

On the subgrouping of Afroasiatic

or: How to use an unrooted phylogenetic tree in historical linguistics

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Abstract

This is a follow-up to my article on stemma construction in the discipline of textual criticism. In linguistics, too, the major challenge of genetic subgrouping is posed by the need to distinguish between shared innovations and shared retentions. The method presented here, which has been adopted from textual criticism and has never before been applied to linguistics, drops the requirement to identify shared innovations during the first step of the procedure. The result is an unrooted rather than a rooted family tree, which is assigned an orientation only in a second step. This method makes genetic subgrouping both easier and more reliable than it used to be.

I exemplify this method by constructing a genetic tree from the six accepted subgroups of the Afroasiatic language family. The resulting tree suggests that the first split-up within Afroasiatic was between Egyptian on the one side and all other languages on the other.

The problem of subgrouping

The relationship of languages is commonly visualized as a family tree. The tree shows the genetic relations of the individual languages by making the simplified assumption that each language derives from a single ancestor. In reality, virtually every language was influenced by more than one earlier language, all of which could be claimed to be “ancestors” of particular aspects of that language. Nevertheless, it is usually possible to single out one of a language’s ancestors as being more important than the others. We define this one as its “genetic” ancestor.¹ A tree representation based exclusively on “genetic” ancestors is a simplified model of reality, but provides a condensed overview of the major layout of a genetic group of languages.

In this article, I will propose a new method of constructing a linguistic family tree and apply this method to the Afroasiatic language family. Two issues need to be explained, namely which kind of data is used as input, and which procedure is applied to turn the data into a tree. As for the data, historical linguists can generally make use of lexicon, morphology, or any other level of language. But I will rely primarily on so-called core vocabulary, by which I understand more or less the same as what has become known as Swadesh word lists or what Rössler (1979) termed “Kernvokabular”. I believe that core vocabulary is the best choice in particular for investigating distant relationships. Although anything can be borrowed, core vocabulary is likely to be derived from the primary (“genetic”) ancestor of a language, in other words to be

¹ I am arguing here that the distinction between genetic relationship and language contact is only quantitative, not qualitative. In borderline cases, it might be a matter of personal choice whether to say that a language A descends from B but borrowed heavily from C, or that A descends from C but preserved traces of a B substratum.

genetically stable, whereas more marginal vocabulary can easily be imported (“borrowed”) from a variety of sources. It has often been stated that morphology is even less borrowable than basic vocabulary and therefore even more suitable for determining genetic relationships. Be that as it may, I see three considerable drawbacks with morphology. First, inflectional morphemes are short and often contain only a single consonant. This fact increases the risk of chance resemblance, which is poison for historical linguists. Second, morphology does not usually draw from the whole phonemic inventory of a language. Instead, morphemes tend to consist of a few recurring very basic and frequent consonants.² This fact increases the already high risk of chance resemblance. Third, morphology is most frequently located in the end (right edge) of words (cf. Dryer 2011). Unfortunately, words tend to be subject to phonetic erosion particularly at their ends. This means that morphology tends to get lost quickly. After a few thousand years, the old morphological system of a language is usually gone. Nobody knows this better than Egyptologists.

Let me now come to the method of turning the data into a tree. All linguistic handbooks agree that language subgrouping can only be based on shared innovations and not on shared retentions:

“Similarities between languages can be explained as being due to either shared retention from the protolanguage or shared innovations since the time of the protolanguage. If two languages are similar because they both have some feature that has been retained from the protolanguage, you cannot use this similarity as evidence that they have gone through a period of common descent. (...) However, if two languages are similar because they have both undergone the same innovation or change, then you can say that this is evidence that they have had a period of common descent and that they therefore do belong to the same subgroup.” (Crowley & Bowerman 2010:111f.)

“The only generally accepted criterion for subgrouping is *shared innovation*. (...) it is important to keep in mind that *shared retentions* are of practically no value for subgrouping” (Campbell 2004: 190 and 197)

“The best, most reliable indicator of subgrouping relationship is ‘shared innovation’. If some languages have undergone a distinctive change not found in other members of the family, this suggests strongly that the languages in question shared a common ancestor and thus constitute a subgroup.” (Newman 2000b: 264)

“(...) we look for shared innovations, changes which have appeared in some members of the family but not in others. Here the thinking is that the languages which do not share a particular innovation probably split off early from the languages which do share it (...). Shared innovations must be distinguished from shared archaisms (...). Shared archaisms are of little or no use in establishing groupings within families.” (Trask 1996: 182)

2 Campbell (1997: 221): “morphological affixes tend to utilize only a subset of all the consonants available within a particular language; typically this subset comprises the less marked phonological segments (...). Since the typically unmarked consonants involved in grammatical affixes are often those which recur with the greatest frequency across languages, numerous similarities that are purely accidental will likely be encountered in comparisons of such morphemes among languages.” He further elaborates on this *ibid.* p. 243.

