

**“PROTOLANGUAGES’ VS. LINGUISTIC NETWORKS
ACROSS LANGUAGE BRANCHES’. A BASIC INVENTORY
FOR RELATIONS OF CONCEPTS IN PREHISTORIC STATES
OF LINGUISTIC COMMUNICATION**

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Abstract: *The following is a study of the representation of the reflexes of the roots of the Borean language family in the Eurasiatic, Afroasiatic, Sino-Caucasian, Austric, and Amerind language families. This Borean language family is considered to be a macro-language family, which comprises the aforementioned language families as their members. With the selection of words of this macro-family we can state that the roots of this macro-family are neither equally distributed among the member families nor distributed in the framework of the traditional borders of natural languages families. In order to check the distribution of these Borean roots, we use the “100-Words-Swadesh List” to check extensions of the related roots within the 5 different language families. The results are presented in a list of 100 concepts and a theory of the conditions of linguistic communication in pre-historic time, for which linguists usually employ the concept of ‘protolanguages’. We derive from our findings that the early hypothetical linguistic states of humans allowed the representation of oneself and the environment as its thesaurus entailed the conceptual meanings for it. On the contrary, a grammaticalization in the traditional understanding is not obviously resulting from the material as well as unlikely to have happened. The linguistic state was a ‘phonetic networking network’ across language families, so that the concept ‘language family’ should be critically revised.*

Keywords: *protolanguage, concept, a prehistoric state, linguistic, communication.*

1. Introduction: *About the need of theory of linguistics at the end of linguistic history*

The following article is an approach to find answers to the question of relations between languages transgressing the traditional classification systems of language branches of natural languages. While no doubt exists among linguists that natural languages change in a diachronic range for historically documented chronological ranges of natural languages, the situation is completely different for languages and/or linguistic varieties, which lack historical documentation, since they were just orally transmitted. Nevertheless, historical linguistic studies have since the 19th century discovered that the branches of language families have hypothetical common ancestors or at least share a common morphological material at the level of the words of their lexical inventory.

The contemporary state of knowledge in linguistics represents that the concept of ‘language’ is multilayered and also alternative conceptual frameworks should be taken into account in order to describe the linguistic situation for pre-historical linguistic states. The state of lack of historical material leads *nolens volens* to the necessity of theoretical frameworks about

linguistic states in pre-historical times. The scientific approach needs to be experimentally based on non-empirical comparisons of documented linguistic material from different branches and the detection of the maximum amount of commonly shared linguistic features within the lexicon of the linguistic varieties and/or languages. This work of historical linguistic research has brought forward since the 19th century not only the knowledge of relationships between widely disperses languages as language families (, which also tells us something about the migration backgrounds that can be additionally compared to findings in archeology and anthropology as supporting evidence). Also systematic linguistic inventory lists of the commonly shared lexical inventory have been presented by linguists. Pokorny's list of Indo-European roots as well as the Starostinian approach of multiple comparisons of similar material across language families supported by rich database material can be mentioned here besides selective studies in 'language contacts' (,a problematic term we like to exchange against 'linguistic communication'), which uncover linguistic communication beyond the area of the commonly established language families.

The question how a community of speakers actually evolves increases our relative helpless state of methodological approaches, as even the theoretical material seem to be in need of a revision. The assumption that a language exists in pre-historical times, means that also the contemporary dominant associations of the concepts 'language' is applicable for pre-historic linguistic states. But this is not the case and we will in the following article based on the material of the Borean language family demonstrate how the a community of speakers through differentiation of linguistic material and secondary grammaticalization could have communicated without the social and cultural borders we usually associate to linguistic varieties.

2. The state of research: language as faculty of linguistic communication, the concept 'protolanguage', and the idea of an evolution of languages

P. Kiparsky's article *Historical Linguistics and the Origin of Language* [7, p. 97–103] still refers to the idea of an origin of language in the tradition of the philologies of the 18th and 19th century. In *Reconsidering the "Isolating Protolanguage Hypothesis."* in *the Evolution of Morphology* J. Dubé wrote: "Much recent work on the evolution of language assumes explicitly or implicitly that the original language was without morphology. Under this assumption, morphology is merely a consequence of language use: affixal morphology is the result of the agglutination of free words, and morphophonemic (MP) alternations arise through the morphologization of once regular phonological processes [3]. This hypothesis is based on at least two questionable assumptions: first, that the methods and results of historical linguistics can provide a "window" on the evolution of language,

and second, based on the claim that some languages have no morphology (the so-called isolating languages), that morphology is not a necessary part of language. The aim of this paper is to suggest that there is in fact no basis for what I will call the “Isolating Proto-Language Hypothesis” (henceforth IPH), either on historical or typological grounds, and that the evolution of morphology remains an interesting question”. J. Dubé mentioned that “to appeal to a random genetic mutation or to a stroke of lightning in order to explain the evolutionary origins of language, or of one of its components, is clearly not an explanation, but it is equally unhelpful to keep a demonstrably wrong hypothesis because it may be the only available alternative to date to the argument from ignorance. Both of these views risk having the effect of preventing interesting investigations of the *problem* (not the *mystery*) of the evolution of morphology” [*ibidem*]. K. R. Gibson in *Language or Protolanguage? A Review of the Ape Language Literature* described actual ape behaviors without prejudging their linguistic nature concluding “that a number of apes mastered essential components of protolanguage, but none constructed hierarchically structured sentences containing embedded phrases or clauses” [4]. J. R. Hurford in *The Evolution of Language and Languages* mentioned that “Bickerton's term *protolanguage* is a useful attention-focussing device, postulating that the class of ‘languages’ biologically available to *Homo erectus* was the class of protolanguages, defined quite roughly as systems for concatenating vocabulary with none of the complex syntactic dependencies, constituencies, command and control relations characterizing modern languages. A *Homo erectus* individual, even if somehow presented with modern linguistic experience, could not make of it what a modern child makes of it, due to innate limitations” [5]. The researcher stated that “the language faculty has evolved as other genetically determined traits have evolved, via selection over the millions of alleles that contribute to the human genome. The phylogenetic evolution of the language faculty must have been slower by several orders of magnitude (assuming one could even quantify such things) than the sociocultural evolution of individual languages“ [*ibidem*]. Proto-Indo-European is “presumed to have been spoken somewhere in Eastern Europe about five thousand years ago, and Proto-Iroquoian, the ancestor language from which the modern American languages of the Iroquoian family, such as Mohawk, are descended”. J. R. Hurford [5] and D. Bickerton [1] wrote regarding the timing of protolanguage: “The question of when protolanguage emerged merits a brief consideration, if only because an adequate theory must eventually be able to integrate language evolution into the overall development of the genus *Homo*. The wide range of estimates in the literature (from the australopithecine era to the emergence of our own species) suggests that there are inadequate constraints to determine dates at

this point. Much depends, too, on the nature of the initial selective pressure. If this was scavenging (as suggested above) the likeliest time of onset would be between two and three million years ago. It seems intrinsically plausible that a longish period elapsed between the emergence of symbolic units and the emergence of syntax, since complex connections not required by any previous brain operations had to be forged, while perhaps also a critical mass of “recruitable neurons” had to be achieved”.

