

An Algorithm Describing the Choice of Verbal Vowel Prefixes in the Kartvelian Linguistic Space¹

Rusudan Asatiani

Institute of Theoretical and Applied Linguistics, Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia

Abstract. The four vowel-prefixes of the verb, which are distinguished in the South Caucasian (resp. Kartvelian) languages, represent various verb forms, such as: transitive, causative, reflexive, reciprocal, deponent, passive, potential, subjective and objective version. Such polyfunctionality of the prefixes leads us to suppose that they should have more general, common function. Based on a semantic and functional analysis of these prefixes the certain generalization is proposed; and the whole process of prefixes choices is presented as an algorithm with four implicational rules. The algorithm reflects a hierarchically organized optimal generating/dynamic process of linguistic structuring of the verb valence changes continuum both in the Proto-Kartvelian and in the contemporary Kartvelian languages. Such a dynamic approach clarifies why these vowels are poly-functional in the whole Karvelian linguistic space: Georgian, Svan, Megrelian and Laz (id. modern Kartvelian languages) and their dialects; and describes the main direction of diachronic changes in the functions of valence markers, which turn into (co)markers for various derivational verb categories.

Key words: Kartvelian languages, verb valence, verb derivational categories, semantic roles, algorithms in grammar

I. Introduction

There are four verbal pre-root vowel prefixes in the South Caucasian (resp. Kartvelian) languages. Based on the Comparative-Historical methodology they can be reconstructed for the Proto-Kartvelian level: **a-*, **i-*, **e-*, **u-*.

Table 1: Correspondences of the vowel prefixes

Proto-	Georgian	Megrelian/La	Svan
<i>*a-</i>	<i>a-</i>	<i>o-</i>	<i>a-</i>
<i>*e-</i>	<i>e-</i>	<i>a-</i>	<i>e-</i>
<i>*i-</i>	<i>i-</i>	<i>i-</i>	<i>i-</i>
<i>*u-</i>	<i>u-</i>	<i>u-</i>	<i>o-</i>

According to the Georgian grammatical tradition, these prefixes are the markers of the main categories, such are: Voice – **i-* (monopersonal passive) and **e-* (bipersonal prefix), Causative – **a-*; and Version – **i-* (subjective version), **u-* (objective version), and **a-* (neutral version) ([1]), but they can represent also different semantics and, therefore, verb categories as well: transitive, reflexive, reciprocal, potential, deponent and some other so-called middle forms ([2], [3], [4], [5], [6]). Thus, they are poly-functional and occupy one and the same position in the string of verb morphemes, never appearing simultaneously in the structure of verb forms. All this complicates their unequivocal interpretation ([7]). Reconstruction of these categories for the Proto-Kartvelian level is also problematic ([8], [9], [10]), while diachronic reconstruction of the prefixes themselves is quite transparent. To solve such problems it is assumed that they should have one common, more general function.

¹ The work has been supported by the Shota Rustaveli National Science Foundation under the project 216682.

For more sufficient analysis we turned on new theoretical approaches (e.g. functional approach – [11], theory of semantic roles – [12]) and methodological devises (e.g. tree-structures – [13], algorithms in grammar – [14], conceptual frames – [15]).

II. Semantics and functions of the prefixes

An exhaustive analysis of concrete prefixes shows (See examples below in the appendix):

***a-** marks out an increase of verb valence: when Agent-Actor and/or Agent-Initiator of an action appears in a verb argument structure, additionally, specific suffixes arise in a verb form: ***-(ev)in** (in case of Causative) or the specific thematic marker of Present Tense forms ***(-eb)** (in case of Transitive); while when Locative appears, only ***a-** presented in a verb form.

***u- i-** marks out an increase of verb valence when Recipient/Benefactive appears in a verb argument structure (resp. Objective Version).

***i-** marks out a decrease of verb valence when disappears either an Agent (resp. so-called Monopersonal Passive sometimes expressing Potential), or Recipient/Benefactive (resp. Subjective Version expressing Reflexive as well).

***e-** marks out the more complicated case: simultaneously, Agent's disappearance and Recipient/Benefactive's appearance (resp. Bipersonal Passive sometimes expressing Potential as well).

