

Roots, States, and Stative Passives

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1 Questions

At least four components to meaning:

- (M1) The meaning of Roots
- (M2) The denotations of functional heads in a syntactic structure
- (M3) Operators introduced in the semantics (CAUSE, BECOME, etc.) when syntactic structures are interpreted
- (M4) Aspects of meaning that arise via (competition for) use

What's in a Root (M1)? I.e., what types of semantic information could be built into the semantics of a Root. Theories within such frameworks can differ greatly in terms of how much semantic information is built into Roots versus derivative of (M2-4).

Working Hypothesis: Meaning in language is *disjoint* or *bifurcated*; in the broadest form, this is the idea that there is no overlap between M's (maybe overlap for M1/4). Concentrating on Root meaning:

Bifurcation Thesis for Roots (BT-R): If a component of meaning is introduced by a semantic rule that applies to elements in combination, then that component of meaning cannot be part of the meaning of a Root.

PROGRAM: Determine (i) what types of meanings are associated with Roots, (ii) how this information correlates with patterns of Root distribution.

Today: Concentrating on States: Many approaches recognize a basic distinction between states like *dark* on the one hand, versus “resultative” or “target” states like *broken* on the other. They are similar in some respects; both are stative in the broad sense, and both relate to verbs that alternate in a similar way (*darken, break*). With respect to this distinction, the assumptions (A1,2):

- (A1) *Target state* (= state caused by an event) is not a primitive; it is what happens when a state (= type of eventuality) is an argument of CAUSE (Parsons (1990); more recently, Kratzer 2001, and references cited there).
- (A2) CAUSE is introduced when a structure is interpreted; it is not a head (e.g. von Stechow 1996 and others; see e.g. Schaefer 2007:186 for discussion and references).

Taking (A1-2) in conjunction with the idea that Roots cannot contain “grammatical” components of meaning:

HYPOTHESIS: Target states or Result states cannot be part of a Root's meaning, by BT:R

PLAN: Reexamine/reanalyze the generalizations that building Target States into Roots was meant to account for; this leads directly to a discussion of how Root-type interacts with the stative passive. More specifically:

- Starting with the basic difference between “accomplishments verbs based on simple states”, and “accomplishments involving derived states”, we will look at ways of accounting for the relevant differences without building “target state” meaning into the latter.
- Stative Passive formation allows for a further examination of generalizations that look like they require inherent target states. The crucial analytical tension concerns (i) how “Root-specific” factors interact with Stative Passive formation; and (ii) whether building Target State meanings into (certain) Roots is motivated by such patterns. I argue that it is not.
- If these considerations are on the right track, then there are further questions about how to state patterns of Root distribution. I will look at some basic contrasts, in terms of a view in which Root-distribution is determined by what type of eventuality the Root modifies (and perhaps some material in the environment of the Root).

A lot of the discussion centers on the types of generalizations regarding different types of states. The final set of comments are more speculative, concerning how, in terms of the program above, Root distributions work.

2 Roots and Eventualities

Questions: Why posit target state meaning as part of a Root → What is the difference between $\sqrt{\text{BREAK}}$ -type Roots and $\sqrt{\text{DARK}}$ type Roots?

By looking at this, it is possible to see the motivation for the representation with the inherent target state, and therefore what a BT-compatible theory must account for.

(1) Similarities

- a. **alternation:** participation in causative/inchoative:
 - i. The vase broke, John broke the vase
 - ii. The sky darkened, The clouds darkened the sky
- b. **access to result state:** Possible with duratives (cf. Kratzer 2001, building on Dowty (1979) and others):
 - i. We are going to break the connection [for 2 hours].
→ two hours in the broken state
 - ii. The organizers will darken the room [for 2 hours].
→ two hours in the dark state

The similarities can be accounted for by putting $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ in similar structures (=deriving something that looks like *break* from *dark*, in a Lexical theory). The differences are more revealing. Two of the more salient ones:

(2) Differences

- a. **stative passive** Change of state verbs work fine in stative passive (*The chair is broken*); verbs derived from “pure states” are odd out of context (*the sky is darkened*).
- b. **pure states:** Supposedly no “pure” adjective of *break*-type; only(?) resultative participles. But *dark*-type have “simple” adjectives. See §4.

This is for English; for German, e.g. Kratzer (2001) holds that the equivalent of the $\sqrt{\text{DARK}}$ -type do not license *for*-phrases. See below.

