

The States in Changes of State

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0. States and the causative/inchoative alternation

The morphological typology of words denoting non-causative and causative COS predicates, as in (1a,b) respectively (i.e., the causative/inchoative alternation) has been relatively well studied in the typological literature (Nedjalkov and Silnitsky 1973, Croft 1990, Haspelmath 1993).¹

- (1) a. The vase broke. b. Kim broke the vase.

One of the main findings of this body of research is that there is no single direction of morphological derivation from causative to inchoative or inchoative to causative. Instead, words naming different kinds of events tend to show different directions of derivation (Croft 1990, Haspelmath 1993, Levin and Rappaport Hovav 1995). COS events that generally come about spontaneously, such as *freezing* events, for example, tend to be lexicalized as inchoatives, with the causative being derived, as shown for Swahili in (2).

- (2) Swahili *freezing* events (Haspelmath 2005, 5)
a. ganda (intransitive) b. gand-**isha** (transitive)

In contrast, events that tend not to come about spontaneously, such as events of *breaking*, are generally lexicalized as causatives, with the inchoative derived as shown again for Swahili by the data in (3).

- (3) Swahili *breaking* events (Haspelmath 2005, 5)
a. vunja (transitive) b. vunj-**ika** (intransitive)

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In what follows, I show that in addition to how the COS event is brought about (spontaneously or not), another factor that impacts the encoding of COS events is the nature of the state underlying the change of state. This is demonstrated primarily on the basis of data from Ulwa (Misumalpan), which show that COS events based on particular kinds of states (Dixon’s 1982 *property concepts* or adjectival states), are treated differently from other kinds of COS events (e.g., *break-type* COS events). Data from a number of other languages further suggest that it is not only in Ulwa that the nature of the state in a COS event has an impact on the encoding of the COS event. Instead, in a number of other unrelated languages, COS events based on adjectival states are, as in Ulwa, encoded differently from *break-type* COS events. This distinction has not been previously recognized—most discussions of the event structure of the causative/inchoative alternation make no distinction between deadjectival COS events and other COS events (Dowty 1979, Levin and Rappaport Hovav 1995, Piñon 2001), while some explicitly treat deadjectival and other types of COS events (e.g., *break-type*) on a par with one another (Parsons 1990, Baker 2003, Embick 2004). The findings suggest that COS events need to be distinguished on the basis of whether they are lexicalized as eventive eventualities (as with *break-type* eventualities) or whether the COS event is instead derived from the stative eventuality underlying the (derived) COS event, as in the case of change into adjectival state events.

I begin by discussing the privileged crosslinguistic status of adjectival states. I then examine deadjectival verbs and *break-type* verbs in the context of Ulwa verb class morphology. Next, I outline an analysis of the observed contrast in the encoding of COS events, proposing that it follows from differences in lexicalization. I then point toward data from other languages that suggest the highlighted contrast to be crosslinguistically robust.

1. Adjectival states as a privileged class of states

Two empirical observations suggest that adjectival states, the kinds of stative notions in (4) that Dixon (1982, 2004) refers to as *property concepts*, are a privileged class of stative predicates crosslinguistically.

(4) Dixon’s classes of adjectival states (Dixon 2004, 3ff.)

dimension	big, small, long, tall, short, wide, deep, etc.
age	new, young, old, etc.
value	good, bad, lovely, atrocious, perfect, etc.
color	black, white, red, etc.
phys. prop.	hard, soft, heavy, wet, rough, strong, etc.
speed	fast, quick, slow, etc.
human propensity	jealous, happy, kind, clever, generous, etc.