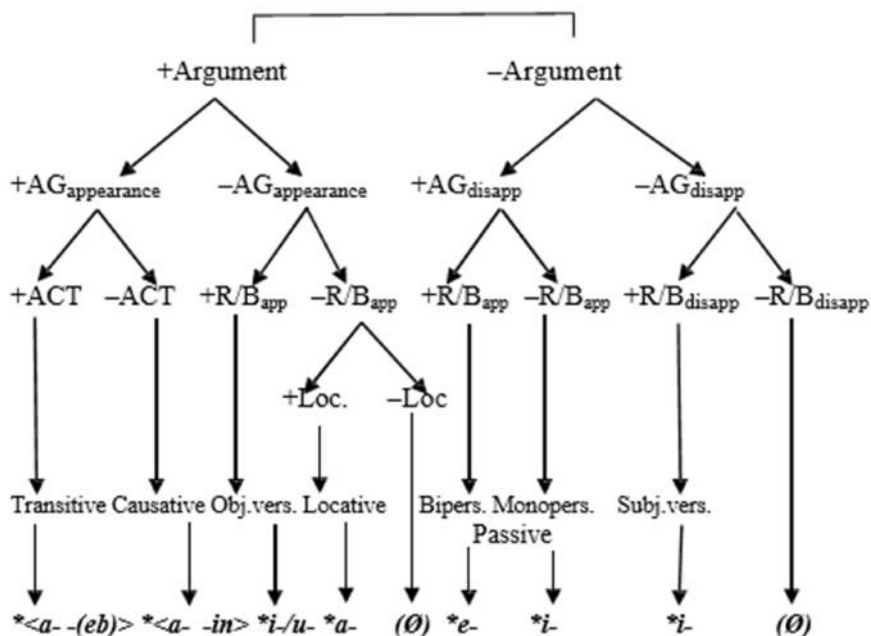
III. New interpretations: general function of the prefixes and the tree-structure describing various verb derivatives

Based on semantic and functional analysis of vowel prefixes, the following generalization is proposed:

*The main function of verbal vowel prefixes is to represent conceptual changes resulting from **an increase and/or decrease** of verb valence implying either appearance or disappearance of semantic roles in a verb argument structures.*

Various possibilities of verb valence changes can be summarized by the scheme, which reflects generalized functions of verbal pre-root vowel prefixes mainly preserved in all Kartvelian languages (Georgian, Svan, Megrelian and Laz) and their dialects.

Figure 1.



A generative strategy of verb forms creation is based on either appearance and/or disappearance of decisive Semantic Roles: +/-[ARGUMENT], +/-[AGENTAPPEARANCE], +/-[AGENTDISAPPEARANCE], +/-[AGENT-ACTOR], +/-[RECIPIENT/BENEFACTIVEAPPEARANCE], +/-[RECIPIENT/BENEFACTIVEDISAP], +/-[LOCATIVEAPPEARANCE].

IV. The Algorithm describing the valence changes

The whole process can also be reinterpreted and represented as an algorithm with the four stages of implicational rules where critical features for choices of the vowel-prefixes are adding or/and removing of certain semantic roles.

Figure 2.



Additional rules: if there is neither +/-[AGAPP] nor +/-[AGDISAPP] (the case: {-[AGAPP] and -[AGDISAPP]}), then +[REC/BENAPP] is formalized by the prefix *e-* representing semantics of Reciprocals, while +[REC/BENDISAPP] is formalized by the prefix *i-* representing so called Deponent verbs. If REC/BEN and PATIENT have the same referent, *i-* prefix represents Reflexive (especially in Laz), while if +[AGDISAPP] is ‘generalized, indefinable’ argument, *i-* and *e-* prefixes represent semantics of Potentials (especially, in Laz).

V. Conclusions

The four vowel prefixes, which traditionally were considered as markers of the categories of voice, version and causative, being poly-functional, are reinterpreted and qualified within more general conceptual frames as the markers of valence changes.

The tree structure shows that the choices are hierarchically organized.

The generation of different verbs forms is represented as the algorithm with four implication rules.

The proposed algorithm has the universal character: above given changes of a verb valence, defined by ‘adding’ and/or ‘removing’ of semantic roles in the verb argument structures, exist in every language; and the algorithm differs only in strategies of formal representation of the changes that determine the specificity of grammatical systems of various languages.

The algorithm reflects the hierarchically organized optimal generative/dynamic process of linguistic structuring of a verb valence changing continuum that is characteristic as for the Proto-Kartvelian so for the modern Kartvelian languages and dialects.

