

## The lexical aspect and argument structure of atemporal uses of change-of-state verbs

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### 1 Introduction: Change of state verbs and varieties of change

- The concept of change has been rampant throughout this seminar, and we have explored both its scalar underpinnings and also all the temporal properties that come from such an approach.
- For example, degree achievements show variable telicity (Dowty 1979:88-90):
  - (1) a. The soup cooled for ten minutes.  
b. The soup cooled in ten minutes.
- This relates to how the property scales these verbs and their adjectival bases share are contextually or lexically bounded or not (Hay et al. 1999; Kennedy and Levin 2008; Beavers 2012, *inter alia*), i.e. the difference between quantized and non-quantized change.
  - (2) a. The soup cooled to 15c in ten minutes.  
b. #The soup cooled to 15c for ten minutes.
- So there's interaction between scales and temporality (and events).
- However, change-of-state verbs (especially degree achievements) have *also* received attention for allowing dynamic readings which are atemporal in nature (Sweetser 1997; Gawron 2009; Koontz-Garboden 2010; Deo et al. 2013): Thus while (3a) describes change over time, (3b) describes a change across space.
  - (3) a. The sky darkened between 8pm and 9pm last night.  
b. Kim's skin darkens between his calf and his knee.
- To the extent to which these have been examined together, they are treated with the same notion of scalar change. The difference is just the interval it happens over — time in (3a), space in (3b)
- Andrew and I are currently in the process of critically examining this hypothesis, which crucially predicts that both types of readings should behave the same on a variety of semantic and syntactic properties already known to hold of temporal change verbs, including:
  - Restrictions on types of change to particular types of change of state verbs
  - Lexical aspectual properties
  - Possible diathesis alternations
- What I want to do today is explore some of this, drawing on both the kinds of deadjectival degree achievements that have mostly formed the basis for prior discussion and also other change-of-state verbs, on the grounds that they're really the same fundamental class (Tenny 1994; Krifka 1998; Hay et al. 1999; Beavers 2008, 2012; Kennedy and Levin 2008).
- This work is quite preliminary — we probably have ways to analyze all of these together by utilizing the tools of prior work on temporal change, but it's hard to even get a line on the empirical observations. So mainly I'll just focus on that here — really, the question is, are temporal and atemporal change different at all?

## 2 Background: A Typology of Atemporal Change

- A temporal change event  $e$  involves three entities (Krifka 1998; Hay et al. 1999; Beavers 2012):
  - (4) a. A **patient**  $x$  that undergoes the change.  
b. A **scale**  $s$  of degrees to which  $x$  possesses some property  $\delta$  (e.g. temperature, height, color), where  $x$ 's degree of  $\delta$  changes over the event.  
c. An temporal **axis of measurement** (i.e. a time span)  $t$  along which the change occurs.
- If atemporal change is a variant of this, the difference is in what the axis of measurement is.
- Deo et al. (2013:99-103) articulate four different kinds of atemporal changes found at least with degree achievements (if not other change of state verbs).
- **Spatial extent:** These are cases where there is a change over a spatial interval, not a temporal one:
  - (5) Kim's skin darkens between his calf and his knee.
- Consistent with the idea that there is no change in time, i.e., that these are *temporally stative* predications, they pass canonical stativity diagnostics.
  - (6) Inability to occur in the progressive
    - a. The sky was darkening between 8pm and 9pm last night.
    - b. #Kim's skin is darkening between his calf and his knee.
  - (7) Non-habitual reading in present tense
    - a. The sky darkens between 8pm and 9pm. (habitual only)
    - b. Kim's skin darkens between his calf and his knee. (true at moment of speaking)
- As Gawron (2009:6–7) points out, however, such uses are *dynamic*, i.e., they entail a change in the degree that the patient holds the property defined by the scale across the spatial domain.
- For example, they support degree modifiers that reflect the change in degree:
  - (8) The crack widened nearly half an inch in ten meters.
- They can also be modified by modifiers that entail dynamicity, like *gradually*, something that is not possible with the underlying adjectival source:
  - (9) a. The crack gradually widened from the north gate to the tower. (Gawron 2009: 6–7)  
b. #The crack is gradually wide from the north gate to the tower.
- **Abstract extent:** In this sort of change there is still change in degree for some individual, but it is measured by some abstract dimension that is neither time nor space (Deo et al. 2013:100):
  - (10) The plot thickens in Chapter 3. (Deo et al. 2013:100)  
'The plot is thicker in Chapter 3 than before Chapter 3'
- Like the spatial cases, they are stative, passing stativity diagnostics.
- My take on these is that the property of change is thickness, the patient is the plot, and the axis of measurement is neither space nor time but the storyline.

