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Applicativization and Root-Sensitivity in Argument Alternations
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1 Introduction

- Two fundamental questions in the study of verb meaning are (a) what are the basic building blocks of verb meaning and (b) how is a verb's meaning related to its grammatical properties?

- A long-standing mainstay in studying these questions (Lakoff 1965, Fillmore 1968, 1970) are argument alternations, wherein a single verb occurs in multiple argument frame:

  (1) a. Sandy sent Mary a book.   (IO construction)
       b. Sandy sent a book to Mary.   (*to* construction)

- Event structural approaches have been especially successful in modeling alternations (Lakoff 1965, Dowty 1979, Rappaport Hovav & Levin 1998, Harley 2003, 2012, *inter alia*).

  – Verbs meanings are decomposed into components event structures consisting of:
    (a) A skeletal event template defining the broad temporal and causal contours of the event that groups verbs into classes and determines their grammatical properties.
    (b) An idiosyncratic root naming real world actions or states that individuates verbs within a class and determines the verb's idiosyncratic morphology.
  – Argument alternations reflect the same root in two distinct templates (see e.g. Rappaport & Levin 1988 for an early defense, and Beavers 2010 for a critique).

- Using syntactic decompositions, Harley (2003) decomposes ditransitives into v_{cause} with a manner root modifier and PP defining possession or co-location (cf. Pylkkänen 2008):

(2) a.
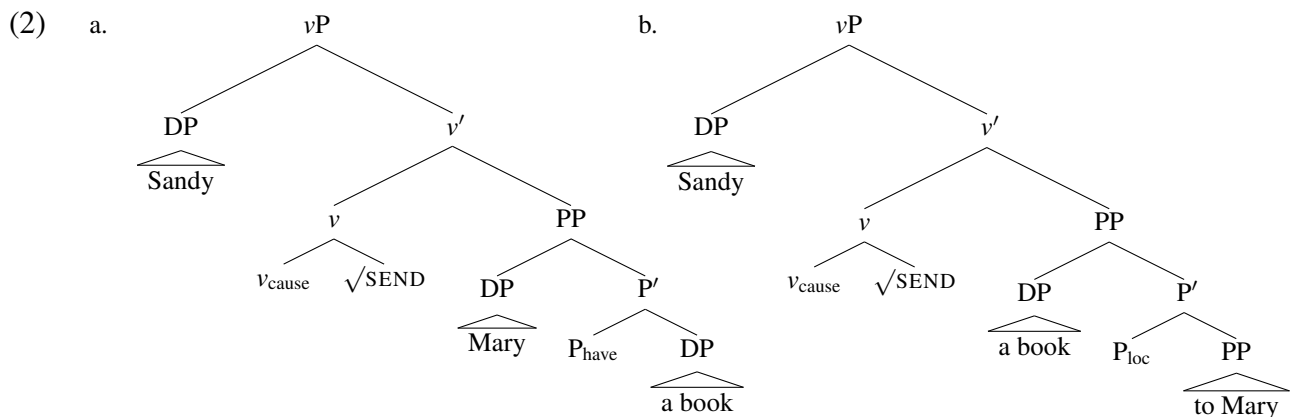
- These structures explain the alternation, but also why (1) allow different non-theme complements (the *London Office* effect), plus they predict the well-known asymmetric binding relations via asymmetric c-command c-command facts (Barss & Lasnik 1986, Larson 1988):

  (3) a. Sandy sent a letter to London.   b. #Sandy sent London a letter.
  (4) a. Sandy sent [every owner]$_i$ [her$_i$ check]/[every check]$_i$ [to [its$_i$ owner]].
       b. *Sandy sent [its$_i$ owner] [every$_i$ check]/[her$_i$ check] [to [every$_i$ owner]$_i$].

- However, there are some known issues. First, not all roots of the same semantic type show the same alternations, e.g. *carry* verbs rarely allow IOs (Bresnan & Nikitina 2009):

  (5) a. Jim threw/carried a ball to his friend.
       b. Jim threw/??carried his friend a ball.

- Second, the meaning of an alternation can vary depending on the root (Rappaport Hovav & Levin 2008 call this "verb-sensitivity"; I use "root-sensitivity"). For example, while caused possession IO constructions have possession as a component, with *to* it depends on the root:

  (6) a. #Kim mail/sent/threw/gave/bequeathed/loaned London a book.
       b. Kim mail/sent/threw/#gave/#bequeathed/#loaned a book to London.

∴ The two alternants are synonymous with *give* but not with *throw*.

- Furthermore, whether receiving/arriving occurs depends on the root:

  (7) a. Kim sent/mailed/#gave/#loaned John a book, but he never received it.
       b. Kim threw/hurled/#carried/#took a ball to left field, but it never got there.

- Rather, the possession that gives rise to the "London Office" effect when it arises in most cases is just "prospective" (Gropen et al. 1989, Beavers 2011) (ditto for prospective arrival).

- However, most roots that do not entail actual receiving/arriving *do* entail loss by the agent:

  (8) a. #Kim threw/hurled/sent/mailed John a ball, but it never left her hands.
       b. #Kim threw/hurled/sent/mailed a ball to John, but it never left her hands.

∴ Roots determine what each template means (and these are just a smattering of the effects).

- There have been various proposals to address such issues within event structural approaches:

  - Roots may fall into semantic classes (e.g. Rappaport Hovav & Levin 1998, Arad 2005, Alexiadou et al. 2006, Levinson 2007) or come with specific features (e.g. Ramchand 2008) that constrain what templates they occur in (due to some realization principles).
  - Templates may be polysemous depending on what roots they occur with (Wood & Marantz 2015, Myler 2016), which could allow roots to control alternation meaning.

- In my own work (Beavers 2010, following Dowty 1991, Ackerman & Moore 2001) I abandoned event structures, seeking direct correlates between a verb's truth conditions and argument structure, though accepting that event structures have a place for other phenomena. I basically left it at that (e.g. Beavers & Zubair 2013, 2016, Beavers and Udayana in revision).

- But in subsequent, independent work, Beavers & Koontz-Garboden (2020) and Beavers et al. (to appear) have developed a theory wherein roots may entail templatic meaning (contra e.g. Arad 2005, Embick 2009, Dunbar & Wellwood 2016). The verb's meaning derives from how potentially overlapping meanings interact through regular compositional processes.

- These compositional interactions may result in subsumption, augmentation, and misalignment in ways that could explain root-sensitivity with no (or few) additional conditions, something Beavers & Koontz-Garboden show can derive facts like those above for English dative alternations (see also Green 1974, Oehrle 1976, Goldberg 1995, Beavers 2011).

- However, the limited availability of English IO templates means that root-sensitivity effects could alternatively just reflect idiosyncratic lexicalization, and not a general theory.

- Today I present recent work on ditransitives in Kinyarwanda (Rwanda; Bantu), where IOs correspond to applied objects (AO) of applicative *–ir* (see e.g. Kimenyi 1980, Jerro 2016b):[1]

    (9) a. *Nkusi y-a-juguny-e   umu-pira.*
            Nkusi 1S-PST-throw-PRFV 3-ball
            'Nkusi threw the ball.'

        b. *Nkusi y-a-juguny-iy-e   Karemera umu-pira.*
            Nkusi 1S-PST-throw-APPL-PRFV Karemera 3-ball
            'Nkusi threw Karemera the ball.'

- The processes for deriving ditransitives in Kinyarwanda are much more productive than in English, and exhibit considerably more root-sensitivity. Yet nonetheless they show many of the same fundamental patterns. This better justifies the need for a general theory of how roots and templates interact semantically in determining argument alternation patterns.

- I will first sketch the framework of analysis and show its utility for English, before moving on to the Kinyarwanda data and how this theory of roots can help explain its properties.

- I will utilize syntactic decompositions as per (2), though this is for expository convenience in outlining a compositional analysis. Event structures can be lexical or non-phrase structural constructions, and the conclusions here apply equally well to any such framework.