2.1 Target States in Verb Meanings

Working towards this, consider the commonly-employed denotations for two types of states (see Kratzer and refs. cited there):

- (3) a. Basic States (e.g. *cool*): $\lambda x \lambda s \text{ cool}(x,s)$
- b. Target State (e.g. *cooled*): $\lambda x \lambda s \exists e [\text{cool}(x,s) \wedge \text{CAUSE}(e,s)]$

See also e.g. Koontz-Garboden and Levin (2005:188), not all states are the same: the *break* type verbs are some version of Levin and Rappaport Hovav’s (2008, based on much earlier work) (4)– where the italicized component is where named by *break*– whereas the “adjective” type are just states:

- (4) $[[x \text{ ACT}] \text{CAUSE} [y \text{ BECOME} \langle \text{RESULT-STATE} \rangle]]$

Either way amounts to saying that the target state meaning is part of the semantics of *break* qua primitive. This inherent component of meaning is what accounts for differences between the two state classes; that is

1. *Break*-type and *Dark*-type lexical items are similar, because the latter can be derived into the former type, accounting for why they behave identically as change of state verbs; but
2. Different because *break*-verbs are inherently resultative, and thus can’t be “simple” states.

Some other assumptions are required here (e.g. so-called “monotonicity” as discussed in Koontz-Garboden 2007, or in general something that disallows removing the eventive component from BREAK). The important point for now is to focus on the idea that positing a target state as part of *break*-verb’s lexical meaning (and treating *dark* as a simple state) is supposed to account for a generalization about the distribution of *break* and *dark* type verbs.

2.2 Alternative; Roots, Distributions, Eventualities

I assume that the denotations of the type in (3) are not meanings of Roots. These representations of meaning (could) arise when a Root appears in a syntactic context. This means there must be a theory of

- The types of meanings that Roots have inherently; and how this interacts with
- The distribution of Roots in syntactic structures, and
- The meanings derived when syntactic structures (with Roots) are interpreted

Roots can be classified into different categories in terms of whether they are (particular types of) events, states, entities, etc.. They don’t decompose into such features, though (not in a grammatically-relevant sense, anyway); in this I draw on Borer and others, but not to the extent of claiming that Roots are totally indifferent to distributions. Examples:

- (5) $\sqrt{\text{COOL}}$: type of state
- $\sqrt{\text{CAT}}$: type of entity

The classificatory system on the right of the :’s is crucial to explain distributional properties of Roots (e.g. “states make good adjectives”), as well as interpretive properties. For stating these distributions, see below.

As noted above, in the kind of program I am advancing Target States cannot be part of a primitive (part of a Root’s meaning, in the case at hand); rather

- (6) **Assumption:** Target States are defined in terms of the CAUSE relation. A “Target State” is a state that is an argument of CAUSE:

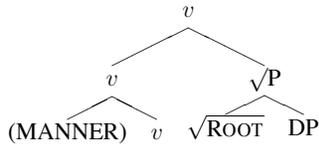
...STATE(s) \wedge CAUSE(e,s)...

Where STATE is a predicate of states. As will be discussed below, many important questions center on how this state predicate is determined. Working towards these, the idea is that Target States come about in the interpretation of syntactic structures in which a state is in a local relationship with an event, the latter associated with verbalizing structure *v*:

- (7) [*v* STATE]

Many of the examples to be discussed below involve a structure like the following:

- (8) Structure



The interpretation has the RootP as a state of the DP, and the *v* as the cause of this. More precisely, with δ for the DP’s denotation and with no commitments as to how this might be built, and using the lambdas for expository purposes:

- (9) $\lambda e \exists s [\text{(MANNER)}(e) \wedge \text{THEME}(e,\delta) \wedge \sqrt{\text{ROOT}}(s,\delta) \wedge \text{CAUSE}(e,s)]$

Within this structure, the Roots are interpreted as predicates of eventualities. The question is how to account for the similarities and differences between $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ -type Roots.

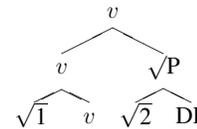
First pass: $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ type Roots differ in terms of what they are good predicates of; i.e.,

- (10) The meaning of Roots is such that
 a. $\sqrt{\text{DARK}}$ type; predicate of states.

- b. $\sqrt{\text{BREAK}}$ type; predicate of states or of events.
 c. $\sqrt{\text{POUND}}$ type; predicate of events.

