

Change of state in Kinyarwanda: A study in root meaning

Kyle Jerro*

Abstract. I investigate the paradigms of change of state verb roots in Kinyarwanda, comparing the simple state, inchoative, causative, and result state members of 81 root paradigms. I show that the morphological shape of the causative/inchoative members of the paradigm and whether there is a simple state term are both contingent upon root semantics. Certain change of state roots in Kinyarwanda lack simple state meanings and always give rise to change entailments; this correlates with the lack of the simple state in the paradigm. I further show that verb meaning also partially determines which of several derivational strategies are used by a given change of state paradigm.

Keywords. lexical semantics, syntax, morphology, change of state, verb meaning

1. Introduction. On many current event structural approaches, a verb’s meaning has two interrelated components: the root and the template. The template is built up from a universal set of logical primitives and captures the basic temporal, causal, and thematic nature of the event described by the verb. The root, on the other hand, is the idiosyncratic information which distinguishes a particular verb from other verbs in the same class (i.e. verbs which share an event template). Consider an event structural analysis of the adjective *flat* in (1) (cf. Embick 2004).

- (1) a. The car is flat. $\approx [_{AspP} Asp \sqrt{flat}]$
 b. The car flattened. $\approx [_{vP} DP [_{v'} v_{become} \sqrt{flat}]]$
 c. Kim flattened the car. $\approx [_{vP} DP [_{v'} v_{cause} [_{vP} DP [_{v'} v_{become} \sqrt{flat}]]]]$
 d. The car is flattened. $\approx [_{AspP} Asp [_{vP} DP [_{v'} v_{cause} [_{vP} DP [_{v'} v_{become} \sqrt{flat}]]]]]]$

On this view a change of state verb (1b) is built around a state denoting root (1a), and the deverbal adjective (1d) is built around the corresponding causative verb (1c). A question that arises is what are possible meanings of verbal roots. The null hypothesis is that if templates determine grammatical behavior semantically, such information should be excluded from roots — e.g. Embick’s (2009) “Bifurcation Thesis for Roots” (cf. Arad 2005, Borer 2005, Dunbar and Wellwood 2016) — henceforth BTR. Generally, change of state verbs are assumed to share templatic structure, and the change entailment comes from the same template (of the types in (1)) across verbs, thus individual verbs within a class differ only in the meaning of the root. This makes two predictions: first, change entailments are only present when there is templatic material to introduce it, and second, barring language-specific idiosyncrasy, roots of all change of state verbs should exist in the same templatic contexts given their shared structure.

As part of a larger study on the cross-linguistic nature of roots (Beavers et al. 2017), I investigate the paradigms of change-of state (COS) verb roots in Kinyarwanda (Bantu; Rwanda), comparing the entailments of and derivational relationship between simple state, inchoative, causative, and result state paradigm members for 81 roots (see Appendix 1 for the list of verbs).

*I am grateful to several people for their judgments on the Kinyarwanda data, including Olivier Munyaneza, Oliver Kansiime, Erick Bakinahe, Olive Nyiracumi, Gilbert Habarurema, and Félicité Ingabire. Thanks to John Beavers, Andrew Koontz-Garboden, Michael Everdell, Elise LeBovidge, Thera Crane, Sebastian Dom, and Bastian Persohn for helpful comments. All faults remain mine. This material is based upon work supported by the National Science Foundation under grant no. BCS-1451765 and grant no. DDIG-1451566. Author: Kyle Jerro, The University of Texas at Austin (jerrrokyle@utexas.edu).

To test the contribution of different verb roots, I compare two broad classes of roots in Kinyarwanda: result roots (cf. Levin’s (1993) *crack* roots) of the classes in (2) and property concepts (e.g. color, age, dimension; Dixon 1982) of the type in (3).

- (2) **Classes of Result Roots** (32 roots):
entity-specific change of state, cooking verbs, breaking verbs, verbs of killing, destroying verbs, verbs of calibratable change of state, verbs of inherently directed motion
- (3) **Classes of Property Concepts** (49 roots):
dimension, age, value, color, physical property, speed, human propensity

I show that the paradigms’ morphological and semantic properties are contingent on the root in two ways. First, the morphological shape of the causative/inchoative members of the paradigm are dependent upon root meaning. Second, whether there is a simple state term is contingent upon root semantics; result roots systematically lack simple stative forms. This finding builds on growing evidence against the BTR (Beavers and Koontz-Garboden 2012, 2016, Beavers et al. 2017, Valle et al. 2017), where it has been argued that result roots lack simple stative forms because there is an entailment of change in their roots.

Addressing the question of root meaning with COS predicates in Kinyarwanda, however, raises various descriptive questions since there are several instances of overlap and distinction among change of state paradigm members that have not been previously described in the language. In particular, I focus on two points of interest: the lack of differentiation in inchoative/stative forms and the lack of derivational marking between simple states and result states. Thus this paper serves the dual purpose of testing the BTR in Kinyarwanda as well as describing heretofore un(der)-described phenomena which relate to the marking of states and changes of state in the language.

The structure of the paper is as follows. In the next section I provide a description of derivational strategies in Kinyarwanda. In section 3 I outline the differences in the two classes of roots. In section 4 I show that there is root-determined variation in derivational strategies for change of state paradigms. I conclude with some directions for future research in section 5.