First, in a survey of languages with small inventories of adjectives, where many stative notions are instead lexicalized as nouns or verbs, Dixon (1982) found that no matter how small a class of adjectives a language has, if it has any adjectives

at all, the class includes notions of *dimension*, *age*, *value*, and *color*. Crosslinguistically, as languages have progressively larger classes of adjectives, *physical property*, *speed*, and *human propensity* notions are also included in the class (see also Stassen 1997). Secondly, the names given to these stative eventualities are always morphologically simple, regardless of lexical category (Koontz-Garboden 2005, 2006a, Koontz-Garboden and Levin 2005). These facts suggest that adjectival states are a privileged lexical semantic class crosslinguistically. Given this observation, then, it might not be surprising to find that changes into these kinds of states are encoded differently from other types of COS events, in particular changes into states which are not in this privileged class.

2. Two classes of change of state verbs in Ulwa

Data from Ulwa, an endangered Misumalpan language spoken by approximately 350 people in the village of Karawala on Nicaragua's Atlantic coast, confirm the suspicion that COS events based on adjectival states are treated differently from changes into states that are not in the core Dixonian class. I show this by contrasting the behavior of deadjectival verbs and *break*-type verbs, drawing on data from eleven months of my own fieldwork in 2004–2005 and from Green (1999).

I begin by laying out the facts of the Ulwa system of verb class suffixes. I then show that in this context, COS events based on different kinds of states receive different kinds of encoding. I follow this by an analysis which is built on the idea that change into adjectival state events are built on adjectival state roots, while *break*-type COS events are built on eventive roots.

2.1. Ulwa verb class suffixes

Ulwa verbs are divided into four major morphological classes according to the suffix that appears following the verbal root: *-da-*, *-pa-*, *-wa-*, and *-ta-*. The data in (5) illustrate verbs of each of these four classes, showing that while *-da-* and *-wa-* verbs are intransitive (5a,c), there exist both transitive (5b,d) and intransitive (5e,f) verbs in the *-pa-* and *-ta-* classes. (Infixes are glossed with <>.)²

- (5) a. As-ki-na ya andih birh-d-ida.
 shirt-<1SING> DEF already tear-DA-3SING.PAST
 ‘My shirt has already torn.’
 b. Asna ya birh-p-i yâ-t-ah.
 cloth DEF tear-PA-PROX 1SING.OBJ-TA-2SING.IMP
 ‘Tear the cloth and give it to me.’

² Although Hale and Salamanca (2002) briefly acknowledge that there are not only transitive *-pa/ta-* verbs, but intransitive as well, their analysis is built around the idea that *-pa-* and *-ta-* are transitivizers, an idea that (5e,f) show cannot be correct. In fact, Green's (1999) dictionary lists approximately one hundred *-pa/ta-* class intransitive verbs, many of whose intransitivity I have verified.

- c. Arak-ki-bus bah-w-ida.
gun-<1 SING> break-WA-3SING.PAST
'My gun broke.'
- d. Wahai-ki arak-ki-bus bah-t-ida.
brother-1 SING gun-<1 SING> break-TA-3SING.PAST
'My brother broke my gun.'
- e. Kimby ya madi laih babar-p-ida.
Kimby DEF now TOP thin-PA-3SING.PAST
'Kimby has become thin.'
- f. Kung-ki-mak pupuh-t-ida, yapa bahangh sip
lip-<1 SING> swell-TA-3SING.PAST that so possible
wui-pa-sing.
whistle-PA-1 SING.NEG
'My lip is swollen, and so I cannot whistle.'

The generalization, then, captured by the table in (6) is that any verb that is transitive will be in the *-ta/pa-* class. For intransitive verbs, however, there are four possibilities for what class a meaning could fall into.

- (6) An overview of the transitivity of Ulwa morphological verb classes

	intransitive	transitive
<i>-da-</i>	yes	no
<i>-wa-</i>	yes	no
<i>-pa-</i>	yes	yes
<i>-ta-</i>	yes	yes

2.2. The morphological classes of COS verbs in Ulwa

Data presented in the following two sections show that in the context of the Ulwa verb class system, change into adjectival state events are encoded differently from *break*-type COS events, which are not based on the Dixonian adjectival states.