“(...) we look not merely for a feature that two languages have in common, but for evidence that this feature is the result of innovation in both languages simultaneously. Provided that this feature is sufficiently distinctive, and unlikely to have arisen by chance in each language independently, we can be reasonably confident that it is evidence that the two languages were a single language at the time of innovation, and therefore constitute an independent branch of the family.” (Fox 1995: 220)

“Notice that only common innovations are indicative of (...) a special relationship. Common archaisms (or inheritances) can be found between any two members of a larger language family.” (Hock 1991: 579)

“On establishing a genetic node – i.e., a proto-language – only innovations count: a common feature of a group of languages proves nothing if it may be a retention, an unchanged inheritance from an older, more inclusive stage of development.” (Salminen 1989: 16)

“Features are only of significance for classification if they are shared innovations. Shared inheritance of a feature from an earlier, common stage proves nothing about relationships.” (Kaufman 1988: 46)

“archaisms (...) play an important function in classification, at the stage where the relationship itself between languages must be proved, but they are to be disregarded when it comes to a reconstruction of the intermediary splits, the subbranchings” (Hetzron 1988: 108)

“Im Allgemeinen ist es klar, dass nicht jede Gleichheit zwischen zwei Sprachen als Argument für eine Urgemeinschaft betrachtet werden kann. (...) Auch wird man zugeben, dass Gleichheit im Wortschatz (wenn sie nicht in überwältigend grosser Menge hervortritt) nicht zum Beweise für Urgemeinschaft gebraucht werden kann, weil immer die Möglichkeit offen gehalten werden muss, dass ein Wort, welches wir nur in einigen Sprachen finden, in den anderen auch vorhanden gewesen, uns aber durch die »Unbill der Zeiten« entzogen worden ist. Durch diese Erwägungen schrumpft das Material sehr zusammen und es bleiben streng genommen nur gemeinsam vollzogene Neuerungen als beweiskräftig übrig.” (Delbrück 1880: 135)³

This issue can be regarded as near to consensual among linguists even though very occasional claims to the contrary have also been raised.⁴

3 This is the first published account of the principle, which was stated shortly later also by Karl Brugmann and has sometimes since been referred to as “Brugmann’s principle”. See Chrétien (1963) for the issue of priority.

4 Holzer (1996: 32): “Gemeinsames Nichtinnovieren hat hinsichtlich der Verwandtschaft denselben Effekt wie gemeinsames Innovieren”. Krishnamurti *et al.* (1983: 543): “Within the framework of the theory of lexical gradualness of sound change, we find that consideration of unchanged cognates also has an important role to play in linguistic subgrouping.” What these scholars are concerned with is not lexical change but phonological change. In phonological change, it is methodologically problematic to decide which of two different successors of one proto-phoneme is “identical” and which is “innovated” with respect to the proto-phoneme, because the respective phonemic systems are, in any case, no longer those of the proto-language. On the other hand, there is often evidence to determine the chronological order of phonological changes, because a change may feed or block a subsequent change. This is why Holzer does not base his trees on common

The requirement of common innovation holds for establishing genetic trees not only in linguistics but also in other disciplines such as textual criticism or evolutionary biology. In order to illustrate my point, let me use a demonstrative example from the field of biology. Assume that we want to establish a family tree of the three species “dog”, “baboon” and “human” based on the following features:

	Has tail?	Has fur?	Moves on 4 legs?	Has fingerprints?
Dog	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>no</i>
Baboon	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Human	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>

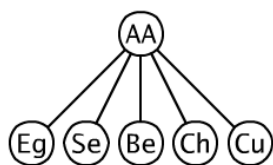
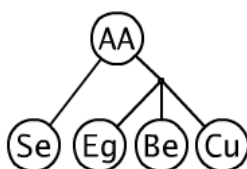
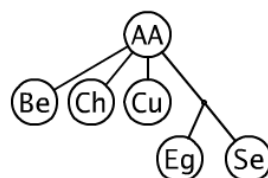
The greatest similarity in numerical terms is found between dogs and baboons, who share three out of four features. Can we conclude that dogs and baboons are closely related to each other and form a genetic subgroup? No, we cannot, because the three shared features (having a tail, having fur, moving on four legs) were inherited from earlier types of mammals and are only shared retentions in dogs and baboons, not shared innovations. The only thing that counts are shared innovations, no matter how few they are. The inconspicuous feature of fingerprints makes the decision because this is a shared innovation, a feature which was absent from earlier mammals. It proves that baboons are related more closely to humans than to dogs.⁵

Let me sum this up: The absolute amount of similarities is not a valid argument for constructing a genetic tree. It is not true that languages that are more similar should be closer to each other in the tree. A tree constructed in a quantitative way bears the risk of forming clusters not of related languages, but of conservative languages, which is not what a genetic tree is meant to represent. A genetic tree must be constructed from shared innovations, and from nothing else.

