

Diagnosing root suppletion: evidence from Georgian and Hiaki

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1 Introduction

There's a debate in the Distributed Morphology literature about the status of lexical roots. More specifically, the debate is about whether

- 1) lexical roots have contents (phonological, semantic, just a formal index), i.e. they're individuated in the syntax
- 2) or not, i.e. roots are not individuated upon Merge

Using a number of diagnostics, Harley 2014b argued that Hiaki number-conditioned stem alternation really is suppletion. Therefore, lexical roots must have contents.

Here we take a look at number-conditioned so-called suppletive verbs in Georgian using the same diagnostics as used in Harley 2014b, and a few others.

Our conclusion however is that these verbs in Georgian are not (forms of) the same lexical item, but are rather pairs of distinct lexical items (*// throw vs scatter*).

The contrast between Hiaki and Georgian number-conditioned stem alternation on the same diagnostics actually supports the idea that lexical roots are individuated in the syntax.

Indeed, hypothesizing that roots are individuated in the syntax allows us to account for the cross-linguistic difference:

- in Hiaki suppletive verbs are true suppletive (allomorphic realizations of the same roots)
- in Georgian, suppletive verbs are paired up distinct roots

Outline:

- Number-conditioned suppletion in Georgian
- Evidence that “number-conditioned suppletive verbs” in Georgian are not actually suppletive
- Our diagnostics work: comparison with tense-conditioned suppletion in Georgian
- Conclusion

NB: When there's variation in the judgment, we report a score, e.g. 3/6 means that 3 out of 6 consultants found the sentence acceptable.

2 Participant-number-marking suppletion in Georgian

Modern Georgian has 11 verb root pairs whose form is conditioned by the number of S/O.

(A) Georgian number-conditioned stem-alternating verbs

1. **-b- / -sx-** “bear fruit, hang”
2. **-j-, -z-/ -sx-** “sit, settle (intr)”

3. -sv-, -sm- /-sx- “seat, set, put down, place (tr)” (pl. -sx unknown)
4. -gd-/ -qr- “throw, scatter”
5. -k'(l)- /-xoc- “kill”
6. -k'(v)-/-xoc- “die”
7. -t'ex-/ -mt'vr- “break”
8. -d-/ -c'q'- “lie/placed in order, lay/place/put in order”
9. -vard-/ -cv- “fall”
10. -c-/ -sx- “attack” (Aronson 1981)
11. -gd-/ -rek'- “let out/in cattle to field” (Shanidze 1973, Lomashvili 2019)
12. -q'v-/ -sx- “take someone somewhere” OLD GEORGIAN (Lomashvili 2019)
13. -d-/ -sx- “build” OLD GEORGIAN (Lomashvili 2019)

These verb roots feed into the verbal system of Georgian which gives rise to a lot more forms.

- They can be transitivized
- They can combine with different preverbs

We've so far systematically examined 7 (out of 11) verbs on 8 diagnostics/properties.

3 Diagnosing suppletion, not!

3.1 No complementary distribution of Vsg/Vpl

These pairs can be characterized by three general properties:

- the number of S/O can condition the form of the V
- Vsg is underspecified wrt number, Vpl is not
- Vpl is licensed by semantic plurality

1-These verb alternations are described as S/O number-conditioned suppletion in the literature (Shanidze 1973: 500-505, Aronson 1981: 406, Apridonidze 1989, Lomashvili 2019). Indeed, we've also found that the choice between one form vs the other is often sensitive to S/O number.

2-In general, we've found that Vsg can be used with both sg and pl S/O (*pace* previous literature which presented them as being in complementary distribution: Vsg iff S/Osg, Vpl iff S/Opl). It is only Vpl that tends to be incompatible with S/Osg (1).

- (1) a. leam da-k'l-a katami/katm-eb-i
 Lea.ERG prev-kill.sg-AOR.3SG chicken.SG/chicken-PL-NOM
- b. leam da-xoc-a *katami/^{ok}katm-eb-i
 Lea.ERG prev-kill.pl-AOR.3SG chicken.SG/chicken-PL-NOM
 Lea killed a chicken/chickens

Examples of Vsg with S/Opl are also found online (2).