2 Analyzing English Ditransitives

- Putting all the above pieces together, Beavers & Koontz-Garboden (2020) (see also Beavers 2011) argue that the IO and *to* templates have weak meanings, and roots fill in the details:

    (10) a. IO template: caused prospective receiving

        b. *to* template: caused prospective receiving or prospective arriving

- We analyze prospectivity as sublexical modality (Koenig & Davis 2001, Beck & Johnson 2004, Beavers 2011). Specifically, following work in non-culmination (Koenig & Muan-suwan 2000, Bar-el et al. 2005, Tatevosov 2008, and Martin & Schäfer 2012, 2017, Beavers & Lee 2020), we assume a modal $\Box_B$ in v_{cause}, where the modal base B of the modal might contain the reference world w (e.g. the real world w_o), but not necessarily:

    (11) $[\![v_{\text{cause}}]\!] = \lambda P \lambda x \lambda v[agent'(x, v) \wedge \Box_B \exists s[cause'(v, s) \wedge P(s)]]$

- Following Beavers (2011:31) we divide changes-of-state into monadic changes and dyadic changes defined relative to another participant. Beavers implements this in a scalar model of change; for expository purposes we suppress the scales, defining two dyadic states:

    (12) a. $\mathbf{broken}'(y, s)$ b. $have'(y, z, s)$ ("z has y in s")   c. $at'(y, z, s)$ ("y is at z in s")

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[1]Vowel harmony determines the quality of the applicative's vowel (*e* vs. *i*), and the perfective suffix causes conso-nant mutations at the end of the verbal stem, which often turns /–ir/ to /–ij/ (represented orthographically as "iy").

- P_{have} entails possession, while P_{loc} generalizes over location and possession. We represent this by defining a relation R' defined disjunctively for all y, z, s:

  (13)   a. $[\![P_{have}]\!] = \lambda y \lambda z \lambda s [have'(y, z, s)]$

  b. $[\![P_{loc}]\!] = \lambda z \lambda y \lambda s [R'(y, z, s)]$, where $\forall y \forall z \forall s [R'(y, z, s) \leftrightarrow have'(y, z, s) \vee at'(y, z, s)]$.

- The next question is what the meanings of the roots are and how they are combined into these templates. Crucially, ditransitive roots define a manner M' for causer x plus also possibly information Q' about the templatic result predicate's theme y and goal/recipient z.

- To get the goal/recipient out of the PP complement with meaning P we define functions th' and rg' that take the result predicate P and pick out the unique theme and result/goal respectively entailed by P, assuming uniqueness of participants (Krifka 1998:209, (41)):

  (14)   a. $\forall P \forall v [th'(v, P) = \iota y \forall s \Box [cause'(v, s) \wedge P(s)] \to \exists z [R'(y, z, s)]]$
  "$th'(P)$ is the theme of any P state caused by v"

  b. $\forall P \forall v [rg'(v, P) = \iota z \forall s \Box [cause'(v, s) \wedge P(s)] \to \exists y [R'(y, z, s)]]$
  "$rg'(P)$ is the recipient/goal of any P state caused by v."

- We will assume the root has a denotation that is the same type as v_{cause}, applying manner M' and information Q' over the relevant participants (ignore vacuous abstraction over x):

  (15) $[\![\sqrt{\text{ROOT}}]\!] = \lambda P \lambda x \lambda v [Q'(th'(v, P), rg'(v, P)) \wedge M'(v)]$

- Head-adjunction has the semantics in (16) (cp. Kratzer 1996: 121-122):

  (16) $[\![[_v \, v_{cause} \, \sqrt{\text{ROOT}} \,]]\!] = \lambda P \lambda x \lambda v [[\![v_{cause}]\!](P, x, v) \wedge [\![\sqrt{\text{ROOT}}]\!](P, x, v)]$

- Applying (16) to predicates projected by (13a,b) derives the templatic meanings in (17) for specific causer $\mathbf{x}$, theme $\mathbf{y}$, and recipient/goal $\mathbf{z}$, substituting the outputs of th' and rg' (root meanings here and below are underlined):

  (17)   a. $[\![[_{vP} \, DP_x \, [_{v'} \, [_v \, v_{cause} \, \sqrt{\text{ROOT}} \,] \, [_{PP} \, DP_z \, [_{P'} \, P_{have} \, DP_y \,] \,] \,]]\!] =$
  $\lambda v [agent'(\mathbf{x}, v) \wedge \Box_B \exists s [cause'(v, s) \wedge have'(\mathbf{y}, \mathbf{z}, s)] \wedge Q'(\mathbf{y}, \mathbf{z}) \wedge \underline{M'(v)}]$
  "Causer $\mathbf{x}$ of event v with manner M' possibly causes a state s of $\underline{\mathbf{z} \text{ having } \mathbf{y}}$, plus some condition Q holds between $\mathbf{z}$ and $\mathbf{y}$."

  b. $[\![[_{vP} \, DP_x \, [_{v'} \, [_v \, v_{cause} \, \sqrt{\text{ROOT}} \,] \, [_{PP} \, DP_y \, [_{P'} \, P_{loc} \, PP_z \,] \,] \,]]\!] =$
  $\lambda v [agent'(\mathbf{x}, v) \wedge \Box_B \exists s [cause'(v, s) \wedge R'(\mathbf{y}, \mathbf{z}, s)] \wedge Q'(\mathbf{y}, \mathbf{z}) \wedge \underline{M'(v)}]$
  "Causer $\mathbf{x}$ of event v with manner M' possibly causes a state s $\underline{\text{of } \mathbf{y} \text{ being } R'}$-related to $\mathbf{z}$, plus some condition Q holds between $\mathbf{z}$ and $\mathbf{y}$."

- Now we just need root meanings. We propose that $\sqrt{\text{GIVE}}$ has the denotation in (18), where $\Box_{B_w}$ has modal base $B_w = B \cup \{w\}$, ensuring the event must occur at the reference world.

  (18) $[\![\sqrt{\text{GIVE}}]\!] = \lambda P \lambda x \lambda v [\Box_{B_w} \exists s [cause'(v, s) \wedge have'(th'(v, P), rg'(v, P), s)] \wedge \mathbf{giving'}(v)]$

- We derive a meaning for *Mary gave John the book* as in (19).

  (19) $\exists v[agent'(\mathbf{m}, v) \wedge \square_B \exists s[cause'(v, s) \wedge have'(\mathbf{b}, \mathbf{j}, s)] \wedge \underline{\square_{B_w} \exists s[cause'(v, s) \wedge have'(\mathbf{b}, \mathbf{j}, s)]} \wedge$
  $\underline{\mathbf{giving'}(v)]}$

- Since actual receiving entails prospective receiving (i.e. since $\square_{B_w} P$ entails $\square_B P$ it follows that $[\square_B P \wedge \square_{B_w} P]$ is equivalent to $\square_{B_w} P$), then (19) is equivalent to (20), the right result.

  (20) $\exists v[agent'(\mathbf{m}, v) \wedge \underline{\square_{B_w} \exists s[cause'(v, s) \wedge have'(\mathbf{b}, \mathbf{j}, s)]} \wedge \mathbf{giving'}(v)]$

- Key is that the root-entailed result is strictly stronger than the IO template's, and thus the root monotonically strengthens what would be entailed by the template to actual having.

- Furthermore, the result entailed by the root also subsumes that of the *to* template as well (since for all y, z, s $have'(y, z, s)$ entails $R'(y, z, s)$). Thus analogously to above, the meaning of *Mary gave a book to John* will ultimately resolve to the same meaning as in (20):

  (21) $\exists v[agent'(\mathbf{m}, v) \wedge \square_B \exists s[cause'(v, s) \wedge R'(\mathbf{b}, \mathbf{j}, s)] \wedge \underline{\square_{B_w} \exists s[cause'(v, s) \wedge have'(\mathbf{b}, \mathbf{j}, s)]} \wedge$
  $\underline{\mathbf{giving'}(v)]} = \exists v[agent'(\mathbf{m}, v) \wedge \underline{\square_{B_w} \exists s[cause'(v, s) \wedge have'(\mathbf{b}, \mathbf{j}, s)]} \wedge \mathbf{giving'}(v)]$

- Conversely, if the root does not itself entail prospective possession, then the templates will derive distinct readings because the IO template *will* introduce it while the *to* template won't. For example, $\sqrt{\text{THROW}}$ entails possible arrival and actual leaving, but no possession:[2]

  (22) $[\![\sqrt{\text{THROW}}]\!] = \lambda P \lambda x \lambda v[\square_{B_w} \exists s[cause'(v, s) \wedge not.at'(th'(v, P), x, s, v)] \wedge \square_B \exists s[cause'(v, s) \wedge$
  $at'(th'(v, P), rg'(v, P), s)] \wedge \mathbf{throwing'}(v)]$

- A root's meaning may also conflict with that of a template — Beavers & Koontz-Garboden (2020:148-150) argue that the type of manner embodied in *carry* conflicts with the possession in the IO template, degrading acceptability (but not ruling it out).

∴ The potential for overlap in root and template meaning derives root-sensitivity and rules out certain root+template combinations, albeit merely as a result of what individual roots mean and standard compositional processes.

- But the IO template in English *is* limited, occurring with roots that indicate manners of caused possession (and creation verbs on a beneficiary reading). These data could be written off as lexicalized quirks. Kinyarwanda *–ir* AOs are much more productive.