- **Kind readings:** Kind readings are characterized by a kind-type subject of the verbal predication:

- (11) a. The wells deepen as you go down the road.  
 b. The terrain flattens as you go towards the midwest.

- As Deo et al. (2013:101) note, such examples have been observed with analytic change-of-state predicates based on the comparative adjective (Carlson 1977; Sweetser 1997; Zwarts et al. 2005):

- (12) a. The wells get deeper as you go down in the road. (Sweetser 1997)  
 b. The terrain gets flatter as you go towards the midwest. (Carlson 1977)

- Here (as I understand Deo et al. 2013) the property is deepness of flatness, the axis here is space, but the patient is interpreted as a kind and thus it's different instances of this kind arranged along the axis.

- **Functional readings:** “[T]he verb describes a difference with respect to some attribute between different entities that seem to be determined by some relation to elements of an ordered domain” (Deo et al. 2013:102). For example, the following describes change across a population:

- (13) In children with fetal alcohol syndrome, the divot or groove between the nose and upper lip flattens with increased prenatal alcohol exposure.

- Deo et al. note that these are similar (and might be instances of) Montague's (1973) temperature paradox sentences, which again do not describe change in time or even in any single individual:

- (14) The temperature is rising.

- I'll be honest: I'm not sure what this one means. The idea is that *divot* somehow takes individuals as an argument and outputs a specific divot (or temperature), and it is these that are being compared.
- A lot of the formal work in Deo et al.) is thus generalizing the analysis of all types of change to this sort of “worst case”, but I'm not convinced this isn't just a kind reading or something else.
- But at any rate, I'm going to keep things here to just spatial change, since it's the easiest to get my head around. But future work should look at all kinds of atemporal change.

### 3 Atemporal change and eventuality types

- Temporal change exists for a range of scale types, including change in position, existence, and an array of properties (see e.g. Beavers 2011). Koontz-Garboden (2010) and Beavers and Koontz-Garboden (2020) show that not all changes derive atemporal uses. Consider atemporal *cook*, which is impossible even in plausible contexts:

- (15) [ A side of beef is cooked to different degrees along its length. ]  
 #The side of beef cooks between the rib and the joint.

- This might mean temporal and atemporal change are distinct. However, Koontz-Garboden (2010:299) and Beavers and Koontz-Garboden (2020:71) argue that this is all lexicalized, like other conditions:
  - Verbs like *murder* and *shatter* require their changes be caused, unlike *flatten* or *cool*.
  - Verbs like *load* require change to a specific degree (e.g. fully loaded); verbs like *cool* do not.
  - Verbs like *break* describe non-gradable changes; *polish* describes gradable change.
  - Verbs constrain the specific scale (temperature for *cool*, width for *narrow*; Beavers 2011).

- Thus it is not unreasonable that verbs could also place constraints on the axis of measurement (i.e. that it be temporal or spatial or something else).
- This maintains the possibility that temporal and spatial change are identical, save the axis.

