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## 1 Introduction

In sentences such as (1), there is a sentence-final modifier which seems to pertain to a 'result' of some sort<sup>1</sup>. These modifiers at least superficially resemble resultative predicates, such as 'flat' in (2):

- (1) Mary braided her hair *tight*.
- (2) Susan hammered the metal *flat*.

However, while resultative predicates modify the direct object of the verb, the predicate in (1) does not. That is, while the metal becomes flat as a result of Susan's hammering it, Mary's hair does not become tight as a result of her braiding it; nor is the event of braiding what is 'tight'. Rather, what becomes tight is the braid which is created by the braiding. Yet there is no overt 'braid' DP in the syntax for *tight* to modify. Thus, these sentences present a puzzle for the syntax/semantics interface – what argument are these modifiers modifying?

While resultatives are available with a variety of verbs in English, the problematic type of predicates as in (1) seem to occur only with a relatively small number of verbs. In this paper, I argue that this is due to the fact that these 'pseudo-resultative' adjectives are dependent upon elements unique to the semantic decomposition of a particular class of verbs which I call 'creation inchoatives'. I also propose a parallel syntactic decomposition which provides for a compositional analysis of these predicates.

## 2 Pseudo-Resultatives Are Not Resultatives

Despite the surface similarity between resultatives and pseudo-resultatives, they are semantically and syntactically distinct types of predicates. Consider

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<sup>1</sup>I will discuss in section 2.3 the additional possibility of the adverbial form *tightly*.

the examples in (3), which are all pseudo-resultatives, in that the predicate does not modify the direct object of the verb:

- (3) a. Mary braided her hair tight. → Mary's hair is tight.  
 b. She tied her shoelaces tight. → Her shoelaces are tight.  
 c. Mary piled the cushions high. → The cushions are high.  
 d. She chopped the parsley fine. → The parsley is fine.  
 e. She sliced the bread thin. → The bread is thin.

This is in contrast with resultatives as in (2), where the resultative could be analyzed as a modifier of the object.

### 2.1 Lack of Event Homomorphism

Further semantic evidence for a distinction between resultatives and pseudo-resultatives can be found relating to the 'event homomorphism' constraint on resultatives (Wechsler 2005), which is absent from pseudo-resultatives. This can be seen in the fact that the paraphrases available for the resultative (4) do not carry over to pseudo-resultatives (5):

- (4) I hammered the metal flat. ≈ I hammered until the metal was flat.  
 (5) I braided her hair tight. ≠ I braided until her hair/braid was tight.

The 'until it was' paraphrase is generally compatible with resultatives because of the event homomorphism constraint discussed in (Wechsler 2005). The empirical observation is in essence that paraphrases like those in (4) will be possible for true resultatives because the change of state in the direct object of the verb in the resultative construction will proceed along with the event which causes the change of state. In an example such as (4), the scalar, gradable, adjective *flat* provides the scale along which we can assess the state of the metal; as the event proceeds, the metal changes from less flat to more flat. The event ends when maximum, or complete, flatness has been achieved, when the affected theme reaches the end of the path.

This event homomorphism is not present with pseudo-resultatives, as the object of the verb and the adjective need not proceed along the scale together; rather, the adjective only holds of the final result state. The braid does not become tighter and tighter as the braiding event proceeds.

### 2.2 Morphological Distinctions

Furthermore, there are morphological distinctions between resultatives and pseudo-resultatives in languages other than English. Resultatives in Finnish

bear translative case, with the suffix *-ksi*:

- (6) Mari hakkasi metalli-n litteä-ksi.  
 Mari.NOM hammered-ACC metal-ACC flat-TRANS  
 'Mari hammered the metal flat.'

However, Finnish marks pseudo-resultatives with illative case (7a), not translative case (7b).

- (7) a. Mari leti-tt-i hiuksensa tiukka-an.  
 Mari braid-caus-past hair.ACC.POSS tight-ILL  
 'Mari braided her hair tight.'  
 b. \*Mari leti-tt-i hiuksensa tiuka-ksi.  
 Mari braid-caus-past hair.ACC.POSS tight-TRANS  
 'Mari braided her hair tight.'

### 2.3 Crosslinguistic Availability

Further evidence that resultatives and pseudo-resultatives are distinct comes from Romance. For example, Catalan does not have resultatives of the canonical type (Mateu 2000). However, there are pseudo-resultatives, as in (8)<sup>2</sup>:

- (8) M' he lligat els cordons de les sabates (ben) estrets.  
 Me-dat have-1st tied the laces of the shoes (very) tight-pl  
 'I tied the laces of my shoes very tight.'

