Morphology Model For Western Armenian Language

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ABSTRACT
The morphology model of the Western Armenian in comparison with Eastern Armenian language morphology model on an example of a verb is given.
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Modern Armenian literary language is presented by two variants: Eastern and Western Armenian. Eastern Armenian is the official language of the Republic of Armenia, Western Armenian serves as a means of communication for the Armenian Diaspora, is the language of the Western Armenian periodical Press, fiction literature. It is studied in the primary and secondary schools of the Armenian Diaspora.

The morphology model for the Western Armenian variant has been developed for automatic correction of texts in the FineReader system and will be applied also in the UNL-Armenian module.

We will show the morphology model on an example of a verb as the most morphologically rich part of speech of the modern Western Armenian language, which besides of conjugation paradigm for finite verbs contains also a declension paradigm for non-finite verbs (participle forms). Thus, we can show both the conjugation and declension on an example of a verb.

In this article the morphology model for Western Armenian is given in comparison with Eastern Armenian, since both variants in their material units and by structural-typological characteristics have more similarities in common, than differences.

The verb system of modern Armenian language (Eastern and Western), as it has been mentioned above, (V) includes two classes: the finite (Vf) and non-finite (participles) verbs (V=Vf, Part). The participles are divided into two groups - declinable and indeclinable: Part = {Part1, Part2}. The indeclinable participles compose finite forms.

The most relevant differences between Eastern and Western Armenian are observed especially in the non-finite verb system.

Declinable participles in Eastern Armenian are the following: Part1 = {Inf, Res, Sub, Fut}, where Inf - infinitive, Res – perfect (resultant), Sub - subjective, Fut – future - a future tense participle. Indeclinable participles are: Part2 = {Imp, Hyp, Plu, Adv, Neg}, where Imp - imperfect, Hyp - hypothetical (future), Plu - pluperfect, Adv – adverbial, Neg – a negative participle.

The participles of Western Armenian differ from those of Eastern Armenian in quantity and formation means, as well as in some functional peculiarities. In the Western Armenian the adverbial participle of Eastern Armenian (-elis, -alis) and the indefinite participle (-um), that serves as the analytical verbal stem, that creates present and past indefinite tenses of the Indicative Mood are absent. Thus, in Western Armenian there are 7 non-finite forms (instead of 9 in Eastern Armenian). In the Table 1 the declinable and indeclinable participles for both Eastern and Western Armenian variants and their word-formative suffixes are presented.

Western Armenian

Part 1	Suf	Part 2	Suf
Inf	-ել/-ալ/-իլ/-ուլ	-	-
Res	-ած* (Part 2)	Hyp	-ելու/-ալու**
Sub	-ող	Plu	-եր/-ացեր
Fut	-ելիք/-ալիք	-	-
		Neg	-եր/-առ***

Eastern Armenian

Part 1	Suf	Part 2	Suf
Inf	-ել/-ալ	Imp	-ում
Res	-ած	Hyp	-ելու/-ալու
Sub	-ող	Plu	-ել/-ացել
Fut	-ելիք/-ալիք	Adv	-ելիս/-ալիս
		Neg	-ի/-ա

Table1. Participles of the Eastern and Western Armenian variants and their word-formative suffixes.

* These forms in the Western Armenian can be used as independent participles with an attributive meaning, and at the same time they are complete analytic stems for creating resultative Past tense as for static verbs (in Eastern Armenian), as well as for the verbs denoting action.

** These participles form the Future tenses of the Indicative Mood in the Eastern Armenian (գրելու եմ - "I will write"), meanwhile in the Western Armenian the following form denotes an Compulsive Mood (գրելու եմ - "I must write").

*** In both variants the negative participles differ in form and in function. In the Eastern Armenian they create negative forms of the Optative Mood (Future tenses and the Future-in-the-Past) and in the Western Armenian the present and the imperfect forms of the Indicative Mood. (cf.:

East. Arm.: չեմ գրի "I will not write", չեմ կարդա "I will not read" – West. Arm.: չեմ գրեր "I do not write", չեմ կարդար "I do not read").