In structural terms, this means that the $\sqrt{\text{BREAK}}$ -type can appear in either position 1 or position 2 in (11); the $\sqrt{\text{DARK}}$ -type, on the other hand, is restricted to 2 (although see below):

- (11) Structure



1 = predicate of causing event

2 = predicate of caused state

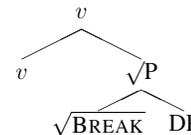
(I’m assuming that 1 and 2 can’t be filled at the same time, except perhaps in cases in which 1-position is a Root, and 2 a “particle”; *auf-pumpen*, *de-stry*, etc.)

So, then, in examples like

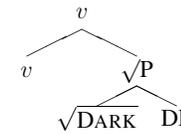
- (12) We’re going to break the connection/darken the room [for 2 hours]

The structure is the same, and differs in terms of whether or not the *v* is spelled out as \emptyset or *-en* (voice features, in *v* or a higher voice head, determine transitivity):

- (13) break



- (14) darken

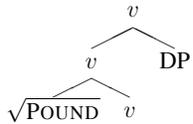


The state that is targeted by the durative adverbial is the one associated with the \sqrt{P} . Semantically, these structures involve CAUSE. The DP is in the state that the Root is a predicate of; this is a Target State because it is related by CAUSE to the *v*-event:

- (15) $\lambda P \lambda e \exists s [P(e) \wedge \dots \sqrt{\text{ROOT}}(s,\delta) \wedge \text{CAUSE}(s,e)]$

Note that there is no predicate of the “manner” component (i.e., no modifier of *v*) in this type of example. This is dealt with by the *P* predicate of events here which function as a dummy. The Manner component is what the Root is a predicate of in e.g. *John pounded the cutlet*:

(16) Root on *v*



Here there is no lower structure with a stative Root and a DP; this correlates with the fact that these verbs do not allow durative adverbials. *Al pounded the metal for 3 hours* has only the reading with 3 hours of pounding action.

2.3 Some Notes on Comparing Approaches

To this point, we have the beginnings of an account of how Roots are interpreted in structures like (11). There's no account of how exactly $\sqrt{\text{DARK}}$ and $\sqrt{\text{BREAK}}$ differ yet. On the way towards this, consider the question of how this type of account differs in general from an account that builds Target State meaning into primitives.

Specifically: what are the differences between saying that a lexical item is/has a result state on the one hand, versus saying that it could be a predicate of such a state on the other?

- THEORY 1 predicts that every in every use of *break*, all of the lexical meaning shown in (4) should be present (unless it has been “removed” by some operation?)
- THEORY 2 says that $\sqrt{\text{BREAK}}$ could be a property of either an event or a state, but whether or not this particular meaning is present depends on the interpretation of the syntactic context in which $\sqrt{\text{BREAK}}$ is found. I.e., *there is target state meaning with this Root only if (i) the syntax constructs an object that receives a target state interpretation, and (ii) the Root is a predicate of that state.*

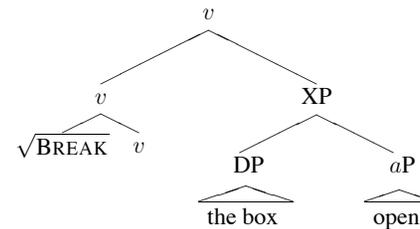
Thinking along these lines, notice an asymmetry: *break*-type Roots can function as *v*-modifiers, *dark*-type cannot:¹

- (17) a. Mary $\left\{ \begin{array}{l} \text{broke} \\ \text{cut} \\ \text{split} \end{array} \right\}$ the package open.
- b. *John $\left\{ \begin{array}{l} \text{opened} \\ \text{darkened} \\ \text{blackened} \end{array} \right\}$ DP RSP

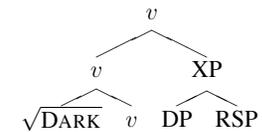
¹For *open*-type, particles like *up* don't count as stative predicates.

- If lexical operations convert *dark* into *darken*, something that is identical with *break*, how can the asymmetry be stated?
- It seems like the result state in (17a) is named by *open*, not by *break*. Is this compatible with the idea that what *break* is is the name of such a state?
- In the eventuality-modification theory outlined above, which takes $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ Roots to have different distributions:

(18) Root Modifying *v* Ok



(19) Root Modifying *v* not Ok



Side Note: *There's a question about how phrasal the secondary predicate is in these cases. It seems like it's hard to modify with other material (see e.g. John cut the box halfway/partially open), although there could be other reasons for that. Consider, though, Mary cut open the box versus John hammered flat the cutlet, the former much more natural. See §4.*

It looks like the view being sketched has something to offer. There are a number of questions, though, centering on the distribution of $\sqrt{\text{BREAK}}$; for example:

1. If $\sqrt{\text{BREAK}}$ Roots can be a predicate of events in (18), can it be a predicate of events elsewhere. E.g. “activity” *break* doesn't seem to be possible. How is that restriction stated?
2. If $\sqrt{\text{BREAK}}$ can be a predicate of states, how do we state the restriction that *BREAK* cannot be a “simple” state? Is the best way of stating $\sqrt{\text{BREAK}}$ versus $\sqrt{\text{DARK}}$ differences holding that the former have to be predicates of caused states, period?

