

## Deconstructing Affectedness: A Hierarchical Approach

### 1 Introduction

- The term “affectedness” has existed in the literature for some time, usually tied to a notion of change-of-state (Fillmore 1968, Anderson 1977, Dowty 1991, Beavers 2006).
  - Argument realization - one of the defining notions of Patienthood; linked to objecthood (Fillmore 1968, 1970, 1977, Anderson 1971, 1977, Jackendoff 1990, Beavers 2006).
  - Transitivity - one of many determining factors (Hopper and Thompson 1980, Tsunoda 1981, 1985, Blume 1998, Testelec 1998, Næss 2003, Beavers 2006, 2007a).
  - NP-Preposing (NP-passives, middles) - certain syntactic operations are restricted to affected participants (Anderson 1979, Jaeggli 1986).
  - Lexical Aspect - implicated in (and often reduced to) temporal properties of dynamic events (Tenny 1987, 1992, 1994, Jackendoff 1996, Krifka 1998, Beavers 2006, 2007c).
- Despite this, affectedness rarely receives a unified, linguistically-motivated definition, and often such work proposes conflicting results. In this talk I attempt to resolve these conflicts.
- I begin by summarizing and critiquing some of the results of this previous literature. I then sketch a notion of affectedness that builds on all of this, with the following properties:
  - Affectedness is a generalization over various real world properties (e.g. change of state, location) (Jackendoff 1990, *inter alia*).
  - Affectedness is best defined as a three-place relation, relating an event, an affected entity, and a property scale (Hay et al. 1999, Beavers 2006, 2007c).
  - Affectedness is not reducible to aspect, though they are closely tied (cp. Tenny 1992).
- On the basis of this I define varying “degrees” of affectedness that form an implicational Affectedness Hierarchy that I show underlies all of these phenomena (Beavers 2006).
- I conclude by suggesting that there is gradient behavior and implicational relationships between verb classes in terms of this hierarchy, a prediction unique to this hypothesis.

### 2 What is Affectedness?

- Jackendoff (1990) (following partly Cruse 1973) provides perhaps the world’s only test for affectedness, the *What happened to X was .../What Y did to X was...* test.
  - (1) a. The Romans destroyed *the barbarian city*.
  - b. What happened to the barbarian city was that the Romans destroyed it.
  - (2) a. Barry hit *the ball* into the field.
  - b. What happened to the ball was Pete hit it into the field.

- (3) a. They followed *the star* (out of Bethlehem).  
 b. \*What they did to the star is follow it.
- However, there are some false positives, which lead Rappaport Hovav and Levin (2001:786-787) to propose that this test picks out a “force recipient” (Croft 1990, 1991, 1998):
- (4) a. John hit/slapped/touched/wiped the car. (No effect)  
 b. What John did to the car was hit/slapped/touch/wipe it. (Still passes test)
- So what are the relevant types of effects? Despite their dissimilarities, the following factors have all been tied to objecthood or affectedness (Jackendoff 1990, Beavers 2006):
- (5) a. **Changing state: change in some measurable property of *x*.** (*clean/paint x*)  
 b. Changing location: *x* moves to and stays at some new location. (*move/push x*)  
 c. Coming into existence: *x* comes to exist (more than before). (*build x*)  
 d. Going out of existence: *x* ceases to exist (more than before). (*destroy x*)  
 e. Transforming: *x* becomes something wholly different. (*turn x (into y)*)  
 f. Changing possession: *x* changes hands. (*give x (to y)*)  
 g. Coming to possess: *x* possesses something new. (*grace x (with y)*)  
 h. Ceasing to possess: *x* loses something. (*deprive x (of y)*)

I assume all of these are different sorts of affectedness, a connection I sharpen later.