The Ինfinitive, as in the Eastern Armenian, stand for the initial form of the verb. The formal marker of the infinitive in the Western Armenian are the –ել,-ալ,-իլ,-ուլ suffixes, in contrast to the Eastern Armenian, which has only two suffixes: –ել, and -ալ.

All participles of Part1 are characterized by all substantive categories, independent declination paradigm and can take all noun functions in the sentence. These categories are: number, case and actualization that are expressed by suffixes.

The verb of the Western Armenian like the verb of the Eastern Armenian is characterized by positive and negative conjugations: Con1 = {Pos, Neg}), and depending on verb flexion in infinitive forms also belongs to one of four types of conjugation - Con2 = {–ել,-ալ,-իլ,-ուլ}.

The list of the grammatical categories and their values describing a verb for both variants is following:

Mood. M= {Ind, Imp, Opt, Comp}, where Ind – Indicative, Imp – Imperative, Opt – Optative, Comp - Compulsive mood, in Eastern Armenian the Conditional mood is more. The differences between formation of the finite forms are presented in the Table 2.

Tense. Tns = {Pres, Fut, Past}, where Pres- Present, Fut - Future, Past - Past tense.

Voice. Voc = {Act, Pas, Med} where Act - Active, Pas- Passive, Med - Medial voice.

Transitivity. This category (Trans=(trans, intranas)) including causative (Caus), in the Western Armenian has the same semantic and functional oppositions as in the Eastern Armenian, but causative verbs have some differences in conjugation paradigm. The causative suffix –ցն-/-ցը- forms verbs of Active voice from verbs of both active and medial voice verbs.

Aspect. Asp = {Perf, Imp, It}, where Perf –perfect, Imp - imperfect, It- iterative.

Number. Num = {Sg, Pl}, where Sg –Singular, Pl- Plural number.

Person. Pers = {P1, P2, P3}, where P1 - first, P2 - second, P3 - third person.

Case. Case = {Nom-Acc, Gen-Dat, Abl, Instr}, where Nom - nominative, Gen - genitive, Dat - dative, Acc – accusative (in the Western Armenian a complete identification of Nominative and Accusative, Genitive and Dative cases has taken place), Abl - ablative, Ins - instrumental. In Eastern Armenian there are 7 cases (+ locative case), and the Accusative and Dative cases have morphological markers.

Actualization. Def = {def1, def2, Pers1, Pers2}, where def1 - absence of an article, def2 - definite article –ը/-ն, Pers1 – `possessive` article of first person (-ս), Pers2 – possessive article of second person (-դ).

Two last categories (Case and Def) are nominal and characterize only forms of declinable participles Part1.

Mood	Finite forms	Western Armenian	Eastern Armenian
Indicative	Present	կը գրեմ*, կ'ըսեմ	գրում եմ
	Imperfect	կը գրէի*	գրում էի
	Perfect	գրեցի	գրեցի
	Past	գրէր// գրած եմ	գրել եմ
	Pluperfect	գրէր // գրած էի	գրել էի
	Future	պիտի գրեմ**	գրելու եմ
	Future in the past	պիտի գրէի**	գրելու էի
Compulsive	Future	գրելու եմ	պիտի գրեմ**
	Future in the past	գրելու էի	պիտի գրէի**
Conditional	Future	–	կգրեմ*
	Future in the past	–	կգրէի*
Optative	Future	գրեմ	գրեմ
	Future in the past	գրէի	գրէի
Imperative		գրէ, գրեցէք	գրիր, գրեցէք

Table 2. Comparative table of main tense forms according to the Moods in the Eastern and Western Armenian (verb *գրել* "to write").