#### 4 Aspectual properties

- A well-known property of many temporal change verbs is incrementality, i.e. the event progresses in a step by step fashion as the patient changes in degrees on the scale in ways that determine its durativity and telicity (Tenny 1994; Dowty 1991; Krifka 1998; Beavers 2012, *inter alia*).
- How does this extend, if at all, to spatial change? Here we build on Gawron (2009) in the context of the more complete model of incrementality in Beavers (2012).

##### 4.1 Incrementality in Temporal Change

- We discussed this two weeks ago but we didn't mention it again last week, so I'll recap. Technically there are two sources of incrementality (Beavers 2012:25, (2.5)). First, a predicate is telic iff its theme has quantized reference *and* its scale is bounded, testable by *in/for* tests:

- (16)
- |    |   |          |
|----|---|----------|
| a. | The earthquake shook a book off the shelf <i>in/for</i> a few seconds.  | (telic)  |
| b. | The earthquake shook books off the shelf <i>for/??in</i> a few seconds. | (atelic) |
| c. | The earthquake shook a book <i>for/??in</i> a few seconds.              | (atelic) |
| d. | The earthquake shook books <i>for/??in</i> a few seconds.               | (atelic) |

- Relatedly, a predicate is punctual iff its theme is mereologically atomic *and* its scale is non-gradable (Beavers 2012:49, (2.49)). Durativity is testable by whether a *during* reading is possible in addition to an *after* reading with *in an hour* (Kearns 2000):

- (17)
- |    |  |                                   |
|----|--|-----------------------------------|
| a. | The hiker will cross the border in an hour.  | ( <i>after</i> ; punctual)        |
| b. | The hikers will cross the desert in an hour. | ( <i>during/after</i> ; durative) |
| c. | The hikers will cross the border in an hour. | ( <i>during/after</i> ; durative) |
| d. | The hikers will cross the desert in an hour. | ( <i>during/after</i> ; durative) |

- For durative predicates on an *after* reading, there's still a question of whether the ensuing event is punctual or not. It could be what happens after the expressed time span is punctual or durative.
- Here *in an instant* vs. an expression that requires extension can tease that out:

- (18)
- |    |  |
|----|--|
| a. | The workers will widen the road 15' in ten days using a laborious method that will take a month. |
| b. | The workers will widen the road 15' in ten days in an instant, using a fancy new machine.        |

- To account for double incremental theme effects recall that Beavers (2012) proposed that change is defined by a ternary Figure/Path Relation between the event  $e$ , the theme  $x$ , and the scale  $s$ :

- (19) **Figure/Path Relation:** An event  $e$ , patient  $x$ , and scale  $s$  stand in a Figure/Path Relation iff every unique part  $x' \leq x$  corresponds to a unique subevent  $e' \leq e$ , the sum of all such subevents constitutes  $e$ , and each  $e'$  stands in a Movement Relation (Krifka 1998) with a continuous subscale  $s' \subseteq s$  that  $x'$ 's initial and final degrees on  $s$ .

- For example, in *The soup cooled*, different bits of the soup head from their initial temperatures to their final temperatures along the ordered scale, perhaps going up and down a bit in temperature, until all of it settles on its final degree, and the event is measured by this progress.
- In (19) *e* is mapped straightforwardly to time, the axis of measurement, via a temporal trace function  $\tau$ . Were spatial change a variant of (19), we'd need to generalize (19) to relate patients and scales to states, with the axis of measurement derived via a spatial trace function  $\sigma$ .
- But otherwise the prediction is that properties derived from measuring an eventuality by the quantity of theme and scalar properties should be identical.

## 4.2 Incrementality in Spatial Change

- Gawron (2009) demonstrated that telicity diagnostics work similarly for spatial change (degree achievements allow telic and atelic readings without a result or degree modifier; Hay et al. 1999):

- (20) a. The river narrows for/in three miles.  
 b. The river narrows by 25'/to a tiny trickle in/?for three miles.

