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Korean change of state predicates:

Non-culminating readings across scale and causative structures

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Contents

Non-culminating readings

- CoS (or accomplishment) predicates in the perfective: describe events that have culminated or reached their natural endpoint.
- There is a "complete" change of the affected entity into the state indicated by the semantic core of the verb.
- However, the result state is not always reached, a.k.a. non-culminating readings (failed-attempted readings).

  (cf. Tatevosov & Ivanov 2009; Martin & Schäfer 2017; Martin 2019, 2020, a.o.)
- Different factors allow NC readings: modality, perfective marker, type of subject, a.o. (cf. Martin & Schäfer 2017; Koening & Muansuwan 2000; Koenig & Chief 2008; Demirdache & Martin 2015, a.o.)
- Agent Control Hypothesis (ACH): (cf. Demirdache & Martin 2015)
  - agent = result state does not need to obtain (1a).
    In (1a), negating the result state (*but*-clause) does not generate a contradiction.
  - (inanimate) causer = result state obtains (1b).
    In (1b), negation of result state generates a contradiction.

Non-culminating readings

- Also possible in Korean: non-culminating reading in (1a)

(cf. Lee 2015; example from Beavers & Lee 2020: 1235)

(1) a. ku-ka changmun-ul kkay-ess-ta. haciman changmwun-i
he-NOM window-ACC break-PST-DECL but window-NOM
kkay-ci-ci anh-ass-ta.
break-PASS-COMP NEG-PST-DECL
(lit) 'He broke the window. But the window was not broken.'

b. chentwung-i changmun-ul kkay-ess-ta. #haciman changmwun-i
thunder-NOM window-ACC break-PST-DECL but window-NOM
kkay-ci-ci anh-ass-ta.
break-PASS-COMP NEG-PST-DECL
(lit) 'The thunder broke the window. But the window was not broken.'

Non-culminating readings

- Korean NC readings are similar to constructions meaning "try to P".
- Sublexical modality: the result obtains in some possible world and not in the real world. (cf. Martin & Schäfer 2017)
- In Korean, the intentionality of the subject is necessary.
- The modal base defines the subject's intentions. (cf. Beavers & Lee 2020)

In this study:

- We follow the ACH.
- Different from Beavers & Lee (2020):
  - Lexical causatives (e.g. *kkayta* 'break') are not considered.
  - Achievement predicates are not included.
  - Research has shown that achievements disallow non-culminating construals.

    (cf. Bar-el 2005 on Salish languages; Tatevosov & Ivanov 2009 on Russian; Altshuler 2014 on Hindi and Russian; Fritz-Huechante et al. 2020 on Spanish psych verbs)

Research Questions

- What are the factors that allow for non-culminating readings in Korean?
- Subject type, scale structure, type of causative structure
- Is the factor animacy sufficient to explain non-culmination in Korean? (No)

To answer those questions, we inspect:

- semantic and syntactic properties of causatives CoS predicates in Korean
- experimental study (*but*-test)

Scalar structure

Verbs of gradual change: (Hay et al. 1999; Kennedy & McNally 2005; a.o.)

- Increase in a range of *values*
- Standard degree of comparison (SDC): degree that manifests the property determined at the semantic core of a verb (degree that *stands out*).
  (Kennedy 1999; Kennedy & Levin 2008)
- Division into upper-bounded and lower-bounded items
  (cf. English: Kennedy 2007; Kennedy & McNally 2005; Kennedy & Levin 2008, a.o.)
- Upper-bounded verbs: e.g. *mallita* 'to dry'
- Semantic core: stative verb *maluta* 'be dry' (Choi 2015a,b; Kim 2002)
- SDC is maximally oriented.
- For *maluta* 'be dry' to be true, there must be no amount of water left in the affected entity, i.e. "totally" dry (under normal usage).

Scalar structure

- Adverb *pwupwuncekulo* 'partially': *x is partially adj.* in (2a) entails that *x is not adj.* in (2b) since a maximum degree has not been reached.

(cf. Kennedy & McNally 2005)

(2) a. ipwul-i pwupwuncekulo mall-ass-ta.
blanket-NOM partially dry-PST-DECL
'The blanket is partially dry.'

b. ipwul-i malu-ci anh-ass-ta.
blanket-NOM dry-CONN NEG-PST-DECL
'The blanket is not dry.'

- Causative CoS: the degree of change that has to take place is also a maximum degree (inherited from the semantic core).