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[2]For ease of exposition I have defined leaving as a caused $not.at'$ state, where $\forall x \forall y \forall e \forall s[not.at'(y, x, s, e) \leftrightarrow [at'(y, x, init'(e)) \wedge \exists z[at'(y, z, s) \wedge z \neq x]]]$.

3 The Similarity of English IOs and Kinyarwanda AOs

- English IOs and Kinyarwanda –*ir* AOs share some core features. AOs with caused possession verbs must be animate (e.g. *Kigali* is disallowed unless interpreted as "The Kigali Office"):

  (23)   a. *Nkusi y-a-juguny-*(iy)-e   Karemera umu-pira.*
             Nkusi 1S-PST-throw-APPL-PRFV Karemera 3-ball
             'Nkusi threw Karemera the ball.'

         b. *#Nkusi a-ri-mo   ku-junguy-ir-a   umu-pira i Kigali.*
             Nkusi 1S-COP-LOC INF-throw-APPL-IMP 3-ball   23 Kigali
             'Nkusi throwing the ball to Kigali.'

- Second, AOs asymmetrically c-command thematic objects (TOs) just as English IOs to DOs (which is surprising because Kinyarwanda is a famously symmetric language where AOs and TOs share objecthood properties; see e.g. Kimenyi 1980 and Jerro 2016b:172ff for more):

  (24)   a. *N-a-juguny-iy-e   buri mu-gabo uru-funguzo rwe.*
             1SGS-PST-throw-APPL-PERF every 1-man   11-key   11.his
             'I threw each man his key.'

         b. **N-a-juguny-iy-e   buri ru-funguzo umu-gabo wayo.*
             1SGS-PST-throw-APPL-PERF every 11-key   1-man   1.its
             'I threw each key to its man.'

         c. *?N-a-juguny-iy-e   im-funguzo ze   buri mu-gabo.*
             1SGS-PST-throw-APPL-PERF 10-key   10.his every 1-man
             'I threw his keys to each man.'

         d. **N-a-jugun-iy-e   umu-gabo wayo buri ru-funguzo.*
             1SGS-PST-throw-APPL-PERF 1-man   1.its every 11-key
             'I threw every key to its man.'

∴ This suggests an equivalence of AOs and IOs, justifying apples-to-apples comparison.

- The root of interest to us are change-of-state roots (25a) plus the translation equivalents of the English caused possession ditransitives of Gropen et al. (1989) and Pinker (1989) (25b-h).

  (25)   a. **Verbs of change-of-state**: *kumena* 'break', *gusenyuka* 'destroy', *kuvuna* 'snap (break)'

         b. **Verbs that inherently signify acts of giving:** *guha* 'give', *guhereza* 'hand/pass', *gutiza* 'lend', *kugabura* 'serve'

         c. **Verbs of sending:** *kohereza* 'send', *gutuma* 'send someone'

         d. **Verbs of instantaneous causation of ballistic motion (Verbs of throwing):** *gutera* 'throw', *kujugunya* 'throw'

         e. **Verbs of continuous causation of accompanied motion in a deictically specified direction:** *kuzana* 'bring', *kujyana* 'take'

         f. **Verbs of future having:** *kuraga* 'leave (inheritance)', *gusiga* 'leave'

         g. **Verbs of fulfilling:** *kubitsa* 'deposit'

         h. **Verbs of continuous causation of accompanied motion in some manner:** *gusunika* 'push', *gukurura* 'pull'

4 Monotransitive Base Verbs and Applicativization

4.1 The Broad Thematic Role of the AO

- Unlike English IOs, *–ir* AOs in Kinyarwanda occur with any transitive change verb. However, with canonical change-of-state verbs (25a) the AO is a beneficiary and not a recipient:

(26)   a.   *Mukamana y-a-menny-e   (*Karemera) igi-kombe.*
            Mukamana 1S-PST-break-PRFV   Karemera 7-cup
            'Mukamana broke the cup.'

       b.   *Mukamana y-a-men-ey-e   Karemera igi-kombe.*
            Mukamana 1S-PST-break-APPL-PRFV Karemera 7-cup
            'Mukamana broke the cup on behalf of Karemera/#to Karemera'.

- A recipient AO is only licensed with certain roots, viz. translation equivalents of English caused possession ditransitives among (25b-h) (though a beneficiary AO is also possible):

(27)   a.   *Mukamana y-a-juguny-e   (*Nkusi) umu-pira.*
            Mukamana 1S-PST-throw-PRFV   Nkusi 3-ball
            'Mukamana threw the ball.'

       b.   *Mukamana y-a-juguny-iy-e   Nkusi umu-pira.*
            Mukamana 1S-PST-throw-APPL-PRFV Nkusi 3-ball
            'Mukamana threw the ball to Nkusi.'

(28)   a.   *Habimana y-a-gabuy-e   ibi-jumba   (*aba-na).*
            Habimana 1S-PST-serve-PRFV 8-sweet.potatoes   2-children
            'Habimana served sweet potatoes.'

       b.   *Gatete y-a-gabur-iy-e   ibi-jumba   aba-na.*
            Gatete 1S-PST-serve-APPL-PRFV 8-sweet.potatoes 2-children
            'Gatete served the children sweet potatoes.'

- We must demonstrate that receiving and benefiting are distinct. Applied variants of canonical change verbs are compatible with contexts with benefiting/malefiting but no receiving:

(29)   a.   [Nkusi is bound to his bed, and wants to see the beautiful mountain view outside, but there's a tree blocking the view. Karemera cuts it down and discards it.]

            Karemera y-a-kat-iy-e   igi-ti Nkusi.
            Karemera 1S-PST-cut-APPL-PRFV 7-tree Nkusi

            'Karemera cut the tree on behalf of Nkusi.'

       b.   [Karemera accidentally broke a window that belonged to Nkusi.]

            Karemera y-a-men-ey-e   Nkusi i-dirishya.
            Karemera 1S-PST-break-APPL-PRFV Nkusi 5-window

            'Karemera broke the window to the disaffection of Nkusi.'

- Conversely, the other monotransitive roots allow receiving without benefiting:

(30) a. [I need to give Nkusi a mango, but he's on the other side of the room.]

N-a-juguny-iy-e   *Habimana umw-embe ngo*
1SGS-PST-throw-APPL-PRFV Habimana 3-mango   so.that
a-wu-juguny-ir-e   *Nkusi.*
1S-3O-throw-APPL-PRFV Nkusi

'I threw the mango to Habimana so he could throw it to Nkusi.'

  b. [I need to send Nkusi a letter, but I can't send any mail internationally, so I first send it to Habimana to then send it to Nkusi]

N-∅-oher-er-ej-e   *Habimana i-barwa ngo*
1SGS-PST-send-APPL-IMB-PRFV Habimana 5-letter so.that
a-ry-oher-er-ez-e   *Nkusi.*
1S-5O-throw-APPL-IMB-PRFV Nkusi

'I send the letter to Habimana so he could send it to Nkusi.'

∴ The broad thematic role of the AO is contingent at least partly on the root.

4.2 The Syntax and Semantics of the Non-Applicativized Monotransitives

- While some non-applied monotransitives allow (presumably) oblique XPs akin to English *to* PPs, such as *ku-jugunya* 'hit' and *gu-sunika* 'push', others do not, such as *k-ohereza* 'send' (see Jerro 2016a, 2018b on the status of locative XPs in Kinyarwanda).

(31) a. *Nkusi y-a-sunits-e   in-tebe kuri Olive.*
        Nkusi 1S-PST-push-PRFV 9-chair 17   Olive

        'Nkusi pushed the chair to Olive('s location).'

  b. *Mukankusi y-a-juguny-e   umu-pira kuri Gatete.*
     Mukankusi 1S-PST-throw-PRFV 3-ball   17   Gatete
     'Mukankusi threw the ball at Gatete.'

  c. *Mukankusi y-∅-oherej-e   igi-tabo (*kuri Gatete).*
     Mukankusi 1S-PST-send-PRFV 7-book   17   Gatete

     'Mukankusi sent the book (*to Gatete).'

- Regardless, base monotransitive verbs with a recipient AO always entail that there is an implicit third participant absent the AO, e.g. the theme ends up elsewhere in (32):

(32) a. *#Nkusi y-a-juguny-e   umu-pira ariko Nkusi*
        Nkusi 1S-PST-throw-PRFV 3-ball   but   Nkusi
        a-ra-cya-wu-fit-e.
        1S-NON.PST-PERS-3O-have-PRFV
        'Nkusi threw the ball, but Nkusi still has it.'

  b. *#Nkusi y-∅-oherej-e   im-pano ariko a-ra-cya-yi-fit-e.*
     Nkusi 1S-PST-send-PRFV 9-gift   but   1S-NON.PST-PERS-9O-have-PRFV

     'Nkusi sent the gift, but he still has it.'