Change into adjectival state verbs

COS verbs related to core adjectival states with few exceptions have intransitive verbs in either the *-ta-* or the *-pa-* class, as illustrated by the table in (7).

- (7) Adjectives with associated intransitive COS verb

adjective	gloss	Dixon class	intrans COS verb class
auhka	fat	physical property	ta
babarka	thin	physical property	pa
sikka	big	dimension	wa
itukwana	big	dimension	wa
bisika	small	dimension	pa

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tubakka	thick/dense	dimension	ta
siuka	grown/mature (fruit)	age	ta
yamka	good	value	pa
dutka	bad	value	ta
pauka	red	color	ta
pihka	white	color	ta
baraska	black	color	pa
puputka	brown	color	ta
lalahka	yellow	color	ta

The first observation, revealed by the table in (7), is that deadjectival verbs always have adjectives based on the same roots. This may seem a tautologous observation for a class called “deadjectival”, but it is nevertheless important. As shown below, this is not necessarily the case for COS verbs based on non-adjectival states.

Next, some of these verbs participate in the causative/inchoative alternation, such as *auhnaka* ‘to become fat’ in (8). Noteworthy, however, is the fact that there is no change in verb class associated with the alternation—both the inchoative in (8a) and the causative in (8b) are in the *-ta-* class.

(8) *auhnaka* ‘to become fat’

- a. Kasnaka dî-ka mah-ka kas-ring laih
 food thing-3SING much-ADJ eat-3SING.IRR if
 auh-ta-ring.
 fat-TA-1SING.IRR
 ‘If I eat a lot I will become fat.’
- b. Sû-ki-lu auh-t-ikda.
 dog-<1SING> fat-TA-1SING.PAST
 ‘I fattened my dog up.’

Other change into adjectival state verbs fail to participate in the causative/inchoative alternation, lacking the causative variant, as illustrated for the verb *babarnaka* ‘to become thin’ in (9).

(9) *babarnaka* ‘to become thin’

- a. Sûlu as watah yang katka babar-p-ida bahangh
 dog INDEF have 1SING but thin-PA-3SING.PAST so
 wal-ta-sing.
 want-TA-1SING.NEG
 ‘I have a dog that has become thin, so I no longer want him/her.’
- b. * Yang raupi sù-ki-lu babar-p-ikda, kanas auhka
 1SING SUBJ dog-<1SING> thin-PA-1SING.PAST more fat-ADJ
 dai bahangh.
 PAST.COP so
 ‘I thinned my dog up because he was so fat.’

In summary, deadjectival verbs have adjectives based on the same roots, the verbs are in the *-ta/pa-* classes, and sometimes participate in the causative/inchoative alternation, though without a change in morphological class.

Break and cooking-type COS verbs

In contrast to what was just seen for deadjectival verbs which have intransitives in the *-ta/pa-* classes, intransitive verbs based on states that don't fall into Dixon's core class, exemplified by Levin's (1993) *break* and cooking verbs, have intransitive verbs that tend to be in the *-da-* or the *-wa-* classes, as shown for the infinitival forms of such verbs in (10) and (11).

(10) Infinitival forms of some intransitive *break* verbs

bah-**wa**-naka 'break', pil-**da**-naka 'chip', sah-**wa**-naka 'crack', dak-**wa**-naka/dak-**da**-naka 'rip/snap', sah-**wa**-naka 'split', birh-**da**-naka 'tear, rip, shred', kalh-**da**-naka 'crush/break', lis-**da**-naka 'split/cleave', suih-**da**-naka 'break, snap off', tak-**da**-naka 'chip, flake off, peel', turu-**da**-naka 'flake (skin)', buk-**da**-naka 'chip/crack (e.g. lips)'

(11) Infinitival forms of some intransitive cooking verbs

lah-**wa**-naka 'boil', dâ-**wa**-naka 'burn/bake'

Another point of contrast with deadjectival verbs is that the *break*-type and cooking type verbs consistently participate in the causative/inchoative alternation *with a difference in the morphological class of the two variants*, as illustrated for the verb *bah(wa)naka* 'break' in (12), where the intransitive variant in (12a) is in the *-wa-* class with the transitive variant in (12b) in the *-ta-* class.