- (2) man ar mo-mi-smin-a, gada-a-gd-o c'ign-eb-i
 he.ERG NEG prev-1OBJ-listen-AOR.3SG prev-vc-throw.sg-AOR.3SG book-PL-NOM

da barat-eb-i
 and card-PL-NOM
 He didn't listen to me, he threw away the books and cards.

3-Any plural S/O, as long as it's semantically plural, can license Vpl.

(3) **numeral + count noun**

- a. * vanom ç'ika da-a-c'q'-o magidaze.
 Vano.ERG glass.NOM prev-vc-put.pl-AOR.3G table.on
 Vano put a/the glass on the table
- b. vanom ç'ik-eb-i da-a-c'q'-o magidaze.
 Vano.ERG glass-PL-NOM prev-vc-put.pl-AOR.3SG table.on
 Vano put (the) glasses on the table
- c. vanom asi ç'ika da-a-c'q'-o magidaze.
 Vano.ERG 100 glass prev-vc-put.pl-AOR.3SG table.on
 Vano put 100 glasses on the table

3.2 Too much homonymy!

Given 11 verb pairs, we'd expect 22 forms in total, but there are actually 16 forms only: the same forms are used in several pairs.

Singular roots

1. -d- "put, place, flow"	8, 13
2. -gd- "let out, throw out"	4, 11
3. -k'vd- "die"	5, 6
4. -vard- "fall"	9
5. -t'ex- "break"	7
6. -dj-, -z- "sit"	2
7. -sv-, -sm- "seat"	3
8. -c- "get in contact ??"	10
9. -b- "tie"	1

Some of these roots (e.g. -c-, -d-) are completely bleached, it's really hard to give them a meaning (every motion verb has -d-, though it does not alternate with -c'q'- in all of its uses)

Plural roots

10. -sx- "sit"	1, 2, 3, 10, 13
11. -xoc- "slaughter, kill"	5, 6
12. -mt'vr- "break" from mt'veri "dust"	7
13. -q'r "throw, scatter"	4
14. -c'q'- de "order, lineup"	8
15. -rek'- "chase away"	11
16. -cv- "movement/falling out of multiple entities"	9

If, for instance,

- -b- / -sx- “bear fruit, hang”,
- -dj-, -z-/ -sx- “sit, settle (intr)”
- -sv-, -sm-/ -sx- “seat, set, put down, place (tr)”
- -c-/ -sx- “attack”

were truly suppletive, it’s very unlikely that their Vpl allomorph would all be homophonous.

On the other hand, if they’re just pair of lexical items, this can be likened to pairs like (4-5).

- | | | | |
|-----|--|-----|---|
| (4) | Drop/scatter
Throw/scatter
Toss/scatter
Place/scatter
Cast/scatter | (5) | Kill/massacre
Kill/slaughter
Kill/exterminate
Kill/decimate
Kill/wipe |
|-----|--|-----|---|

By comparison, there is no homonymy in Hiaki (6).

(6)

Hiaki participant-number marking verbs

Intransitive			Transitive		
Sg. Subj.	Pl. Subj.		Sg. Obj.	Pl. Obj.	
<i>weye</i>	<i>kaate</i>	‘go, walk’	<i>kecha</i>	<i>ha’abwa</i>	‘stand X up’
<i>vuite</i>	<i>tenne</i>	‘run’	<i>yecha</i>	<i>hoa</i>	‘set X down’
<i>weama</i>	<i>rehte</i>	‘walk around’	<i>kivacha</i>	<i>kiima</i>	‘bring X in’
<i>kivake</i>	<i>kiimu</i>	‘enter’	<i>me’a</i>	<i>sua</i>	‘kill X’
<i>yepsa</i>	<i>yaha</i>	‘arrive’			
<i>siime</i>	<i>saka</i>	‘go, leave’ (present)			
<i>weche</i>	<i>watte</i>	‘fall down’			
<i>muuke</i>	<i>koko</i>	‘die’			
<i>kikte</i>	<i>hapte</i>	‘stand up’			
<i>yeesa</i>	<i>hooye</i>	‘sit down’ (present)			

3.3 Is S/Opl even necessary?

Some verbs don’t even need a plural S/O as long as the result of the event they describe is plural. The best example of such a verb we have is -*mt’vr*- ‘break.pl’ (7): as long as the result of the breaking event yields multiple pieces, this form is licensed.