The usual approach for the reconstruction of linguistic states, which lack historical documentation, is the reconstruction of a hypothetical former state based on the material of words in historical languages, which show similarities. These similar words can be cognates or other phonetically similar words. A common hypothetical ancestral root of the protolanguage both share is made in a method called ‘comparative method’. The state of the protolanguages is discussed, as one position refers to them as hypothetical, whereas another position states that these protolanguages have existed and were used around 5000 BCE. In other words: The previously mentioned approach tends to an evolutionary perspective of languages including protolanguages going hand in hand with the evolution of the human from the apes, which already partly were able to produce and use features of the protolanguages (see [4]). Al. Bouchard-Côté, D. Hall, Th. L. Griffiths, and D. Klein in *Automated Reconstruction of Ancient Languages using Probabilistic Models of Sound Change* (2013) stated that “one of the oldest problems in linguistics is reconstructing the words that appeared in the protolanguages from which modern languages evolved. Identifying the forms of these ancient languages makes it possible to evaluate proposals about the nature of language change and to draw inferences about human history” [2]. According to these linguists, “protolanguages are typically reconstructed using a painstaking manual process known as the comparative method. We present a family of probabilistic models of sound change as well as algorithms for performing inference in these models. The resulting system automatically and accurately reconstructs protolanguages from modern languages” [*ibidem*]. They stated too that “the key observation that makes reconstruction from these data possible is that languages seem to undergo a relatively limited set of regular sound changes, each applied to the entire vocabulary of a language at specific stages of its history” [*ibidem*]. Like for other approached of historical linguistics, the phonetic material is the subject of research: “Using phonological representations allows us to perform reconstruction and does not require us to assume that cognate sets have been fully resolved as a preprocessing step. Representing the words at each point in a phylogeny and having a model of how they change give a way of comparing different hypothesized cognate sets and hence inferring cognate sets automatically”. Al. Bouchard-Côté *et alii* use a probabilistic model of sound change and a Monte Carlo inference algorithm “to reconstruct the lexicon and phonology of protolanguages given a collection of cognate sets

from modern languages. As in other recent work in computational historical linguistics (13–18), we make the simplifying assumption that each word evolves along the branches of a tree of languages, reflecting the languages' phylogenetic relationships. We model the evolution of discrete sequences of phonemes, using a context-dependent probabilistic string transducer". The database *Tower of Babel* entails indexes of the major language families with roots of protolanguages and the hypothetical Borean root as the antecedent root with representations in the main branches of language families. Based on the Borean root, it is possible to trace the relationships between words of protolanguages and the related reflexes in natural languages.

2. Question, methodology, and approach of our research: change and variations as underlying principles of development of 'linguistic communication'

Our study is based on the corpus of the Tower of Babel project. In the tradition of 'big questions' of humankind the question how words and things refer to each other would be the guiding question of our research. In academia the question is approached since antiquity by philosophers and rhetoricians and in the heritage of the tradition of Western academic studies in linguistics, semiotics, and communication sciences further answered. How linguists interpret the findings from the comparisons of linguistic varieties varies. While naïve early 19th century researchers in the tradition of Herders *Ursprache* still assumed the existence of arch-languages as ground for later languages, the framework of the concept 'language' was more and more critically revised. Still the term 'proto-language' is commonly used for a hypothetical antecedent language/linguistic variety. The simplest description for the common features we are interested in is an inductively derived morphological material at word-level, which is shared among language varieties. Our research interest focuses on the common linguistic features of languages beyond the level of a single branch of languages. The Starostinian database and the concept of the Borean macro-language family allow us to have material for the comparison of material beyond the level of language families. The term 'linguistic communication' is used for any linguistically relevant material, which also entails our hypothetical material as representations of 'linguistic communication'.

As propeutics for the problem and our discussion and as the description of the segment of our research in a case study we select a semantic framework idea of most common words of a linguistic variety and semantic categories of lexical material. It is statistically possible to rank the most commonly used words within a text corpus of a thesaurus. An example is the list of the most commonly used words in the English language (see table below). On the contrary, it is not possible to determinate the exact meaning of words, when operating at the level of hypothetical linguistic states, since here *conceptual meanings* are associated to the material. We also have here examples of semantic framework ideas, which aim at the classification of the inventory of a linguistic variety according to the

closeness to this field. Usually, these categorizations refer as *orbis pictus* to the world. The *Semantic Fields* for *Indo-European Linguistics* used at the University of Texas at Austin for the categorization of semantic fields of Pokorny's etyma (see table below). The semantics of the roots of the Borean hypothetical ancestral linguistic variety result from the semantic meanings of the Starostian databases at *Tower of Babel*. (Below we discuss their actual function as concepts rather than lexicological meanings). For our theoretical framework, we rely on the theory of transpositional grammar based on the assumption that parts of speech can be subject of a transposition from one to another part of speech and also complex expressions can be associated to this process.