### 3 Affectedness in Object Realization

- Anderson (1971, 1977) noticed that given the choice of two possible objects, the one that is (most) affected will be the object (see also Fillmore 1977, Dowty 1991):
- (6) a. John loaded the wagon with (the) hay. (wagon all filled up)  
 b. John loaded (the) hay onto the wagon. (hay all moved)
- The relevant notion of affectedness is that the direct object be “completely” filled up/completely moved (sometimes referred to as the “holistic/partitive” effect), itself connected to telicity:
- (7) a. Sandy wrote her dissertation in/?for two years. (holistic = telic)  
 b. Sandy wrote on her dissertation for/??in two years. (partitive = atelic)
- NB: Bare plural/mass nouns are known to muddle interpretations of completeness (Garey 1957, Verkuy1 1972, 1993). I control for this by using only definite, specific DPs (cf. Jeffries and Willis 1984, Dowty 1991, Herslund 1995, Laffut 1998, Beavers and Francez in press).
  - Interestingly, while the objects in (6) pass the affectedness test, so do the obliques:
- (8) a. ?What Bill did to the truck was load the books onto it.  
 b. ?What Bill did to the wall was smear paint on it. (cf. Jackendoff 1990:130)

- This can be explained by the fact that even the obliques undergo some perceptible change, albeit a non-holistic one (Dowty 1991, Beavers 2006).
  - (9) a. #John loaded the wagon with the hay, but none of the hay ended up on the wagon.
  - b. #John loaded the hay onto the wagon, but the wagon had no hay on it.
- This suggests that holistic affectedness is just one factor relevant for objecthood, a conclusion supported by looking at a wider range of object/oblique alternations.
- Consider the following, which involve contrasts in affectedness, but not on a holistic reading:
  - (10) a. John cut/struck/sliced the tire. (Tire affected)
  - b. John cut/struck/sliced at the tire. (Tire not necessarily affected)
- Furthermore, some alternations are sensitive to impingement without a real effect:
  - (11) a. John hit/kicked the wall. (wall impinged, not affected)
  - b. John hit/kicked at the wall. (wall not necessarily impinged)
- Even further, some alternations involve a holistic/partitive contrast but without affectedness, in particular so-called “traversal objects” (see Martin 1975 on Japanese):
  - (12) a. John hiked/walked the trail (in/?for an hour). (holistic; unaffected)
  - b. John hiked/walked up/along the trail (for/?in an hour). (partitive; unaffected)
- Yet there *is* affectedness involved. However, it rests with the subject, which changes position. Surprisingly, though, these subjects do *not* pass the Jackendoff test for affectedness:
  - (13) \*What happened to John is that he walked (up) the trail.
- How might we explain this discrepancy? Cruse (1973) notes that this test forms an opposition with the *What X did was...* test for agentivity:
  - (14) What John did was walk (up) the trail.
- The affectedness test stipulates non-agentivity, confirmed by comparing (13) to (15):
  - (15) What happened to the ball was that it rolled down the hill.
- Thus object alternations can exhibit several types of contrasts for the alternating participant, suggests that there are categories (or “degrees”) of affectedness.
  - Holistic affectedness vs. potentially partial affectedness. (locative, *on*-conative)
  - Affectedness vs. not necessarily affected at all. (*at*-conative)
  - Impinged vs. no necessary impingement. (*at*-conative)
  - Holistic vs. potential partitivity (but no affectedness). (traversal objects)

Affectedness must (a) cross-cut ontological types of changes, (b) make distinctions about the “degree” of effect, and (c) be distinct from the holistic/partitive effect.

#### 4 Affectedness in Transitivity

- Affectedness is a determinant of “high” transitivity; lower degrees of affectedness yield intransitivity in some languages (Hopper and Thompson 1980, Tsunoda 1981, 1985, 1999):

(16) *thub=bstan-gyis blo=bzang-la mur=rdzog*  
Thubten-ERG Lobsang-LOC fist hit-PERF  
‘Thubten punched Lobsang.’ (Tibetan; DeLancey 2000:(63)-(64))

- Malchukov (2005:81), following Tsunoda (1981, 1985) proposes a hierarchy of transitivity based on affectedness (and another one based on agentivity which I ignore here):

(17) ‘break’ > ‘hit’ > ‘pursue’ > ‘go’ (greater effect > lesser/zero effect)

- Verbs that reflect high degrees of affectedness tend to be transitives; those entailing less degrees of affectedness are less likely to be transitive.
- In addition, if a verb class to the right in the hierarchy has transitive members all of those to the left will, even if individual verbs do not (Malchukov 2005:82).