- (12) a. Tulh-ki ya wauh-d-i bah-w-ida.
machete-1 SING DEF fall-DA-SS break-WA-3 SING.PAST
'My machete fell and broke.'
- b. Aaka baka-ka ul-niki pan-ka
this child-3 SING write-1 SING.INF stick-3 SING
bah-t-ida.
break-TA-3 SING.PAST
'This child broke my pen/pencil.'

The *break* and cooking verbs also contrast with the deadjectival verbs in that adjectives based on the same roots as *break*-type and cooking verbs are generally not attested. For example, although there is a verb *lahwanaka* 'boil', there is no associated adjective **lahka* with a meaning related to the verb based on the same root.

In summary, *break*-type verbs are built on roots that do not generally also form adjectives. Further, they consistently participate in the causative/inchoative alternation with a morphological difference between causative, which is in *-ta/pa-*, and inchoative, which is in *-da/wa-*. This contrasts with the situation for the deadjectival verbs, which have intransitives in the *-pa/ta-* classes. These observations lead

to the question whether there is any difference between these morphological classes that might shed light on why deadjectival intransitives and *break*-type transitives are in the *–pa/ta–* classes while *break*-type intransitives are in the *–da/wa–* classes.

2.3. A bit more about Ulwa verb class morphology

It turns out that there is a difference in the extent to which *–pa/ta–* verbs and *–da/wa–* verbs consistently show their thematic markers in verbal paradigms. In infinitival paradigms, *–pa/ta–* verbs fail to show their thematic marker at all, as shown in (13a). Verbs in the *–da/wa–* classes, on the other hand, consistently show their verb class marker throughout the infinitival paradigm, as shown in (13b).

(13) Infinitival paradigms

- a. *–pa–* class *sangnaka* ‘to spoil; to cause to become green’

1sing	sang-niki	1pl.excl	sang-nikina
		1pl.incl	sang-nini
2sing	sang-nama	2pl	sang-namana
3sing	sang-naka	3pl	sang-nakana

- b. *–da–* class *birhdanaka* ‘to become torn’

1sing	birh- da -niki	1pl.excl	birh- da -nikina
		1pl.incl	birh- da -nini
2sing	birh- da -nama	2pl	birh- da -namana
3sing	birh- da -naka	3pl	birh- da -nakana

Similarly, in finite paradigms, while *–pa/ta–* class verbs fail to show their verb class marker in the first person inclusive and the third person plural, as shown in (14a), *–da/wa–* class verbs consistently show their verb class marker throughout the paradigm, as shown in (14b).

(14) Finite paradigms

- a. *–pa–* themed *sangnaka* ‘to spoil; to cause to become green’

1sing	sang- pa -yang	1pl.excl	sang- pa -yangna
		1pl.incl	sang-wai
2sing	sang- pa -yam	2pl	sang- pa -yamna
3sing	sang- pa -i	3pl	sang-dai

- b. *–da–* themed *birhdanaka* ‘to become torn’

1sing	birh- da -yang	1pl.excl	birh- da -yangna
		1pl.incl	yak birh- da -i
2sing	birh- da -yam	2pl	birh- da -yamna
3sing	birh- da -i	3pl	birh- da -dai

Thus, while *–da/wa–* class verbs consistently show their verb class marker throughout the paradigm, this is not so for *–pa/ta–* class verbs, suggesting that these classes are fundamentally different from one another. Further, while *–da/wa–* verbs are consistently intransitive, *–pa/ta–* verbs vary in transitivity. Assuming some treatment of the verb class markers as affixes (cf. Hale and Salamanca 2002), while *–da/wa–*

suffixation is both found throughout the paradigm and has a consistent semantic outcome—intransitivity—neither is the case for *–pa/ta–* suffixation, which neither appears throughout the paradigm nor has a consistent semantic outcome, there being both transitive and intransitive verbs in these classes. These facts suggest that while *–da–* and *–wa–* are derivational affixes operating on a root yielding some semantically altered stem with fixed intransitivity, *–pa/ta–* are something else, possibly part of the person/number/finiteness inflectional morphology.