J. R. Hurford stated that "historical linguists have catalogued many types of change that can occur in the evolution of individual languages, changes such as weakening and strengthening of the meanings of words, change of basic word order, loss of inflections, grammaticalization of lexical words (nouns, verbs, adjectives) into grammatical function words (articles, pronouns, auxiliaries), merger of phonemes, the emergence of novel phonemic distinctions, lowering, raising, fronting, backing and rounding of vowels, palatalization, glottalization, and so on" [5]. The selected 100 words from the *Swedish List* are analyzed regarding their individual reflexes in the main language families, which form cognates across language families. The sets of associated reflexes in protolanguages are the *nodi*, which connect the conceptual Borean roots with natural languages across the main language families. Concerning the main aspects of linguistic studies, the historical linguists rely on a symbolically recording system of phonetic sounds for words and reconstructed or evident roots, which is usually IPA. As the symbolic representations are strings of phonetic values, the morphological aspect of the lexicon is also present. When it comes to semantics, as soon as we leave the area of the historical records, the associated meaning must be considered to be a conceptual meaning, since grammaticalization and differentialization are not reconstructable in linguistic states prior to the existence of historical natural languages. So the meaning 'green' is actually the concept 'green' allowing grammatical alterations like 'greenish', 'green', 'the green', and 'be green' usually coming together with a grammaticalization of the roots. About the syntactical formation and transposition of the lexical inventory of protolanguages we know less. Usually word orders in word compounds (like sentences) and change of the root or its alteration with grammatical markings of single words are the syntactical features of natural formats of linguistic communication like natural languages.

3. Propedeutics of contrastive studies: word lists and other semantic-driven linguistic inventories

A hypothetical construct of a lexical thesaurus of a community of speakers is produced by linguists with top-used lists of words of thesauri of

natural languages. For a community of speakers this hypothetical construct would represent the most commonly used words shared in linguistic communication acts. The most commonly used words for the community, which used the roots of the communication system of the Borean roots of course cannot be determinate. The actual problem of the semantic meanings associated to roots will be discussed below and instead of them, the concept, from which the transpositions derive, will be promoted as theoretical approach. In contrast to the *Swedish List*, contemporary top-100-lists entail grammatical and lexical elements, which are linguistic and grammatical markers (like below *the* and *a*, *be*, *of*, *if*, *her* and *she* and *his* and *him*, *would* and *could* as conditionalizing markers, prepositions like *at* or *in*, *which*, *when*, *or* and *and*, *not*, *just* and *only*, *because* and *so*, which are not referring to the semantic world of things, but their relations in a linguistic framework. They are usually from natural language to natural language differently expressed. In the *Swedish List* they don't exist. According to the *Oxford English Corpus* (2014), the following are the most used words in the English language as of the year 2014:

Rank	Word	Rank	Word	Rank	Word	Rank	Word	Rank	Word
1	The	21	This	41	So	61	people	81	Back
2	Be	22	But	42	Up	62	Into	82	After
3	To	23	His	43	Out	63	Year	83	Use
4	Of	24	By	44	If	64	Your	84	Two
5	And	25	From	45	About	65	Good	85	How
6	A	26	They	46	Who	66	Some	86	Our
7	In	27	We	47	Get	67	Could	87	Work
8	That	28	Say	48	Which	68	Them	88	First
9	Have	29	Her	49	Go	69	See	89	Well
10	I	30	She	50	Me	70	Other	90	Way
11	It	31	Or	51	When	71	Than	91	Even
12	For	32	An	52	Make	72	Then	92	New
13	Not	33	Will	53	Can	73	Now	93	Want
14	On	34	My	54	Like	74	Look	94	Because
15	With	35	One	55	Time	75	Only	95	Any
16	He	36	All	56	No	76	Come	96	These
17	As	37	Would	57	Just	77	Its	97	Give
18	You	38	There	58	Him	78	Over	98	Day
19	Do	39	Their	59	Know	79	Think	99	Most
20	At	40	What	60	Take	80	Also	100	Us

Table 1: *The most used words in English as of the year 2014*

The contemporary text corpus-based 100 most common words in English can –in contrast to the conceptual semantic meanings of proto-material– be classified with exactly one part of speech. In hypothetical linguistic communication material the meaning is conceptual and thus beyond the

level of grammaticality. According to the parts of speech the ranking of the top-100 words in English is as follows:

Nouns	Verbs	Adjectives	Prepositions	Others
• Time	1. be	1. Good	1. to	1) the
• person	2. have	2. new	2. of	2) and
• year	3. do	3. first	3. in	3) a
• way	4. say	4. last	4. for	4) that
• day	5. get	5. long	5. on	5) I
• thing	6. make	6. great	6. with	6) it
• man	7. go	7. little	7. at	7) not
• world	8. know	8. own	8. by	8) he
• life	9. take	9. other	9. from	9) as
• hand	10. see	10. old	10. up	10) you
• part	11. come	11. right	11. about	11) this
• child	12. think	12. big	12. into	12) but
• eye	13. look	13. high	13. over	13) his
• woman	14. want	14. different	14. after	14) they
• place	15. give	15. small	15. beneath	15) her
• work	16. use	16. large	16. under	16) she
• week	17. find	17. next	17. above	17) or
• case	18. tell	18. early		18) an
• point	19. ask	19. young		19) will
• government	20. work	20. important		20) my
• company	21. seem	21. few		21) one
• number	22. feel	22. public		22) all
• group	23. try	23. bad		23) would
• problem	24. leave	24. same		24) there
• fact	25. call	25. able		25) their

Table 2: *The ranking of the top-100 words in English*

G. Starostin in *Preliminary Lexicostatistics as a Basis for Language Classification: A New Approach* presented a 50-item-wordlist for the global lexicostatistical database [8]. This list entails all words of the *Swedish List*, but ranks them differently.

1. we	21. one	41. leaf
2. two	22. tooth	42. kill
3. I	23. new	43. foot
4. eye	24. dry (e.g. of clothes)	44. horn
5. thou	25. eat	45. hear
6. who	26. tail	46. meat (as food)
7. fire	27. hair (of head)	47. egg
8. tongue	28. water	48. black
9. stone	29. nose	49. head

10. name	30. not	50. night
11. hand	31. mouth	
12. what	32. ear	
13. die	33. bird	
14. heart	34. bone	
15. drink	35. sun	
16. dog	36. smoke	
17. louse (head)	37. tree	
18. moon	38. ashes	
19. fingernail	39. rain	
20. blood	40. star	

Table 3: G. Starostin's *50-Words List* (2014)

Did a community of speakers have the same '*orbis pictus*' have in mind and words like a contemporary human? Definitely not, but some basic fields like the nature or human features are continually stable. A list of semantic fields of the lexicon of languages was made in the Department of Linguistics of the University of Texas at Austin [6]. The Department of Linguistics of the University of Texas at Austin employs the following semantic fields for the historical linguistic thesaurus:

Agriculture/Veg. Animals Body Part/Function Clothing/Adornment Dwellings/Furniture Emotion Food/Drink Language/Music Law/Judgment Mankind Mind/Thought	Motion/Transport Physical Acts/Mat'ls Physical World Possession/Trade Quantity/Number Religion/Beliefs Sense Perception Social Relations Spatial Relations Time Warfare/Hunting
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Table 4: *Indo-European Linguistics. Semantic Fields.*
List 1. University of Texas at Austin

The Department of Linguistics of the University of Texas at Austin employs another list of semantic fields for the historical linguistic thesaurus:

1. Physical World 2. Mankind 3. Animals 4. Body Parts & Functions 5. Food & Drink 6. Clothing & Adornment	12. Spatial Relations 13. Quantity & Number 14. Time 15. Sense Perception 16. Emotion 17. Mind & Thought
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7. Dwellings & Furniture	18. Language & Music
8. Agriculture & Vegetation	19. Social Relations
9. Physical Acts & Materials	20. Warfare & Hunting
10. Motion & Transportation	21. Law & Judgment
11. Possession & Trade	22. Religion & Beliefs

Table 5: *Indo-European Linguistics. Semantic Fields.*
List 2. University of Texas at Austin

The classifying categories for the ‘*orbis pictus*’ or –otherwise expressed– the thesaurus of a human linguistic communication enabling system (like a natural language) usually aim at presenting an abstract reference framework for a thesaurus. The *Swedish List* is simpler than the categories of the semantic fields and lacks any complex conditions of single semantic items. Nearly all of the semantic meanings or words of the *Swedish List* are present in the database *Tower of Babel* in the Borean-Proto-Level-database. Our study is based on the so-called ‘words’ of the *Swedish List*. The *Swadesh List* is a compilation of basic words for the purposes of historical-comparative linguistics [10]. This choice derives for from the needs of a semantic selection than from the actual indexing of this list. We discuss the theoretical problems of the *Swedish List* at another place of this article. The list entails the following entries:

1. I	41. nose	81. smoke
2. You	42. mouth	82. fire
3. we	43. tooth	83. ash(es)
4. this	44. tongue	84. burn
5. that	45. claw	85. path
6. who?	46. foot	86. mountain
7. what?	47. knee	87. red
8. not	48. hand	88. green
9. all	49. belly	89. yellow
10. many	50. neck	90. white
11. one	51. breasts	91. black
12. two	52. heart	92. night
13. big	53. liver	93. hot
14. long	54. drink	94. cold
15. small	55. eat	95. full
16. woman	56. bite	96. new
17. man	57. see	97. good
18. person	58. hear	98. round
19. fish	59. know	99. dry
20. bird	60. sleep	100. name
21. dog	61. die	
22. louse	62. kill	
23. tree	63. swim	

24. seed	64. fly	
25. leaf	65. walk	
26. root	66. come	
27. bark	67. lie	
28. skin	68. sit	
29. flesh	69. stand	
30. blood	70. give	
31. bone	71. say	
32. grease	72. sun	
33. egg	73. moon	
34. horn	74. star	
35. tail	75. water	
36. feather	76. rain	
37. hair	77. stone	
38. head	78. sand	
39. ear	79. earth	
40. eye	80. cloud	

Table 6: *Swadesh's 100-Word List.*
Department of Linguistics. Portland State University

4. The interpretation of findings: 'how was pre-historic linguistic communication like?'

Even though we rely in research on the database for the so-called Borean proto-language, we are still aware that the concept 'language' is here more than problematic and we will finally discuss alternatives below. Nevertheless, the merits of the database and the approach of Starosin are evident. The linguistic communicative macro-format we suggest for this kind of linguistic communication is out of the range of the natural language as far as we describe it within the framework of our linguistic method; the list of the Borean roots, which follow the pattern *K1-V2- K1- V2* for *consonant 1 - vowel 1 - consonant 2 - vowel 1* within the traditional root scheme of morphology of words, refers to a general word pattern of two radical consonants followed by a vowel. The Borean roots of one of the semantic meanings refer to at least one of the following language families:

- E: Indo-European Language Family
- A: Afroasiatic Language Family
- SC: Sino-Caucasian Language Family
- AU: Austric Language Family
- AM: Amerindian Language Family

The hypothetical Borean roots, our material from the *Tower of Babel* database, we indexed according to the 100 top common semantic fields of the *Swedish List*. (see table below) Generally speaking, we can say that the

majority of the semantic fields of the *Swedish List* has more than one reference to Borean roots. The majority of the Borean roots also refer to more than one language family. The presence of multiple Borean roots in one language family for the representation of a linguistic concept can be interpreted as:

1. Presence of Multiple Borean roots and their reflexes in one language family;
2. Indicator for a sub-segmented distribution of the Borean roots and their reflexes in the topographical area associated to a language family;
3. The general occurrence of root material in more than one of the traditional language families.

Some of the semantic fields of the *Swedish List* are not or surprisingly thin covered by Borean roots (e.g. 'drink' and some colors). This can be interpreted as a lack of the coverage of these semantic fields in the text corpus of the database *Tower of Babel*. The data derived from this database are probably not sufficient for the coverage of all existing roots. (Below we discuss this as phenomenon of transpositional grammar). We assume that the semantic fields actually allow multiple grammatical realizations in the sense of the transposition grammar, which was in disciplines like Egyptology successfully employed for the description of linguistic features of an early language, which evolved within the transformation of images to writing. The here presented roots are concepts, which have either no concrete part of speech as associated grammatical feature and/or we are not able to construct grammatical features like the associated part of speech out of the material. On the one hand we have an extreme interwoven pattern of concepts and multiple roots across several language families, or the other hand we have a low level of grammatical features. Except the pronouns, we have a morphological pattern of two radicals. (Ancient Egyptian has as standard pattern three radicals). This material allowed alterations for the purpose of grammatical features and in this regard the structure would not be very different from contemporary languages, which use additional sounds for grammatical markings).

5. An outlook to a linguistic categorization: towards a theory of concepts and conceptualization of (pre-historic) linguistic communication as 'phonetic networking network'

In the tradition of transposition grammar we conclude that the semantic inventory of the *Swedish List* must be in the context of our root analysis considered the conceptual inventory of a thesaurus, which allows transpositions of parts of speech for each concept. Alternatively, it can also be assumed that the morphological material was simply not semantically differentiated; it was applied and within the course of the usage among speakers individual meanings as well as the differentiation of grammatical

features occurred and was coded within a selected community of speakers. In the theory of ‘transposition grammar’ the generation of parts of speech is according to transposition grammatical approaches a secondary phenomenon, as an expression can be transposed from one part of speech into another one generating syntactical patterns. The actual appearance of the semantic connotation associated to the roots must be classified as conceptual meaning or concept lacking any grammatical aspects. The meanings are grammar-free concepts, which can be transformed (when realized) into grammatical forms. This conceptuality of the meanings of the roots has to be critically mentioned, when commenting the associated meanings.