Development of the Proto-Kartvelian language system is considered and interpreted as a diachronic process showing that the vowels, expressing changes of verb valence, step by step have specified their own self-semantics and functions mostly by definite suffix endings and have been transformed into the co-markers of various categories: Voice, Version, and Causative. Additionally, preserving the “old”, general function, they can represent semantics and functions of Locative, Reflexive, Reciprocal, Potential and Deponent forms as well.

Such dynamic (both diachronically and synchronically) approach clarifies why these vowels are poly-functional in the contemporary Kartvelian languages (Georgian, Svan,

Megrelian and Laz) and dialects and why the reconstruction of the categories of voice and causation is so problematic for the Proto-Kartvelian level.

Appendix

Table 2: Examples from Georgian

Initial verb form	Valence changing	Derived verb forms and argument structures
<i>is c'ux-s</i> 3.SG.NON be.sad-PRS.S.3.SG 'S/he is sad.'	Adding: {+[ARG], +[AGAPP], +[ACTOR]}	<i>is ma-s a-c'ux-eb-s</i> 3.SG.NON 3.SG-DAT TRN-be.sad-THM-PRS.S.3.SG 'S/he bothers him/her' TRANSITIVE
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Adding: {+[ARG], +[AGAPP], -[ACTOR]}	<i>is ma-s a-c'er-in-eb-s c'eril-s</i> 3.SG.NON 3.SG-DAT CAUS.1-write-CAUS.1-THM-S.3.SG letter-DAT 'S/he has him/her write the letter.' CAUSATIVE
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Adding: {+[ARG], -[AGAPP], +[R/BAPP]}	<i>is ma-s u-c'er-s c'eril-s</i> 3.SG.NON 3.SG-DAT OV-write-PRS.S.3.SG letter-DAT 'S/he writes him/her the letter.' Note! R/B is III person OBJECTIVE VERSION
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Adding: {+[ARG], -[AGAPP], +[R/BAPP]}	<i>is me m-i-c'er-s c'eril-s</i> 3.SG.NON 1.SG-DAT IO.1.SG-OV-write-PRS.S.3.SG letter-DAT 'S/he writes me the letter.' Note! R/B is I or II person OBJECTIVE VERSION
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Adding: {+[ARG], -[AGAPP], -[ADAPP], +[LOCAPP]}	<i>is xel-s a-c'er-s c'eril-s</i> 3.SG.NON hand-DAT LOC-write-PRS.S.3.SG letter-DAT 'S/he signs the letter.' LOCATIVE
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Removing: {-[ARG], -[AGDISAPP], +[R/BDISAPP]}	<i>is i-c'er-s c'eril-s</i> 3.SG.NOM SV-write-PRS.S.3.SG letter-DAT 'S/he writes the letter for her/himself.' SUBJECTIVE VERSION
<i>is ban-s k'at'a-s</i> 3.SG.NON wash-PRS.S.3.SG cat-DAT 'S/he washes the cat.'	Removing: {-[ARG], -[AGDISAPP], +[R/BDISAPP]}	<i>is i-ban-s</i> 3.SG.NOM SV-wash-PRS.S.3.SG 'S/he bathes (her/himself).' Note! P=R/B REFLEXIVE
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Removing: {-[ARG], +[AGDISAPP], -[R/BAPP]}	<i>c'eril-i i-c'er-eb-a m-is mier</i> letter-NOM PASS-write-THM-PASS.PRS.S.3.SG 3.SG-GEN by 'The letter is written by him/her.' PASSIVE (MONOPERSONAL)
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Removing: {-[ARG], +[AGDISAPP], -[R/BAPP]}	<i>c'eril-i advilad i-c'er-eb-a</i> letter-NOM easily PASS-write-THM-PASS.PRS.S.3.SG 'The letter is written (/can be written) easily.' Note! AG is 'generalized' POTENTIAL
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Removing: {-[AGAPP], -[AGDISAPP], +[R/BDISAPP]}	<i>is ceril-s i-c'er-eb-a so-pl-idan</i> 3.SG.NOM letter-DAT PASS-write-THM-PASS.PRS.S.3.SG village-from 'S/he writes the letter from the village.' DEPONENT
<i>is c'er-s c'eril-s</i> 3.SG.NON write-PRS.S.3.SG letter-DAT 'S/he writes the letter.'	Removing and Adding: {-[ARG], +[AGDISAPP], +[R/BAPP]}	<i>c'eril-i ma-s e-c'er-eb-a</i> letter-NOM 3.SG-DAT IO.3.PASS-write-THM-PASS.PRS.S.3.SG 'The letter is written (by him/her) for him/her.' PASSIVE (BIPERSONAL)
<i>is sv-am-s q'ava-s</i> 3.SG.NON drink-THM-PRS.S.3.SG coffee-DAT 'S/he drinks coffee.'	Removing and Adding: {-[ARG], +[AGDISAPP], +[R/BAPP]}	<i>q'ava ma-s e-sm-eb-a</i> coffee.NOM 3.SG-DAT IO.3.PASS-drink-THM-PASS.PRS.S.3.SG 'Coffee is drinkable for him/her //S/he may (without harm) drink coffee.' Note! AG is 'generalized' POTENTIAL
<i>is cek'v-av-s</i> 3.SG.NON dance-THM-PRS.S.3.SG 'S/he dances.'	Adding: {-[AGAPP], -[AGDISAPP], +[R/BAPP]}	<i>is ma-s e-cek'v-eb-a</i> 3.SG.NOM 3.SG-DAT IO.3.PASS-dance-THM-PASS.PRS.S.3.SG 'S/he dances together with him/her // they dance together.' RECIPROCAL