Scalar structure

In this study:

- Upper-bounded predicates allow NC readings with an agent (3) and not with a causer (4).
- Possible interpretation of (3): Yuri acts upon the blanket to dry it without necessarily causing the crucial CoS (i.e. the blanket being completely dry – NC).

(3) Yuli-ka ipwul-ul mal-ly-ess-ta. haciman ipwul-i malu-ci
Yuri-NOM blanket-ACC dry-CAUS-PST-DECL but blanket-NOM dry-CONN
anh-ass-ta.
NEG-PST-DECL
'Yuri dried the blanket, but the blanket was not dry.'

Scalar structure

- However, (4) is understood as the sun acting upon the blanket and immediately starting the process that leads to the change of state.
- This process reaches its culminating change, hence a NC reading is not available.

(4) hayspyeth-i ipwul-ul mal-ly-ess-ta. #haciman ipwul-i
sun-NOM blanket-ACC dry-CAUS-PST-DECL but blanket-NOM
malu-ci anh-ass-ta.
dry-CONN NEG-PST-DECL
'The sun dried the blanket, but the blanket was not dry.'

Scalar structure

- Lower-bounded verbs: e.g. *telephita* 'to dirty'
- Semantic core: stative verb *telepta* 'be dirty' (Choi 2015a,b; Kim 2002)
- SDC is minimally oriented.
- *Telepta* 'be dirty' is true at the presence of a minimal amount of dirt in the affected entity (under normal usage).
- Adverb *pwupwuncekulo* 'partially': *x is partially adj.* in (5a) entails that *x is adj.* in (5b) since the minimum degree has been passed. (cf. Kennedy & McNally 2005)

(5) a. catongcha-ka pwupwuncekulo telew-ess-ta.
car-NOM partially dirty-PST-DECL
'The car is partially dirty.'

b. catongcha-ka telew-ess-ta.
car-NOM dirty-PST-DECL
'The car is dirty.'

Scalar structure

- Causative CoS: the degree of change is also a minimum degree (inherited from the semantic core).
- Differently from upper-bounded predicates, a max. degree cannot be identified.

In this study:

- Lower-bounded predicates do not allow NC readings either with an agent or a causer (6).
- Lower-bounded predicates hold true at the presence of a minimum degree of change.

Scalar structure

- In (6), as soon as the subject referent takes action upon the car, there is a minimum change that counts as sufficient for the car to be dirty, hence a culmination reading.

(6) Sola-ka / pipalam-i catongcha-lul telep-hy-ess-ta. #haciman
Sora-NOM rainstorm-NOM car-ACC dirty-CAUS-PST-DECL but
catongcha-ka telew-eci-ci anh-ass-ta.
car-NOM dirty-INCH-CONN NEG-PST-DECL
'Sora / The rainstorm dirtied the car, but the car was not dirty.'

Causatives in Korean: Morphological

- Korean causative CoS verbs are built on the morphologically more simple stative intransitive verb. (cf. Choi 2015a; Kim 2002; Machicao y Priemer & Fritz-Huechante 2018)

Morphological causative:

- Less productive than periphrastic causatives (cf. O'Grady 1991; Park 1993)
- Causative morpheme *-i* (or its allomorphs *hi*, *ki*, *li*, etc.) attaches to the stem of the stative verb: e.g. *telep-hi* 'dirty-CAUS' in (7).

(cf. Shibatini 1973; Bratt 1996; Shibatini & Pardeshi 2002)

(7) Sola-ka catongcha-lul telep-hy-ess-ta.
Sora-NOM car-ACC dirty-CAUS-PST-DECL
'Sora dirtied the car.'

Causatives in Korean: Morphological

- Morphological causative verbs encode 'direct' causation.
  (cf. Lee 1985; Park 1993; Choe 2022)
- Direct causation is understood as a situation in which there is physical manipulation by the causer on a causee at the same time. (cf. Choe 2022)
- "There is an overlap of the causing and the caused event in terms of space and time." (cf. Choe 2022: 198)

In this study:

- Morphological causative predicates allow NC readings only with upper-bounded predicates in the presence of an agent (8).
- Type of NC: partial
- There is a CoS as soon as the causing event starts, however this CoS is not the maximum change required by the verb.

(8) Yuli-ka ipwul-ul mal-ly-ess-ta. haciman ipwul-i malu-ci
Yuri-NOM blanket-ACC dry-CAUS-PST-DECL but blanket-NOM dry-CONN
anh-ass-ta.
NEG-PST-DECL
'Yuri dried the blanket, but the blanket was not dry.'