(1) Nominal Expressions	Humans	Nouns and Nominal Expressions
	Objects	Nouns and Nominal Expressions
(2) Verbal Expressions	Actions	Verbs and Verbal Expressions
(3) Adjectival Expressions	Nominal Qualities	Adjectives and Adjectival Expressions
(4) Adverbial Expressions	Verbal Qualities	Adverbs and Adverbial Expressions

Table 7: *Transpositional grammatical framework for lexicological entries*

In the following chart the types of actual expressions associated to the words of the *Swedish List* are added. Under the paradigm of the transpositional grammar the concept derive from each of the words is able to have its reflexes in the full range of expressions derived from the main parts of speech. Of course, the realization of the reflexes doesn’t occur in all languages and the concept can be expressed in a certain part of speech with the use of another concept and roots.

1. I	NE	41. nose	NE	81. smoke	NE
2. You	NE	42. mouth	NE	82. fire	NE
3. we	NE	43. tooth	NE	83. ash(es)	NE
4. this	NE	44. tongue	NE	84. burn	VE
5. that	NE	45. claw	NE	85. path	NE
6. who?	NE	46. foot	NE	86. mountain	NE
7. what?	NE	47. knee	NE	87. red	ADJE
8. not		48. hand	NE	88. green	ADJE
9. all	NE	49. belly	NE	89. yellow	ADJE
10. many	NE	50. neck	NE	90. white	ADJE
11. one	ADJE	51. breasts	NE	91. black	ADJE
12. two	ADJE	52. heart	NE	92. night	NE
13. big	ADJE	53. liver	NE	93. hot	ADJE
14. long	ADJE	54. drink	VE	94. cold	ADJE

15. small	ADJE	55. eat	VE	95. full	ADJE
16. woman	NE	56. bite	VE	96. new	ADJE
17. man	NE	57. see	VE	97. good	ADJE
18. person	NE	58. hear	VE	98. round	ADJE
19. fish	NE	59. know	VE	99. dry	ADJE
20. bird	NE	60. sleep	VE	100. name	NE
21. dog	NE	61. die	VE		
22. louse	NE	62. kill	VE		
23. tree	NE	63. swim	VE		
24. seed	NE	64. fly	VE		
25. leaf	NE	65. walk	VE		
26. root	NE	66. come	VE		
27. bark	NE	67. lie	VE		
28. skin	NE	68. sit	VE		
29. flesh	NE	69. stand	VE		
30. blood	NE	70. give	VE		
31. bone	NE	71. say	VE		
32. grease	NE	72. sun	NE		
33. egg	NE	73. moon	NE		
34. horn	NE	74. star	NE		
35. tail	NE	75. water	NE		
36. feather	NE	76. rain	NE		
37. hair	NE	77. stone	NE		
38. head	NE	78. sand	NE		
39. ear	NE	79. earth	NE		
40. eye	NE	80. cloud	NE		

Table 8: Swadesh's 100-Word List.
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The question of the most important words in a thesaurus is –to conclude finally- an unnecessary question; as the transposition of words allows as derivations from one concept multiple realization of reflexes, this question and its answer can only be approached in limited empirical studies. One of the explanations of the multiple appearances of several roots related to different concepts within the Borean roots we examined is that the word lists like the *Swedish List* do not take into account that it should be conceptual meanings and not thesaurus inventory of languages. One root concept (SUN) could for example have represented an adjectival expression in one reflex (sunny), while another one was used for the noun 'sun' or 'shine'. The benefit of the attached list of Borean roots and their conceptual meaning lies in the representation of the widest range of trans-familiar linguistic relations for 100 common words.

The knowledge about pre-historic linguistic states of course needs to be similarly approached like historic linguistic phenomena and thus aims at answers for questions about the lexical, semantic, morphological, and

phonetic qualities of representations of linguistic communication as reconstructed forms from historical documentation of historical linguistic material of natural languages. At the level of the concept, e.g. SUN, such linguistic features are irrelevant. The linguistic features become relevant as soon as the linguistic material is the topic of the research; in our case six Borean roots for the concept SUN exist; five of them are in more than one language family present.

NVJV	E/AF	Sun
KVMV	E/SC	Sun
HVKV	SC/AM	Sun
NVRV	E/AU	Sun
PVCV	AF	Sun
TVNV	E/SF/AU	Sun

The associated meaning 'sun' is actually a hypothetical or conceptual meaning. Approached by the transpositional grammatical theory, it could also refer to such lexical forms like shiny, shine (like the sun), shining etc. Our findings clearly support the existence of a relation of one word of the Swadish list to more than one semantic meaning associated to a root. This is a network, which is not governed by the rules of traditional language families. On the contrary, it exists as not by the borders of language families ruled network. As we are here in the hypothetical area of reconstruction, we have to face also the question of the qualities and features of the pre-historic state of linguistic communication. The problematic state of the term 'proto-language' was raised in recent research. The concept 'language' is here not sufficient, as it implicitly involves the idea that a natural language-like phenomenon exists. The material discussed here actually forces us to assume the contrary: a topographically diverse networked layer of conceptually related linguistic text elements at the micro-level of words. Factors for their extensions and limitations must be sought in non-linguistic and / or socio-linguistic aspects. As for now, we formulate of these as follows for global aspects of pre-historic linguistic communication:

1. Linguistic communication in pre-historic settings was not (only) ruled by the differentiation of languages in language evolution as we know it typically in sets of language families;
2. Micro-linguistic units like the examined roots demonstrate that words or other micro-linguistic contents of linguistic communication in their morphological material and the semantic meaning transcended borders of traditional language families;
3. Instead of the assumption of a word and a semantic meaning we must operate with concepts and conceptual meanings for the description of pre-historic states of linguistic communication.