This and the other evidence above show that pseudo-resultatives are distinct from resultatives. In the following section, I show that they cannot be analyzed as adverbs in any simple sense either.

### 3 Pseudo-Resultatives are not 'Simply' Adverbs

For some speakers, both (9a) and (9b) are possible in English:<sup>3</sup>

- (9) a. Mary braided her hair tight.  
 b. Mary braided her hair tightly.

<sup>2</sup>Mateu (2000) calls these examples 'fake resultatives'. However, he does not provide an analysis for these cases, and considers them to be adverbial.

<sup>3</sup>Some speakers only accept the 'adjectival' form in post-verbal position with pseudo-resultatives. See below.

This fact has led some (Washio 1997, Kratzer 2005) to suggest that *tight* in (9a) is an adverb, as in (9b). That these are different forms are essentially equivalent is made more plausible by the facts that adverb morphology in English can be 'omitted' (descriptively speaking) in certain environments (see section 7.1) and that adverbs and adjectives of certain classes bear identical (lack of) morphology in some languages (e.g. German).

However, to claim that these are the same still would not provide a solution to the compositionality problem. Even if these can appear with adverb morphology, they are not predicates of events like manner adverbs. As argued by Geuder (2000), while manner adverbs like *quick* may be analyzable as neo-Davidsonian predicates of events (Davidson 1967, Parsons 1990), *quick(e)*, it is not possible to analyze the modifiers in (9) in this way.

### 3.1 Pseudo-Resultatives are not 'Resultative Adverbs'

Geuder (2000) presents an account for what he calls 'resultative adverbs', which are also predicates that modify a result without modifying the direct object. However, his analysis does not account for the set of data under consideration here. Pseudo-resultatives with adjectival morphology seem to be more restricted than these resultative adverbs in several respects. Geuder does consider the case in (10), which does have an adjectival 'variant'<sup>4</sup>:

- (10) She sliced the bread thinly.

However, the other cases he considers in (11) do not allow an adjectival form:

- (11) a. They decorated the room beautiful-\*(ly).  
 b. She dressed elegant-\*(ly).  
 c. They loaded the cart heavy-\*(ly).

In contrast, some speakers accept *only* the adjective in pseudo-resultative cases (and thus don't accept Geuder's example in (10)):

- (12) She sliced the bread thin-(%ly).

I consider the examples in (13), also discussed in Geuder (2000), to fall outside the class of pseudo-resultatives, despite lack of adverbial morphology.

<sup>4</sup>According to Geuder, resultative adverbs are in complementary distribution with adjectives, based on the evidence in (11). He does not observe that the adjective form is possible, and for some preferred, with predicates like that in (10).

- (13) a. I opened the door wide.  
 b. I shut the door tight.

For one, these forms of *wide* and *tight* are also possible as modifiers of these adjectives in non-verbal contexts:

- (14) a. The door is (wide) open (wide).  
 b. The door is (tight) shut (tight).

In addition, these are adjective-derived inchoatives, versus the other verbs under consideration, which I argue are nominally-derived in section 4.

Geuder himself acknowledges the intuitive semantic differences between (10) and the rest in deliberately discarding an analysis that can only account for cases like (10) in favor of one that is more general. However, it is precisely this narrower, semantically coherent class that I want to account for, as these are the only result-related non-resultative modifiers that are possible with adjectival morphology.

### 3.2 Adjectival Morphology Cross-Linguistically

Pseudo-resultatives resemble adjectives in other languages as well. Mateu (2000) observes that examples like that in (8) above from Catalan exhibit obligatory adjectival agreement on the predicate.<sup>5</sup> One cannot claim that these are adverbs with omitted adverbial morphology. A similar argument can be constructed based on Finnish, where adverbs and adjectives bear distinct suffixal morphology. Adverbs have a *-sti* suffix (15), whereas pseudo-resultatives have the illative case marker, as seen above in (7a):

- (15) Mari leti-tt-i        hiuksensa        tiuka-sti. (Adverb)  
 Mari braid-caus-past hair.ACC.POSS tight-ADV  
 'Mari braided her hair tightly.'

Since both forms exhibit independent suffixal morphology, the adjectival form cannot be analyzed as an adverb simply lacking adverbial morphology.