- Furthermore, atelicity vs. telicity can hinge, as in the previous example, on the presence/absence of resultative or degree expressions for something like *narrow*, just as in temporal change.
- But does the expression of the theme matter? I *think* so: a non-quantized theme seems to me to introduce atelicity for an otherwise telic predicate, just as with temporal change, but I fully admit the contexts are delicate and complex.

- (21) [ We are on the south side of a mountain, and on the other side of a mountain is a very long, broad valley, which contains a number of small creeks all running north. We know some (or maybe all) creeks narrow by 15' over a stretch of at least three miles, possibly more. ]  
 Creeks narrow by 15' for/??in three miles.

- We get similar results for durativity tests. Spatial change verbs vary in telicity by scalar complexity (e.g. widening can be gradual but ending, exiting, and entering are not):

- (22) a. The road will widen 15' in five miles. (during/after)  
 b. The road will end (abruptly) in five miles. (after)

- Once again, theme complexity matters, where a complex theme can make an otherwise punctual predicate have a durational reading, just as with temporal change:

- (23) All of the roads will end (abruptly) in five miles. (during/after)

- As above, on an *after* reading we can tease apart “punctual” vs. “durational” readings with *at a (single) point* vs. some more extended spatial region expression:

- (24) a. The road will widen 15' in ten miles, gradually, over the subsequent twenty miles.  
 (i.e. the road is one width until the ten mile mark, at which point we'll see a gradual, “durational” widening)  
 b. The road will widen 15' in ten miles at the next intersection.  
 (i.e. the road is one width until the ten mile mark, when it'll suddenly be a different width)

∴ The same distinctions exist in spatial change that exist in temporal change, suggesting some notion of an FPR in spatial change as well.

### 4.3 A Difference between Temporal and Spatial Change?

- Yet there are ways that spatial change may differ. Temporal *fall* requires the patient to be at all points between initial location  $x$  and final location  $x - 500\text{ft}$  at some point on the time axis.

(25) The rock fell 500 feet down the mountain. (temporal)

- Conversely, spatial *fall* seem to admit a spatially instantaneous reading: in (26) on one side of the 40th parallel the mountain has height  $x$  and due to a sheer cliff on the other side is  $x - 500\text{ft}$ .

(26) The mountain fell 500 feet at the 40th parallel. (spatial)

- At no point in between did the mountain hold any height  $n$  for  $x - 500\text{ft} < n < x\text{ft}$ .
- Thus spatial falling can happen at a point, but temporal falling is incremental, suggesting a difference in temporal and atemporal change. Deadjectival dimension and color verbs are the same:

(27) a. [ South of intersection, the road is 50' wide, and north of it the road is 70' wide. ]  
The road widens at the intersection.

b. [ A wall has been painted dark blue above a picture rail, and it is light blue below the picture rail. ]  
The wall darkens at the picture rail.

- Is this an atemporal change effect? We suggest the differences are rooted not in a difference between temporal or atemporal change, but rather in the pragmatics of reconceptualization.

#1 Beavers (2008) notes that in certain contexts gradable scales may be conceptualized as non-gradable by collapsing or removing degrees:

(28) a. John will stamp the tulips flat in two minutes. (during/after)

b. With one quick motion, John will stamp the tulips flat in two minutes. (after)

- Admittedly, in this case I don't think that we have truly *eliminated* the degrees between the initial and final degree of flatness for the tulips in (28b).
- But the nature of the action has made them basically irrelevant. On mereological models it's natural to think of things that objectively have complexity as atomic for purposes of conceptualization.
- For what it's worth, it's sometimes mentioned in literature on aspectual coercion that you can treat non-gradable scales as gradable by "stretching them out" (Gyarmathy 2014, 2015).

(29) a. She is slowly reaching the top of the mountain.

b. The train is slowly arriving at the station.

- But in reality, those points between not being somewhere and "instantly" being there exist in some objective reality, we just ignore them. I'm just suggesting it can go the other way as well.