However linguistic communication took part, we assume that it was less limited and structured as contemporary definitions might imply. The content of these pre-historic linguistic communication was highly communicable and less regulated by socio-cultural factors. Also its grammaticality stands at disposal. We know that older languages have a low level of grammatical markers. The exchange of vocals as the principle of grammaticalization is a feature of languages, which usually fall from a language-evolutionary perspective in a time frame, which was before the use of distinct grammatical markers. (Arabic is a language, which still uses the vowel changing, while in Germanic languages this principle was exchanged by implemented markers, which were/are not vowels). The relative simple sound patterns of the roots of the Borean language family allowed alterations among the communities of their users. We can assume that among the variety of roots offered the members of open speech communities saw themselves permanently in the position of selecting and specifying the linguistic communication material they received. Within this process actually a 'community of speakers' could rise and evolve and distinguish itself from the other users of linguistic communication.

Our interest is not to find evidence or contribute to a theory of the evolution of language as a human faculty or as a system of linguistic communication. The evolutionary approaches we discussed in the introductory part of this article assume that language evolves from simpler forms (like proto-languages) to higher patterns of linguistic communication like the contemporary natural languages. But this is not the aim of our studies here, which look for an answer regarding the kind of formation of language varieties. As far as we see the distribution of Borean roots, we can assume that linguistic communication operated, generally speaking, in all directions as a networking process of the networked substance for the communicative performance. This undirected and unstructured process was on the other hand modified by social and extrinsic (e.g. natural) conditions. The participation in a common phonetic symbolic system allowed participating in social activities. The stabilization or codification of the 'phonetic networking network' was not practiced and when it occurred, it marked in a region with a community of speakers the step from a-historical to historical time. We should not project our – actually accrued – contemporary understanding about language etc. onto the situation of the state of 'linguistic communication' before the rise of historical languages. We are able to reconstruct common aspects of groups of languages in the linguistic symbolic representation of phonetics. But we are not able to differentiate a grammatical structure. Even the association of a grammaticalization of former linguistic states is wrong, as the earliest natural languages were coded signs (China, Egypt). Letters as arbitrary signs did not exist, they developed later. Additional information, for which we usually use grammar (like plural, tense etc.), were and are implemented by

markers for the change of a word or a specific grammatical phenomenon or the establishment of certain positions or orders of words. What we can say about the status of the linguistic communication is that specific patterns ('strings') of vowels and consonants were stable components of communication across generations in terms of their phonetic components and basic morphological components as well as concerning their reference to a specific semantic concept. Such strings for specific concepts existed in wide areas across the globe. They do not show the regional limitation to a certain region like we find it in the separation of regions associated to the main branches of language families for historical languages. The communication of the humans able to perform linguistic communication was purely applied and allowed the sharing entities to communicate within a symbolic representative system of sounds the world around them and themselves as a semiotic process for references. We do not know if the communication at this state already entailed functional pragmatic aspects like expressions of orders, conditions, negations etc. But looking at the variety of linguistic forms for such functional aspects in natural languages, it is likely that this was a state of differentiation among smaller units of speakers driven by the rules of their own socialization.

Appendix: The Historical Linguistic Paths of the Semantic Fields of Borean Roots

Semantic value/concept	Annotated Borean root	The language families, in which reflexes of the respective Borean root exist
1. <i>I</i>	HVKV MV NV WV HVCV CV	E / A / SC / AU / AM E / A / SC / AU / AM E / A / SC / AU / AM E / A / AU A / SC / AU / AM SC / AU / AM
2. <i>You</i>	HU MV NV TV WV CV	E / A / SC / AM AU / AM E / A / SC E / AM / SC / AM SC / AM E / SC / AU / AM
3. <i>we</i>	PV TV LV WV	AU / AM SC / AU / AM SC SC / AU / AM
4. <i>this</i>	NV KV HV CV	E / A / SC / AU / AM E / A / SC / AM E / AF / SC / AM E / A / SC / AU / AM

5. that	MV PV TV HV(1) HV (2) HV (3)	A / SC / AM E / A / SC / AM E / A / SC / AU / AM E / A / SC / AM E / A / SC / AU / AM E / A / SC / AU / AM
6. who?	KV NV CV	E / A / SC / AU / AM E / A / SC / AU / AM E / SC / AU / AM
7. what?	MV PV RV	E / A / SC / AM / AU SC / AU / AM AU
8. not	CV HV HVLV HNVV MV PV TV	A / SC / AU E / AF / SC / AU E / A E / A / AU E / A / SC A / SC SC / AU
9. all	HVLV WVNCV KVLV KVLWV	SC / AU / AM E / A / SC E / A E / A / SC / AM
10. many	PVLV MVNV PVHV PVTV	E / AF / SC / AM / AU E / A / SC / AM E / A / SC / AU / AM E / A / SC
11. one	HVRV TVKV HVTV HVNNV	E E / A / SC . AU / AM E / A E / AU
12. two	HVNLV CVRV JVRU MVLV TVWV CVNV	E / SC / AU A E E / A / SC E / A / SC / AM / AU A / SC / AU
13. big	HNVV MVKV TVT	E / A / SC E / A / AU / AM E / A / SC /
14. long	KVLV	E / AM
15. small	KVRCV KVTV PVTV TVHV TVHV	SC / AU E / A / SC / AM E / A / SC E / A / SC / AU E / A / SC / AU

	TVNV CVKV	E / SC / AM E / A / SC
16. <i>woman</i>	KVNV NVCV PVNV NVTV CVCV	E / A / SC / AU / AM E / A / SC E / SC / AU / AM E / A E / SC
17. <i>man</i>	KVNTV MVNV MVRV KVCV	E / A / SC / AM E / A / SC / AU / AM E / A / SC / AU SC / AM
18. <i>person</i>	CVPV MVCV	E / A SC / AU / AM
19. <i>fish</i>	KVLV KVMVC KVRV LVMV NVNV TVKV CVMV	E / A / AM E / A / SC / AM E / A E / A / AM E / A E / A / SC E / A / AM
20. <i>bird</i>	PVHV KVLV KVMV KVNV KVPV KVRV KVTV LVKV SVKV TVRV CVKV CVPV HVWV	A / SC E / E / SC E / A E / SC / AU E / A E / A E / A / SC / AU E / A / SC / AU E / AM E / A E / A / SC / AM E / A E / A
21. <i>dog</i>	KVTV KVPV NVKV KVNV PVRV NVNTV CVKV CVRPV HVCV HVMV KVCV KVLV	A / AU E E / AM E / A / SC / AU / AM E / A / SC / AM E / A SC A / SC A / AU / AM A E / A / SC / AM A / AU