Having shown that pseudo-resultatives are not resultatives or adverbs as we know them, and that we do not yet have an answer in the literature as to what they might be modifying, in the next section I present my proposal for how these predicates are semantically licensed.

<sup>5</sup>Note that, since the adjective does not semantically modify the argument that it agrees with, this highlights the purely syntactic nature of agreement.

#### 4 Creation Inchoatives and Licensing Pseudo-resultatives

The range of verbs which 'license' pseudo-resultatives form a small, semantically coherent class. In this section, I sketch the semantics of this verb class and how this relates to the availability of pseudo-resultative modification.

As mentioned above, the analysis presented here is inspired by Geuder's (2000) notion of the 'resultant individual' introduced in his treatment of resultative adverbs. However, I propose that the created individual is not purely a semantic role introduced by creation inchoative verbs, but is syntactically realized by the root of the verb. Thus such verbs are a special subclass of inchoative (change-of-state) verbs, derived from nominal roots (e.g., *braid*), rather than adjectival ones (e.g., *cool*). The change-of-state in such cases involves the rearrangement of some material (such as hair) into a new individual (such as a braid) which did not exist prior to the event. The material is denoted by the object of the verb and the created individual by the root of the verb.<sup>6</sup> The object created may be nameable with the same root from which the verb is derived (one can describe the object created by braiding as a braid), or there may not be a form-identical nominal form of the root (one would not describe the pieces created by chopping as 'chops').

Parsons (1990) analyzes adjective-derived inchoative verbs as encoding a change-of-state via a BECOME operator. Thus *The soup cooled* is analyzed as 'The soup BECOME cool'. The proposal is that while verbs such as *cool* are derived from a BECOME operator plus predicates of states (as in Parsons (1990)), verbs like *braid* are derived in a similar way from predicates of individuals. Pseudo-resultatives are able to combine via intersective modification with predicates of individuals, but not with predicates of states, thus only combine with 'creation inchoatives', not inchoatives more generally. Table 1 illustrates the different types of inchoative verbs and their properties<sup>7</sup>:

What is crucial is not the specific types given here, but the contrast between the underlying root of adjectival versus nominal inchoatives, which derives the fact that only the latter license pseudo-resultatives.

<sup>6</sup>This created individual argument belongs to the class of arguments which Pustejovsky (1995) calls 'shadow arguments', defined as "Parameters which are semantically incorporated into the lexical item [which] can be expressed only by operations of subtyping or discourse specification; e.g., 'Mary buttered her toast with an expensive butter.'"

<sup>7</sup>All of the creation inchoatives under consideration are transitive. The lack of unaccusatives does not follow directly from my analysis, but may be due to the semantic unlikelihood of creation of an object occurring without a causer (e.g., *Her hair braided*). There may yet be unaccusative examples which I am not aware of.



verb	BECOME	CAUSE	ROOT	CLASS	PR?
cool (intr)	y	n	<s,t>	inch	n
cool (tr)	y	y	<s,t>	caus-inch	n
braid (tr)	y	y	<e,t>	creation caus-inch	y

Table 1: Inchoative Verb Properties

In the next section I propose a syntactic decomposition of creation inchoative verbs which allows of a compositional analysis of the combination of pseudo-resultative predicates and creation inchoative verbs.

## 5 The Compositional Semantics of Creation Inchoatives

I have argued in the previous section that pseudo-resultatives modify an object denoted by the root of the verb. The adjective has access to modify this root as a root, rather than modifying it once the root has 'become' a verb or part of a VP, where a modifier with adverbial morphology would presumably be required. In order for this root to be accessible to the adjective for modification, the derivation from root to verb must occur in the syntax, where semantic composition also takes place. If adjectives like *tight* in *she braided her hair tight* modify roots, then this is an argument for having such roots in the syntax. That is, there must be a point in the derivation where *braid* is not 'yet' a verb, but either a noun or a root with some nominal character to its semantic denotation. This would give a syntactic decomposition which can be connected to the semantic decomposition argued for in the previous section.

Such syntactic morphological decomposition is at the core of the work of Hale and Keyser (1993, 2002) and Marantz (1997, 2005). Hale and Keyser argue that the morphology is subject to syntactic constraints, and constitutes what they dub 'L-syntax'. However, the proposals in this vein for the decomposition of verbs into other syntactic categories have focused on syntax, and there has been little investigation of the compositional semantics of such structures. Developing such an account, however, is of great significance in realizing the constraints on these various constructions, to the extent that they depend not only on syntactic, but also semantic, constraints on composition.