Causatives in Korean: Periphrastic *-key hata*

- Verbal complex structure setting two verbs functioning together as one unit.
  (cf. Sohn 1973; Kang 1986; Bratt 1996; Lee 2007)
- *telepta* 'be dirty' and the light verb *hata* 'to do' in (9) (cf. Shibatini 1973; Bratt 1996; Shibatini & Pardeshi 2002)

(9) Sola-ka catongcha-lul telep-key hay-ss-ta.
Sora-NOM car-ACC dirty-KEY do-PST-DECL
'Sora made the car dirty.'

- Literature argues that periphrastic causatives encode 'indirect' causation.
  (cf. Lee 1985; Cho 1988; Park 1993; Choe 2022)
- The causing event and the caused eventuality might have two different spatial and temporal parameters. (cf. Choe 2022: 198)
- The action described by the verb *ha-* 'do' (related to the state of the verb) is performed without necessarily causing the result state.
  (cf. Cho 1988; O'Grady 1991; Fritz-Huechante et al. 2020)

Causatives in Korean

In this study:

- Periphrastic causative predicates allow zero NC readings independently from the scalar structure of the predicate and only in the presence of an agent (10).
- Easy accessibility of causing event due to *ha* 'do'
- Two readings readily available: (a) the process/activity reading, and (b) the caused state reading
- *-key ha-* 'make' seems to prevail over the scalar properties of the embedded verb.

In this study:

(10) Yuli-ka ipwul-ul malu-key hay-ss-ta / telep-key hay-ss-ta.
Yuri-NOM blanket-ACC dry-KEY do-PST-DECL dirty-KEY do-PST-DECL
haciman ipwul-i malu-ci anh-ass-ta / telew-eci-ci
but blanket-NOM dry-CONN NEG-PST-DECL dirty-INCH-CONN
anh-ass-ta.
NEG-PST-DECL
'Yuri made the blanket dry / dirty, but the blanket was not dry / dirty.'

Experimental stage: *but*-test

- Test presentation: 1-5 Likert Scale, where 1 = very bad & 5 = very good
- Sentences presented individually
- Target items embedded in frame as in (11)
- Online on IBEX (https://www.pcibex.net/)

(11) a. Yuli-ka ipwul-ul mal-ly-ess-ta. haciman ipwul-i
Yuri-NOM blanket-ACC dry-CAUS-PST-DECL but blanket-NOM
malu-ci anh-ass-ta.
dry-CONN NEG-PST-DECL
'Yuri dried the blanket, but the blanket was not dry.'

b. pipalam-i catongcha-lul telep-key hay-ss-ta. haciman
rain.storm-NOM car-ACC dirty-KEY do-PST-DECL but
catongcha-ka telew-eci-ci anh-ass-ta.
car-NOM dirty-INCH-CONN NEG-PST-DECL
'The rainstorm made the car dirty, but the car was not dirty.'

Experimental stage: *but*-test

- 2 experiments:
- CAUSATIVE STRUCTURE: morphological vs. periphrastic
- Design: 2x2
  - SUBJECT TYPE: animate vs. inanimate
  - SCALAR STRUCTURE: lower vs. upper
- Dependent variable: Acceptability of NC reading

Table 1: Experimental categories and expectations for Korean morphological causative.

		SCALAR STRUCTURE	
		lower	upper
SUBJECT TYPE	animate	NC not possible	NC possible
	inanimate	NC not possible	NC not possible

Experimental stage: *but*-test

Table 2: Experimental categories and expectations for Korean periphrastic causative.