References

1. Shanidze A. (1973) *kartuli enis gramat'ik'is sapu vlebi* (Fundamentals of the Georgian Language Grammar). Tbilisi: TSU publ.

2. Asatiani R. (2001) Conceptual Structure of Reflexive and Middle. *Proceedings of 4th International Symposium on Language, Logic and Computation*, pp.5-16. ILLC scientific publications, Amsterdam
3. Holisky D.A. (1981) Aspect and Georgian Medial Verbs. Caravan Books, Delmar-N.Y.
4. Ivanishvili M., Soselia E. (2001) A Morphological Structure and Semantics of the Georgian So-called Passive Forms. In: de Jongh, D., Zeevat, H., Nilsenova, M. (eds) *Proceedings of the 3rd and 4th International Symposium on language, Logic and Computation*, Batumi, Georgia, September 12-16 (1999); September 23-28, Borjomi, Georgia.
5. Nozadze N. (2015) “ecek’veba” t’ip’is zmnebi da mati semant’ik’a (Semantic interpretation of the ecek’veba type verbs. *Enatmecnierebis sak’itxebi (Issues of Linguistics)*. Tbilisi: TSU publ.
6. Tuite K. (2002) Deponent Verbs in Georgian. In: Bublitz, W., Boeder, W., von Roncador, M., Vater, H. (eds.) *Philologie, Typologie und Sprachstruktur: Festschrift Für Winfried Boeder zum 65. Geburtstag*, pp. 375-589. Peter Lang Verlag, Frankfurt am Main.
7. Asatiani R. (1987) zmnur p’repiksul xmovanta punkcionaluri k’valipik’acia kartvelur enebši (The Functional Qualification of Verbal Vowel Prefixes in the Kartvelian Languages). Macne, Tbilisi.
8. Asatiani R. (2013) The Information Structure and Typological Peculiarities of the Georgian Passive Constructions. In: Bezhanishvili, G., Löbner, S., Marra, V., Richter, F. (eds.) *Proceedings of the 9th International Tbilisi Symposium on Language, Logic and Computation*. (LNAD), vol. 7758, pp. 17-34. Springer, Heidelberg.
9. Asatiani R. (2017) k’auzacia kartvelur enebši (Causative in the Kartvelian languages). *Enatmecnierebis sak’itxebi (Issues of Linguistics)*. Tbilisi: TSU publ.
10. Machavariani G. (2002) kartvelur enata šedarebiti gramat’ik’a (Comparative grammar of the Kartvelian languages). Tbilisi: TSU publ.
11. Harris A.C. (1981) Georgian Syntax: a study in relational grammar. Cambridge University Press, Cambridge.
12. Dowty D. (1991) Thematic Proto-roles and Argument Selection. *Language*, vol. 67, no. 3, pp. 547-619. Linguistic Society of America.
13. Berg T. (2009) Structure in language: A dynamic perspective. New York: Rout ledge.
14. Rieber L. (1992) Grammar Rules as Computer Algorithms, *College Teaching*, Vol. 40, No. 2, JOURNAL ARTICLE.
15. Shibatani M. (2006) On the Conceptual Framework for Voice Phenomena. *Linguistics* 44-2. pp. 217-269.