- Crucially, sometimes it is an implicit recipient, sometimes a goal, contingent on the root:

(33) a. [Karemera is making a fancy cake for a competition. Nobody will eat the cake, it's just going to be displayed.]

#Karemera y-a-gabuy-e cake.
Karemera 1S-PST-serve-PRFV cake

'Karemera served the cake.'

b. [Habimana is a spy and sends a microphone in a letter to record people without them knowing. There is no specific person he is sending it to]

Habimana y-∅-oherej-e i-barwa.
Habimana 1S-PST-send-PRFV 9-letter

'Habimana sent the letter.'

- Conversely, canonical change-of-state verbs do not entail a beneficiary absent the AO:

(34) *Nkusi y-a-menny-e igi-kombe.*
Nkusi 1S-PST-break-PRFV 7-cup

'Nkusi broke the cup (#to the benefit of someone else).'

∴ The roots of recipient AO verbs entail a third participant and define its role. This includes notions of co-location and possession that are supposedly templatic.

4.3 Entailments of Change of State

- Generally, with recipient AO monotransitive roots receiving by/arriving at the (contextually defined) recipient/goal is always cancelable both with and without an AO:

(35) a. [Karemera sent the letter to his school, but it got lost in the mail]

Karemera y-∅-oherej-e i-barwa
Karemera 1S-PST-send-PRFV 5-letter

'Karemera sent the letter.'

b. [Karemera sent the letter to Nkusi, but it got lost in the mail]

Karemera y-∅-oher-er-ej-e i-barwa Nkusi
Karemera 1S-PST-send-APPL-IMB-PRFV 5-letter Nkusi

'Karemera sent the letter to Nkusi.'

(36) a. [Nkusi intended to threw the ball into the basket, but the wind blew it away]

Nkusi y-a-juguny-e umu-pira.
Nkusi 1S-PST-throw-PRFV 3-ball

'Nkusi threw the ball.'

b. [Nkusi throws a ball to Karemera, but the wind blows it over the fence]

Nkusi y-a-juguny-iy-e Karemera umu-pira.
Nkusi 1S-PST-throw-APPL-PRFV Karemera 3-ball

'Nkusi threw the ball to Karemera.'

- Yet loss/leaving *is* usually entailed, with some root-by-root variation:

(37) a. *#Nkusi y-∅-oher-er-ej-e*   *Karemera im-pano ariko Nkusi*
       Nkusi 1S-PST-send-APPL-IMB-PRFV Karemera 9-gift   but   Nkusi
       a-ra-cya-yi-fit-e.
       1S-NON.PST-PERS-9O-have-PRFV
       'Nkusi sent the gift to Karemera, but Nkusi still has it.'

      b. *#Nkusi y-∅-oherej-e*   *im-pano ariko a-ra-cya-yi-fit-e.*
       Nkusi 1S-PST-send-PRFV 9-gift   but   1S-NON.PST-PERS-9O-have-PRFV
       'Nkusi sent the gift, but he still has it.'

(38) a. *Nkusi y-a-zany-e*   *aga-seke, ariko Nkusi*
       Nkusi 1S-PST-bring-PRFV 12-basket but   Nkusi
       a-ra-cya-ga-fit-e.
       1S-NON.PST-PERS-12O-have-PRFV
       'Nkusi brought the little basket, but he still has it.

      b. *Nkusi y-a-zan-iy-e*   *aga-seke Karemera ariko Nkusi*
       Nkusi 1S-PST-bring-APPL-PRFV 12-basket Karemera but   Nkusi
       a-ra-cya-ga-fit-e.
       1S-NON.PST-PERS-12O-have-PRFV
       'Nkusi brought the little basket to Karemera, but Nkusi still has it.' (e.g. maybe we're at a wedding and it's not time to give gifts yet, so you still have it.)

∴ Entailments of loss and leaving — two types of change — are root, not template defined.

5 Lexical Ditransitives
5.1 Lexical Ditransitives and Indirect Objects
- Roots among (25b,d,g) allow additional objects without *–ir* (IOs) with a root-contingent role:

(39) a. *N-a-ha-ye*   *Mukankusi igi-tabo.*
       1SGS-PST-give-PRFV Mukankusi 7-book
       'I gave Mukankusi the book.'   (recipient IO)

      b. *Nkusi y-a-siz-e*   *igi-tabo i Kigali.*
       Nkusi 1S-PST-leave-PRFV 7-book   19 Kigali
       'Nkusi left a book in Kigali.'   (goal IO)

- With the *guha* 'give' type the Kigali Office effect obtains, and in general we see the same asymmetric c-command facts suggesting an equivalence to AO (and English IO) structures:

(40) a. *#Nkusi y-a-hay-e*   *Kigali i-barwa.*
       Nkusi 1S-PST-give-PRFV Kigali 9-letter
       Intended: 'Nkusi gave Kigali the letter.'

      b. *#Nkusi y-a-herej-e*   *Muhanga ama-faranga.*
       Nkusi 1S-PST-hand-PRFV Muhanga 6-money
       Intended: 'Nkusi handed money to Muhanga District.'

(41) a. *N-a-ha-ye*   *buri mu-gabo ama-faranga ye.*
      1SGS-PST-give-PRFV every 1-man   6-money   6.its
      'I gave every man his money.'

      b. **N-a-ha-ye*   *ama-faranga ye   buri mu-gabo.*
      1SGS-PST-give-PRFV 6-money   6.its every 1-man

      c. **N-a-ha-ye*   *umu-gabo ye   buri ma-faranga.*
      1SGS-PST-give-PRFV 1-man   1.its every 6-money

      d. **N-a-ha-ye*   *buri ma-faranga umu-gabo ye.*
      1SGS-PST-give-PRFV every 6-money   1-man   1.its

- This suggests a broad apples-to-apples comparison with English IOs and also AOs.

5.2 Applicativizing Lexical Ditransitives

- The effect of adding *–ir* to a lexical ditransitive is root contingent. With most the AO is a new benefactive and the IO remains a recipient (creating a tritransitive), but with *gu-siga* 'to leave' and *gu-tera* 'throw at' the goal IO becomes a recipient AO and the result is ditransitive:

(42) a. *N-a-h-er-ey-e*   *Nkusi igi-tabo Habimana.*
      1SGS-PST-give-APPL-PRFV Nkusi 7-book Habimana
      'I gave Habimana the book for Nkusi.'
      (not: 'I gave Habimana the book to Nkusi')

      b. *Nkusi y-a-sig-iy-e*   *Gatete igi-tabo.*
      Nkusi 1S-PST-leave-APPL-PRFV Gatete 7-book
      'Nkusi left Gatete a book.'

∴ For lexical ditransitives the semantic and grammatical effects of adding *–ir* are root-contingent.

5.3 Entailments of Change Among Lexical Ditransitives

- These roots again vary in whether arriving/receiving and loss/leaving are entailed (we do not give tritransitives since the addition of a beneficiary does not change the underlying event):

(43) a. [I go to give Nkusi the book, but Karemera slaps it out my hand]
      #N-a-ha-ye/n-a-herej-e   *Nkusi igi-tabo.*
      1SGS-PST-give-PRFV/1SGS-PST-hand-PRFV Nkusi 7-book
      'I gave/handed Nkusi the book.'

      b. *N-a-raz-e*   *ama-faranga Olivier, ariko Olivier ntabwo*
      1SGS-PST-bequeath-PRFV 6-money   Olivier but   Olivier NEG
      y-a-y-akiriy-e.
      1S-PST-6O-receive-PRFV
      'I left the money for Olivier, but he didn't receive it.'

(44) a. *#Nkusi y-a-herej-e*   *igi-tabo Karemera, ariko Nkusi*
      Nkusi 1S-PST-hand-PRFV 7-book Karemera but   Nkusi
      a-ra-cya-gi-fit-e.
      1S-NON.PST-PERS-7O-have-PRFV
      'Nkusi handed the book to Karemera, but Nkusi still has it.'

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b. *Nkusi y-a-raz-e   ama-faranga aba-na be   ariko*
Nkusi 1S-PST-bequeath-PRFV 6-money   2-child 2.his but

a-ra-cya-ya-fit-e.
1S-NON.PST-PERS-6O-have-PRFV
'Nkusi bequeathed his children the money, but he still has it.'

∴ Entailments of change into non-templatic states come from the root.