In attempting to determine the structure underlying such decompositions, one can ask whether there are parallels in overt syntax to be drawn. Establishing such parallelisms is important, since if we want to derive the verb *braid* in syntax, then the elements which are present in this syntactic derivation should correspond to other elements that we are familiar with in syntax. That is, there

ideally should be some paraphrase that is syntactically similar to the structure of *braid* as a verb which makes use of the root *braid* elsewhere in the structure. In English we find this parallelism with *put* (or *make*) as in (16):

- (16) She put/made her hair into a (tight) braid.

In the parallel Finnish example, the created object and its modifier are marked with illative case, just as in the pseudo-resultative, as seen in (17):

- (17) Mari pisti hiukse-nsa (tiukka-*an*) letti-*in*.  
 Mari put hair-3SG.POSS (tight-ILL) braid-ILL  
 'Mari put her hair into a tight braid.'

I propose that sentences with pseudo-resultatives have verbs which decompose into structures that are very similar to that which appears in less 'compressed' form in (16) and (17). The created object merged as a root never forms a DP, but rather comes to 'name' the verb. *Braid* could be represented informally as 'put-into-braid', or 'put-ILL-braid', where ILL stands for the head responsible for illative case marking in Finnish<sup>8</sup>. The incorporation/conflation structure is more semantically restricted, however, than these non-incorporated parallels, as will be discussed in section 7.2.

The basic outline of the structure I propose for the syntactic decomposition of creation inchoatives and the attachment of the pseudo-resultative is as in (18a), drawing a parallel with (18b):<sup>9</sup>

- (18) a. [ CAUSE [ her hair [ TO [ IN [  $\sqrt{\text{braid}}$  [ tight ] ] ] ] ] ] ]  
 b. [ put [ her hair [ in+to [  $t_{in}$  [ a tight braid ] ] ] ] ] ]

In the next sections, I outline in more detail the analogues between the incorporated and non-incorporated structures.

<sup>8</sup>The canonical use of the illative is as in (1):

- (1) Mari meni talo-on.  
 Mari went house-ILL  
 'Mari went into the house.'

Thus the illative case appears to be semantically related to *into* in English. See section 5.1 for semantics proposed for *into*.

<sup>9</sup>In outlining the semantics of (18) above, I will abstract away from the question of head movement of the root to higher verbal projections and will interpret the root in its base position, assuming that such head movement has no semantic import.

### 5.1 The Syntactic Locus of Inchoative Semantics

The change-of-state in (18b) above seems to be mediated by the preposition *into*. I propose that a BECOME operator is introduced by the preposition *to* contained in *into*, in a Change-of-State (CoS) guise.<sup>10</sup> The *in* element is responsible for taking a nominal argument and returning a predicate of states which is a suitable argument for the BECOME operator (in essence a syntactically overt type-shifter). This is supported by the fact that change-of-state semantics is possible with *to* alone in (19), where it takes an AP complement: However, *in* is necessary where there is a DP complement (20).

(19) The weather suddenly went from hot *to* [<sub>AP</sub> cold].

- (20) a. I made her hair *into* [<sub>DP</sub> a braid].  
 b. I went *into* [<sub>DP</sub> the store].

I further propose that there is a null variant of *in*, IN, which takes a nominal root argument and also returns a predicate of states. These heads are parts of a creation inchoative such as *braid*. Their denotations are as in (21):

- (21) a.  $[[\text{IN}]] = \lambda f_{\langle e,t \rangle} \lambda x_e \lambda s_s . f(s) \ \& \ \text{in}(s,x)$   
 b.  $[[\text{TO}_{\text{CoS}}]] = \lambda f_{\langle e, \langle s,t \rangle \rangle} \lambda x_e \lambda e_s \exists s_s . \text{BECOME}(f(s)(x))(e)$

In sum, there are the following possibilities for *to* and TO:

- to* + AP <sub>$\langle e, \langle s,t \rangle \rangle$</sub>  (as in 19)  
*into* + DP <sub>$e$</sub>  (as 20)  
 INTO +  $\sqrt{\langle e,t \rangle}$  (as in decomposition of creation inchoatives)

In the case of creation inchoatives, the null IN and TO combine with the root and a causative head as in (22), and the verb *braid* will be derived by conflation/incorporation (see the appendix for semantic detail):