- However, Malchukov doesn’t detail an analysis of the hierarchy, nor tie it into anything else.

#### 5 Affectedness in NP-Preposing and Aspect

- Certain other syntactic operations are apparently restricted to affected participants (Anderson 1979, Jaeggli 1986, Tenny 1992, 1994, Cornips and Hulk 1999, Egerland 2000):

(18) a. The Mongols’ destruction of the city.  
b. The city’s destruction by the Mongols.  
c. John’s avoidance of Bill.  
d. \*Bill’s avoidance by John. (NP-passives; cf. Tenny 1992)

(19) a. This door opens easily.  
b. This cinch tightens easily.  
c. \*Traffic jams avoids easily.  
d. \*Fleeing burglars pursue easily. (Middles; cf. Tenny 1992)

(20) *Affectedness Constraint*: If a complement of X is unaffected, it is impossible to eliminate the external  $\theta$ -role of X. (Jaeggli 1986:607)

- However, as Tenny (1987, 1992, 1994) points out, more factors are at play than affectedness, since many unaffected objects (which do not pass the Jackendoff test) may be preposed:

(21) a. The play’s performance. (The company’s performance of the play).  
b. The mountain path’s traversal. (The settlers’ traversal of the mountain path.)  
c. \*The play’s hatred. (John’s hatred of/for the play.)

- However, note that these are essentially traversal objects, literally or figuratively. Thus, just like object/oblique alternations, traversal objects and affected objects pattern alike.

- Tenny proposes that traversal objects and affected objects both “measure out” the event.

(22) “The verb’s direct internal argument may be thought of as being converted into a function of time at some level of semantic representation... [t]he term ‘measure out’ is used here in an informal sense, as a convenient metaphor for uniform and consistent change, such as change along a scale.” (Tenny 1992:4-5)

- This is evidenced by the *halfway/half of* correlation:

(23) a. John ate half of the apple. ⇔ John ate the apple halfway.  
 b. John wiped half of the table clean. ⇔ John wiped the table clean halfway.  
 c. John hiked half of the trail. ⇔ John hiked the trail halfway.

- Tenny reduces affectedness to measuring out plus delimitation (which yields holistic affectedness readings) (see also Cornips and Hulk 1999, Egerland 2000).

(24) “An affected argument has been generally described as an argument which undergoes some change. Undergoing change is a temporal process. An affected argument can be more adequately described in aspectual terms, as an argument which measures out and delimits the event described by the verb.” (Tenny 1992:9)

- All affected arguments (on the intuitive sense) plus paths are “affected” on Tenny’s sense, and we can still analyze NP-preposing under a single definition as in (20).
- However, there are two reasons to take exception to this analysis. First, the intuitive notion of affectedness is not subsumed by NP-preposing (as pointed out by Jackendoff 1996:312,fn.7).

(25) a. John hit the fence. (Impinged)  
 b. \*This fence hits easily. (What John did to the fence was hit it.)

- Second, change isn’t always measured out by the object per se (Beavers 2006).

(26) a. McCoy scanned half of Spock’s brain. ⇏ McCoy scanned Spock’s brain halfway.  
 b. Sulu dimmed half of the lights. ⇏ Sulu dimmed the lights halfway.

Affectedness and aspect are correlated but disjoint, suggesting we need an intermediary.

## 6 A Ternary Analysis of Affectedness/Measuring Out

- I present a model of change-of-state that captures these properties, recapping my previous work on aspect (Beavers 2002, 2007c) and object realization (Beavers 2006:Ch.3-6) (building on ideas implicit in Tenny 1987, 1992, 1994, Dowty 1991, Jackendoff 1996, Krifka 1998 and explicit in Hay et al. 1999, Kennedy and Levin 2001, Wechsler 2001, 2005).
- The crucial basis is to look again at motion verbs with traversal objects:

(27) John hiked the lonesome trail. (*position* of John, i.e. the path, measures event)

- The event begins when the theme changes location from the initial point on the path.
- The event progresses temporally as the theme progresses adjacently on the path.
- The event ends when the theme changes location a final time to the end of the path.