- (7) k’acma da-a-mt’vr-ia ç’ika
 man.ERG prev-vc-break.pl-AOR.3SG glass.NOM
 The man broke a glass. [in small pieces/smashed]

As far as we know, all Hiaki suppletive verbs show a strong correlation: S/Osg with Vsg, and S/Opl with Vpl, and no mismatch is allowed.

(8)

- | | | | |
|----|---|----|---|
| a. | Aapo weye
3sg walk.sg
'He/she/it is walking.' | b. | Vempo kaate
3pl walk.pl
'They are walking.' |
|----|---|----|---|

(9)

- | | |
|----|--|
| a. | Aapo/Vempo uka koowi-ta mea-k
3sg/3plthe.sg pig-ACC.sg kill.sg-PRF
'He/They killed the pig.' |
| b. | Aapo/Vempo ume kowi-m sua-k
3sg/3pl the.pl pig-pl kill.pl-PRF
'He/they killed the pigs.' |

Even a sg count noun can license Vpl, provided that its referent can be coerced into something plural, that is, provided that parts can be picked out (10).

- (10) balani ga-cviv-d-a.
fur.NOM prev-fall.pl-nact-AOR.3SG
(The animal's) coat fell / The animal lost its fur (bit by bit).

3.4 With S/O.pl; is Vpl licensed by 1+ or many?

For 6 (out of 7) verbs, Vpl is licensed only if many S/O are involved; 1 or 2 is not enough (11).

- (11) a. ??ori c'igni çamo-cviv-d-a.
two book.NOM prev-fall.pl-nact-AOR.3SG
Two books fell
- b. c'ign-eb-i çamo-cviv-d-a.
book-PL-NOM prev-fall.pl-nact-AOR.3SG
Books fell
- c. asi c'igni çamo-cviv-d-a.
100 book prev-fall.pl-nact-AOR.3SG
100 books fell

One Vpl (-sx- *sit*) is clearly licensed with 1+ S/O (12).

- (12) a. *erti k'aci da-sx-d-a.
one man.NOM prev-sit.pl-nact-AOR.3SG
One man sat down
- b. ori k'aci da-sx-d-a-{-nen}.
two man.NOM prev-sit.pl-nact-AOR.3SG {AOR.3PL}
'Two men sat down'
- b'. ivane da mariami da-sx-d-nen.
Ivan.NOM and Maryam.NOM prev-sit.pl-nact-AOR.3PL
Ivan and Maryam sat down
- c. asi k'aci da-sx-d-a-{-nen}.
hundred man.NOM prev-sit.pl-nact-AOR.3SG-{AOR.3PL}

Hundred men sat down

In Hiaki, things are lot crisper: Harley reports that Vpl is licensed when S/O is of cardinality 1+ and Vsg when S/O=1. The two forms are in sharp complementary distribution (13).

(13)

- a. Heidi hichikia into palam ama ha'abwa-k *kecha-k
Heidi broom and shovel there stand.PL-PRF stand.SG-PRF
"Heidi stood the broom and the shovel over there."
- b. Heidi uka kovanau kuta-ta ama kecha-k *ha'abwa-k
Heidi the.PL governor stick-ACC.SG there stand.SG-PRF stand.PL-PRF
"Heidi stood the staff over there"

3.5 Identity under elision

If Vsg/Vpl are the same root, an elided Vsg should be able to be licensed by a Vpl antecedent under identity modulo number inflection.

- (14) (a) The children have been here since Sunday, and Mary ~~[has been]~~ since this afternoon
(b) A. Who is calling? B. Your parents ~~[are calling]~~
(c) Your brothers have cleaned their rooms, but not your sister ~~[has cleaned her room]~~.

If however, Vsg and Vpl are different lexical items, things shouldn't be as clear.

- (15) a. #Christian sprinkled grass seed in his garden, and Mary a rock in the flowerbed.
b. #The guests scattered money, and the priest a petal on the bride's head.