2. Descriptive Summary of Derivational Strategies for COS Paradigms. Before addressing the question of entailments of change in verbal roots, I first discuss several preliminary features of Kinyarwanda COS paradigms. A crucial feature of Kinyarwanda is that the vast majority of states are described by verbs. Furthermore, across both classes of predicate in Kinyarwanda, there is no derivational relationship between the simple state, result state, and inchoative members of the paradigm. Instead, root meaning and inflectional morphology disambiguate the different paradigm members. Consider the paradigm of *gu-tyara* ‘to be(come) sharp’. The simple state, inchoative, and result state in (4) - (6) have the same morphological root, i.e. the verbal root *-tyara* (phonologically realized as [tʃaj] ‘tyay’ due to a mutation triggered by the perfective suffix).

- (4) *Icy-uma ki-ra-tyay-e.*
7-knife 7.SBJ-NON.PST-sharp-PRFV
‘The knife is sharp.’ (Simple State Reading)
- (5) *Icy-uma cy-a-tyay-e.*
7-knife 7.SBJ-PST-sharp-PRFV
‘The knife sharpened.’ (Inchoative Reading)

(6) [Context: In a scenario where the speaker has witnessed a knife being sharpened.]

M-perez-a *icy-uma gi-tyay-e.*
1SG.SBJ-hand/pass-IMP 7-knife 7.SBJ-sharp-PRFV

‘Give me the sharpened knife.’ (Result State Reading)

The causative differs in the morphological shape of the root, namely the labile *gu-tyaza* [guʔcaza] ‘to sharpen’ in (7).

(7) *Umu-gabo a-ri* *gu-tyaz-a* *icy-uma.*
1-man 1.SBJ-cop INF-sharpen-IMP 7-knife

‘The man is sharpening the knife.’ (Causative Reading)

The example of the *gu-tyara/gu-tyaza* ‘sharp/sharpen’ paradigm is typical of the preference in the language to mark simple-result-inchoative on one hand and causative on the other. As will be discussed below, this pattern is pervasive in the language regardless of the direction of derivation between the causative and simple-result-inchoative markings.

A small set of exceptions exists with respect to the tendency for verbal marking for states. On the one hand, a small class of true adjectives does exist in the language, and these are related to terms of dimension and value, such as *-nini* ‘big’, *-re-re* ‘deep’, and *-iza* ‘good’. Interestingly, the verbal inchoative and causative forms are not morphologically related to these adjectives (e.g. *kw-iyongera* ‘to get bigger/to improve/to widen’ and *gu-tebera* ‘to become bigger’, which is the causative form for all three senses of *kw-iyongera*). This is somewhat surprising given the standard assumption in previous work that other paradigm members are built up from the simple state; in fact, no root in Kinyarwanda has been observed to work this way.

Another class that does not employ the verbal strategy is color terms, which are described via a noun in a copular construction, e.g. *umweru* ‘white’, *umukara* ‘black’, and *icyatsi* ‘green/grass’. These forms do not have lexically-specified inchoatives, but rather use the verb *gu-hinduka* ‘to become’ to periphrastically indicate a change in color. There are no corresponding causative forms; when asked, speakers offered words like *gu-siga* ‘to paint’ to convey instances of causing a change in color.

Besides these few cases of nouns and true adjectives, the general pattern in the language is that states are coded with verbs, and stative (both simple and result) and inchoative forms are all distinct from causative forms. States and inchoatives are distinguished only by the tense and aspect morphology on the verb. As I show below, simple and result state readings are distinguished by the entailments associated with a particular root; specifically, in some cases the simple state does not exist due to the entailment of change present with certain roots.

2.1 DISAMBIGUATING STATIVES AND THE INCHOATIVE. Tense and aspect are marked morphologically in Kinyarwanda as prefixes and suffixes (respectively) on the verb. The tense and aspect morphology marked on the verb distinguishes the inchoative from the stative readings. With the past inchoative, the tense is one of various past-tense forms, such as *a-* or *ara-* combined with a perfective or imperfective aspect morpheme; in the present, the inchoative is formed in a present progressive construction. The stative readings (in the present) are marked with the non-past morpheme *ra-* and the perfective aspect. A stative reading is not possible with the imperfective morpheme, and statives cannot appear in the present progressive.¹

¹The table in (8) is not intended to be an exhaustive representation of tenses and aspects in Kinyarwanda, but rather

(8)

<i>Tense</i>	<i>Gloss</i>	<i>Aspect</i>	<i>Gloss</i>	<i>Reading</i>
<i>á-</i>	‘dist. past’	<i>-e</i>	‘perfective’	distant past inchoative
<i>a-</i>	‘recent past’	<i>-e</i>	‘perfective’	recent past inchoative
<i>ra-</i>	‘non past’	<i>-e</i>	‘perfective’	present stative
<i>ra-</i>	‘non past’	<i>-a</i>	‘imperfective’	present progressive or hodiernal future

For example, consider the verb *ku-ryoha* ‘to be(come) sweet’, with the stative in (9) and the inchoative in (10). In (9), the non-past tense and perfective aspect give rise to a present stative reading; in (10), the past tense and perfective aspect give rise to a past inchoative reading.