6 Interim Summary

- We have observed at least five types of roots in terms of their non-applicativized variants (with the caveat that in all cases the AO can also just be a wholly separate beneficiary):

(45)

example	root type	third participant	Applicative effect
gu-ha 'give'	ditransitive	recipient IO	add beneficiary AO($\neq$IO)
gu-siza 'leave'	ditransitive	goal IO	IO becomes recipient AO
ku-gabura 'serve'	monotransitive	unexpressed recipient	AO realizes recipient
ku-jugunya 'throw'	monotransitive	unexpressed goal	goal becomes recipient AO
kumena 'break'	monotransitive	none	add beneficiary AO

- The templates themselves have very general meanings; the root must define the actual change:

(46) a. AO template: caused possible receiving or benefiting   (cp. English IO)

b. IO template: caused possible receiving or possible arriving   (cp. English *to*)

c. Monotransitive template (with optional location XP): caused (possible) change

∴ Thus possession and co-location (and possibly even change) — templatic meanings associated with functional heads on previous accounts — can be root meanings.

7 Analyzing Kinyarwanda Ditransitives
7.1 Monotransitive Base Verbs

- For monotransitives we assume that change-of-state verbs have root-defining states, but recipient AO roots are akin to (2), save that P head takes just a theme, deriving monotransitivity.

(47) a.

b.
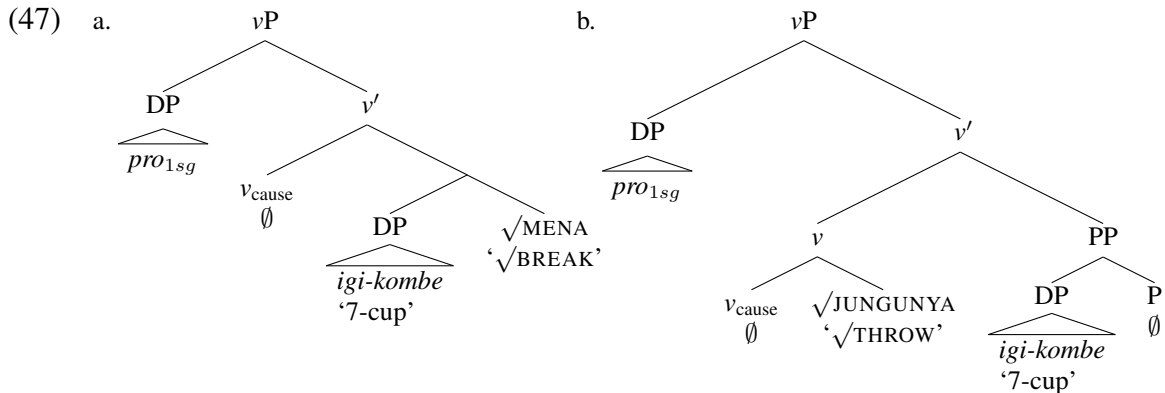
- The P-head is like P_{loc}, albeit relating the theme to an implicit R' participant:

(48) a. $[\![\sqrt{\text{MENA}}]\!] = \lambda y \lambda s[\mathbf{broken}'(y, s)]$ (one participant in s)

b. $[\![P]\!] = \lambda y \lambda s \exists z[R'(y, z, s)]$ (two participants in s)

- We have two types of manner roots vis-a-vis the implicit argument: it is a recipient or a goal.

(49) a. $[\![\sqrt{\text{GABURA}}]\!] = \lambda P \lambda x \lambda v \exists a[a = rg'(v,P) \wedge \Box_B \exists s[cause'(v,s) \wedge have'(th'(v,P),a,s)] \wedge$
        $\textbf{serving}'(v)]$
        "x performed a serving event v that possibly caused a state s of the recipient of
        the state P having the theme of state P."

      b. $[\![\sqrt{\text{JUNGUNYA}}]\!] = \lambda P \lambda x \lambda v \exists a[a = rg'(v,P) \wedge \Box_{B_w} \exists s[cause'(v,s) \wedge not.at'(th'(v,P),x,s,v)]$
        $\wedge \Box_B \exists s[cause'(v,s) \wedge at'(th'(v,P),a,s)] \wedge \textbf{throwing}'(v)]$
        "x performed a throwing event v that caused a state s in which the theme of P
        is no longer with x and that possibly caused a state s of the theme of the state P
        being at the recipient/goal of P."

- Composing (48) with theme DPs and the (modified) v_{cause} and its causer DP, $\exists$-binding e and
  s, substituting relevant participants for the output of th', assuming a unique output a for rg'
  (where applicable), and eliminating redundant conjunctions will propose:

(50) *N-a-menny/juguny/gabuy-e   igi-kombe.*
      1SGS-PST-break/throw/serve-PFV 7-cup

      'I broke/threw/served a cup.'

      a. $\exists v[agent'(\mathbf{I}',v) \wedge \Box_B \exists s[cause'(v,s) \wedge \underline{\textbf{broken}'(\mathbf{c}',s)]]}$

      b. $\exists v[agent'(\mathbf{I}',v) \wedge \underline{\exists a[\Box_B \exists s[cause'(v,s) \wedge have'(\mathbf{c}',a,s)] \wedge \textbf{serving}'(v)]]}$

      c. $\exists v[agent'(\mathbf{I}',v) \wedge \underline{\exists a[\Box_{B_w} \exists s[cause'(v,s) \wedge not.at'(\mathbf{c}',\mathbf{I}',s,v)] \wedge}$
        $\underline{\Box_B \exists s[cause'(v,s) \wedge at'(\mathbf{c}',a,s)] \wedge \textbf{throwing}'(v)]]}$

- This is all like English save that the recipient is not named, but is existentially bound.

7.2 The Semantics of The Applicative

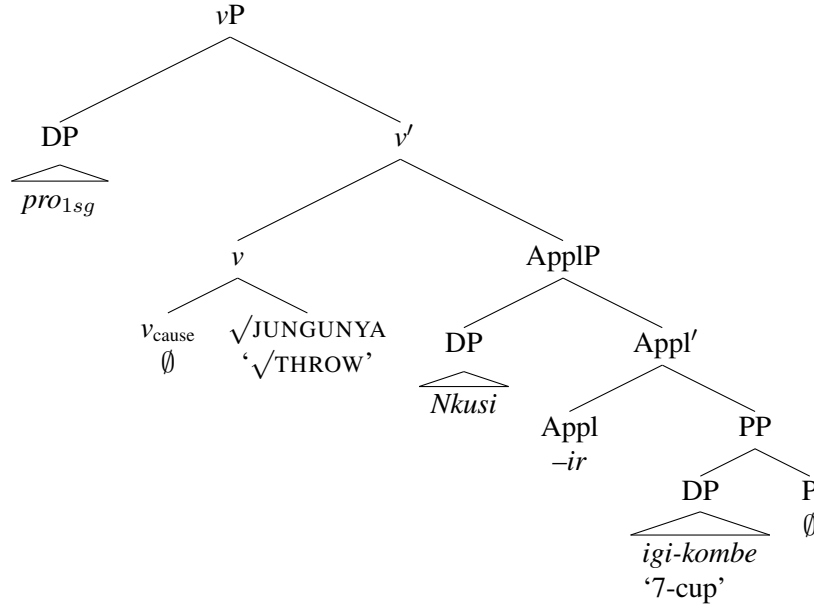- We assume all changes can have a beneficiary, i.e. the outcome can benefit someone:

(51) $benefit'(z,s)$ ("z benefits from s")

- This can add a participant to any sate, making it dyadic if not already. We generalize over
  recipients and beneficiaries qua animate(-like) second participant of dyadic changes:

(52) $B'(z,s)$ is true iff $\exists y[have'(y,z,s)]$ is true or $benefit'(z,s)$ is true.

- We assume –*ir* applies between v_{cause} and P, adding a B' argument (as a low applicative,
  contra Pylkkänen 2008, though see Jerro 2016b for discussion of this point):

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(53) a.

vP
- DP
  - *pro*$_{1sg}$
- v′
  - v
    - v$_{cause}$ $\emptyset$
    - √JUNGUNYA '√THROW'
  - ApplP
    - DP
      - *Nkusi*
    - Appl′
      - Appl –*ir*
      - PP
        - DP
          - *igi-kombe* '7-cup'
        - P $\emptyset$

b. $[\![-ir]\!] = \lambda P \lambda r \lambda s [B'(r,s) \wedge P(s)]$

- This gives the following for the verb classes in (50).