#2 Relative size differences between the theme and scale can force reinterpretation of one or the other in terms of mereological complexity (Beavers 2012):

(30) a. The pea will fly across the border in 5 seconds. (likely after)

b. The plane will fly across the border in 5 seconds. (likely during)

- In a sense this is the same point as above: the mereological complexity of the pea exists, but we mostly ignore it. It's just more obvious with the plane.

#3 Still further, as Dowty (1991) notes, real world factors of the nature of the event itself can influence interpretation of incrementality, e.g. entering icy water is usually unpleasant and thus slow, measured by one's body, unlike entering a room:

- (31) a. John will enter the icy water in ten minutes. (likely *during*)  
 b. John will enter the bedroom in ten minutes. (likely *after*)

- We don't need to worry about the parts of John in some contexts, but do in others.
- ∴ My take is that how we conceive of events, scales, and themes can impact the aspectual properties of the event description just as much as "objective" differences.

- Returning to spatial *fall* above, in the real world there *is* a path (qua scale) that covers all heights from the top of the cliff face to the bottom, namely the one where the *x* (latitude) and *y* (longitude) coordinates stay the same, but the *z* (height) coordinate changes continuously.
- The context of a sheer cliff face and the lack of temporal change may favor "stitching together" positions  $\langle x, y, z \rangle$  and  $\langle x, y, z - 500\text{ft} \rangle$ , reconceptualizing the path as transitional.
- But does that mean spatial change is altering the notion of change? Likely not. Even temporal change can involve reconceptualization of motion. It's just that it takes a little context:

- (32) [ Scotty used the teleporter to move the rock. ]  
 [ The rock on the surface of Venus was moved by wind traveling 186.4mph ]  
 The rock moved 100ft. in an instant.

- Some reconceptualizations may be harder. Temperature change strongly implies duration: in temporal and spatial *cool* each degree between the initial and final will be attested at some point.

- (33) a. The desert cooled from 40°C to 30°C, #but at no point was ever 35°C.  
 b. The desert cools from 40°C to 30°C at the 40th parallel, ?but at no point around that parallel does it ever measure 35°C.

- Yet even here it could be possible to ignore such gradations:

- (34) a. [ A very thin metal plate is shielded from the dry ice below it by a temperature-resistant coat of film. Pushing a button chemically dissolves the film in an instant, thus connecting the metal to the dry ice. ]  
 The sheet of metal cooled from 50°F to -109°F in an instant.  
 b. [ A directional fan creates a wind tunnel of very fast air along 40th parallel in an otherwise very hot desert, so that stepping from outside the wind tunnel to inside feels like an instantaneous change. ]  
 c. The desert cools 15°F at the 40th parallel.

- Again, technically there *is* incrementality here in both cases; but properties of the event obscure it, true of both spatial and temporal change.

∴ The distinctions above are orthogonal to nature of change, and hinge solely on how scales (and themes and events) are conceived of in distinct contexts. Temporal vs. spatial change may make it easier or harder for certain reconceptualizations to be possible, but it is equally so across both.

## 5 Diathesis alternations

- Temporal change-of-state verbs in principle participate in a wide variety of argument alternations (see Levin 1993; see also Fillmore 1970; Dowty 1991; Ackerman and Moore 2001; Beavers 2010).
- We explore whether this holds for spatial change, starting with the causative/inchoative alternation since it turns out that the answer to whether spatial change verbs show this alternation matters for what other alternations are possible.

### 5.1 Causative

- Change-of-state verbs (with some well-defined exceptions) show the causative alternation (35), while contact verbs do not (36) (Fillmore 1970):

- (35) a. The blue paint darkened the room.  
b. The room darkened (when the lights were turned down).

- (36) a. Kim touched the table.  
b. \*The table touched.

- Sweetser (1997:132) observed that spatial readings of change-of-state verbs lack causatives:

- (37) #He deepened the wells as you go up the road.