22. louse	MVHV NVJV TVJV JVLKV	AU E / A / SC E / A / SC / AU / AM A
23. tree	HVJWV HVLV KVJWV KVRV NVKV PVJV PVNCV TVNV TVRV CVLV WVTV	E / AM E / A / SC / AU E / SC / AU / AM E / A / SC E / AM E / A / SC E / SC E / A / SC E / A / SC E E / A / AM
24. seed	WVTV	E / A / AM
25. leaf	PVLV HVRLV LVPV PVNKV	E / A / SC E / A / SC / AU E / A / SC E / SC / AU / AM
26. root	TVMV MVRKV KVRV WVRTV	E / A / SC E / A / SV A / SC E / SC
27. bark	KVRV KVLV KVNKV KVRPV PVKV CVPV KVPV	E / A / SC / AU E / E / SC E / A / SC E / A / SC E / A / Sc / AU E / A / SC E / A / SC / AU
28. skin	KVLV	E / A / SC / AU
29. flesh	TVLV HVMCV NVKRV CVLV CVCV CVKV	SC E / SC / AM E / SC / AU E / SC E / A / SC / AU E / A / SC
30. blood	CVLV PVLV KVRV WVRV HVNV KVN PVRV CVHV	E / SC E / A / AM E / SC E / SC / AU E / SC / AU E A E / SC / AM

	CVMV CVNV	A E / A
31. <i>bone</i>	TVKV PVNV KVRV LVNV MVKV RVNV CVMV CVNV HVCV HVKV HVMTV KVCV	AU E / SC / AM A SC / AU A / SC / AM SC / AU E / A / SC / AU / AM E / SC E / A / SC / AU / AM A / AM SC E / AF / SC / AM
32. <i>grease</i>	KVJV CVPV MVRV CVMV	E / SC / AU / AM E / AF / SC E / AF / SC / AU AF / E / SC / AU
33. <i>egg</i>	LVNV TVLV	SC / AU E / SC
34. <i>horn</i>	MVRKV LVRV KVRV	E / AF / SC SC E / AF / SC
35. <i>tail</i>	PVNCV CVPV CVRV KVRV KVTV MVHV TVKV TVNV	E / SC / AU AF E / AF AF / AU E / AF / SC / AU / AM SC E / AM AU
36. <i>feather</i>	KVMV PVLV	AF / SC / AM E / AF / SC / AU / AM
37. <i>hair</i>	PVWV KVRV PVTV KVLV NVJV NVNV NVRV PVLV PVNV PVRV TVKV TVMV TVRV	SC / AU / AM E / SC E / SC / AU / AM E / AF / SC E / AF / SC E / SC E SC E E / AF / SC E / AF / SC / AM E / AF E

	CVKV CVRV KVCV LVHV	E / AF / AC / AU E / SC / AU E / Sc / AU AF / SC / AM
38. <i>head</i>	KVHV MVHV MVTV WVNLV WVTMV CVKV	AF / SC / AU / AM E / SC E / AF / SC / AU SC / AU E / SC SC / EM
39. <i>ear</i>	KVRV LVLV MVHV MVNCV CVRV HVNv	E / AF / AU SC / AU E E / SC AU SC
40. <i>eye</i>	HVNv HVPV WVMKV HVKV CVLV	E / AF / SC / AU / AM AF / AM SC E / AF / SC / AU / AM E
41. <i>nose</i>	NVKCV NVRV TVNV WVKV CVRV KVNv	E / AF / AM E / AF / SC E / AF / AU E E / AF E / SC
42. <i>mouth</i>	HVPV HVWV KVMPV	E / AF / AU / AM E / AF E / SC / AU
43. <i>tooth</i>	HVNv LVKV MVNV PVLV	E / SC / AU A / AF / SC / AU AF / SC AU / E
44. <i>tongue</i>	MVLV KVLV LVLV NVNV SVMV SVWV CVHV	SC / AU / AM E / AF / SC / AM E / SC / AU E / AU / AM AU SC SC
45. <i>claw</i>	-	-
46. <i>foot</i>	PVLMV KVLV HVPV KVNv	AF / SC / AM SC / AU E / SC SC / AU

	KVRV KVSV LVKV MVLV PVCKV CVKV	E / SC SC / AM E / AF / SC SC E / AF / SC / AM E / AF / SC / AM
47. knee	-	-
48. hand	LVLV KVN CVPV KVRV MVNV PVCV PVKV PUNKV	E / SC / AU / AM E / AF / SC / AM E / AF E / AF E / AF / SC / AU / AM AF / SC E / AF / SC / AM E / SC / AU
49. belly	KVRPV KVTV PVHV PVNKV PVRV TVKV WVNCV KVN HVLV	E / AF / SC E / AF / SC / AM AF / SC / AU / AM SC / AU / AM E / AF SC / AU / AM E / AF / SC / AM E / AF / SC / AM E / AF / SC / AM
50. neck	KVLV KVNKV	E / AF / SC / AM E / AF / SC
51. breasts	KVRTV MVLKV MVNV WVN XV	E / AF / SC E / AF / SC / AM E / AF / SC / AU AF / SC / AU
52. heart	RVKV CVLMV	SC / AU E
53. liver	TVRNV CVNCV KVLV LVLV MCKV MVLV PVKV PVLV PVNTV TVPV KVPV	E / AF / CS / AU E / SC E / AF / SC / AU / AM E / AF / SC E E / AF E E / AF / SC / AM E AU AF
54. drink	JVKV	E / SC / AU
55. eat	HVLV KVMV	E / SC / AU E / AF / SC / AU / AM

	TVNV HVN CVHV CVMV HVTV	E E / AF / SC / AU / AM E / AF / SC / AU / AM E / AF / SC / AU / AM E / A / SC / AM
56. <i>bite</i>	KVWV	E / SC / AM
57. <i>see</i>	HVCV WVTV KVRV NVKV TVLV HVJV	E / SC / AM E / AF / AM E / AF / SC E / SC / AM SC / AU E
58. <i>hear</i>	HVLV CVMV KVLV	E / SC / AM E / AF / AM E / AF / SC
59. <i>know</i>	NVRV TVNV HVN HVPV KVMV KVNTV KVKV KVPCV CVKV CVNV PVNV	E / SC / AU E / AU E / AF / SC E / AF / AU E / AF / SC / AU E / SC / AU E / AF / SC / AU / AM E / AF / SC / AU / AM E / AF / SC E / AF / SC AF / AU
60. <i>sleep</i>	HVMLV HVMV	SC / AM E / SC / AU
61. <i>die</i>	KVLV HVLV MVRV MVTV NVKV NVWV TVNV HVN	E / SC E / AF / SC E / AF E / AF / SC E / AM E / AF / SC E / SF / SC E / AF / AM
62. <i>kill</i>	HVWV KVWV	E / AF / SC E / AF / SC
63. <i>swim</i>	-	
64. <i>fly</i>	PVLV PVRV	E / AF / SC / AU E / AF / SC / AU
65. <i>walk</i>	CVHV HVMNV HVRV KVLV KVRV	E / AF / SC E / AF / AM E / AF / SC / AU E / AF / SC / AU E / AF / SC / AU