(54) *N-a-men-ey-e/-juguny-iy-e/-gabur-iy-e*   *igikombe Nkusi.*
1SGS-PST-break-APPL-PFV/throw-APPL-PFV/serve-APPL-PFV cup   Nkusi
'I broke a cup for Nkusi.'
'I threw/served Nkusi a cup.'/'I threw/served a cup to someone on Nkusi's behalf.'

a. $\exists v[agent'(\mathbf{I}',v) \wedge \Box_B \exists s[cause'(v,s) \wedge B'(\mathbf{n}',s) \wedge \underline{\mathbf{broken}'(\mathbf{c}',s)}]]$

b. $\exists v[agent'(\mathbf{I}',v) \wedge \Box_B \exists s[cause'(v,s) \wedge B'(\mathbf{n}',s) \wedge \exists z[R'(\mathbf{c}',z,s)]] \wedge$
$\underline{\exists a[\Box_B \exists s[cause'(v,s) \wedge have'(\mathbf{c}',a,s)] \wedge \mathbf{serving}'(v)]}]$

c. $\exists v[agent'(\mathbf{I}',v) \wedge \Box_B \exists s[cause'(v,s) \wedge B'(\mathbf{n}',s) \wedge \exists z[R'(\mathbf{c}',z,s)]]$
$\wedge \underline{\exists a[\Box_{B_w} \exists s[cause'(v,s) \wedge not.at'(\mathbf{c}',\mathbf{I}',s,v)]] \wedge \Box_B \exists s[cause'(v,s) \wedge at'(\mathbf{c}',a,s)] \wedge}$
$\underline{\mathbf{throwing}'(v)]}]$

- Here the thematic roles resolving depending on context and the root class:

  - In (54a) the root-supplied change is non-dyadic, so Nkusi's role cannot be a recipient and thus must be a beneficiary (i.e. B' when R' does not also hold).

  - In (54b,c) the change is dyadic, with two possible contextual interpretations:
    * If Nkusi is interpreted distinct from a he will be a beneficiary.
    * If Nkusi is conflated with a (i.e. $\mathbf{n}' = a$) he will be interpreted as a recipient (the intersection of R' an B', assuming that an animate goal will have some kind of control or alienable possession à la Tham 2005, 2006).
      · In (54b) nothing changes save naming a, since a is a recipient anyway.
      · In (54c) a becomes a recipient due to B' (although still also a goal).

∴ Whether the AO is (a) a wholly new beneficiary, (b) realizing an implicit recipient, or (c) converting an implicit goal into an overt recipient all hinges on how its meaning interacts with the meaning of the rest of the template and, crucially, the root.

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7.3 Lexical Ditransitive Base Verbs

- Analyzing lexical ditransitives is a bit different. The minimal assumption is that such roots require two DPs in an R' relation, and Harley's P_{loc} head is uniquely possible with them. (I have no explanation for this save a syntactic feature à la Ramchand 2008, though verbs with very possessional 'give' type meanings do tend to pattern distinctly across languages, so this is not entirely unexpected; see Croft et al. 2001):

(55)
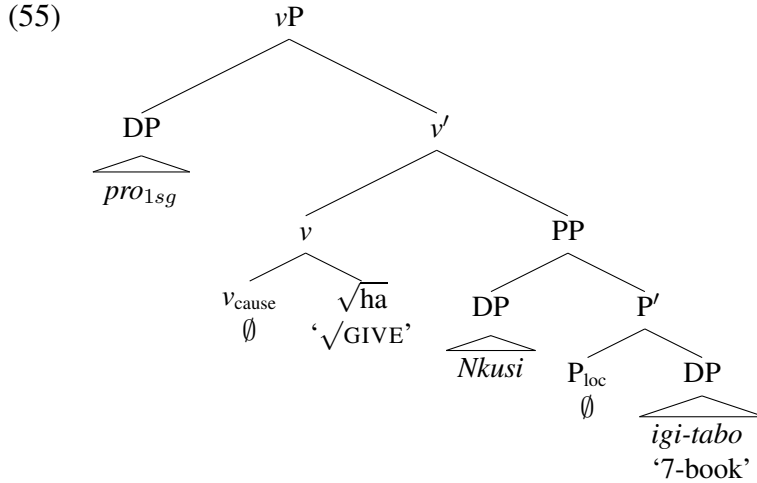
- With $\sqrt{}$HA the role is already a root-selected, non-prospective recipient, but for $\sqrt{}$SIGA it is a prospective goal:

(56) a. $[\![\sqrt{}\text{HA}]\!] = \lambda P \lambda x \lambda v \exists a[a = rg'(v,P) \wedge \Box_{B_w} \exists s[cause'(v,s) \wedge have'(th'(v,P),a,s)] \wedge \mathbf{giving}'(v)]$

  b. $[\![\sqrt{}\text{SIGA}]\!] = \lambda P \lambda x \lambda v \exists a[a = rg'(v,P) \wedge \Box_{B_w} \exists s[cause'(v,s) \wedge not.at'(th'(v,P),x,s,v)] \wedge \Box_B \exists s[cause'(v,s) \wedge at'(th'(v,P),a,s)] \wedge \mathbf{leaving}'(v)]$

- This produces analyses like the following (with appropriate substitutions and reductions):

(57) a. *N-a-ha-ye Nkusi igi-tabo.*
    1SGS-PST-give-PRFV Nkusi 7-book
    'I gave Nkusi the book.'
    $\exists v[agent'(\mathbf{I},v) \wedge \underline{\exists a[a = \mathbf{n}' \wedge \Box_{B_w} \exists s[cause'(v,s) \wedge have'(\mathbf{b}',a,s)] \wedge \mathbf{giving}'(v)]}]$

  b. *Nkusi y-a-siz-e igi-tabo i Kigali.*
    Nkusi 1S-PST-leave-PRFV 7-book 19 Kigali
    'Nkusi left a book in Kigali.'
 $\exists v[agent'(\mathbf{n}',v) \wedge \underline{\exists a[a = \mathbf{k}' \wedge \Box_{B_w} \exists s[cause'(v,s) \wedge not.at'(\mathbf{b}',\mathbf{n}',s,v)] \wedge}$
    $\underline{\Box_B \exists s[cause'(v,s) \wedge at'(\mathbf{b}',a,s)] \wedge \mathbf{leaving}'(v)]}]$

- Crucially, substituting *–ir*+monotransitive P for the PP with $\sqrt{}$SIGA and assuming the AO is interpreted as the IO ($\mathbf{g}' = a$) would generate the same meaning save that the third argument was also a B', licensing a recipient reading (the intersection of B' and R'):

(58) a.
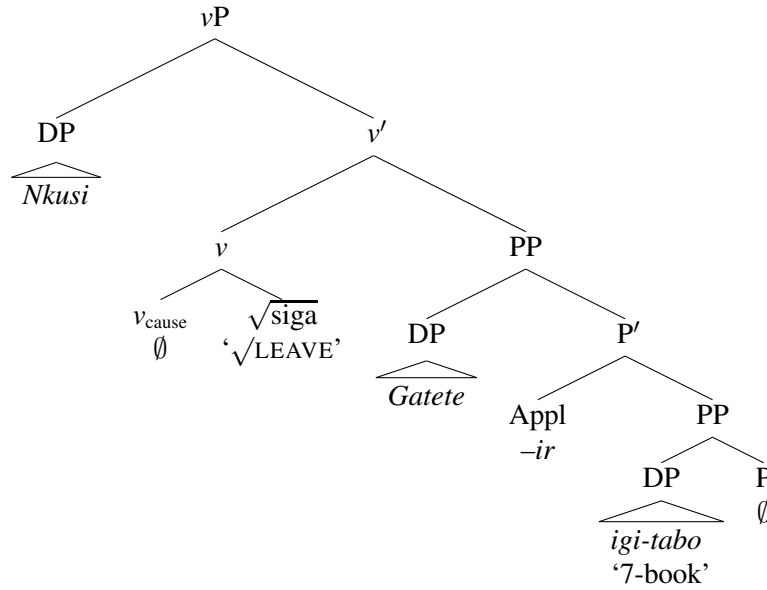
b. *Nkusi y-a-sig-iy-e   Gatete igi-tabo.*
Nkusi 1S-PST-leave-APPL-PRFV Gatete 7-book
'Nkusi left Gatete a book.'
$\exists v[agent'(\mathbf{n}', v) \land \Box_B \exists s[cause'(v, s) \land B'(\mathbf{g}', s) \land \exists z[R'(\mathbf{b}', z, s)]] \land \underline{\exists a[a = \mathbf{g}' \land}$
$\underline{\Box_{B_w} \exists s[cause'(v, s) \land not.at'(\mathbf{b}', \mathbf{n}', s, v)] \land \Box_B \exists s[cause'(v, s) \land at'(\mathbf{b}', a, s)] \land \mathbf{leaving}'(v)]]}$

- Doing this with $\sqrt{\text{HA}}$ would be non-contentful, since IO is already a recipient (a B'). This violates Jerro's (2016b:57) Applicativization Output Condition (cf. Beavers 2010) that applicativized verbs must have monotonically stronger readings than non-applicativized bases:

  (59) **Applicativization Output Condition (AOC):** In alternations between applied and non-applied forms of a verb, the applied variant has at least one internal argument, and the truth conditions associated with that internal argument are a strict superset of those associated with an internal argument of the non-applied variant.