Looking at Stative Passives helps here, because it provides a case in which the different Root-types listed above ($\sqrt{\text{BREAK}}$, $\sqrt{\text{POUND}}$, $\sqrt{\text{DARK}}$) behave differently, and where it has been argued that building a Target State into the meaning of the $\sqrt{\text{BREAK}}$ type is essential.

3 States and Stative Passives

Question: Why are stative passives based on “adjectival” $\sqrt{\text{DARK}}$ -type roots– which, after all, are states– often not as good as stative passives based on $\sqrt{\text{BREAK}}$ -type Roots?

- (20) English
- The vase is broken
 - The sky is darkened (weird out of context/without more material)

The analysis of “Resultant State” versus “Target State” passives in Kratzer (2001) is based on the idea that some verbs are specified lexically from primitives that have a target state argument, whereas others do not. Possessing a target state inherently is what makes a verb ok in the stative passive (*immer noch* ‘still’ requires Target State, according to her):

- (21) a. Die Reifen sind immer noch aufgepumpt.
 the tires are still pumped.up
 ‘The tires are still pumped up.’
- b. Der Briefkasten ist (*immer noch) geleert.
 the mailbox is still emptied
 ‘The mailbox is (*still) emptied.’

Kratzer’s way of framing this is based on her take on some verb behaviors in German, which appear to differ from what is seen in English. She builds the target state into the “Root” (for her, *aufpumpen* ‘pump up’ is “simplex”) so that the stative passive morpheme can pull out the root-defined state:

- (22) Phrasal, Target State, verb *aufpumpen* ‘pump up’
- $\lambda s \lambda e$ [pump(e) \wedge event(e) \wedge inflated(boat)(s) \wedge cause(s)(e)]
 - Stativizer: $\lambda R \lambda s \exists e R(s)(e)$
 note: $R = \langle s \langle s, t \rangle \rangle$
 - Output: $\lambda s \exists e$ [pump(e) \wedge event(e) \wedge inflated(boat)(s) \wedge cause(s)(e)]

In some sense, then, the question is how to account for the difference between $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ without saying that $\sqrt{\text{BREAK}}$ is inherently like Kratzer’s *aufpumpen*.

Kratzer reports for German that e.g. *leeren* ‘empty’ does not allow a durative adverbial to specify the length of the empty state:

- (23) *Wir werden den Briefkasten für drei Tage leeren.
 we will the mailbox for three days empty
 ‘We will empty the mailbox for three days.’

This behavior is supposed to pattern with the (21) facts, namely that the same verb doesn’t form a stative passive. Then:

- Kratzer (2001:6): “...those verbs that allow target state passives and modification by *für*-PPs are verbs that are constructed from stems that have both an event argument...and a target state argument.”
- $\sqrt{\text{DARK}}$ -type Roots cannot form Target State stative passives, because they don’t have a Target State inherently.

Kratzer takes the durative facts as an argument against the kind of structures posited above for the $\sqrt{\text{DARK}}$ -type Roots; for German... For English, the “state” type Roots allow the durative adverbial (we started with this):

- (24) a. Mary darkened the area for three minutes ...
 b. We emptied the front room (out) for three hours ...
 c. John cleared the desk (off) for three days ...

However, as mentioned before, the stative passives of these Roots are odd out of context:

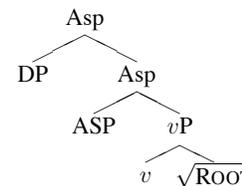
- (25) a. The area is darkened
 b. The room is emptied
 c. The desk is cleared

Are these ungrammatical? I.e., does English have a “mixed” set of results for these diagnostics, which appear to correlate in Kratzer’s German? I think the answer is no; seeing this requires a longer look at the stative passive.