* In the Western Armenian the Conditional Mood with the modal particle կ- of the Eastern Armenian is absent. These forms express the Present tense of the Indicative Mood in Western Armenian. They differ in orthography: in the Western Armenian the particle is written separately or, if the next word starts with a vowel, it is separated by an apostrophe (կը գրեմ, կ'ընսեմ).
** The Compulsive Mood forms of the Eastern Armenian with the modal particle պիտի in the Western Armenian serves to express Future tense of the Indicative Mood. The meaning of the Compulsive Mood in the Western Armenian expresses the Future tense of the Indicative Mood in the Eastern Armenian, i.e. they have shifted places. Correspondingly the functions of the particle պիտի differ. In the Eastern Armenian it is the marker of the Compulsive Mood, in the Western Armenian – only a marker of the Future tense.

The finite forms of verbs are of two types: simple and compound.
The characteristics of the simple verbal forms in Western Armenian like those in Eastern Armenian are formed of the characteristics of their morphs. Morphs, constituting forms of the verbs, are divided into following groups: stems (O), suffixes of participles (Sp), verbal suffixes (Sv), verbal inflexions (Fv), nominal inflexions (Fn), prepositive modal particles, auxiliary verbs –Va, negative auxiliary verbs - Van.
The compound forms are constituted by addition of auxiliary verbs to Part2.
Stems of a verb are characterized by the following categories: Con1, Con2, Voc, Trans (Caus) and number of paradigm VPi, where i=1... N. N is amount of inflection types of a verb. For this model dictionary with word-list of 52 000 entries is compiled (the amount of verbs is about 7000). From a verbal stem like those in Eastern Armenian the initial forms of all participles and simple finite forms are synthesizing.

In total about 20 patterns for verbs are developed, including irregular verbs, for which two initial forms - stem of an infinitive (OInf) and stem of past tense (aorist) (OPastPerf) are stored in the dictionary.

The negative forms are constituted by means of addition to a stem at the left of negative particle (ch- չ), like those in Eastern Armenian, and form of a passive voice(pas) are constituted by addition to the right before inflexion or before participle suffix the affiex of Passive (-ուի) instead of -վ- in the Eastern Armenian variant. The combinations of values of above mentioned categories constitute the characteristics of morphs and word-forms.
For the description of constitution of the verbal forms we use two operations - concatenation (*) for the connected way of writing and addition (+) for the separate one. O – the stem of verb, Sp- suffixes of participles - Modal prepositional particles are: negative particle – չ, particle, forming Present – կ, particle, forming Future of the Indicative – պիտի, prohibitive particle մի. The rules of forms constitution are: negative forms – չ*O, Present and past Imperfect – կը+O/ կ'*O, Future of the Indicative – պիտի + O* Fv/O*Fv +պիտի, negative forms of Imperative - մի+O*Fv.
Then the rules of the verb forms synthesizing will be as follows (calculus of rules):

Table 3.The rules of the verb forms synthesizing

Forms	Rule of form constitution	Example
The direct forms of participles	O*Sp	գր*ել
The negative forms of participles	չ* O*Sp	չ*գր*ել
The simple finite forms of a verb (Optative, Imperative, Indicative Perfect)	O*Fv	գր*եմ, գր*է, գր*եց
The negative simple finite forms of a verb	չ*O*Fv, Van+O*Fv	չ*գր*եմ, չեմ+ գր*եր
The indirect forms of participles	O*Sp *Fn	գր*ել*ով
Indicative Present and Imperfect	կը+ O*Fv/ կ'*O*Fv	կը+գչ*եմ, կ'*ընսեմ
The compound forms	O*Fv +Va, O*Sp + Va	գր*եր+եմ, գր*ած+եմ
The negative compound forms	Van+Part2	չեմ+գր*եր
The Future and Future in the Past of Indicative	պիտի + O*Fv / O*Fv + պիտի	պիտի գր*եմ
The negative forms of Future, Future in the Past of Indicative	չ* պիտի + O*Fv	չ*պիտի+ գր*եմ
The negative forms of Imperative	մի+ O*Fv	մի գր*է

Suffixes of the participles (Sp) see in the Table1.

The verb flexions with their characteristics are listed in theTable 4.