In the context of the encoding of COS events in Ulwa, then, the observation is that while intransitive verbs in the *–da/wa–* classes, including intransitive *break*-type verbs, are based on derived stems, intransitives in the *–pa/ta–* classes, including intransitive deadjectival verbs, are not (see Koontz-Garboden 2006b for an additional argument to this effect).

2.4. Summary of the Ulwa facts

The table in (15) summarizes the facts of Ulwa discussed in the previous sections.

(15) *Break* versus deadjectival verbs in Ulwa

	adj	inchoative	causative
deadjectival	yes	<i>–pa/ta–</i> (underived)	<i>–pa/ta–</i> (underived)
<i>break</i>	no	<i>–da/wa–</i> (derived)	<i>–pa/ta–</i> (underived)

First, while deadjectival intransitives are in the *–pa/ta–* morphological verb classes, *break*-type intransitives are in the *–da/wa–* classes. The difference between these morphological classes is such that deadjectival intransitives are underived while *break*-type intransitives are derived. Further, *break*-type transitives fall into the *–pa/ta–* class, showing that in their underived form, they are causative. Next, *break*-type verbs consistently participate in the causative/inchoative alternation, with the intransitive variant in the derived *–da/wa–* classes. Finally, there are adjectives based on the roots forming deadjectival verbs, while there are no adjectives based on the roots forming *break* verbs. In the following section, I suggest the outlines of an analysis of the lexical semantics of Ulwa roots and Ulwa derivational operations that captures these facts.

3. Toward an analysis

The core theoretical assumption that the analysis of the highlighted contrasts rests on is the Monotonicity Hypothesis (MH), the idea that word formation processes add, but do not delete meaning (Kiparsky 1982, Rappaport Hovav and Levin 1998, Koontz-Garboden 2005, 2006a, in prep.). Given this idea, the roots underlying deadjectival verbs must be stative—while change into adjectival state verbs can be derived from states monotonically, states cannot be so derived from changes of state; a derivation from change of state to state would necessarily involve the deletion of change semantics, inconsistent with the MH. The lexical semantics of the root underlying the deadjectival verb *auhnaka* ‘fatten’, then, would be as in (16a), where *x* ranges over ordinary individuals and *s* over stative eventualities. In

contrast, roots underlying *break*-type verbs are causative and eventive, as in (16b), where e ranges over eventive eventualities, v ranges over eventualities more generally (whether stative or eventive), and θ is an unspecified theta role, determined in part by the nature of the causing eventuality v .

- (16) a. denotation of the root *auh*– ‘fat’ = $\lambda x \lambda s [fat(s, x)]$
 b. denotation of the root *bah*– ‘break’ = $\lambda y \lambda x \lambda e [\exists v \exists s [CAUSE(v, e) \wedge \theta(v, x) \wedge BECOME(e, s) \wedge THEME(s, y) \wedge \neg whole(s)]]$

Given the lexical semantics in (16b), the MH predicts that there should not be adjectives based on these roots, since such a derivation would involve the deletion of causative and change of state semantics (i.e., to get from something like (16b) to something like (16a)). As discussed above, this prediction is borne out. Further, the treatment of the root as causative captures the fact that verbs based on such roots are causatives as underived *-ta/pa-* class verbs. Concerning the intransitive *-da/wa-* variants of *break*-type verbs, I treat the *-da/wa-* suffixes as anticausativizers, with anticausativization semantically being a kind of reflexivization operation (Chierchia 2004). This is discussed in detail in Koontz-Garboden (in prep.), who further shows the reflexivization analysis to be consistent with the MH.