Still the two hypotheses make different predictions:

- One root -> clear licensing of ellipsis (Hiaki)
- Two roots -> variation: baseline unacceptable but can be made better

We tested three types of ellipsis. Our results on this diagnostic support the two root hypothesis.

NB: since -*mt'vr*- "break.pl" is always licensed by plurality of results, the ellipsis tests are uninformative for it.

Ellipsis in fragment answers to wh-questions

- (16) A: ra çamo-cviv-d-a p'irveli sartulidan?
what.NOM prev-fall.pl-nact-AOR.3SG first floor.from
What fell from the first floor?
- B1: c'ign-eb-i
book-PL-NOM
Books

- B2: t'ansacmeli
body.wear.NOM
Clothes (mass)
- B3 : #c'igni
book.NOM
A book

Negative stripping

- (17) a. vanom c'ign-eb-i da-d-o magidaze rveuli k'i ara.
Vano.ERG book-PL-NOM prev-put.sg-AOR.3SG table.on notebook.NOM yes no
b. ??vanom c'ign-eb-i da-a-c'q'-o magidaze rveuli k'i ara.
Vano.ERG book-PL-NOM prev-vc-put.pl-AOR.3SG table.on notebook.NOM yes no
Vano put books on the table, and not a notebook (2/6)

Gapping

- (18) a. Vanom c'ign-eb-i da-do magidaze da mariamma
Vano.ERG book-PL-NOM prev-vc-put.sg-AOR.3SG table.on and Mariam.ERG
rveuli.
notebook.NOM
Vano put books on the table, and not a notebook
- b. *vanom c'ign-eb-i da-a-c'q'-o magidaze da mariamma
Vano.ERG book-PL-NOM prev-vc-put.pl-AOR.3SG table.on and Mariam.ERG
rveuli.
notebook.NOM
Vano put books on the table, and not a notebook

If Vsg and Vpl are distinct lexical items, we expect ellipsis to be less available, because it will be conditioned by the closeness of the meanings of Vsg and Vpl and different ellipsis types could also be more or less tolerant of different degrees of similarity (where max similarity = identity).

3.6 Idioms

In Georgian, we found that in expressions that are clearly idiomatic and far removed from their literal meaning, a form of the verb cannot be changed for the other (run/stampede in English).

In (19), the students are not sitting, nor are they in a mold.

- (19) Expression using Vsg
- a. st'udent'ebi k'alap'otši ça-dj-d-nen
student-PL-NOM mold.in prev-sit.sg-nact-AOR.3PL
The students fit the mold (i.e. after initially being undisciplined)
- b. #st'udent'ebi k'alap'otši ça-sx-d-nen
student-PL-NOM mold.in prev-sit.pl-nact-AOR.3PL

Int. The students fit the mold. (Lit. The students sit in the mold.)

This makes sense if Vsg and Vpl are in fact two different lexical items. Since lexically-fixed idiomatic expressions are frozen forms, we expect forms to matter more than meaning.

If Vsg/Vpl are in fact two different roots/lexical items, it explains why they are not interchangeable (// English *he kicked the bucket* = he died != *he kicked the pail*, Gibbs et al. 1989).

By contrast, varying Vsg/Vpl as a function of S/O number in idiomatic expressions is reported to be totally fine for Hiaki. This is expected if Vsg/Vpl in Hiaki are just different realizations of the same lexical item.

(20)

amae yehte~hoote, ‘change one’s mind, stand down from commitment’

- a. Tevan pahko-vae-n, ta ama-e yehte-k
Steven fiesta-PROSP- P.IMPF but there-OBL sit.SG-PRF
“Steven was going to hold a fiesta, but he changed his mind.”

- b. Ne-mak weeri-me pahko-vae-n,
1sg-WITH relate-S.REL fiesta-PROSP-P.IMPF
ta kaa ama yuma-kai, vena ama-e hoote-k
but not there arrive-PPL, then there-OBL sit.PL-PRF

“My relatives were going to hold a fiesta, but they couldn’t manage it, so they changed their minds.”

We have found variation in Georgian for expressions that are semi-idiomatic, i.e. the literal meaning and the idiomatic meaning are not far removed.