3.1 Stative Passive

I assume that the stative passive has a structure like (26), along the lines of Embick 2004 but without the explicit “become” type of semantics for *v* (rather, the event causes the (target) state):

- (26) Structure of Stative Passive



One way of making this more specific: stative passives of the relevant type are Target States. The Aspectual head here introduces a state that is caused by the eventuality named in the *vP* (cf. Marantz 2009). For instance:

(27) $\lambda s \exists e [\text{Root}(e) \wedge \text{STATE}(\delta, s) \wedge \text{CAUSE}(e, s)]$

Note that

- The Root must be interpreted as a predicate of the event, because that’s what the structure forces.
- Something further has to be said about how the STATE predicate in (27) comes to mean what it means.

Root-specific effects in the stative passive have to be understood against this background. In something like the theory of Embick (2004), the stative meaning is something that can be specified via coercion; that is

1. If the Root is a good stative Root like $\sqrt{\text{BREAK}}$, it names the state
2. If the Root is not typically a good property of states, such as $\sqrt{\text{POUND}}$ or $\sqrt{\text{KICK}}$, it is harder to coerce the states—*pounded*, *kicked*.

Consider

(28) The outlet is pounded.

For e.g. $\sqrt{\text{KICK}}$, the coercion is even harder. Thus e.g. the factory scenario (from both Kratzer and me but with different interpretations on what it means):

(29) Ok, the tires are kicked, let’s go home.

I.e., if the context allows a coercion of a state that is caused by a kicking event, then *kicked* is possible. (*When Mary kicks a tire, it stays kicked.*)

Notice here that the state part can’t just be some pragmatically accessible state: then it would be easy to get from *kicked* the interpretation that the tires are e.g. *knocked over*. Rather, it seems that the state part has to come from the Root.

Another possibility is that the state is named by something else inside the *vP*:

(30) These outlets are pounded flat.

Returning to the Root-specific effects, the STATE-naming step differs depending on the Root involved. For $\sqrt{\text{BREAK}}$, the idea would be that this is easy, since $\sqrt{\text{BREAK}}$ functions as a predicate of states. For $\sqrt{\text{POUND}}$, extra work is required. For $\sqrt{\text{KICK}}$, much extra work is required.

So what about e.g. $\sqrt{\text{OPEN}}$ or $\sqrt{\text{DARK}}$ in the stative passive?

- (31) a. The door is opened
b. The sky is darkened

According to the structure for stative passives presented above, the interpretation must be something like

- (32) a. $\lambda s \exists e [\text{Open}(e) \wedge \text{STATE}(\delta, s) \wedge \text{CAUSE}(e, s)]$
b. $\lambda s \exists e [\text{Dark}(e) \wedge \text{STATE}(\delta, s) \wedge \text{CAUSE}(e, s)]$

The problem cannot be that these are not good predicates of states (as is the case with, say, $\sqrt{\text{POUND}}$ or $\sqrt{\text{KICK}}$).

Two types of difficulty:

1. In this structure, the Root must be interpreted as a predicate of the event that causes the state. Recall from above that $\sqrt{\text{DARK}}$ -type roots do not function as event-modifiers. In the stative passive, the “adjectival” Roots are salvageable; why they are not completely ungrammatical (and how this can be stated) is of some interest.
2. Whatever *opened* and *darkened* mean has to be distinguished from what the pure statives (adjectives) *open* and *dark* mean. There’s a kind of “competition for use” effect related to these simple states.

3.2 The Competition Effect

There are cases in which the same Root can evidently surface either as a simple state, or with the target state interpretation; there are some generalizations about the allomorphic patterns that are found when this happens, Embick (2003):

(33) Root, “Adjective”, Participle

a.	$\sqrt{\text{BLESS}}$	bless-èd	bless-ed
	$\sqrt{\text{AGE}}$	ag-èd	ag-ed
	$\sqrt{\text{ALLEGE}}$	alleg-èd	alleg-ed
b.	$\sqrt{\text{ROT}}$	rott-en	rott-ed
	$\sqrt{\text{SINK}}$	sunk-en	sunk-Ø
	$\sqrt{\text{SHAVE}}$	(clean)-shav-en	shav-ed
c.	$\sqrt{\text{OPEN}}$	open-Ø	open-ed
	$\sqrt{\text{EMPTY}}$	empty-Ø	empti-ed
	$\sqrt{\text{DRY}}$	dry-Ø	dri-ed

The question is, particularly for the latter (c) type, under what circumstances it makes sense to assert that something is *opened* as the result of some causing event, versus simply *open*.