- No one entity does everything: the path measures out the event, but only in conjunction with the theme (the affected participant) (cf. Dowty 1991:569, on *incremental vs. holistic theme*).
- Non-motion change can be viewed in exactly the same way (on a Localist Hypothesis).
- Entities have a number of properties associated with them, which form scales along which entities can “move” (Hay et al. 1999, Kennedy and Levin 2001, Krifka 1998).
- A dynamic predicate  $\phi$  over event  $e$ , theme  $x$ , and scale of change  $s$  describes  $x$ 's progress on  $s$  in  $e$ .  $\phi$  names the ontological type of  $s$  (Beavers 2007c):

(28) a. John ate the apple. (scale of *volume* of apple)  
b. John wiped the table clean. (scale of *cleanliness* of the table)  
c. John handed Mary a basket. (scale of *possession* of the basket)

- The relationship between  $e$ ,  $x$ , and  $e$  is in all cases a **movement relation**: the progress of  $e$  is measured by  $x$ 's adjacent progress along  $s$  from its initial state on  $s$  to its final state on  $s$ .

(29) baked the lobster till half done (cf. Krifka 1998:229-230, (77a))  
 $\lambda e.[bake(l, e, s_b) \wedge \theta_S(e, s_b) \wedge \theta_T(e, x) \wedge SOURCE(s_b, raw, l, e) \wedge GOAL(s_b, half\ done, l, e)]$

- The upshot to this approach is that we have a clean, homogeneous distinction between measuring out and affectedness, predicting a disconnect between the *halfway* and *half of* tests.

(30) a. McCoy scanned half of Spock's brain. (Half of the brain)  
b. McCoy scanned Spock's brain halfway. (Halfway on the scanned scale)

- The downside is that we have to introduce a scale for every event. However, there's evidence for this (see Beavers 2006:Ch.4 for an extended discussion):

- **Overt Scalars:** Result XPs/paths impose aspectual constraints via scalar gradability:

(31) The outlaw shot the sheriff dead/to death. (punctual/durative)

This is predicted if the relationship  $\theta_S$  between  $s$  and  $e$  preserves aspects of scalar structure in the event (Hay et al. 1999, Wechsler 2001, 2005, Beavers 2002, 2007c).

- **Covert Scales:** In the absence of overt scalars, context can impose constraints on scalar interpretations that determine aspectual properties (Hay et al. 1999, Beavers 2007c).

(32) Sulu killed the lights. (by switch=punctual, by knob=durative)

- **Category Shifts:** Aspectual properties of verbs map to scalar properties of deverbal adjectives (e.g. punctual *die*  $\leftrightarrow$  non-gradable *dead*; Kennedy and McNally 2005).

- Thus there is independent evidence that scales underlie changes of state.

## 7 Defining Degrees of Affectedness and their Linguistic Correlates

### 7.1 Degrees of Affectedness and Aspect

- We can now define the abstract types of affectedness relevant for various phenomena above.
- I start with the holistic vs. partitive affectedness contrast, which is tied to telicity. In a scalar model this is what Hay et al. (1999) called **quantized** vs. **non-quantized** change:

- (33) a. The tailor lengthened the jeans 5ins. (quantized = definite, specific change)  
b. The tailor lengthened the jeans. (non-quantized = non-specific change)

- We can model this in terms of how **specific**  $\phi$  is about  $x$ 's progress on  $s$  ( $C$ =context):

- (34) a. **quantized** (“ $x$  transitions between specific states  $\mathbf{b}_{\phi,C}$  and  $\mathbf{g}_{\phi,C}$  on  $s$  in  $\phi$ ”):  
[ $SOURCE(s, \mathbf{b}_{\phi,C}, x, e) \wedge GOAL(s, \mathbf{g}_{\phi,C}, x, e)$ ]  
b. **non-quantized** (“ $x$  transitions between non-specific states on  $s$  in  $\phi$ ”):  
 $\exists b, g.[SOURCE(s, b, x, e) \wedge GOAL(s, g, x, e)]$

- Note that the relevant result state is determined by the whole predicate; a verb alone can entail a quantized change, or a verb+result state modifier can, as in (29) and (33).
- The main way to tell these types of changes apart is telicity: as Hay et al. note, quantized change yields telicity, since the event ends only when the specific result state is achieved (the implementation in (34a) yields telicity on the definition of telicity in Krifka 1998:207, (37)).
- Another distinguishing factor is the range of possible result XPs in resultative constructions (though I cannot quantify this):

- (35) a. John shattered the vase into a million/thousand/thirty-six different pieces.  
b. #John shattered the vase only slightly/into two pieces/in half/silly/purple/up.