- (21) a. iap’onel-eb-i mtvareze da-dj-d-nen
Japanese-PL-NOM moon.on prev-sit.sg-nact-AOR.3PL
The Japanese landed on the moon
b. iap’onel-eb-i mtvareze da-sx-d-nen
Japanese-PL-NOM moon.on prev-sit.pl-nact-AOR.3PL
The Japanese ‘sat down’ on the moon (5/7)

In (25), the Japanese are indeed located on the moon.

Such expressions are still somewhat compositional: words can alternate so long as the meaning stays close to what is intended (e.g. English: *add/pour fuel on the fire*, *not lift/raise a finger*). These are lexically-flexible idiomatic expressions.

Upshot : when an expression is not lexically-flexible, Vsg/Vpl cannot alternate in Georgian unlike in Hiaki. This follows if Vsg/Vpl are two paired up lexical items.

3.7 Coordinated mismatched V with shared S/Osg

If number-conditioned V alternation in Georgian is suppletion, then it shouldn't be possible to coordinate distinctly valued Vs in a shared-object construction (RNR or ATB).

- (22) I [broke.pl ____] and he [threw.sg ____] a toy_i.
What_i did you [break.pl ____] and he [throw.sg ____]?

If Vsg/Vpl in Georgian are inflected forms of the same underlying V, then each form is conditioned by the number of S/O.

Since S/O is shared, the conditioning applies equally to both Vs.

If however, Vsg/Vpl are just distinct lexical items, no restriction on their coordination (except general encyclopedic compatibility) should hold (// I dropped and he scattered the seeds.).

In Georgian, we found that it is possible to coordinate two differently valued forms of V.

- (23) vanom da-d-o magram ar da-a-c'q'o
Vano.ERG prev-put.sg-AOR.3SG but not prev-vc-put.pl-AOR.3SG
c'ign-eb-i magidaze.
book-PL-NOM table.on
Vano put down but did not arrange the books on the table

3.8 No perfect overlap in semantic extensions, and native speaker intuitions

While it is true that in Georgian verb pairs, the second member combines only with plural DP, this is not the only difference. Their meanings diverge in other non-systematic ways which further supports the hypothesis according to which they are distinct lexical items.

-gd/-q'r — throw

- **-gd-** denotes a neutral throwing event of one or several animate or inanimate entities, compatible with one or several throwing events
- **-q'r-** requires *messy, unindividuated* throwings of aggregate entities (e.g. garbage, crowd, aggregate mass nouns in general)

- (24) a. Context : Vano throws three balls into the air
vanom burt-eb-i a-a-gd-o.
Vano.ERG ball-PL-NOM prev-vc-throw.sg-AOR.3SG
Vano threw the balls into the air (ok for soccer balls and for tennis balls)
- b. vanom burt-ebi a-q'ar-a.
Vano.ERG ball-PL-NOM prev-vc-throw.pl-AOR.3SG
Vano threw the balls up in the air. [ok for tennis balls, but #for soccer balls]
[If a machine is invented that throws out soccer balls, then 22b can be said for soccer balls too]

In these verbs we see that that Vpl is not just the plural counterpart of Vsg for when S/O is plural. Rather, Vpl is associated with additional lexical traits, such as:

- [+messy / aggregate, +small, -animate O] (q'ar-)

That Vpl stems are endowed with more features than Vsg entails that Vsg/Vpl are not just allomorphic realizations of the same root.

If they are different lexical items however, this is expected.

4. Comparing with tense suppletion in Georgian

Georgian has other types of verbal suppletion: tense-based and aspect-based.

We looked at tense-based suppletive forms.

List of tense suppletive verbs in Georgian (non-exhaustive, roots in bold)

nominalisation	past	present	future	
tkm-a	tkv-a	amb-ob-s	i-t'q'v-is	say
q'op-na	i-q'-o	ar-is	i-kn-eb-a	be
mi-c-em-a	mi-s-c-a	a-dzl-ev-s	mi-s-c-em-s	give
kn-a	kn-a	šv(r)-eb-a	i-z-am-s	act

N.B: Not all diagnostics are applicable (those relying on number).