- (34) a. When I saw the cans, they were still partially emptied.
 b. The door remained partially opened until someone dealt with it in the evening.

Or, for example, the context can do a lot of this work:

- (35) a. Darkened skin is a sign that there might be an infection.
 b. The once white walls remained blackened for several years after the fire.

I.e., what matters in these contexts is not just the state, but its etiology (or that it have one); *dried apricots* are not the same as *dry apricots*, and so on.

Negation; affixation of *un-* etc. with pure states (=adjectives) is sporadic and gives contrary interpretation. Affixation with participles is fully productive and transparent semantically:

- (36) Some examples

adj	neg	part	neg
empty	*unempty	emptied	unemptied
open	*unopen	opened	unopened
awake	unawake	awakened	unawakened
clean	unclean	cleaned	uncleaned
clear	unclear	cleared	uncleared
even	uneven	evened	unevened
ripe	unripe	ripened	unripened

So, it appears that once there ceases to be potential interference from the pure state, the stative passive from the $\sqrt{\text{DARK}}$ type are fine.

I'm departing from Kratzer, who says that target state passives cannot be prefixed with *un-*. Notice that the *un-*-prefixed participles allow *still*:

- (37) a. The package remained unopened for many weeks after it arrived.
 b. Those cans are still unemptied.

A few notes:

- See Kratzer (2001) for a discussion of how negation produces “Result State” interpretations. I'm not sure how this would fit with the compatibility of *un-* with the *still* in (37)
- Given the way that the participial allomorphy interacts with negation in e.g. Greek— see Anagnostopoulou (2003) and Alexiadou and Anagnostopoulou (2008)—there's something more to be said about negation and participles cross-linguistically.

Another direction that is worth looking into is what happens cross-linguistically. In Hindi, for example, there appears to be very little “category flexibility”; nothing that can be a “simple” adjective can be a verb, evidently (and vice versa)...

- (38) Verb/Adjective/Participle Relations

verb	adjective	participle	gloss
khul	--	khul-aa	'open'
tuuṭ	--	tuuṭ-aa	'break'
suukh	--	suukh-aa	'dry'
bhiig	--	bhiig-aa	'wet/soaked'
--	haraa [†]	--	'green'
--	lambaa [†]	--	'tall'
--	laal	--	'red'
--	khaalii	-	'empty'

[†] no stance on whether there is an *-aa* exponent here

Evidently *khul-aa* has all of the properties of *opened* in the sense that it is a derived state; however, it's the only way of expressing “openness”, since there's no simplex *open* in the language.

3.3 So...

The beginning of this section raises the question of whether $\sqrt{\text{BREAK}}$ has to have a Target State inherently in order to make it different from $\sqrt{\text{DARK}}$, as in Kratzer's treatment.

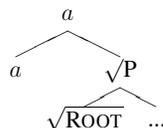
- It appears that $\sqrt{\text{DARK}}$ type Roots can in fact appear in stative passives. When they're odd, the oddness can be attributed to other factors.
- In some sense the idea that Target States can be coerced, or that they can be brought out with adverbs, an idea Kratzer also explores, is evidence against the claim that $\sqrt{\text{BREAK}}$ versus $\sqrt{\text{DARK}}$ differences require the former to be specified with a target state inherently. After all, Kratzer's idea is that the stative passive can be phrasal, so the insights should be compatible with the idea that even the target states introduced with “simple” stative passives are not part of the verb; i.e. target states are always arise phrasally.

It can be concluded from this that inherent Target States aren't the best or only way of dealing with $\sqrt{\text{BREAK}}$ versus $\sqrt{\text{DARK}}$. Before talking more about distributions, one more type of generalization to talk about...

3.4 $\sqrt{\text{BREAK}}$ -type as Uncaused State?

Another question: Above, the question was primarily why “stative-only” Roots do not form good stative passives. There’s a reverse to this question: *do Roots that are good event predicates form pure statives?*

I.e., is it possible for (i) $\sqrt{\text{BREAK}}$, and (ii) $\sqrt{\text{POUND}}$ Roots to appear in the following structure: (39) Adjectival Structure



There are important cross-linguistic dimensions to this question; see, for example, Alexiadou and Anagnostopoulou (2008) on *-menos* versus *-tos* participles in Greek, where it is suggested that “unspecified cause” verbs— both *break* and *open*, can form both types (might be complicated depending on what the *-tos*-forms mean.)