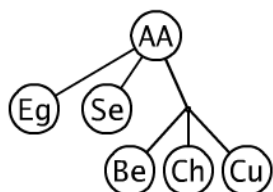
While there is widespread agreement about this requirement in terms of theory, linguistic classification has often neglected this insight in practice. Before continuing the discussion of method, I will present the trees that I have found to have been proposed for the Afroasiatic language family. I have simplified some of them and modernized terms for linguistic groupings where appropriate. Omotic is not shown in trees from a time prior to its recognition as a separate branch. These languages were either included into Cushitic or not considered at all at that time. The following abbreviations are used: *AA* = Afroasiatic proto-language, *Eg* = Egyptian, *Se* = Semitic, *Be* = Berber, *Ch* = Chadic, *Cu* = Cushitic, *Om* = Omotic.

innovations but on the chronological succession of isoglosses. I think that this is simply an alternative, and likewise valid, method of constructing genealogical trees, albeit a method which requires a kind of knowledge typically unavailable for long-distance relationships. – Kogan (2005: 537f.) does reject “trivial retention” as a criterion for subgrouping but admits “non-trivial retention”. By this he understands that there were more than one competing terms for one concept in the source language, and a group of languages selected one of these terms as their main exponent of the concept. I would argue that this may better be regarded as a kind of a common innovation, consisting in the promotion of one among two or more terms to the most frequent one, albeit an innovation which bears some risk of occurring independently and thus is not particularly distinctive.

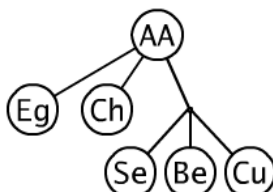
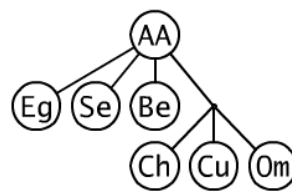
5 Under the assumption that this feature is distinctive, i.e. that fingerprints did not easily develop independently.

(Greenberg 1966: 48)⁶(Cust 1883, II: 467-474,
Müller 1887: 224-230,
Zyhlarz 1932/3: 250f.)⁷

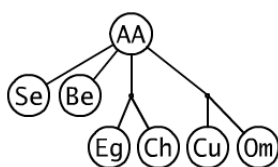
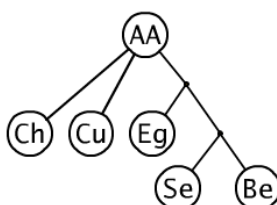
(Brockelmann 1908/13, I: 3)



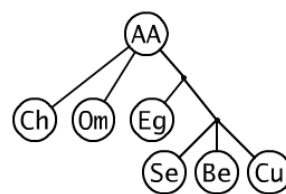
(Behnk 1928)

(Appleyard 2004: 176;
Mukarovsky 1966: 25)

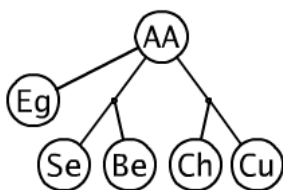
(Skinner 1977: 57)

(Takács 1999a: 35-46;
cf. also Takács 1999b)

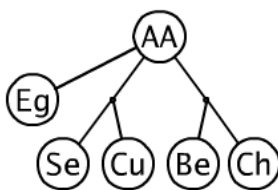
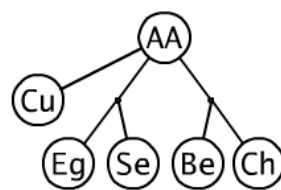
(Breyer 2003: 29f.)



(Bender 2007: 731f.)

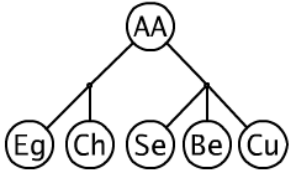


(Voigt 1989: 281f.)