4.1 Complementary distribution of past/present/future V

A future stem can't be used in present. And likewise for other tenses.

- (25) dghes nik'a amas **amb**-ob-s da xval sxva rames
 Today Nika.NOM this.ACC say-TS-PRES.3SG and tomorrow other thing.ACC
 i-t'q'v-is.
 nact-say-FUT.3G
 Today Nika is saying this and tomorrow he will say something else

- (26) *dghes nik'a **tkv**-am-s amas.
 Today Nika.NOM say-TS-PRES.3SG this.ACC
 Int. Today Nika says this.

4.2 Homonymy of forms across V

The root -kn-, found in the future form of the verb *be* is also found in the past form of *do*.

However, the verbal morphology reveals that the future of the verb *be* is the non-active counterpart of the verb *act*.

We do not think it is a syncretism, rather a causative-inchoative alternation of some abstract predicate ‘to cause to be – be’.

4.3 Identity under ellipsis

Gapping

(27) dghes nik’a amas **amb**-ob-s da xval sxva rames ____
 today Nika this.ACC say-TS-PRES.3SG and tomorrow other thing.ACC
 Today Nika says this but tomorrow he will say something else.

(28) *dghes nik’a amas **ambobs** da xval sxva rames ____
 today Nika this.ACC say-TS-PRES.3SG and tomorrow other thing.ACC
amb-ob-s
 say-TS-PRES.3SG

We could not find another type of ellipsis in Georgian where the verb can be elided and tense is allowed to vary.

4.4 Identity in idioms

In the expression *to be anxious* (lit. *be on needles*) the stem of the verb *be* can vary as a function of temporal reference without the whole expression losing the idiomatic meaning.

- (29) a. st’udent’ebi nemsebze i-**q’v**-nen gamocdamde.
 students.NOM needles.on nact-be-Past.3PL exam.before
 The students were anxious and febrile before the exam.
 b. st’udent’ebi nemsebze **ar**-ian gamocdamde.
 studentq.NOM needles.on be-PRES.3PL exam.before
 The students are anxious and febrile before the exam.
 c. st’udent’ebi nemsebze i-**kn**-eb-ian gamocdamde
 children.NOM needles.on nact-be-TS- FUT.3PL exam.before
 The students will be anxious and febrile before the exam

4.5 Perfect semantic overlap between forms

As far as we can tell, no semantic difference beside tense varies from tense to tense.

4.6 Interim conclusion

According to our tests, tense suppletion really is suppletion: one lexical root spelled out differently as a function of context (the specification on the T head).

5. Concluding remarks

Here’s a summary of the generalizations we’ve presented:

	G. Vsg/pl	Hiaki	G. tense
1. Complementary distribution of Vsg/Vpl	X	V	V
2. Homonymy of forms across V	V	X	X
3. Some verbs contribute plurality themselves (not a reflection of argument plurality)	V	X	n.a.
4. To the extent that Vpl are licensed by S/Opl, the cardinality of S/O must be “many”	V	X	n.a.
5. Identity of Vpl/sg under ellipsis	X	V	V
6. Identity of Vpl/sg in idioms	X	V	V
7. Coordinated mismatched V with shared S/Osg	V	-	n.a.
8. Perfect semantic overlap between Vsg/Vpl	X	V	V

We have argued is that Georgian number-conditioned verb alternation is actually a case of paired-up lexical items.

By contrast, our diagnostics show that Georgian tense-condition verb alternation and Hiaki Georgian number-conditioned verb alternation are suppletive.

Positing individuated roots affords us a mechanism to model the variation:

-Vsg/Vpl in Hiaki are allomorphs of one root/lexical item (same for Georgian tense-based V alternation) <- true suppletion

-Vsg/Vpl in Georgian correspond to a pairing of two roots/lexical items

A plausible direction for further analysis is a lexicographic approach where:

- Each root is associated with a bundle of features or semes to capture the similarities/differences between the items.
- More or fewer features in common could perhaps explain the gradation in judgments.

Such an analysis would also fit in with the intuition that suppletion is the endpoint of a process of lexical convergence.

In Georgian, that process is incomplete: the verbs are related but not enough to form a single root with contextually conditioned allomorphy.

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