- (22) [ CAUSE [ her hair <sub>$e$</sub>  [ TO<sub>CoS</sub> [ IN  $\sqrt{\text{braid}}$  ] ] ] ]

When there is a pseudo-resultative predicate present, it enters the structure as an adjective of type  $\langle e,t \rangle$  and combines with *braid* by intersective modification (see the appendix for semantic detail):

<sup>10</sup>The BECOME operator I propose has the semantics in (1), where type  $e$  is used for individuals,  $s$  for eventualities (both events and states), and  $t$  for truth values:

- (1)  $[[\text{BECOME}]](f_{\langle e, \langle s,t \rangle \rangle})(x_e)(e_s) = 1$  iff  $e$  is the smallest event such that  $f$  is not true of the pre-state of  $e$  but  $f$  is true of the target state of  $e$

This denotation is based on that found in (von Stechow 1996), however, TO<sub>CoS</sub> takes a state argument before it combines with the individual which will come to be in that state. In this way, TO<sub>CoS</sub> more closely resembles (Embick 2004)'s FIEN head.

- (23) [ CAUSE [ her hair<sub>e</sub> [ TO<sub>CoS</sub> [ IN  $\sqrt{\text{braid tight}}$  ] ] ] ]

## 5.2 Overt Syntactic Counterparts

The overt syntactic counterparts to creation inchoatives as in (16) and (17) have a similar structure with overt *in* and *to* instead of the null variants. The semantics for overt *to*<sub>CoS</sub> is the same as the null TO<sub>CoS</sub>. Overt *in* takes a DP complement of type *e* rather than a type  $\langle e, t \rangle$  argument taken by IN.

- (24) [ her hair<sub>e</sub> [ in+to<sub>CoS</sub> [ t<sub>in</sub> [ a tight braid ] ] ] ]

## 6 Additional Evidence

A variety of syntactic tests provide further support for the decomposition proposed here. Creation inchoatives pattern with the overt syntactic counterparts suggested here, such as *put her hair into a braid*, while other possible paraphrases, such as *make a braid out offrom/with hair*, pattern otherwise.

### 6.1 Availability of Passive

Assuming that Voice assigns accusative case to the closest DP argument below it via Agree, in the given structures *her hair* should receive structural case. Also assuming that arguments assigned structural case by Voice can passivize, the structure given predicts that passivization of the 'source' argument should be available, as is the case in (25):

- (25) a. *The string* was braided by Mary.  
 b. *The string* was put/made into a braid by Mary.  
 (26) \**The string* was made a braid out of by Mary.

### 6.2 Unavailability of a Low Applicative Arguments

The analysis also correctly predicts the unavailability of low applicative, or Goal, arguments, if we assume an analysis as in (Pykkänen 2002). On that account, the low applicative head, APPL, takes three arguments: two individual arguments and then a function of type  $\langle e, \langle s, t \rangle \rangle$ . There is no position in the structure where an APPL head can be attached. In the case of *braid*, there is only one individual argument to begin with. In the case of *put*, there are two individuals, but these are arguments of other elements.

- (27) a. \* I braided Mary the string.  
 b. \* I put/made Mary the string into a braid.  
 (28) I made Mary a braid out of her hair.

### 6.3 Availability of Depictives

Following the analysis of depictives in Pylkkänen (2002), the analysis predicts the availability of object depictives, which are indeed possible:<sup>11</sup>

- (29) a. I braided her hair<sub>i</sub> (tight) wet<sub>i</sub>.  
 b. I put her hair<sub>i</sub> into a braid wet<sub>i</sub>.  
 (30) \* I made a braid out of her hair<sub>i</sub> wet<sub>i</sub>.

### 6.4 Obligatory Arguments

The analysis predicts that the direct object of the verb *braid* will be obligatory, since it is selected by the state introduced by the root. This prediction is borne out, as shown in (31).

- (31) a. I braided \*(her hair).  
 b. I put/made \*(her hair) into a braid.  
 (32) I made a braid (with her hair).

## 7 Open Questions

### 7.1 Relevance of Adverb Morphology

What is the status of adverb morphology in cases like (33)?

- (33) She braided her hair tightly.

Such morphology cannot be 'hypercorrection', as proposed for similar cases in Parsons (1990), since this would incorrectly predict that such hypercorrection is possible with true resultatives as in (34). With a participle, only the form with adverb morphology is possible (35).