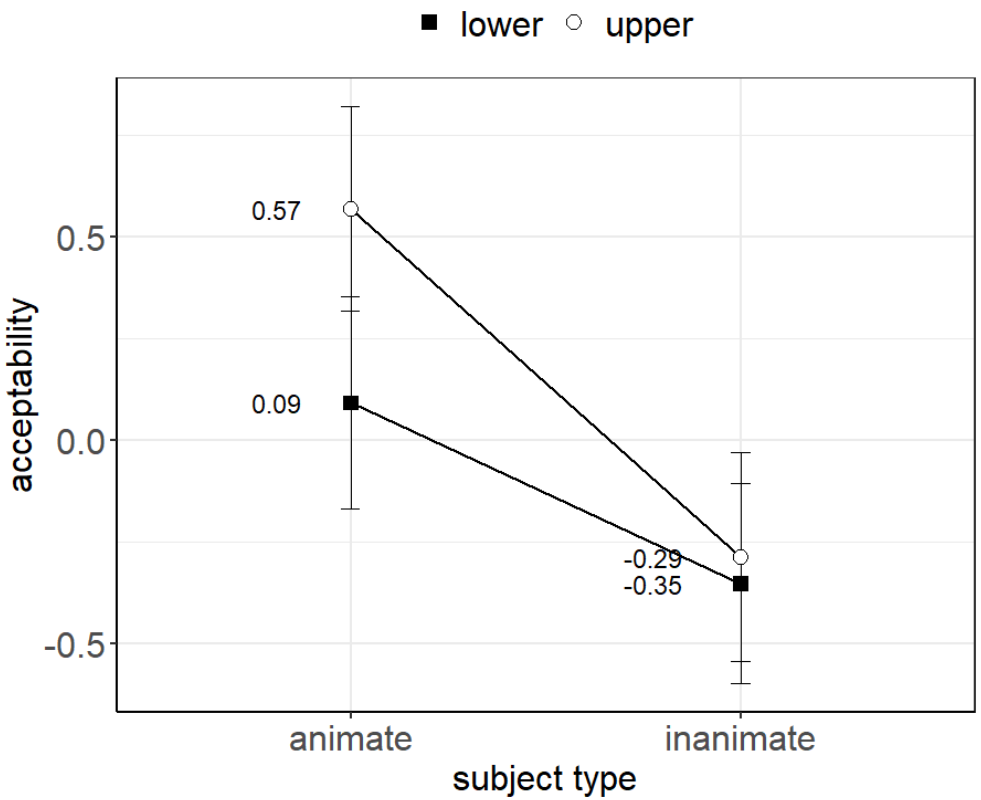
		SCALAR STRUCTURE	
		lower	upper
SUBJECT	animate	NC possible	NC possible
TYPE	inanimate	NC not possible	NC not possible

Items:

- critical: 8
  - lower: 4, upper: 4
  - same items in 2 lists: morphological (e.g. *mallita* 'to dry') vs. periphrastic (e.g. *malukey hata* 'make dry')
- fillers: 24 per list
- participants: n = 32 (data excluded: 1 participant, n = 31)
- age: 22-42. M = 29,90. Gender: F = 15, M = 15, No Gender = 1