Fv	Characteristic	Fv	Characteristic	Fv	Characteristic
-եմ	Pres, Sg, P1,	-էի	Past, Sg, P1,	-եցի	Pres, Perf, Sg, P1
-ես	Pres, Sg, P2,	-էիր	Past, Sg, P2	-եցիր	Pres, Perf, Sg, P2
-ի	Pres, Sg, P3	-էր	Past, Sg, P3	-եց	Pres, Perf, Sg, P3
-ենք	Pres, Pl, P1	-էինք	Past, Pl, P1	-եցինք	Pres,Perf, Pl, P1
-եք	Pres, Pl, P2	-էիք	Past, Pl, P2	-եցիք	Pres, Perf, Pl, P2
-են	Pres, Pl, P3	-էին	Past, Pl, P3	-եցին	Pres, Perf, Pl, P3

Table4. Verb flexions (Fv)

The non-finite verb system includes 4 initial forms of declinable participles Part1, being declined on a sample of nominal declination. Categories describing these forms are: Con1, Voc, Num, Case, Def. Not all values of the specified categories are combined with each other. In Westwrn Armenian language for each initial form of a declinable participle 22 forms are realized. The indirect forms of an infinitive are formed by connecting nominal inflexions to Part1 (the participle declination is shown on the example of Infinitive with Con1==ել).

Fn	Characteristic	Fn	Characteristic
-ը/-ն	INFel Sg, Nom/Acc, Def2	-ները/-ներն	INFel Pl,Nom/Acc, Def2
-ուն	INFel Sg, Gen/Dat,Def1	-ներուն	INFel Pl,Gen/ Dat,Def1
-էն	INFel Sg, Abl, Def1	-ներէն	INFel Pl, Abl, Def1
-ով	INFel Sg, Ins, Def1	-ներով	INFel Pl, Ins, Def1
-ս	INFel Sg, Nom/Acc, Act1	-ներս	INF1el Pl,Nom/Acc, Act1
-դ	INFel Sg, Nom/Acc, Act2	-ներդ	INFel Pl,Nom/Acc, Act2
-ուս	INFel Sg, Gen/ Dat, Act1	-ներուս	INFel Pl,Gen/ Dat, Act1
-ուդ	INFel Sg, Gen/ Dat, Act2	-ներուդ	INFel Pl,Gen/ Dat, Act2
-էս	INFel Sg, Abl, Act1	-ներէս	INFel Pl,Abl, Act1
-էդ	INFel Sg, Abl, Act2	-ներէդ	INFel Pl,Abl, Act2
-ովս	INFel Sg, Ins, Act1	-ներովս	INFel Pl,Ins, Act1
-ովդ	INFel Sg, Ins, Act2	-ներովդ	INFel Pl,Ins, Act2

Table 5. Declination of an infinitive. Fn - nominal inflexion**.**

The paradigm of a verb includes also 3 initial forms of participles (Part2), constituting the personal form with the aid of auxiliary verbs (see Table 6). Categories describing these forms are: Con1, Mood, Voc, Asp, Tns, Num, Pers. The combinations of the values of these categories form the personal verb characteristics of Western Armenian language.

Table 6. Auxiliary verbs (Va)

The rule of the finite forms constitution is: PART 2+Va/Va + PART 2

Va	Characteristic	Va	Characteristic
եմ	Pres, Sg, P1	էի	Past, Sg, P1
ես	Pres, Sg, P2,	էիր	Past, Sg, P2,
է	Pres, Sg, P3,	էր	Past, Sg, P3.
ենք	Pres, Pl, P1	էինք	Past, Pl, P1
եք	Pres, Pl, P2,	էիք	Past, Pl, P2,
են	Pres, Pl, P3.	էին	Past, Pl, P3.

The quantity of negative forms of auxiliary verbs (Van) is the same. The rule of the personal forms constituting for negative conjugation is Van+Part2.

The submitted formalized model of the Western Armenian morphology will be realized for UNL in the "Little Prince" Project. This model holds the vocabulary of stems with the characteristics including number of paradigm and tables of morphs with grammatical characteristics. Also the grammatical rules of the analysis and synthesis of the forms are developed according to UNL rules format. The model allows to carry out the analysis and synthesis of Western Armenian language words.

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