(9) *Ubu-ki bu-ra-ryoshy-e.*
14-honey 14.SBJ-NON.PST-sweet-PRFV
‘The honey is sweet.’ (stative)

(10) *Umu-vinyo w-a-ryoshy-e.*
3-wine 3.SBJ-PST-sweet-PRFV
‘The wine became sweet.’ (inchoative)

One way of bringing out these intuitions is the use of the prefix *cya-* ‘still’, which I assume describes a non-completed state of affairs and not an event which is already complete (cf. the use of *immer noch* ‘still’ in German; Kratzer 2000). The prefix *cya-* should be available in cases where the state still holds (or when the event has not yet been completed, such as in the present progressive), and *cya-* should be out in cases where there is a completed change, such as with inchoatives. This expected pattern is borne out; the statives in the (a) sentences are acceptable while the inchoatives in the (b) sentences are out:

- (11) a. *N-da-cya-rakay-e.*
1SG.SBJ-NON.PST-STILL-angry-PRFV
‘I am still angry.’
b. *#N-a-cya-rakay-e.*
1SG.SBJ-PST-STILL-angry-PRFV
Intended: ‘I was still angry.’
- (12) a. *Mudasobwa i-ra-cya-men-ets-e.*
9.computer 9.SBJ-NON.PST-STILL-break-STAT-PRFV
‘The computer is still broken.’
b. *#Mudasobwa y-a-cya-men-ets-e.*
9.computer 9.SBJ-PST-STILL-break-STAT-PRFV
Intended: ‘The computer was still broken.’

Further evidence of the contrast between the stative and inchoative comes from the inability of verbs marked in the stative combination of tense and aspect to appear with the modifier *vuba* ‘quickly’, which I assume is only compatible with events. In (13a) and (13b), the use of the modifier *vuba* ‘quickly’ is out.

an overview of the frames that appear in the present paper. See Kimenyi (1973), Coupez (1980), Botne (1983) and Ngoboka and Zeller (2017) for discussion of tense, aspect, and information structure in Kinyarwanda.

- (13) a. #*In-zu i-ra-senyuts-e vuba.*
 9-house 9.SBJ-NON.PST-destroy-PRFV quickly
 # ‘The house is destroyed quickly.’
 b. #*I-vi ri-ra-vun-its-e vuba.*
 5-knee 5.SBJ-NON.PST-break-STAT-PRFV quickly
 # ‘The knee is broken quickly.’

This contrasts with inchoatives, which do permit the modifier *vuba* ‘quickly’, which is expected given that they describe an event.

- (14) a. *In-zu y-a-senyuts-e vuba.*
 9-house 9.SBJ-PST-destroy-PRFV quickly
 ‘The house got destroyed quickly.’
 b. *Igi-kombe cy-a-men-ets-e vuba.*
 7-cup 7.SBJ-PST-break-STAT-PRFV quickly
 ‘The cup broke quickly.’

The ungrammaticality of the prefix *cya-* with the combination of tense and aspect in (11b) and (12b) is evidence that this particular tense and aspect combination gives rise to the inchoative reading, and furthermore, the inability of the statives with the modifier *vuba* ‘quickly’ in (13) is evidence that these indeed describe states. I discuss the difference between simple state and result state readings in detail in §3.

2.2 DERIVATIONAL STRATEGIES. With these distinctions in mind, there are several derivational strategies for marking causative-inchoative pairs in Kinyarwanda. I discuss them briefly in turn, as many have not been described in previous work.

The so-called “stative” morpheme *-ek* is used as an anticausative morpheme (see Mchombo 1993, Dubinsky and Simango 1996, Seidl and Dimitriadis 2003 for discussion of this morpheme in Bantu). Examples of *-ek* are given in (15). The quality of the vowel alternates between *e* and *i*, in accordance with the height of the vowel in the preceding syllable.

(15)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
gu-c- ik -a	gu-ca	‘tear’
ku-vun- ik -a	ku-vuna	‘break/snap’
ku-gond- ek -a	ku-gond-a	‘bend’

The morpheme *-esh* is a causative that is derived from the inchoative, as in (16). This morpheme also has a use as an instrumental applicative, as I discuss in §4.3.

(16)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
gu-shonga	gu-shong- esh -a	‘melt’
gu-tinya	gu-tiny- ish -a	‘fear’
ku-ma	ku-m- ish -a	‘dry’

Various suppletive pairs exist in the language, and incidentally all observed instances of these relate to verbs of dying such as those in (17).

(17)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
gu-pfa	kw-ica	‘die/kill’
ku-rohama	kw-ibiza	‘drown’

Equipollent paradigm members are marked with an alternation between a palatalized and non-palatalized final consonant as in (18), often alternating between *r* with the inchoative and *z* with the causative. This is likely a lexicalization of a productive causative morpheme *y* in Proto-Bantu (Kimenyi 2006).

(18)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
ku-rakara	ku-rakaza	‘angry’
gu-toha	gu-tosa	‘wet’
kw-andura	kw-anduza	‘dirty’
gu-shyuha	gu-shyushya	‘hot’

Some of the forms are marked with a non-productive causative morpheme *-iz* as in (19), which I assume is a separate lexicalized realization of the same frozen causative in (18).

(19)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
ku-ryoha	ku-ryoh- ez -a	‘sweet’
ku-raba	ku-rab- iz -a	‘wilt’

Some paradigm members mark inchoatives/statives with the reflexive prefix *-i*. Others mark the causative with the reciprocal suffix *-an*; in these cases, the reciprocal has a causative reading.

(20)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
kw- i -hinarika	gu-hinarika	‘wrinkle’
ku-za	ku-z- an -a	‘come’
ku-genda	ku-jy- an -a	‘go’

Finally, some forms are marked by the passive suffix *-w* on the inchoative member. However, these are not productive passives, but rather they are lexicalized with specific verbs such as those in (21).