- This condition captures the variation in contributions of applicative morphemes in Bantu languages, implemented as a paradigmatic approach to applicative morphology in which the applied variant of a verb has an increase of lexical entailments as compared to the non-applied variant, which verbs have (semi-)lexicalized ways of satisfying (see also Jerro 2018a).

- We suggest that this independently attested principle of Kinyarwanda applicativization thus blocks the substitution. As such, *–ir* instead adds an additional argument for such verbs, producing a tritransitive structure:

(60)
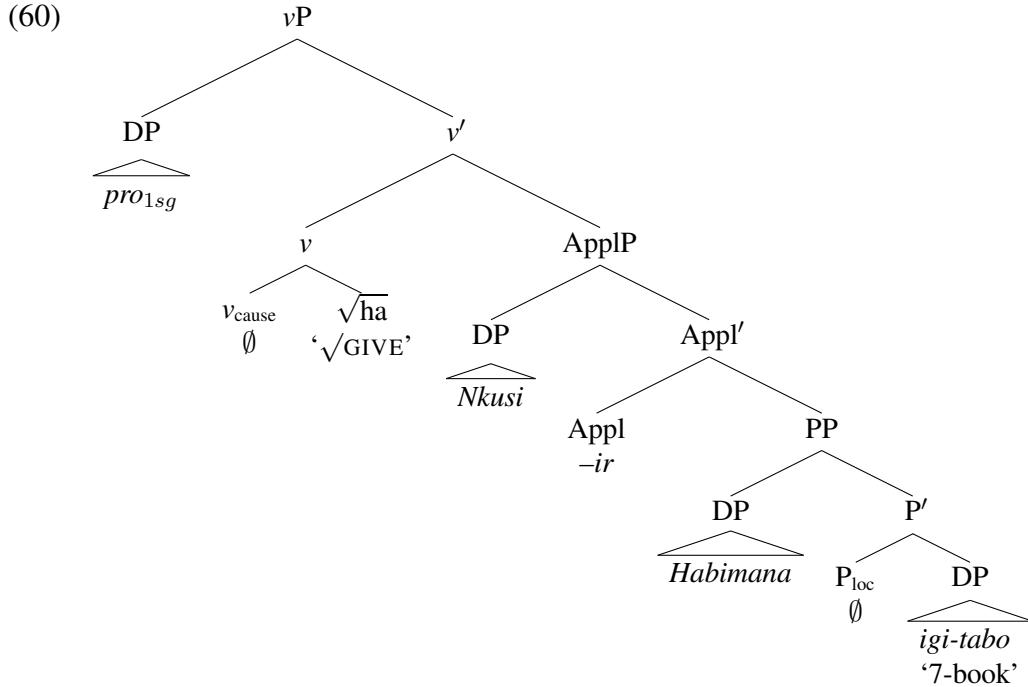
- Here there is no option for interpreting the *–ir* AO as anything other than a beneficiary:

(61) *N-a-h-er-eye*   *Nkusi igi-tabo Habimana.*
1SGS-PST-give-APPL-PRFV Nkusi 7-book Habimana
'I gave Habimana the book for Nkusi.'
$\exists v[agent'(\mathbf{I}', v) \wedge \Box_B \exists s[cause'(v, s) \wedge B'(\mathbf{n}', s) \wedge \exists z[R'(\mathbf{b}', z, s)]] \wedge \underline{\exists a[a = \mathbf{h}' \wedge}$
$\underline{\Box_{B_w} \exists s[cause'(v, s) \wedge have'(\mathbf{b}', a, s)] \wedge \mathbf{giving}'(v)]]}$

∴ Thus root-sensitivity in which roots allow certain templates among lexical ditransitives again follows from semantics: synonymy of applied and non-applied versions interact with independent principles of argument realization in Kinyarwanda to rule out an alternation.

8 Conclusion

- Taking monotransitive, applicative, IO, and tritransitive constructions to reflect distinct templates in Kinyarwanda there is considerable root-sensitivity in how each is used:

  - The interpretation of the template and thus any alternations between templates depend on the root.

  - Which templates are allowed with which roots is also constrained by the root.

- Looking at evidence from individual roots across templates and individual templates across roots are able to factor out semantic contributions of each. Assuming standard compositional processes, interactions between the two determine root-sensitivity.

  - The possibility of root subsumption of templatic meaning and vice versa opens the possibility for root-contingent interpretations.

  - Incompatibilities between roots and templates will constrain certain combinations.

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- Language particular argument realization rules (e.g. the ban on synonymy in applicativization in Kinyarwanda) may also interact with root-sensitive interpretations to rule out otherwise possible combinations.

- Potentially this sort of analysis could apply to other types of argument alternations, though I am skeptical that there must still be some amount of non-wholly compositional semantic classes and lexicalization (as we saw with Kinyarwanda lexical ditransitives):

  #1 Beavers (2010) explores direct/oblique alternations (locative, conative, preposition drop, and dative) and argues that they reflect strictly decreasing specificity in lexical entailments associated with alternating arguments. The roles of direct arguments are verb-specific, yielding verb-sensitivity in the sense of Rappaport Hovav & Levin (2008).

  - In many cases the specificity contrast could be restated as conditions on alternating templates, with roots overlaying the specific semantics.

  #2 Koontz-Garboden (2009) explores anticausativization qua reflexivization in Spanish and suggests a significant effect of verbal semantics on the interpretation as an interaction with a generalized reflexivizer (though see Schäfer & Vivanco 2016).

  - The causative/inchoative alternation is a textbook case of application of event structural approaches. The question would be if root meanings could be defined to interact with the two templates in appropriate ways.

  #3 The broader class of middle constructions (broadly, detransitivization; see e.g. Kemmer 1993, *inter alia*) can have such disparate interpretations it's hard to see unity (though see Beavers and Udayana under revision), especially in unifying naturally reflexive roots with anticausativizing roots.

  - Here may be a case where there's possibly some amount of predefined root classes or lexicalization is necessarily at play.

  #4 It could of course be that some alternations inherently have no truth conditional semantic content, e.g. voice phenomena in some languages. In this case we may simply see no root-sensitivity effects. This is compatible with the approach outlined here.

- Finally, the Kinyarwanda data here are also interesting in other respects:

#1 Kinyarwanda ditransitive roots entail possessional and co-locational meaning (and presumably change) otherwise found in templatic heads, suggesting the incorrectness of theories that assume roots never introduce templatic meaning (see also Jerro 2017 on Kinyarwanda change-of-state roots that entail change like v_{become}; see also Jerro 2017, 2018a, Spathas 2017, Valle et al. 2017, Beavers & Koontz-Garboden 2020, Beavers et al. to appear)

#2 Furthermore, these data also fundamentally support the conclusion of Marten (2003), Jerro (2016b), and Sibanda (2016) that Bantu applicatives do more than just add wholly new arguments into event structures, but interact with root meanings to also modify thematic roles of existing arguments or give expression to implicit event participants.

9   Acknowledgements

References

Ackerman, F. & Moore, J. (2001). *Proto-properties and grammatical encoding: A correspondence theory of argument selection*. Stanford: CSLI Publications.

Alexiadou, A., Anagnostopoulou, E. & Schäfer, F. (2006). The properties of anti-causatives crosslinguistically. In Frascarelli, M. (ed.), *Phases of interpretation*, Berlin: Mouton de Gruyter. 187–211.

Arad, M. (2005). *Roots and patterns: Hebrew morpho-syntax*. Dordrecht: Springer.

Bar-el, L., Davis, H. & Matthewson, L. (2005). On non-culminating accomplishments. In *Proceedings of nels 35*. 79–92.

Barss, A. & Lasnik, H. (1986). A note on anaphora and double objects. *Linguistic Inquiry* **17**. 347–354.

Beavers, J. (2010). The structure of lexical meaning: Why semantics really matters. *Language* **86**. 821–864.

Beavers, J. (2011). An aspectual analysis of ditransitive verbs of caused possession in English. *Journal of Semantics* **28**. 1–54.

Beavers, J., Everdell, M., Jerro, K., Kauhanen, H., Koontz-Garboden, A., LeBovidge, E. & Nichols, S. (To appear). States and changes-of-state: A cross-linguistic study of the roots of verbal meaning. *Language* .

Beavers, J. & Koontz-Garboden, A. (2020). The Roots of Verbal Meaning. Oxford: Oxford University Press.