- We might think this is due to a tendency for (lexical) causatives to be eventive, though stative causatives have been entertained before (Van Valin and LaPolla 1997:402-403; Pytkäinen 1999:142-143), albeit not with canonical change-of-state verbs (see also Maienborn and Herdtfelder 2017 on German *von* PPs and stative causation more broadly).
- So taking that explanation away, we might have to say that whatever causation is it won't admit spatial change as a caused event, and that could reflect a difference between spatial and temporal change (though if it's just selectional, then it could be like *cook* above).
- But we believe the problem with (37) is the subject, which is human. It's not immediately clear pragmatically what *other* than an event a human could do to cause a certain spatial state. Yet immutable environmental factors might conspire to ensure a certain spatial change:

- (38) [ A narrow canyon gets narrower to the south because of a certain rock formation that lines both walls ]  
The rock formation narrows the canyon on the south end.

- This relies on very specific types of change and context. To find good examples it may require creative thinking, but in principle it is possible with any spatial change reading:

- (39) a. 1980s style lengthens the dress in the back.  
b. Kim's medical condition darkens her skin between the calf and the knee.

∴ While some factors about the nature of causation with certain causers may make it hard to get causatives, spatial change-of-state verbs *can* show them, meaning there is no categorical distinction between temporal and atemporal change.

## 5.2 Other Alternations?

- Change-of-state verbs are known to show a wide range of other alternations, and some of the semantic effects of those alternations are known to depend on or effect aspectual properties.

#1 A classic is the locative alternation, where two separate complements vie for objecthood; whichever is the object is what measures out the event (Anderson 1971; Dowty 1991; Beavers 2010):

- (40) a. Sandy loaded the hay onto the wagon. (all of hay moved)  
b. Sandy loaded the wagon with the hay. (wagon totally full)

- This would require a spatial extent reading with an environmental causer that also involves some sense of putting something somewhere. The following is a possible example, but does not allow the *with* variant on the intended reading:

- (41) a. Geographical features within the canyon widen the river into the valley.  
b. #Geographical features within the canyon widen the valley with the river. (on intended reading)

- The problem here is selectional: the *with* variant requires the complement of *with* to be a movable object (a “displaced theme” as per Rappaport and Levin 1988), and that’s not what’s going on here.
- Indeed, even on temporal uses Levin (1993:245-246) reports that degree achievements do not show this alternation:

- (42) a. We lengthened the pants legs into the socks.  
b. #We lengthened the socks with the pants leg. (on intended reading)

#2 The *swarm* alternation is effectively an unaccusative variant of the locative alternation:

- (43) a. Bees swarm in the garden.  
b. The garden swarms with bees.

- But Dowty (2000) has suggested that *swarm* alternations fundamentally involve actual movement of the agent, with the difference being that in (43a) there’s just simple movement but in (43b) it’s movement that creates what he calls “dynamic texture” predicated of the entirety of the location.
- And indeed, temporal uses of degree achievements do not admit it, much less spatial ones:

- (44) a. The towels dried in the drying machine.  
b. #The drying machine dried with the towels.

- (45) a. The skin darkens on the leg.  
b. #The leg darkens with the skin.

#3 The conative alternation has usually been discussed in terms of the manner of the subject, but Beavers (2013) has noted that it also has an effect on degree of affectedness:

- (46) a. Sandy ate her lunch.  
b. Sandy (nervously) ate at her lunch (barely eating any at all).

- (47) a. Sandy cut the assailant.  
b. Sandy cut at the assailant (but kept missing).

- But conatives *also* have some kind of manner condition on the part of the subject as well (Guerssel et al. 1985; Broccias 2003; Beavers 2013):

- (48) a. The boxer/the car hit the wall.  
 b. The boxer/#the car hit at the wall.

- Again the conative does not occur with degree achievements (Levin 1993:245-246):

- (49) a. #The workers narrowed at the road.  
 b. #Geographical features at the 40th parallel narrow at the canyon.