(21)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
gu-tungur- w -a	gu-tungura	‘surprised’
ku-nanir- w -a	ku-naniza	‘be tired/tire’

Evidence for the lexicalization of the passive morpheme in (21) is that a true passive reading is not available, as in (22) where the reading is crucially not that subject has been made tired.²

- (22) *N-da-naniw-e*.
 1 SG.SBJ-NON.PST-tired-PRFV
 ‘I am tired.’
 #‘I have been (made) tired.’

²In the case of *ku-nanirwa* ‘to be tired’, the perfective deletes the final [r] in the stem.

Furthermore, the lexicalized passives in (21) cannot appear with agentive *na*-obliques such as in (23), as is typical of productive passives. Compare the inability of the verb *ku-nanirwa* ‘to be tired’ to appear with the *na*-oblique with the productive passive on the verb *k-ubakir-w-a* ‘to build for’ in (24).

(23) *Libby a-ra-naniw-e* (**n’ aba-na*).
 Libby 1.SBJ-NON.PST-tired-PRFV by 2-child
 Intended: ‘Libby is tired (*by her kids).’

(24) *In-zu y-∅-ubak-i-w-e umw-ana n’ umu-yobozi.*
 9-house 9.SBJ-PST-build-APPL-PASS-PRFV 1-child by 1-chief
 ‘The house was built for the child by the chief.’ (Jerro 2015:176,(43b))

Finally, *ku-nanirwa* ‘to be tired’ is doubly marked from the causative *ku-naniza* ‘to tire someone’ in that it is both marked as an *r*-intransitive (cf. the “*r-z* alternation” above) and also marked with the lexicalized passive *-w*. The non-passive form *ku-nanira* ‘to fail’ is unrelated to the paradigm. From the possible readings of the form, the inability to appear with *na*-obliques, and the doubly-derived marking of these forms, I conclude that the seeming passive morphology on verbs of the type in (21) is lexicalized.

In this section I have provided a description of the seven observed derivational strategies in Kinyarwanda. This sets the stage for the discussion in the next section regarding the various COS paradigms and the entailments of change present with certain root meanings.

3. Two Types of Roots. Work on event structure has assumed, and at times explicitly claimed (e.g. Embick 2009), that templatic entailments such as *change* are only introduced by functional heads, though recent work has challenged this assumption (Koontz-Garboden and Beavers 2016, Valle et al. 2017, Beavers et al. 2017). I show in this section that a subset of result roots in Kinyarwanda lack simple state meanings and always give rise to change entailments, which thus correlates with the lack of the simple state in the paradigm. Unlike many state-denoting verbs in Kinyarwanda where there is an ambiguity between simple and result state, with these verbs, the result state reading is unambiguous; there is no simple state reading available. For example, the root *gu-konjoroka* ‘thaw/be thawed’ in (26) entails that the meat has undergone a change from frozen to not frozen, while *gu-tyara* ‘be sharp’ in (25) does not entail such change, as shown by the use of contradiction diagnostics.

(25) *Iki cy-uma ki-ra-tyay-e, ariko ntikigezwe gi-tyaz-w-a.*
 7.this 7-knife 7.SBJ-NON.PST-sharp-PRFV but never 7.SBJ-sharpen-PASS-FV
 ‘This knife is sharp, but it was never sharpened.’

(26) *#In-yama zi-ra-konjorots-e, ariko ntizigezwe z-a-konjorok-a.*
 10-meat 10.SBJ-NON.PST-thaw-PRFV but never 10.SBJ-PST-thaw-IMP
 ‘The meat is thawed, but it never thawed.’

In (26) it is contradictory to say that the meat is thawed but that it has never undergone an event of thawing. This contrasts with (25) where it is not contradictory to say that the knife is sharp but was never sharpened. I argue that the result entailment of *gu-konjoroka* ‘thaw/be thawed’ accounts for the absence of the simple state in the paradigm. It is worth noting that due to the language-specific fact that the morphological form which describes the simple and result state is

the same (cf. §2 above), speakers often found the contradiction diagnostics of the type in (25) and (26) awkward and redundant, even in cases where there is no contradiction.

Sharper judgments were found when providing a context where the state has always held (and thus ruling out that there has ever been a change), by the use of the verb *gu-hora* ‘always’.³ In (27) the state described by the verb is felicitous in the context that the state has always held of an individual. In (28), on the other hand, the same contexts are infelicitous.

- (27) a. *Icy-umba cya Nkusi gi-hora gi-sukuy-e.*
 7-room 7.of Nkusi 7.SBJ-always 7.SBJ-clean-PRFV
 ‘Nkusi’s room has always been clean.’
- b. *Icy-uma gi-hora gi-tyay-e.*
 7-knife 7.SBJ-always 7.SBJ-sharp-PRFV
 ‘The knife has always been sharp.’
- c. *Iki ki-buye gi-hora gi-komey-e.*
 7.this 7-rock 7.SBJ-always 7.SBJ-hard-PRFV
 ‘This rock has always been hard.’
- (28) a. *#Uyu mu-gabo a-hora a-pfuy-e.*
 1.this 1-man 1.SBJ-always 1.SBJ-die-PRFV
 Intended: ‘This man has always been dead.’
- b. *#Uyu mu-gabo a-hora a-rohamy-e.*
 1.this 1-man 1.SBJ-always 1.SBJ-drown-PRFV
 Intended: ‘This man has always been drowned.’
- c. *#Iki gi-kombe gi-hora gi-shwanyuts-e.*
 7.this 7-cup 7.SBJ-always 7.SBJ-shattered-PRFV
 Intended: ‘This cup has always been shattered.’