Embick (2004) employs a diagnostic with a verb of creation to this end. The idea is that derived states are incompatible with the requirement that the verb imposes:

- (40) a. This door was built open/*opened.
 b. The new models were made dark/*darkened.
 c. These new devices were built long/*lengthened.

It seems that the $\sqrt{\text{BREAK}}$ type verbs don’t function very well in this context:

- (41) a. ?*This part of the machine was built broken.
 b. ?*These jeans were made torn.
 c. ?*The wood on the frame was built snapped.

It is important to be careful with the semantic classes here, though. For example, Levin’s *bend* verbs do ok in this context, as far as I can tell: *These new pipes were made bent*, *The new metal sheets were built wrinkled*, etc.

As far as I can tell, $\sqrt{\text{BREAK}}$ type Roots do not have this possibility. I think the works by Koontz-Garboden cited above arrive at a similar conclusion (this is what disallowing “deletion” of the eventive component would achieve).

The next step, then, is to see how the different distributions of $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ can be accounted for in the type of theory outlined above.

4 Accounting for Root Distributions: Some Thoughts

In principle, there are a number of different ways in which distributional generalizations about Root-types could be stated; for example:

- Root-type \mathcal{R} can merge with x head, but not y
- Root-type \mathcal{R} can be a predicate of states, or predicate of events, or both, etc. (“Predicative” View)
- Root-type \mathcal{R} can be a predicate of state/event etc., but additional information about the context is required

What is at issue is an important general question: what is the size of the domain over which distributional requirements about Roots can be stated?

In the particular set of cases at hand, we have generalizations like the following:

(42) Summary 1

	$\sqrt{\text{BREAK}}$	$\sqrt{\text{DARK}}$	$\sqrt{\text{POUND}}$
P of Causing event	yes [†]	no	yes [‡]
P of non-causing event	no	no	yes
P of Caused State	yes	yes	no
P of Uncaused State	no	yes	no
Stative Passive	yes	(yes)	((yes))

† = with e.g. *open*

‡ = only with resultative secondary predicate

Some of these generalizations might connect with larger patterns. For example, the fact that $\sqrt{\text{DARK}}$ type Roots can only be predicates of events in the stative passive might be of the “requirements that go away when *v* does not combine with T” variety (cf. nominalization, maybe middle formation, etc.). There might be more structural ways of saying this, though.

Concentrating on $\sqrt{\text{BREAK}}$...

4.1 State Proxies

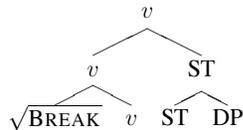
Here’s the analytical tension: it seems plausible to say that $\sqrt{\text{DARK}}$ is a predicate of states, and $\sqrt{\text{POUND}}$ a predicate of events. How can the distribution of $\sqrt{\text{BREAK}}$ be accounted for? It looks like it has “mixed” properties, given the presentation above.

One way of handling this is to say that

1. $\sqrt{\text{BREAK}}$ is always a predicate of events; in particular, it is a predicate of events that requires a special type of stative complement, ST.
2. That is, in the same way that the STATE of stative passives is determined by the Root in the *vP*, there is a “proxy” state ST that appears with certain “accomplishments”, whose identity is determined by the Root that is a predicate of *v*.

Illustration:

(43) $\sqrt{\text{BREAK}}$ with Proxy ST



State caused by breaking event = *broken*; i.e. the end state the adjectival passive (see e.g. von Stechow 1996). This is the relevance of the Stative Passive. In the same way that ASP in the stative passive is a state caused by the *vP*, the ST proxy here is a state defined by the Manner predicate of *v*. So, if ST is “empty”, the meaning that is filled in is “state caused by a breaking event” = *broken*.

Remember

(44) John broke/cut/smashed the box open.

The proposal above works out cleanly if *open* is an overt pronunciation of ST; this means that it is not “phrasal” in the relevant examples (see below for a little more on this and its connection to $\sqrt{\text{POUND}}$). There might be some problems with this.

Overall the idea is that the distributions look like this:

- (45)
- a. $\sqrt{\text{DARK}}$ -type: Predicate of states
 - b. $\sqrt{\text{POUND}}$ -type: Predicate of events; can’t co-occur with ST
 - c. $\sqrt{\text{BREAK}}$ -type: Predicate of events; must co-occur with ST

Working out the relationship between ST and RSPs is important, both for English and cross-linguistically (for, e.g. languages that lack the latter).