- (36) a. John cut the bread into fifteen/a million pieces/an amusing shape/very slightly/up.  
b. #John cut the bread clean silly/purple/flat.

- Thus variability of different verb classes in their syntactic frame (e.g. resultative constructions) further distinguishes the two types of affectedness.
- Where they don't differ is in the affectedness test, which we can define as follows:

- (37) *What happened to  $x$  is  $\phi$*  is true iff  $x$  undergoes a (non)-quantized change in  $\phi$

### 7.2 Degrees of Affectedness and Object Realization

- Some object/oblique alternations are sensitive to the quantized/non-quantized contrast:

- (38) a. wrote my dissertation. (quantized change for dissertation)  
b. wrote on my dissertation. (non-quantized change for dissertation)

- However, recall that other types of contrasts are relevant for other object alternations:

- (39) a. John kicked the wall. (wall impinged, not necessarily affected)  
 b. John kicked at the wall. (wall not necessarily even impinged)
- We can model impingement as potential for an effect (i.e. an effect in some possible world), and the absence of impingement as the absence of any constraint on an effect at all:
 

(40) a. **impinged** (“ $x$  might transition between non-specific states on  $s$  in  $\phi$ ”):  
 $\diamond \exists b, g. [SOURCE(s, b, x, e) \wedge GOAL(s, g, x, e)]$   
 b. **unspecified** (for a change) (“ $x$  is a theme, but may not change or be impinged”):  
 $x$  is a theme but  $\phi$  imposes no conditions on  $x$ ’s position/progress on  $s$ .
  - We can distinguish these by an updated affectedness test:
 

(41) a. What happened to the wall was that John kicked it.  
 b.?What happened to the wall was that John kicked at it.

(42) *W.h.t.  $x$  is  $\phi$*  is true iff  $x$  undergoes a (non)-quantized change or is impinged in  $\phi$ .
  - The main thing that distinguishes (40) from (34) is that the latter entail a result state. Furthermore, Rappaport Hovav and Levin (1998) note that result verbs (e.g. *break*) and manner (non-result) verbs (e.g. *sweep*) differ in terms of resultative predication.
 

(43) a. Terry swept the floor (clean).  
 b. Terry swept the crumbs into the corner.

(44) a. Kelly broke the dishes (to pieces)  
 b. \*Kelly broke the dishes off the table/broke his knuckles to the bone.
  - Furthermore, in Japanese only verbs that entail change allow resultatives (Washio 1997):
 

(45) a. *boku-wa aisu kuriimu-o katikati-ni koorase-ta*  
 I-top ice cream-ACC solid-DAT freeze-PAST  
 ‘I froze the ice cream hard/solid.’ (Weak resultative)  
 b. \**John-ga kinzoku-o petyanko-ni tatai-ta.*  
 John-NOM metal-ACC flat-DAT hammer-PAST  
 ‘John hammered the metal flat.’ (Strong resultative)
  - Finally, recall this further contrast, between entailing an effect and not entailing an effect:
 

(46) a. John sliced the salami. (salami affected somehow)  
 b. John sliced at the salami. (salami not necessarily affected)
  - The effect in (46a) is non-quantized: the salami is changed but not to any specific degree. We could view the great possibility of a result in (46b) as a type of impingement:
 

(47) ?What happened to the salami was that John sliced at it.
  - We do not need further definitions to capture (46): it is a non-quantized vs. impinged contrast.

Thus all of these object/oblique alternation contrasts can be captured under a single notion: contrasts in how specific  $\phi$  is about the change that occurred.