Result roots like those in (28) entail a change, and thus cannot have been always in the state described by the root.

A similar contrast is found with *again*-modification, which in Kinyarwanda is conveyed with the verb *k-ongera* ‘again’. Predicates which entail a change have two readings with *k-ongera* ‘again’: a repetitive reading where the entire event described by the predicate happens again, and a restitutive reading where *k-ongera* ‘again’ only has scope over the result state.

- (29) a. *Icy-uma cy-ongey-e gu-tyar-a.*
 7-knife 7.SBJ-again-PRFV INF-sharp-IMP
 ‘The knife is sharp again’.
 ✓: Restitutive Reading (originally a sharp knife that became dulled, and is then made sharp again)
 ✓: Repetitive Reading (someone sharpened it before)
- b. *I-shati y-∅-ongey-e ku-ba umw-eru.*
 9-shirt 9.SBJ-PST-again-PRFV INF-be 3-white

³When the main verb is marked for the perfective, the construction with *gu-hora* ‘always’ has a perfect reading; this contrasts with the imperfective, where the reading is a present habitual.

‘The shirt is white again.

√: Restitutive Reading (originally a white shirt that became grey, and it was made white again)

√: Repetitive Reading (the shirt has been changed to white for a second time)

- c. *Kyle y-∅-ongey-e ku-rakar-a.*
Kyle 1.SBJ-PST-again-PRFV INF-angry-IMP

‘Kyle is angry again.’

√: Restitutive Reading (Kyle was always angry but stopped, and now is back to that state)

√: Repetitive Reading (Kyle became angry before and is angry again)

- (30) a. *In-yama z-∅-ongey-e zi-ra-konjorok-a.*
10-meat 10.SBJ-PST-again-PRFV 10.SBJ-NON.PST-thaw-IMP

‘The meat thawed again.’

#: Restitutive Reading (the meat was frozen and is thawed for the first time)

√: Repetitive Reading (the meat thawed, froze, and thawed again)

- b. *Igi-kombe cy-∅-ongey-e gu-saduka.*
7-cup 7.SBJ-PST-again-PRFV INF-crack

‘The cup cracked again.’

#: Restitutive Reading (it was cracked from its inception and now its back to being cracked)

√: Repetitive Reading (it became cracked, was fixed, and now it’s cracked again)

- c. *Umu-gabo y-∅-ongey-e gu-pfa.*
1-man 1.SBJ-PST-again-PRFV INF-die

‘The man died again.’

#: Restitutive Reading (the man was always dead, resurrected, and died again)

√: Repetitive Reading (the man died, was resurrected, and died again)

For many result predicates, the preferred reading with *k-ongera* ‘to do again’ is neither a repetitive nor restitutive reading, but rather a recurring incremental change reading where the event happens once, and then the event happens again, but crucially it builds upon the previous change.

- (31) a. *In-dabo z-∅-ongey-e ku-raby-a.*
10-flowers 10.SBJ-PST-again-PRFV INF-sprout-IMP
‘The flowers sprouted again.’ (the flowers sprouted and then sprouted some more)
- b. *Uru-papuro rw-∅-ongey-e gu-c-ik-a.*
11-paper 11.SBJ-PST-again-PRFV INF-tear-STAT-IMP
‘The paper ripped again.’ (the paper ripped some and then ripped some more)
- c. *Igi-kombe cy-∅-ongey-e gu-shwanyuk-a.*
7-cup 7.SBJ-PST-again-PRFV INF-break-IMP
‘The cup broke again.’ (the cup had a small crack and then broke some more)

The readings of the sentences in (31) are crucially not restitutive since the event is not returning the theme to an original state; this suggests that the change entailment is indeed part of the root. The lexical entailments of different result roots and *again*-modification show that roots differ in whether they entail a change. From these diagnostics, I conclude that, contra the BTR, change is entailed by result roots.

4. Root-determination of Derivational Strategies. In this section I show that the derivational strategy of causative-inchoative pairs partially correlates with root meaning. First I show that there is a restriction of the stative morpheme as to which predicates it can appear with, and second, I show that the meaning of the verb root conditions the interpretation of the morpheme *-esh*. This is problematic for the BTR since root meaning should not affect the contribution of a particular template.

4.1 THE STATIVE MORPHEME AND RESULT ROOTS. Recall from above that the stative morpheme *-ek* acts as a marker of the inchoative (among other uses, see §4.2 and Jerro 2017). One generalization is that *-ek* never productively appears with property concept roots on the anticausative reading, but only with a subset of result roots, specifically cooking verbs (*gu-tek-ek-a* ‘to be cooked’, *gu-karang-ik-a* ‘to be fried’), breaking verbs (*ku-men-ek-a* ‘to be broken’, *gu-hond-ek-a* ‘to be crushed’), and the verb *kw-angiza* ‘to destroy’.