Beavers, J. & Lee, J. (2020). Non-culmination in Korean caused change-of-state predicates. *Linguistics* **58**. 12331283.

Beavers, J. & Udayana, I. N. (Under revision). Middle voice as generalized argument suppression: The case from Indonesian. Unpublished ms., The University of Texas at Austin and Udayana University.

Beavers, J. & Zubair, C. (2013). Anticausatives in Sinhala: Involitivity and causer suppression. *Natural Language and Linguistic Theory* **31**. 1–46.

Beavers, J. & Zubair, C. (2016). Anticausatives in Sinhala: A view to the middle. In Balusu, R. & Sundaresan, S. (eds.), *Proceedings of fasal 5*. Journal of South Asian Linguistics. 84–108.

Beck, S. & Johnson, K. (2004). Double objects again. *Linguistic Inquiry* **35**. 97–124.

Bresnan, J. & Nikitina, T. (2009). The gradience of the dative alternation. In Uyechi, L. & Wee, L. H. (eds.), *Reality exploration and discovery: Pattern interaction in language and life*, Stanford: CSLI Publications. 161–184.

Croft, W., Barðdal, J., Hollmann, W., Nielsen, M., Sotirova, V. & Taoka, C. (2001). Discriminating verb meanings: The case of transfer verbs. Handout, LAGB Autumn Meeting, Reading.

Dowty, D. (1979). *Word meaning and Montague Grammar*. Dordrecht: Reidel.

Dowty, D. (1991). Thematic proto-roles and argument selection. *Language* **67**. 547–619.

Dunbar, E. & Wellwood, A. (2016). Addressing the "two interface" problem: Comparatives and superlatives. *Glossa* **1**. 1–29.

Embick, D. (2009). Roots, states, and stative passives. Talk given at the 2009 Roots Workshop, Stuttgart.

Fillmore, C. J. (1968). The case for case. In Bach, E. & Harms, R. T. (eds.), *Universals in linguistic theory*, New York: Holt. 1–90.

Fillmore, C. J. (1970). The grammar of *Hitting* and *Breaking*. In Jacobs, R. & Rosenbaum, P. S. (eds.), *Readings in English transformational grammar*, Waltham: Ginn. 120–133.

Goldberg, A. E. (1995). *Constructions: A construction grammar approach to argument structure*. Chicago, IL: University of Chicago Press.

Green, G. (1974). *Semantic and syntactic regularity*. Bloomington: Indiana University Press.

Gropen, J., Pinker, S., Hollander, M., Goldberg, R. & Wilson, R. (1989). The learnability and acquisition of the dative alternation in English. *Language* **65**. 203–257.

Harley, H. (2003). Possession and the double object construction. In Pica, P. & Rooryck, J. (eds.), *Linguistic variation yearbook 2*, Amsterdam: John Benjamins. 31–70.

Harley, H. (2012). Lexical decomposition in modern syntactic theory. In Hinzen, W., Machery, E. & Werning, M. (eds.), *The oxford handbook of compositionality*, Oxford: Oxford University Press. 328–350.

Jerro, K. (2016a). Locative applicatives and the semantics of verb class. In Doris Payne, M. B., Sara Pacchiarotti (ed.), *The selected proceedings of the 46th Annual Conference on African Linguistics*, Berlin: Language Science Press. 289–309.

Jerro, K. (2016b). *The syntax and semantics of applicative morphology in Bantu*. Ph.D. dissertation, The University of Texas at Austin.

Jerro, K. (2017). Change-of-state in Kinyarwanda: a study in root meaning. In *Proceedings of the Linguistic Society of America Annual Meeting 2017*.

Jerro, K. (2018a). Change-of-state paradigms and the middle in Kinyarwanda. *Southern African Linguistics and Applied Language Studies* **36**. 235–260.

Jerro, K. (2018b). Locative arguments in Kinyarwanda. Conference presentation, Syntax of the World's Languages 8.

Kemmer, S. (1993). *The middle voice*. Amsterdam: John Benjamins.

Kimenyi, A. (1980). *A relational grammar of Kinyarwanda*. Berkeley, CA: University of California Press.

Koenig, J.-P. & Davis, A. R. (2001). Sublexical modality and the structure of lexical semantic representations. *Linguistics and Philosophy* **24**. 71–124.

Koenig, J.-P. & Muansuwan, N. (2000). How to end without ever finishing: Thai semi-perfectivity. *Journal of Semantics* **17**. 147–182.

Koontz-Garboden, A. (2009). Anticausativization. *Natural Language and Linguistic Theory* **27**. 77–138.

Kratzer, A. (1996). Severing the external argument from its verb. In Rooryck, J. & Zaring, L. (eds.), *Phrase structure and the lexicon*, Dordrecht: Kluwer. 109–137.

Krifka, M. (1998). The origins of telicity. In Rothstein, S. (ed.), *Events and grammar*, Dordrecht: Kluwer. 197–235.

Lakoff, G. (1965). *On the nature of syntactic irregularity*. Ph.D. dissertation, Indiana University, Bloomington, Bloomington, IN. Published 1970 as Irregularity in syntax. New York: Holt, Rinehart, and Winston.

Larson, R. K. (1988). On the double object construction. *Linguistic Inquiry* **19**. 335–392.

Levinson, L. (2007). *The roots of verbs*. Ph.D. dissertation, NYU, New York.

Marten, L. (2003). The dynamics of Bantu applied verbs: An analysis at the syntax-pragmatics interface. In Lébikaza, K. K. (ed.), *Acts du 3e congrès mondial de linguistique africaine lomé 2000*, Köln: Köppe. 207–221.

Martin, F. & Schäfer, F. (2012). The modality of *offer* and other defeasible causative verbs. In *Proceedings of the 30th west coast conference on formal linguistics*. 248–258.

Martin, F. & Schäfer, F. (2017). Sublexical modality in defeasible causative verbs. In Arregui, A., Rivero, M. L. & Salanova, A. (eds.), *Modality across syntactic categories*, Oxford: Oxford University Press. 87–108.

Myler, N. (2016). *Building and interpreting possessive sentences*. Cambridge, MA: MIT Press.

Oehrle, R. T. (1976). *The grammatical status of the English dative alternation*. Ph.D. dissertation, MIT.

Pinker, S. (1989). *Learnability and cognition*. Cambridge, MA: MIT Press.

Pylkkänen, L. (2008). *Introducing arguments*. Cambridge, MA: MIT Press.

Ramchand, G. (2008). *Verb meaning and the lexicon: A first phase syntax*. Cambridge: Cambridge University Press.

Rappaport, M. & Levin, B. (1988). What to do with θ-roles. In Wilkins, W. (ed.), *Thematic relations*, San Diego, CA: Academic Press. 7–36.

Rappaport Hovav, M. & Levin, B. (1998). Building verb meanings. In Butt, M. & Geuder, W. (eds.), *The projection of arguments: Lexical and compositional factors*, Stanford: CSLI Publications. 97–133.

Rappaport Hovav, M. & Levin, B. (2008). The English dative alternation: A case for verb sensitivity. *Journal of Linguistics* **44**. 129–167.

Schäfer, F. & Vivanco, M. (2016). Anticausatives are weak scalar expressions, not reflexive expressions. *Glossa* **1**. 18.1–36.

Sibanda, G. (2016). The Ndebele applicative construction. In Doris Payne, M. B., Sara Pacchiarotti (ed.), *The selected proceedings of the 46th Annual Conference on African Linguistics*, Language Science Press. 309–333.

Spathas, G. (2017). Results in the decomposition of verbal predicates: Evidence from additive operators. Talk given at The Building Blocks and Mortar of Meaning II, University of Tübingen, 3-4 November.

Tatevosov, S. (2008). Subevental structure and non-culmination. In Bonami, O. & Hofherr, P. C. (eds.), *Empirical issues in syntax and semantics 7*. 393–422.

Tham, S. W. (2005). *Representing possessive predication: Semantic dimensions and pragmatic bases*. Ph.D. dissertation, Stanford University.

Tham, S. W. (2006). The definiteness effect in English *Have* sentences. In Denis, P., McCready, E., Palmer, A. & Reese, B. (eds.), *Tls 8*. Somerville: Cascadilla Proceedings Project. 137–149.

Valle, D., Beavers, J. & Koontz-Garbodden, A. (2017). States and change-of-state in Kakataibo: The role of the root semantics. Paper presented at the annual meeting of the Society for the Study of the Indigenous Languages of the Americas, Austin, Texas, January 5–8.

Wood, J. & Marantz, A. (2015). The interpretation of external arguments. http://ling.auf.net/lingbuzz/002487.