## 8 From Degrees of Affectedness to The Affectedness Hierarchy

### 8.1 The Affectedness Hierarchy and Object Alternations

- However, we can do better than this, in a way that ties all of these phenomena together: the degrees of affectedness I defined above are related implicationally in an important way:

(48) **The Affectedness Hierarchy:**

for all  $x, s, \phi, e$ , *quantized*  $\rightarrow$  *non-quantized*  $\rightarrow$  *impinged*  $\rightarrow$  *unspecified*

- This hierarchy gives us a way to generalize over a range of phenomena and tie them together.
- For example, our affectedness test can be defined far more simply, since (non)-quantized change entails impingement and thus all three degrees of affectedness satisfy the following:

(49) *What happened to x is  $\phi$*  is true iff  $x$  is impinged in  $\phi$

- Second, different alternations pick out different minimal contrasts along this hierarchy (see Beavers 2006 for an analysis following 1991, generalized to other grammatical functions):

(50)		<b>Contrast</b>	<b>:</b>	<i>quant.</i>	$\rightarrow$	<i>non-quant.</i>	$\rightarrow$	<i>imp.</i>	$\rightarrow$	<i>unspec.</i>
	<i>On-Conative w/write</i>		<b>:</b>	DO	$\Rightarrow$	OBL				
	<i>At-Conative w/slice</i>		<b>:</b>			DO	$\Rightarrow$	OBL		
	<i>At-Conative w/kick</i>		<b>:</b>					DO	$\Rightarrow$	OBL

(51) **Morphosyntactic Alignment Principle** (for objects, Version 1): The theme is affected to degree  $n$  in the object variant and degree  $n - 1$  in the oblique variant.

- This is *not* a complete analysis; each alternation may impose other constraints:
  - Locative alternations require ternary re-location verbs (obviously).
  - Conative alternations seem to also require an instrument and some movement (Guerssel et al. 1985, Laughren 1988, Broccias 2003, Beavers 2006, 2007b)
- However, (51) gives us a unified, general a general constraint on possible alternations.

### 8.2 The Affectedness Hierarchy and Traversal Objects

- However, recall that one alternation involved a holistic/partitive contrast but no affectedness.

(52) John walked (up) the trail. (holistic/partitive)

- On the analysis here the subject undergoes a (non)-quantized contrast (conforming to (51)). But is there a contrast for the alternating participant?
- The correlate of (non)-quantized change of  $x$  is how specific  $\phi$  is about the endpoints of  $s$ :

- (53) a. **delimited** (“ $s$  corresponds to the complete progress of  $x$  in  $\phi$ ”):  
 $[SOURCE(s, \mathbf{b}_{\phi,C}, x, e) \wedge GOAL(s, \mathbf{g}_{\phi,C}, x, e)]$
- b. **non-delimited** (“ $s$  corresponds to the progress of  $x$  in  $\phi$ ”):  
 $\exists b, g. [SOURCE(s, b, x, e) \wedge GOAL(s, g, x, e)]$

- These are the same entailments as for (non)-quantized change, but here applied to  $s$  rather than  $x$ , forming an implicational hierarchy. We can generalize our principle somewhat:

(54) **Delimitation Hierarchy:** for all  $s, x, \phi, e$ , *delimited*  $\rightarrow$  *non-delimited*

(55) **MAP** (for objects, Version 2): In the object variant the alternating participant is at position  $n$  on some hierarchy and in the oblique variant it is at position  $n - 1$ .

- Affectedness/delimitation go hand in hand, but the hierarchies apply to different objects.

### 8.3 The Affectedness Hierarchy and NP-Preposing

- NP-preposing applied to affected entities and traversal objects. In both cases, this means that the theme argument of a **transitive** head undergoes a non-quantized change.

(56) *Affectedness Constraint* (New): If no argument of a transitive head X undergoes a non-quantized change, it is impossible to eliminate the external  $\theta$ -role of X.

- (57)
- |    |  |                                   |
|----|--|-----------------------------------|
| a. | destruction of the city/the city's destruction | (quantized)                       |
| b. | open the door/this door opens easily           | (non-quantized)                   |
| c. | traversal of the path/the path's traversal     | (quantized)                       |
| d. | hit the sailor/*this sailor hits easily        | (impinged)                        |
| e. | caress the duckie/*this duckie caresses easily | (unspecified??)                   |
| f. | move along the path/*the path's motion         | (non-quantized, but intransitive) |

- Note that there are likely other constraints as well (cf. ??*this city destroys easily*).