(32)

<i>Inchoative</i>	<i>Causative</i>	<i>Gloss</i>
gu-tek- ek -a	gu-teka	‘cook’
gu-karang- ik -a	gu-karanga	‘fry’
ku-men- ek -a	ku-mena	‘break’
gu-hond- ek -a	gu-honda	‘crush’
kw-angir- ik -a	kw-angiza	‘destroy’
gu-c- ik -a	gu-ca	‘tear’
ku-vun- ik -a	ku-vuna	‘break/snap’
ku-gond- ek -a	ku-gond-a	‘bend’

The detransitivizer *-ek* only occurs with a subset of verbs which entail a change. Thus result roots not only have change entailments, but the root also conditions the derivational strategy of the paradigm. In other words, the entailment of change in certain roots partially determines the derivational strategy, which is additional evidence against the BTR.

4.2 ADDITIONAL RESTRICTIONS OF *-ek*. The *-ek* morpheme has only recently been studied in Kinyarwanda. I give a brief description of the other uses of *-ek*. The imperfective with the conditional morpheme or the non-past past morpheme has a ‘potential reading’.⁴

- (33) a. *Igi-kombe cy-a-men-ek-a.*
 7-cup 7.SBJ-COND-break-STAT-IMP
 ‘The cup might break.’
- b. *Igi-kombe ki-ra-men-ek-a.*
 7-cup 7.SBJ-NON.PST-break-STAT-IMP
 ‘The cup can break.’

⁴The term ‘potential’ comes from the Bantuist literature on this particular morpheme, but arguably this is actually a middle construction (Keyser and Roeper 1984, Stroik 1992, Ackema and Schoorlemmer 2005).

Another interesting restriction is that the reading is partially determined by the verb. For example, the verb *ku-rya* ‘to eat’ in (34) only allows the potential reading.

- (34) a. *Umu-gati w-a-r-ik-a.*
 3-bread 3.SBJ-COND-eat-STAT-IMP
 ‘The bread is edible.’ Potential
- b. **Umu-gati w-a-r-its-e.*
 3-bread 3.SBJ-PST-eat-STAT-PRFV
 Intended: ‘The bread got eaten.’ Inchoative
- c. **Umu-gati u-ra-r-its-e.*
 3-bread 3.SBJ-NON.PST-eat-STAT-PRFV
 Intended: ‘The bread is eaten.’ Stative

While I leave an analysis of these facts for future research, it is relevant here that the templatic contribution of *-ek* is determined by both tense and aspect of the clause and crucially the verb root, an unexpected fact given the BTR. On most views of event structure, root meaning should not condition the contribution of the template.

4.3 ROOT-CONDITIONING OF THE SYNCRETISTIC *-esh* MORPHEME. The morpheme *-esh* functions as both an instrumental applicative and morphological causative (Kimenyi 1980), though the function is conditioned in part by whether the root entails an instrument (Jerro to appear). This provides additional evidence that the meaning of the root restricts the availability of particular forms. With many verbs, both readings are possible, as in (36).

- (35) *Habimana y-a-men-a igi-kombe.*
 Habimana 1.SBJ-PST-break-IMP 7-cup
 ‘Habimana broke the cup.’
- (36) a. *Habimana y-a-men-esh-eje umw-ana igi-kombe.*
 Habimana 1.SBJ-PST-break-ISH-PRFV 1-child 7-cup
 ‘Habimana made the child break the cup.’
- b. *Habimana y-a-men-esh-eje igi-kombe in-koni.*
 Habimana 1.SBJ-PST-break-ISH-PRFV 7-cup 9-stick.
 ‘Habimana broke the cup with a stick.’

In Jerro (to appear) I propose that the different causative and instrumental readings derive from underspecification of the position of the new link in the causal chain. However, certain verbs do not permit the causative reading due to a verb-specific restriction on the causal chain. Specifically, verbs which entail the use of an instrument, such as *gu-kata* ‘to cut’ in (37), do not permit the causative reading.

- (37) #*Umu-silikari y-a-kat-ish-ije umw-ana igi-ti.*
 1-soldier 1.SBJ-PST-cut-ISH-PRFV 1-child 7-tree
 Intended: ‘The soldier made the child cut the tree.’

In Jerro (to appear) I argue that *-esh* has the effect of bringing out the instrument entailed by (but not licensed by) the meaning of instrument verbs like *gu-kata* ‘to cut’, which restricts the

possible orders of the causal chain. These data bear on the question of root meaning in that this is evidence that the meaning of the root determines the contribution of the template. As with *-ek*, the interpretation of *-esh* should not be determined by the root given the BTR.

5. Conclusions and Directions for Future Work. I have shown that the root of a change of state verb is crucial to determining the morphosyntactic properties of the simple state-causative-inchoative-result state paradigms. I have argued that the available derivational strategies are determined by whether change is entailed by the verbal root as well as properties of the tense and aspect of the clause. Thus this study not only describes various strategies for deriving members in COS paradigms, but also provides further cross-linguistic evidence that verbal roots themselves can entail change. The ability for verbal roots to entail change provides an explanation for the absence of certain simple state paradigm members.

This study opens up several areas for future work. First, recall the absence of any clear derivational relationship between simple state and result readings in Kinyarwanda statives. The question for future research is how this arises. A possible analysis is that the simple state is basic and a result reading can arise via coercion, as proposed for Tongan in Koontz-Garboden (2007). Second, there are several interesting questions related to tense and especially aspect in the language, such as how the perfective aspect gives rise to perfect and stative readings. Third, how is it that aspect interacts with the stative morpheme *-ek* to rule in and out certain readings with certain verbs? Finally, what is the nature of the *-ek* morpheme more broadly? In particular are the potential, stative, and inchoative readings derivable from a single semantics? Jerro (2017) analyzes *-ek* as a middle marker which reduces the semantic valence by one and the different readings arise from different ways of interpreting the open variable, but an alternative account is that *-ek* marks a state, and the variety of readings arise via coercion.