	NVNV TVRKV WVTV KVJV HVJV	E / AF / SC / AU / AM E / AF E / AF / SC / AU / AM E / AF / SC / AM E / AF / AM
66. come	PVHV	AF / SC / AU / AM
67. lie	KVLV KVWV	E / SC E / AF / SC / AU / AM
68. sit	TVNV	AF / SC / AU
69. stand	CVRV HVHV NVHV NVKV PVTV RVPV TVKV TVNV CVLV	E / AF / SC AF E / SC / AU / AM E / SC / AM AF SC E / SC / AM SC / AU E
70. give	TVHV CVHV	E / SC / AM E / AF / SC / AM
71. say	CVWV HVLV HVN HVWV JVNV KVRV KVWV MVHRV MVLV NVKV TVHV TVPV WVKV WVTV CVWV	E / AF SC / AU SC / AU SC / AF / SC / AM E / AF / SC / AM E / AF / SC E / AF / SC E / AF / SC E / AF / AM AF / SC / AM E / AF / AM AF / SC / AM E / AF / SC / AM E / AF E / AF
72. sun	NVJV KVMV HVKV NVRV PVCV TVNV	E / AF E / SC SC / AM E / AU AF E / SF / AU
73. moon	TVLKV	E / AF / AU / AM
74. star	HVCRV TVCTV CVWV	E / AF / SC E / AF E
75. water	HVNV	SC / AM

	KVHNV HVWV JVMV KVTV MVWV PVNV TVKV WVTV CVLV HVKV	AF / AM E / AF / SC E / AF / AU / AM E / AM E / AF / SC / AU E / AF / AM SC / AU E / SC / AM E / SC E / AF / SC / AM
76. rain	HVRCV	E / AF / SC / AM
77. stone	KVWV PVHV HVRV KVLV LVNV PVNV RVMLV TVHV TVLV CVNV HVMCV CVCV HVNLV KVCV	E / AF / SC / AU / AM E / SC / AU SC / AU E / AF / SC / AM SC / AU AF SC / AU AU E / AF / SC AF / SC SC SC AF / SC E / AF / SC
78. sand	KVCV	E / AF / SC
79. earth	HVMGV KVRV PUMV TVHV TVKV	E / SC / AM E / AF / SC SC / AU AF / SC / AU E / AF / SC / AM
80. cloud	HVMKV PVLV NVPV	E / SC E / AF E / AF / SC / AU
81. smoke	CVNKV	E / AF / AU / AM
82. fire	HVMV TVLV HVNKV PVHV TVHV HVKV CVCV HVHV	E / AF / AM E / SC E / SC / AU / AM E / AF / SC / AU / AM E / AF / SC / AU / AM AF / SC / AM E AF / AM
83. ash(es)	PVLV TVT PVT	E / SC / AM E / SC / AM E / AF / SC / AU / AM

84. burn	CVWV KVTV HVLTV HVRV KVPV KVRV KVRV LVKV MVKV PVKV PVLV PVLV PVRV TVKV WVRV KVN CVLV CVNV HVCV KVJV	E / AF / SC E / AF / SC / AU / AM E / AF / AU AF / SC / AU E / AF E / AF E / AF E / SC / AU / AM E / SC / AU / AM E / AF / SC / AU / AM AF / SC / AM E / AF / AU / AM E / AF E / AF / SC / AM E / AF / SC E / AF E / AF / AM E / AF / AM E / AF / AM E / AF / SC / AU
85. path	HVRV LVMV RVMKV KVCV	E / AF / SC SC / AU SC / AU E / AF
86. mountain	KVN KVRV MVLV PVLV WURV PVRV TVKV TVLV TVPV	SC / AU E / AF / SC E / AF / SC AF / SC / AU E / AF E / AF E / AF / SC / AU / AM AF / AU E / AF / SC / AU
87. red	-	
88. green	-	
89. yellow	-	
90. white	LVKV	E / AF / SC / AM
91. black	HVMV KVMV LVMV LVNV MVCV MVTV NVLV PVRKV CVLV	AF / SC / AU / AM E / AF / SC AU SC / AU E / SC / AM E / E / SC / E / SC AF AF / SC

	CVMV CVNV HVPV KVRV	E / AF AF / SC / AU E E / AF / SC / Am
92. <i>night</i>	LVLV HVDV NVNV KVCV	E / AF / SC E / AF E / AF / AM E / SC / AM
93. <i>hot</i>	KVCV LVMV TVPV	E / AF / AM E / AF / SC / AM E / AF / SC / AU
94. <i>cold</i>	CVRV HVKV KVMV PVCV KVRV	E / SC E / AF / SC E / SC E / SC E / SF / SC
95. <i>full</i>	KVPV MVHV MVLV PVNV TVKV TVM TVNKV TVRV HVPTV	E / AF / SC / AU AF E / AF AU / AM E / AF / SC E / AF / SC / AM E / AU E / SC E
96. <i>new</i>	CVRV HVRV MVHV NVWV WVLV	E / AF / SC E / AF / AU AF E / AF / SC E / AF
97. <i>good</i>	HVCV HVJV KVN NVKV WVNLV HVKV	E / AF / AM E / AF / SC E / SC / AM E / AF E / AF / SC / AM SC / AM
98. <i>round</i>	KVLV TVMPV	E / AF / SC E / AF / AM
99. <i>dry</i>	KVKV RVNKV KVRV CVCV KVCV KVLV KVMV	E / AF / SC SC / AU E / AF / SC E / AF E / AF / AM E / AF / SC / AM E /
100. <i>name</i>	PVTV LVMNV MVKV	E / AF E / AF / SC AF / SC

	CVMV	E / AF / SC
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