<sup>11</sup>The object depictive at first seems possible with the paraphrase with *with*:

- (1) I made a braid with her hair<sub>i</sub> wet<sub>i</sub>.

However, here *wet* is a modifier within a reduced clause introduced by *with*, as in *with her hair being wet*. Such a clause cannot be introduced by *out of* or *from*, and thus these do not show this confound.

- (34) a. \* John wiped the table cleanly.  
 b. \* Mary hammered the metal flatly.
- (35) a. \* Mary's hair was tight braided. (without compound intonation)  
 b. Mary's hair was tightly braided.

This particular morphological 'alternation' doesn't seem to correspond with any semantic difference that I have found thus far. This supports the proposal of Corver (2005) and references therein arguing that adverb morphology like English *-ly* is a reflex of syntax, like inflectional, rather than derivational, morphology. Adverb morphology does not seem to be a reliable indicator of semantic argument type (see also cases like *beautiful dancer* as analyzed in (Larson 1998)). However, it remains to be determined whether cases like (33) are mere syntactic variants of pseudo-resultatives like (35b), or whether they diverge truth-conditionally in some systematic way.

## 7.2 Semantic Restrictions

As mentioned above, pseudo-resultatives are more restricted semantically than their 'overt' counterparts. There is a very limited range of possible adjectives, varying with the predicate.

- (36) a. # She braided her hair thick.  
 b. # She piled the pillows wide.

This restrictedness of the adjective is reminiscent of the constraints on resultatives noted in Wechsler (2005), although it is not the same constraints at work, as was shown in section 2.1. Also, there are cases which seem to involve change-of-state and creation that don't necessarily allow pseudo-resultatives:<sup>12</sup>

- (37) a. The witch changed the prince into a frog.  
 b. \* The witch frogged the prince green.

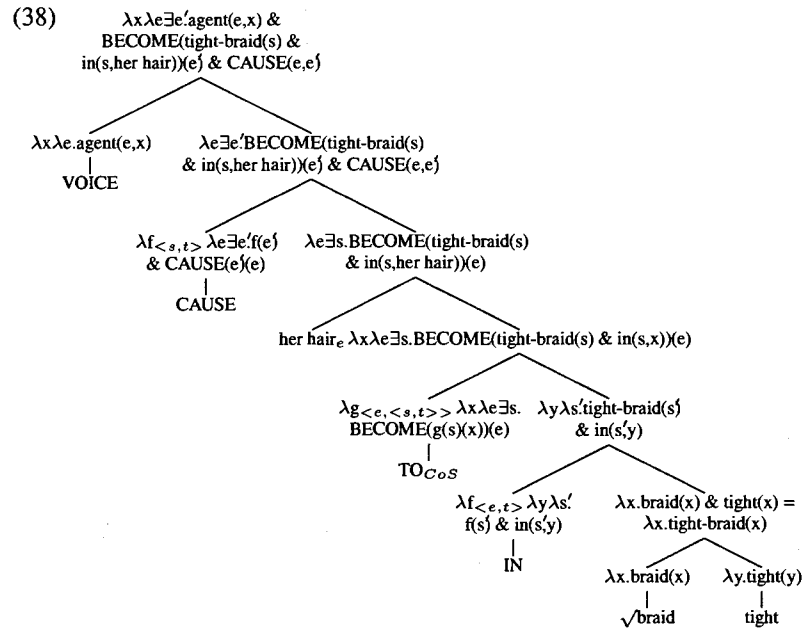
This may be the same problem as in (36) – perhaps there is no possible adjective for this predicate. We ultimately need a more fine-grained semantic analysis which would rule such structures out – making explicit reference to the semantics of 'material rearrangement' or something of the kind. The restrictions that surface here in conflated but not non-conflated structures may also relate to the restrictions on concealed causatives discussed in (Bittner 1999).

<sup>12</sup>I would like to thank Anna Szabolcsi for providing this example.

### 8 Conclusion

In this paper, I have shown with cross-linguistic evidence that pseudo-resultatives are distinct from both resultatives and ‘resultative adverbs’. I have argued that syntactic lexical decomposition of a class of verbs I have called ‘creation inchoatives’ can provide a means for accounting compositionally for the availability of pseudo-resultative adjectives which initially seemed to pose a problem for the syntax-semantics interface. In doing so, I have also drawn parallels between the decomposition of creation inchoatives and other structures which are found in overt syntax in English and Finnish.

### 9 Appendix



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