References

- Ackema, Peter and Maaike Schoorlemmer. 2005. Middles. In M. Everaert and H. van Riemsdijk, eds., *The Blackwell Companion to Syntax, vol. III*, pages 131–203. Oxford: Blackwell.
- Arad, Maya. 2005. *Roots and Patterns: Hebrew morpho-syntax*. Dordrecht: Springer.
- Beavers, John, Michael Everdell, Kyle Jerro, Henri Kauhanen, Andrew Koontz-Garboden, Elise LeBovidge, and Stephen Nichols. 2017. Two types of states: A cross-linguistic study of change-of-state verb roots. Presentation at the Linguistic Society of America Annual Meeting 2017.
- Beavers, John and Andrew Koontz-Garboden. 2012. Manner and result in verbal meaning. *Linguistic Inquiry* 43(331-369).
- Beavers, John and Andrew Koontz-Garboden. 2016. The semantic contribution of idiosyncratic roots to ditransitive verbs. In C. Brendel, A. Kaplan, A. Kaplan, M. McCarvel, J. Pynes, and E. Rubin, eds., *Proceedings of the 34th West Coast Conference on Formal Linguistics*. Cascadilla Proceedings Project.
- Borer, Hagit. 2005. *The normal course of events*. Oxford: Oxford University Press.
- Botne, Robert. 1983. On the notion of “inchoative verb” in Kinyarwanda. In F. Jouannet, ed., *Le Kinyarwanda, langue bantu du Rwanda: études linguistiques*, pages 149–180. Paris: Société d’études linguistiques et anthropologiques de France.
- Coupez, André. 1980. *Abrégé de grammaire rwanda*. Butare, Rwanda: INRS.
- Dixon, R. M. W. 1982. *Where have all the adjectives gone?: and other essay in semantics and syntax*, vol. 107. Walter de Gruyter.

- Dubinsky, Stanley and Silvester Ron Simango. 1996. Passive and stative in Chichewa: Evidence for modular distinctions in grammar. *Language* 72(4):749–781.
- Dunbar, Ewan and Alexis Wellwood. 2016. Addressing the “two interface” problem: Comparatives and superlatives. *Glossa: A Journal of General Linguistics* 1(1):1–29.
- Embick, David. 2004. On the structure of resultative participles in English. *Linguistic Inquiry* 35:355–392.
- Embick, David. 2009. Roots, states, and stative passives. Talk given at the 2009 Roots Workshop, Stuttgart.
- Jerro, Kyle. 2016. *The Syntax and Semantics of Applicative Morphology in Bantu*. Ph.D. thesis, University of Texas at Austin.
- Jerro, Kyle. 2017. The stative morpheme in Kinyarwanda. In *The 48th Annual Conference on African Linguistics*. Indiana University, Bloomington.
- Jerro, Kyle. to appear. The causative-instrumental syncretism. *Journal of Linguistics* 54.
- Keyser, Samuel and Thomas Roeper. 1984. On the middle and ergative constructions in English. *Linguistic Inquiry* 15:381–416.
- Kimenyi, Alexandre. 1973. *Tense-aspect modality systems in English and Kinyarwanda*. Master’s thesis, UCLA.
- Kimenyi, Alexandre. 1980. *A Relational Grammar of Kinyarwanda*. University of California Press.
- Kimenyi, Alexandre. 2006. Kinyarwanda. In *Encyclopedia of Language and Linguistics*, pages 217–223. Elsevier, 2nd edn.
- Koontz-Garboden, Andrew. 2007. Aspectual coercion and the typology of change of state predicates. *Journal of Linguistics* 43:115–152.
- Koontz-Garboden, Andrew and John Beavers. 2016. Change of state verbs and the semantics of roots. In C. Brendel, A. Kaplan, A. Kaplan, M. McCarvel, J. Pynes, and E. Rubin, eds., *Proceedings of the 34th West Coast Conference on Formal Linguistics*. Somerville, MA: Cascadilla Proceedings Project.
- Kratzer, Angelika. 2000. Building statives. *Proceedings of the Twenty-Sixth Annual Meeting of the Berkeley Linguistics Society* pages 385–399.
- Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.
- Mchombo, Sam. 1993. A formal analysis of the stative construction in Bantu. *Journal of African Languages and Linguistics* 14:5–28.
- Ngoboka, Jean Paul and Jochen Zeller. 2017. The conjoint/disjoint alternation in Kinyarwanda. In J. Van der Wal and L. Hyman, eds., *The conjoint/disjoint alternation in Bantu*, pages 350–389. Berlin: Mouton de Gruyter.
- Seidl, Amanda and Alexis Dimitriadis. 2003. Statives and reciprocal in Swahili. *Typologie des langues d’Afrique et universaux de la grammaire* 1:239–284.
- Stroik, Thomas. 1992. Middles and movement. *Linguistic Inquiry* 23:127–137.
- Valle, Daniel, John Beavers, and Andrew Koontz-Garboden. 2017. Presentation at the Society for the Study of the Indigenous Languages of the Americas. State and change-of-state in Kakataibo: The role of the root.