The core of the analysis rests on two simple ideas: the MH and a contrast in the lexicalization of roots. Change into adjectival state verbs are built on roots that are lexicalized as states, while *break*-type COS verbs are built on roots that are lexicalized as (two argument) events. Given the contrast in lexicalization, many of the observed differences in behavior between the two classes follow from the MH.

4. Supporting data from other languages

It is not only in Ulwa that these kinds of contrast in behavior between deadjectival and *break*-type verbs are observed. Indeed, across a number of other languages, deadjectival verbs are derived from morphologically simple state denoting words, while *break*-type verbs are morphologically simple as COS events. Additionally, *break*-type verbs lack corresponding simple adjectives (a fact suggesting they are not derived from the states underlying the COS events). To take one example, the data in (17) and (18) from Megerdooimian (2002) show this kind of contrast in Eastern Armenian. While *-anal* derives a non-causative COS from an adjectival state and *-ats-* a causative COS from this, there appear to be no simple adjectives associated with *break*-type verbs. Instead, the morphologically simple form names a causative COS, with the non-causative COS being derived by an anticausative operation, marked with *-v-*.

(17) Eastern Armenian deadjectival verbs (Megerdooonian 2002, 98)

adjective	non-causative COS	causative COS
layn (wide)	layn.anal (widen)	layn.ats.nel (widen)
čor (dry)	čor.anal (dry)	čor.ats.nel (dry)
metz (big)	metz.anal (grow)	metz.ats.nel (grow, bring up)
arag (fast, quick)	arag.anal (quicken)	arag.ats.nel (accelerate)
čaq (fat)	čaq.anal (become fat)	čaq.ats.nel (fatten)
sev (black)	sev.anal (blacken)	sev.ats.nel (blacken, darken)

(18) Eastern Armenian *break*-type verbs (Megerdooonian 2002, 98)

adjective	causative COS	non-causative COS
–	k’ot’Rel (break)	k’ot’R.v.el (break)
–	epel (cook)	ep.v.el (cook)
–	poxel (change)	pox.v.el (change)
–	šarjel (move)	šarj.v.el (move)
–	xort’ak’el (sink, drown)	xort’ak’.v.el (sink, drown)

Additionally, I have observed similar kinds of contrasts in Tongan (Churchward 1953, 1959), O’odham (Hale and Keyser 1998, 92,95), Pima (Smith 2006), Greek (Alexiadou and Anagnostopoulou 2004, 124-125), Hebrew (Doron 2003, 56, 61–62), Quechua (Cusihuaman 1976, Weber 1989), and Warlpiri (Hale and Keyser 1998). This suggests a crosslinguistic tendency for this kind of contrast in behavior between verbs with these kinds of meanings, a fact which I believe to be the results of (i) the nature of the semantics of word formation (constrained by the MH) and (ii) differences in lexicalization of roots (states versus COS events).

5. Concluding remarks

I have shown, largely on the basis of data from Ulwa, an endangered Misumalpan language that deadjectival verbs and *break*-type verbs differ from one another in fundamental ways. First, there are morphologically simple adjectives based on the roots underlying deadjectival verbs, while there are not for the roots underlying *break*-type verbs. Additionally, only *break*-type verbs consistently have causatives. Finally, intransitive *break*-type verbs and deadjectival verbs fall into different morphological verb classes, the former derived, the latter underived. This contrast, I believe, follows from both local differences in lexicalization and a more global constraint on the semantics of word formation (monotonicity). Regardless of analysis, however, the facts discussed clearly show that deadjectival and *break*-type verbs behave differently from one another, contra many analysis that treat them identically (e.g., Dowty 1979, Parsons 1990, Levin and Rappaport Hovav 1995, Piñón 2001, Baker 2003, Embick 2004). This area, then, is ripe for further theoretical exploration.

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