4.2 Q & A

Some follow up comments/worries/points:

1. Question: Is this better than just saying that $\sqrt{\text{BREAK}}$ has to be a predicate of a caused state?
Answer: I think so, if we take the *break open* facts seriously.

2. Question: Is it necessary to say both that $\sqrt{\text{BREAK}}$ is a predicate of events, and that it occurs with ST?

Answer: $\sqrt{\text{BREAK}}$ can’t occur as an activity alone. So, there still has to be something that says that it has to occur with an ST. I.e., the licensing *makes* reference to the local environment, not just the category of node that $\sqrt{\text{BREAK}}$ is merged with.

3. Question: Why can’t e.g. *pound* appear freely with ST? Since it is possible to coerce this in the stative passive, why can’t we coerce it in the verbal environment, so that e.g.

(46) We pounded the cutlet for three hours

Means that the cutlet was in the *pounded* state for three hours?

Answer: evidently the distributional requirements require reference to a chunk of structure. In the same way that $\sqrt{\text{BREAK}}$ qua verb evidently has to co-occur with ST, $\sqrt{\text{POUND}}$ cannot co-occur with ST.

4. Question: But wait, shouldn’t that make it weird to have stative passives of things that have a piece that indicates the caused state ST? How do *aufgepumpt*, *broken*, or *hammered flat* work?

Answer: the value of the caused STATE in stative passive is given by a state that it finds in the *vP*:

- (a) The Root, in the case of stative Roots
- (b) Another state element (RSP or ST-proxy), with e.g. *hammer flat* or *break* or *pump up*

On this view, the state with ASP is the Target State of “an event of coming to be flat by hammering”. Another possibility, at least for superficial “monomorphemes” like English *break* (but not German *aufpumpen*, is that $\sqrt{\text{BREAK}}$ ’s requirement that an ST be present is turned off in the Stative Passive.

5. Question: Why all these worries about what ST is like, and whether it is “phrasal”?

Answer: It is important in this analysis that the states that are the result of breaking-events, etc. not be the same as RSPs. The basic reason is that, evidently, $\sqrt{\text{POUND}}$ -type Roots co-occur with RSPs, but not STs. This helps explain the fact that you can *re-break a connection*, but not **re-pound the metal flat*. (There’s probably a generalization about why/when ST is good in such cases). Connects with (among other things) work on resultatives, see Kratzer (2004), Williams (2005)).

4.3 Comments

There may be other ways of implementing the relevant distributional patterns. I hope the one here is thought-provoking. I think in the end that what is considered above builds on part of what Kratzer discusses (2001:6). Consider:

Morphologically, *auf-pumpen* consists of the verb *pumpen* ('pump') and the non-compositional prefix *auf-*. If *aufpumpen* had to be syntactically decomposed into a stative and an eventive component, the eventive component could be contributed by *pumpen*, but the stative component couldn't be contributed by *auf-*. In isolation, the prefix *auf-* doesn't have a denotation at all, hence couldn't possibly contribute a target-state property.

She concludes from this that Target States have to be accessed in a way that does not require syntactic decomposition. This is why she builds the Target State meaning into the "Root".

Once it is recognized that the objects that are interpreted are larger than an individual terminal (i.e., larger than *auf-* on its own), this problem does not arise. Put slightly differently, it's exactly right that *auf* by itself wouldn't have the right denotation to allow the "decomposed" analysis. But rather than treating it as simplex, and building more into the semantics of this "Root", the solution is to take seriously the idea that interpretations and distributions require reference to objects that are tree-chunks.

5 Conclusions

- Programatically, the hypothesis that Roots cannot contain meaning components introduced by functional heads, or introduced in the interpretation of structures
- Concentrating on states: the kinds of generalizations that seem to require building Target States into Roots provide an empirical testing ground for working out a theory of what meaning components Roots have, and how this relates to their distribution.
- Contrasts between $\sqrt{\text{BREAK}}$ and $\sqrt{\text{DARK}}$ type Roots don't require building Target States into the former. In one type of case, it suffices to say that $\sqrt{\text{BREAK}}$ -type Roots can be predicates of events, while $\sqrt{\text{DARK}}$ -type Roots cannot. In another case (stative passives), $\sqrt{\text{DARK}}$ -type Roots do in fact form stative passives, as long as other factors are controlled for. These points raise a number of questions about distributions...
- These types of claims highlight the distributional conditions on Roots. With reference to some additional facts (in particular, the fact that $\sqrt{\text{BREAK}}$ -type Roots evidently don't form pure states), I looked at the idea that such Roots are always predicates of events.

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