Appendix: Verb Roots. Verbs are marked by the infinitive *ku-* or its allomorphs. Adjectives are preceded by a front-slash (/). Nouns are not annotated for morpheme boundaries.

English Gloss	Table 1: Result Roots			
	Simple State	Inchoative	Causative	Result State
burned/burn		gu-shiririra	gu-shiririza	gu-shiririra
melted/melt		gu-shonga	gu-shongesha	
congeal		gu-fata	gu-fatisha	gu-fata
decayed/decay, rotten/rot		ku-bora	ku-boza	
swollen/swell			ku-byimbisha	ku-byimba
grown/grow		gu-kura	gu-kuza	
bloomed/bloom		ku-bumbura		ku-bumbura
wilted/wilt		ku-raba	ku-rabiza	ku-raba
withered/wither		ku-raba	ku-rabiza	ku-namba
sprouted/sprout		gu-tunguka		gu-tunguka
tarnished/tarnish		gu-koboka		
roast/roasted			k-otsa	
cook/cooked			gu-teka	gu-tek-ek-a
fry/fried		gu-karang-w-a	gu-karanga	gu-karang-ik-a
broken/break		ku-men-ek-a	ku-mena	ku-men-ek-a
cracked/crack		gu-saduka	gu-satura	
crushed/crush		gu-hond-ek-a	gu-honda	gu-hond-ek-a
shattered/shatter		gu-shwanyuka	gu-shwanyura	
torn/tear, ripped/rip		gu-c-ik-a	gu-ca	gu-c-ik-a
snapped/snap		ku-vun-ik-a	ku-vuna	ku-vun-ik-a
bent/bend		ku-gonda	ku-gonda	ku-gond-ek-a
folded/fold			gu-hina	
wrinkled/wrinkle		kw-ihinarika	gu-hinarika	
dead/killed/kill		gu-pfa	kw-ica	gu-pfa
drowned/drown		ku-rohama	kw-ibiza	ku-rohama
destroyed/destroy, ruined/ruin		kw-angir-ik-a	kw-angiza	kw-angir-ik-a
go up		ku-zamuka	ku-zamura	
go down		ku-manuka	ku-manura	
differing/differ		gu-tandukanya	gu-tandukanya	
come/came		ku-za	ku-zana	
gone/go		ku-genda	ku-jyana	
go in (entered/enter)		kw-injira	kw-injiza	
go out (exited/exit)		gu-sohoka	gu-sohoro	
returned/return		gu-subira	gu-subiza	

Table 2: Property Concept Roots

English Gloss	State (Simple/Result)	Inchoative	Causative
large/big/enlarge	/nini	kw-iyongera	k-ongera
small/shrunk/shrink	/toya		ku-gabanya
short/shorten	/gufi	kw-ihina	ku-gabanya
long/lengthen	/re-re	kw-iyongera	k-ongera
deep/deepen	/re-re	gu-tebera	k-ongera
wide/widen	/gari	kw-iyongera	k-ongera
tall/height/heighten	/-re-re	ku-bara -re-re	k-ongera
aged/age	gu-saza	gu-saza	
bad/worse/worsen	/bi	ku-bara mbikurushaho	
good/improved/improve	/iza	kw-iyongera	
white/whiten	kw-era		
white/whiten	umweru	gu-hinduka umweru	
black/blacken	umukara	gu-hinduka umukara	
red/redden	umutuku	gu-hinduka umutuku	
green/make green	icyatsi	gu-hinduka icyatsi	
blue/make blue	ubururu	gu-hinduka ibururu	
brown/make brown	ikaki	gu-hinduka igitaka	
cold/make cold	gu-konja	gu-konja	gu-konjeshya
hot/heat up	gu-shyuha	gu-shyuha	gu-shyushya
dirty/dirty	umwanda		
dirty/dirty	kw-andura	kw-andura	kw-anduza
dry/dry	ku-ma	ku-ma	ku-misha
wet/wetten	gu-toha	gu-toha	gu-tosa
straight/straighten	ku-gororoka		ku-gorora
hard/harden	gu-komera	gu-komera	
soft/soften	k-orooha	k-orooha	k-oroheza
clean/clean	gu-sukura	gu-sukura	gu-sukura
sharp/sharpen (a point)	gu-songora		gu-songora
sharp/sharpen	gu-tyara	gu-tyara/gu-tyaza	gu-tyaza
sweet/sweeten	ku-ryoha	ku-ryoha	ku-ryoheza
strong/strengthen	gu-komera	gu-komera	gu-komeza
fast/speed up	kw-ihuta	k-ongera umuvuduko	kw-ihutisha
slow/slow down	buhoro	ku-gabanya umuvuduko	
angry/anger	ku-rakara	ku-rakara	ku-rakaza
calm/calmed	kw-ikaruma	kw-ikaruma	gu-karumisha
frightened/frighten	gu-tinya	gu-tinya	gu-tinyisha
sick/sicken	ku-rwara	ku-rwara	
sad/sadden	ku-babara	ku-babara	ku-babaza
hurt/hurt	ku-babara	ku-babara	ku-babaza
tired/tire	ku-nanirwa	ku-nanirwa	ku-naniza
entertained/entertain	ku-nezerwa	ku-nezerwa	ku-nezeza
surprised/surprise	gu-tungurwa	gu-tungurwa	gu-tungura
worried/worry	ubwoba		
pleased/please	kw-ishima	kw-ishima	gu-shimisha