}(s,\text{her hair}) \ \&\ \text{reconfiguration}(e) \ \&\ \text{CAUSE}(s)(e)$

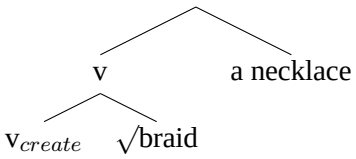
The key component of this analysis which explains the licensing of pseudo-resultatives is the <e,t> denotation of the root, here the set of braids. This analysis also leads to an explanation of the other observations about root creation verbs. In order for a root of type <e,t> to form a verb, it must combine with at least a *v* head which contributes an event variable. The root cannot directly combine with *v*, because the types cannot compose. The head INTO mediates this relationship by adding a state variable, and also selecting an argument which will come to be in that state. The proposed heads INTO and *v* are silent in English, but are syntactically similar to overt counterparts in English and other languages. It is shown in the paper that sentences like (1a) pattern syntactically with 'overt' counterparts like (8), in English and cross-linguistically:

(8) She made her hair into a braid.

The analysis also correctly predicts that the objects of root creation verbs will be obligatory; the head INTO requires an individual argument, and without INTO, the root wouldn't be able to compose with the relevant *v* at all. Low applicatives are also predicted to be unavailable because the only possible site for an APPL head as defined by Pylkkänen (2002) would give an anomalous interpretation.

Object creation verbs are structurally distinct from root creation verbs, driven by the fact that they are derived from a root which denotes a predicate of events, type $<s_e,t>$. Therefore the root of verbs like *braid* must be polysemous between type <e,t> and $<s_e,t>$. Because a root of type $<s_e,t>$ can't compose with INTO, this entails a different structure for verbs built from such roots. Thus a verb like *braid* is actually ambiguous between two **structures**, leading to different morphosyntactic realizations. The analysis of object creation verbs is as in (9):

(9) a.



b. $[\![\sqrt{\text{braid}}]\!] = \lambda e.\text{braiding}(e)$

c. $[\![v_{create}]\!] = \lambda x_e.\lambda e_s.\text{creation}(e) \ \&\ \text{theme}(e,x)$

d. $[\![\text{vP}]\!] = \lambda e_s.\text{creation}(e) \ \&\ \text{braiding}(e) \ \&\ \text{theme}(e,\text{a necklace})$

This analysis predicts that pseudo-resultative modification should not be available, because the root here is not of type <e,t>, but rather of type $<s_e,t>$, in this case denoting the set of braiding events. This root should not require an obligatory object, because it is itself event denoting and need not combine with heads such as INTO in order to build an event. In this case, it is the *v* that selects the object, not the root itself, so in principle another *v* which does not select an individual argument should be able to combine with the $<s_e,t>$ root. Low applicatives are predicted to be available since the merger of APPL leads to a semantically well-formed sentence where the created object is directed towards the possession of the applicative argument.

Conclusion: This paper shows that a formalized account of root semantics can provide crucial insight into correlations between semantic and morphosyntactic verb properties. The proposal also leads to the treatment of a 'polysemous' verb like *braid* as being structurally ambiguous between activity, root creation and object creation **structures**. This work also contributes to our understanding of lexical decomposition, especially the ontology of the roots and the elements that combine with them. The data considered further highlight the fact that the classification of verbs must take into consideration subtle differences in interpretation, and that these can sometimes be controlled for with elements like pseudo-resultative modifiers.

References

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