### 8.4 The Affectedness Hierarchy and Transitivity

- The affectedness hierarchy also defines a hierarchy of predicate types depending on the degree of affectedness they entail, compatible with that proposed by Malchukov (2005).

(58)

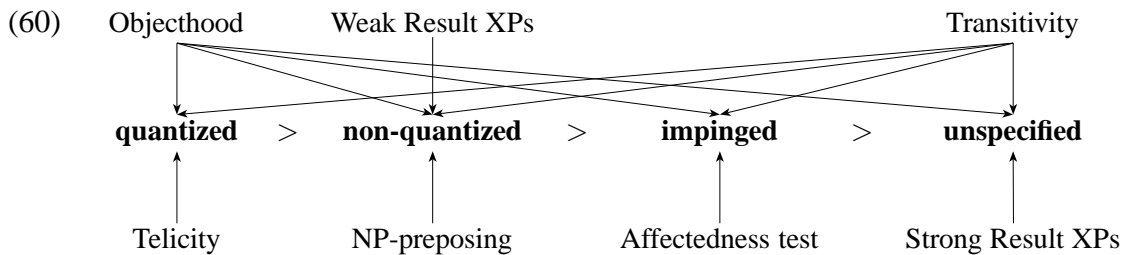
<b>quant.</b>	$\rightarrow$	<b>non-quant.</b>	$\rightarrow$	<b>imp.</b>	$\rightarrow$	<b>unspec.</b>
<i>break, load, build</i>	$>$	<i>slice, cut</i>	$>$	<i>hit, slice at</i>	$>$	<i>caress?, wipe?</i>

(59) **Transitivity Hypothesis:** If a verb entailing a degree of affectedness  $n$  is transitive in a language, then there will be verbs entailing degrees of affectedness greater than  $n$  that will also be transitive.

- As Malchukov notes, there are more parameters than this in transitivity (but some of these may be reducible to or presupposed by affectedness; see Beavers 2006:Ch.7).

## 9 Conclusion - Gradient Behavior and Implicational Relationships

- Affectedness has been employed to explain a range of phenomena, including object realization, transitivity, NP-preposing, and aspect, though rarely in a unified fashion.
- I have argued first and foremost that we need a definition of affectedness that lumps a range of semantic features together in a unified way.
  - Affectedness is a relationship between a theme  $x$ , scale  $s$ , and event  $e$  for predicate  $\phi$ .
  - The ontological type of change is determined by the choice of  $s$  for a particular  $\phi$ .
  - The degree of affectedness is determined by how specific  $\phi$  is about  $x$ 's progress on  $s$ .
- I proposed an Affectedness Hierarchy that is implicated in all of the above phenomena:



- Of course, we can also use this hierarchy to define predicate classes as in (58). One emergent property is the existence of gradient effects and implicational relationships between classes.
- Due to the implicational relationships of the entailments the implicational relationships between predicate types follows, since stating constraints on something of degree  $n$  inherently applies to higher predicate, whereas gradience follows from weakening entailments.
- Indeed, some operations that apply to a predicate of degree  $n$  in a language also apply to higher predicates (transitivity, weak/strong resultatives), and some operations may be freer/more restricted moving up or down the hierarchy (possible result XPs):

(61)

	qua	non-qua	imp	unspec	note
Entails result	yes	yes	no	no	by definition
Telic	yes	no	no	no	by definition
Transitive	usually	often	less often	rarely	implicational/gradient
Resultative	wk/str	wk/str	str	str	implicational
Result XP	restricted	free	very free	??	gradient
<i>W.h.t.x.is.ϕ</i>	yes	yes	yes	no	implicational?
NP-preposing	yes	yes	no	no	implicational?

- On this approach we should expect to find (a) other possible “cut off” points for other languages for similar phenomena and (b) more gradient effects following this hierarchy.
- It could be otherwise: some operations could target certain affectedness types, although this would require very complicated constraints ( $P_n \wedge \neg P_{n+1} \dots$ ) that seem unnatural.
- Furthermore, some of these effects might follow from other factors (grammatical aspect, context/conventionalization, quantitative determinacy), areas that also need to be investigated.

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