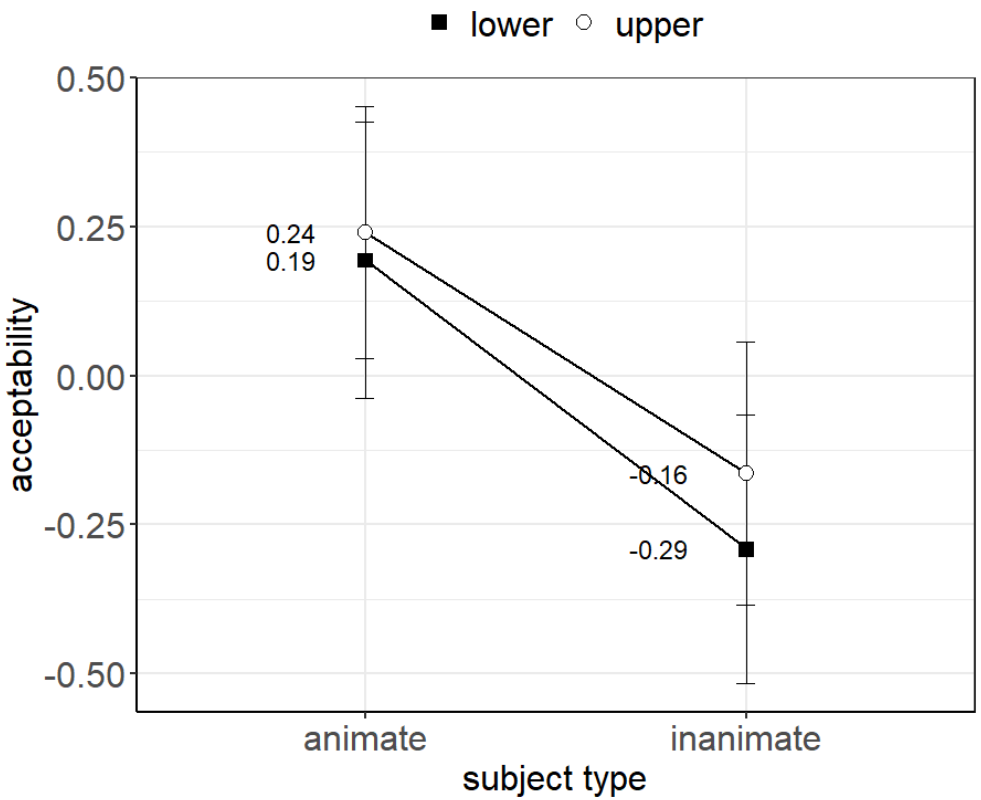
Results

Figure 1: Acceptability NC readings morphological causatives (95% C.I.).



Results

Figure 2: Acceptability NC readings periphrastic causatives (95% C.I.).



Results

Table 3: Model parameter for the morphological non-culminating test.

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**
SCALE (upper)	1.09	0.55	1.97	0.04
SUBTYPE (inanimate)	-1.01	0.42	-2.41	0.01
SCALE∧SUBTYPE	-0.89	0.56	-1.59	0.11

- Data fitted with a cumulative link mixed models
- Random factors: Participants and Items
- Random intercepts and slopes for SUBJECT TYPE

Results

Table 4: Model parameter for the periphrastic non-culminating test.

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**
SCALE (upper)	0.02	0.42	0.05	0.96
SUBTYPE (inanimate)	-1.41	0.70	-1.99	0.04
SCALE∧SUBTYPE	0.31	0.70	0.44	0.65

- Data fitted with a cumulative link mixed models
- Random factors: Participants and Items
- Random intercepts and slopes for SUBJECT TYPE

Experimental stage: Results

Table 5: Model parameter for the morphological & periphrastic non-culminating test.

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**
CausType (peri)	0.26	0.66	0.39	0.69
Scale (upper)	1.24	0.54	2.30	0.02
SubType (inanimate)	-1.21	0.54	-2.21	0.02
CausType∧Scale	-1.25	0.48	-2.57	0.01
CausType∧SubType	0.03	0.65	0.05	0.95
Scale∧SubType	-1.01	0.64	-1.58	0.11
CausType∧Scale∧SubType	1.31	0.69	1.90	0.05

Experimental stage: Discussion

- Results are in line with predictions
- Subject Type: significant effect (p=0.02). Agenthood of subject makes NC readings possible (as in ACH)
- Scalar Structure: significant effect (p=0.02)
- Causative Structure ∧ Scalar Structure: significant interaction (p=0.01). The type of scalar structure plays a role with morphological causatives and not so with periphrastic causatives.
- Causative Structure ∧ Scalar Structure ∧ Subject Type: marginally significant interaction (p=.05). The type of subject plays a role with the type of scalar structure, with morphological causatives and not so with periphrastic causatives.

Conclusion

- Experimental design: three factors showed to have an impact in NC readings in Korean: subject type, scale structure, causative structure.
- The animacy of the subject's referent showed a clear significant effect across the different causative structures.
- Scalar structure: defeating the result state with lower-bounded predicates (and not with upper-bounded predicates) is generally not possible with either an agentive subject or inanimate causer subject.
- This is because a minimum CoS in the affected entity is sufficient for the predicate to hold true. Hence negating a result state generates a contradiction.
- Causative structure seems to override the effect of scale structure to the extend that NC readings are also possible with lower-bounded predicates
- Causative structure: a partial NC reading is possible with morphological causatives whereas a zero NC reading is possible with periphrastic causatives.