#4 Possessor ascension applies among some subclasses of change-of-state verbs:

- (50) a. John cut Bill's arm.  
 b. John cut Bill on the arm.

- This one plausibly applies to spatial change, just as with temporal change:

- (51) a. Current style lengthens the dress at the back.  
 b. Current style lengthens the dress's back.  
 (52) a. The tailor lengthened the dress at the back.  
 b. The tailor lengthened the dress's back.

#5 There is also an unaccusative version of possessor ascension, and spatial change does allow it:

- (53) a. The sky darkens in color above the powerline.  
 b. The sky's color darkens above the powerline.  
 (54) a. The sky darkened in color at five o'clock.  
 b. The sky's color darkened at five o'clock.

#6 Not quite a diathesis alternation per se, but as noted above spatial and temporal change both allow resultatives (and do not require fake reflexives or non-selected objects, as is typical when non-change-of-state verbs occur in resultatives):

- (55) The river cools to 15°C in/??for 10 minutes/miles.

∴ Many factors determine which verbs show a given alternation, some of which are orthogonal to the spatial/temporal distinction. But the degree to which such alternations are possible in the temporal domain with degree achievements, they are also possible with spatial readings.

- Of course, as noted above, it takes context to get transitive uses spatial readings, and many alternations above were object alternations. While we also saw a few subject alternations for intransitives, English is not replete with such alternations. Is there somewhere else we can look for such data?

## 6 Intransitive Subject Alternations

- There are languages that show more variable subject realization than English.

#1 One example is Colloquial Sinhala, where intransitive change-of-state verbs (usually marked in the involitive mood) show two subject case-marking patterns (Beavers and Zubair 2010, 2013).

- (56) a. *Shameela ibeemə hirəwuna/lissuna.*  
Shameela by SELF get.stuck.INV.PST/slip.INV.PST  
'Shameela got stuck/slipped by herself.'
- b. *Shameela-wə (#ibeemə) hirəwuna/lissuna.*  
Shameela-ACC by SELF get.stuck.INV.PST/slip.INV.PST  
'Someone made Shameela get stuck/slip.'

- So does spatial change exist in Sinhala, and does it allow accusative?
- If the underlying causative semantics of the construction in (56b) is necessarily eventive, then spatial readings should be ruled out. If it's possible, though, it may require context.

#2 Holisky (1987) discusses Tsova-Tush fluid-S marking, where for a single intransitive verb the subject can be either absolutive or ergative, but in the former case the reading is simple change-of-state but in the latter case there is some sort of control or agentivity:

- (57) a. *ae wože*  
1SG.ERG fell  
'I fell.' (It was my own fault that I fell down.)
- b. *so wože*  
1SG.NOM fell  
'I fell.' (No implication that it was my fault.) (Holisky 1987:105, (4))

- If agentivity requires temporal change, then the prediction is that if Tsova-Tush allows spatial change readings, it will not do so with ergative case marking. Otherwise, it may require context.

#3 Some languages have quirky case marking, e.g. Icelandic, depending on verb class or other aspectual category distinctions. In principle this might preclude or include spatial change in some particular pattern, though we are not sure of any specific cases.

∴ More research is needed, but there's no reason to think any differences in alternations would undermine the idea that temporal and spatial change are the same, provided the key factor distinguishing them were eventivity vs. stativity and not the change itself.

## 7 Conclusion

- We have shown various aspectual and argument structural behaviors known to be found with change-of-state verbs on their temporal readings is mirrored when they are found on their spatial readings.
- This provides some support at least for the idea that temporal and atemporal change are just the same notion, with the only difference being the axis of measurement.
- The observations are tentative, and meant to open the conversation on how well unified analyses of temporal and atemporal change of state verbs fare in light of the vast work done on temporal change.
- More work is needed to flesh out the details of what is above, including work on more languages, plus also to explore how other atemporal changes beyond just spatial change fit into the picture.

## References

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