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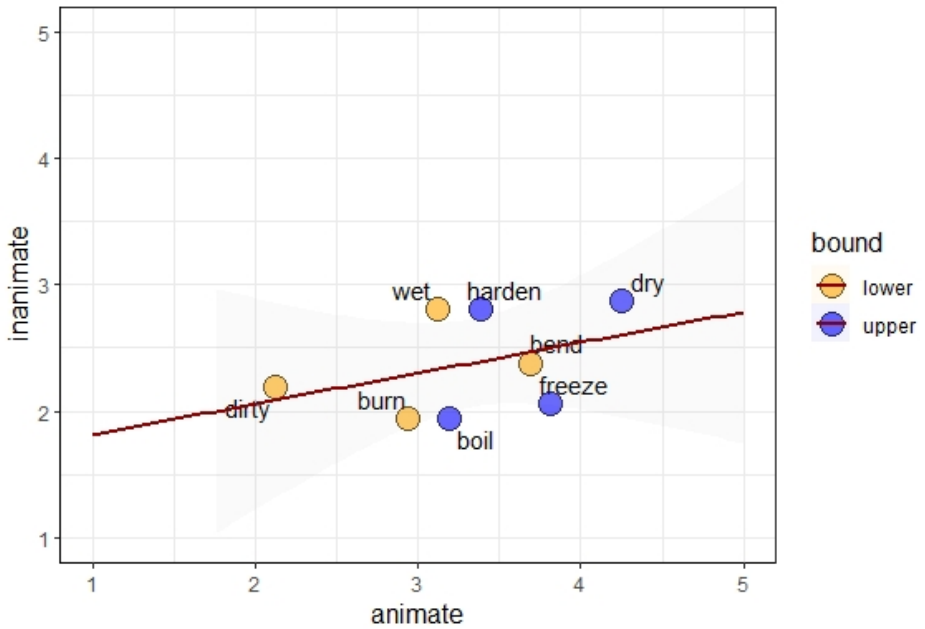
Experimental material

cause type	bound	verb	translation	animate	inanimate
mor	lower	kwuphita	bend	3.69	2.38
mor	lower	thaywuta	burn	2.94	1.94
mor	lower	telephita	dirty	2.12	2.19
mor	lower	ceksita	wet	3.12	2.81
mor	upper	kkulhita	boil	3.19	1.94
mor	upper	mallita	dry	4.25	2.88
mor	upper	ellita	freeze	3.81	2.06
mor	upper	kwuthita	harden	3.38	2.81
peri	lower	kwupkey hata	make bent	3.73	1.93
peri	lower	thakey hata	make burnt	2.80	2.87
peri	lower	telepkey hata	make dirty	2.73	2.47
peri	lower	ceckey hata	make wet	3.20	2.40
peri	upper	kkulhkey hata	make boiled	3.07	2.33
peri	upper	malukey hata	make dry	3.47	3.20
peri	upper	elkey hata	make frozen	3.00	2.40
peri	upper	kwutkey hata	make hard	3.20	2.47

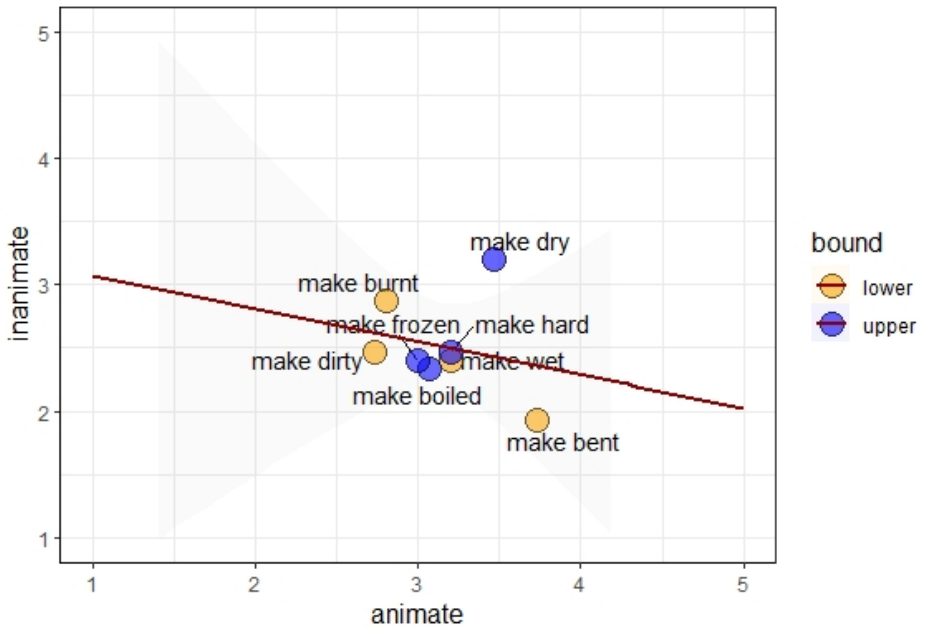
Analysis per verb

Figure 3: Distribution of morphological causative verbs.



Analysis per verb

Figure 4: Distribution of periphrastic causative verbs.



Analysis per verb

Figure 5: Distribution of morphological and periphrastic causative verbs.