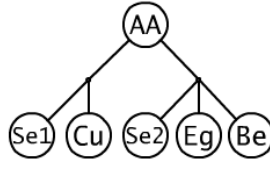
(Reinisch 1909)⁸

(Newman 1980: 22 note 36)

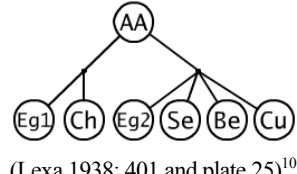
- 6 The same flat structure, but without Chadic, was assumed by Lacau (1912: 207) and Cohen (1969: 45).
- 7 This is the classical “Hamito-Semitic” hypothesis which opposes a “Hamitic” branch to Semitic. Several scholars who also used this wording (among them Brockelmann 1932, Lefebvre 1936, Rössler 1964, and Vycichl 1982: 63f., 1984 and 1987) in fact seem to have regarded the “Hamitic” languages as extensions of Semitic remodelled under the influence of a substratum after their speakers had emigrated to Africa, which means that they may not really have had a genetic tree in mind. Calice (1931) suggested another variety thereof, namely that Egyptian was a Semitic idiom upon a Hamitic substrate.
- 8 Reconstruction of Reinisch’s somewhat implicit assumptions, which were perhaps less tree-like than represented here. Reinisch treats Berber and Hausa as “nordwest-afrikanische sprachen” (p. 125) and thought that Semitic branched off from Cushitic (p. 322).



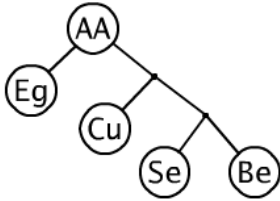
(Diakonoff 1988: 22 with note 8 and 1998: 216f.)



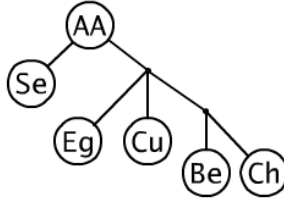
(Garbini 1974: 26)⁹



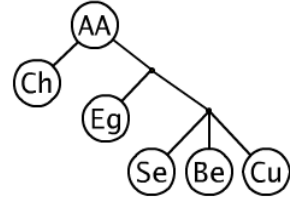
(Lexa 1938: 401 and plate 25)¹⁰



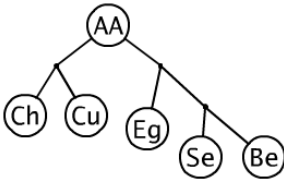
(Lottner 1860/1, particularly p. 124)¹¹



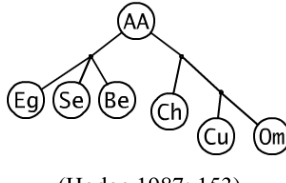
(Lepsius 1863: 303 and 1880: xv-xviii)



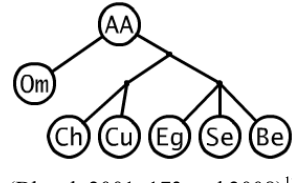
(Zaborski 2005: 138 and 2007: 158f.)



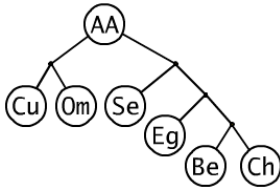
(Diakonoff 1965: 102-105)



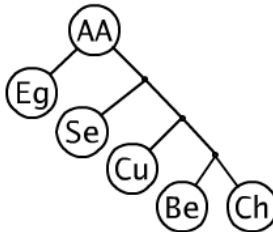
(Hodge 1987: 153)



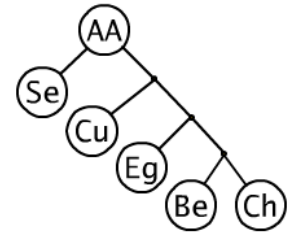
(Blench 2001: 173 and 2008)¹²



(Militarev 2005a: 398f. and 2008: 143)

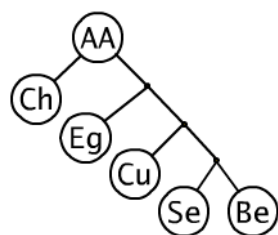


(Bleek 1853: 39)¹³

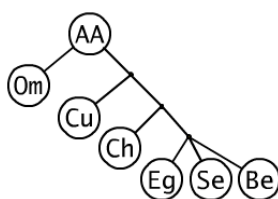
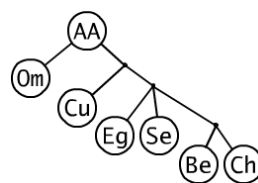


(Trombetti 1922/3: 20 and 38f.)

9 Garbini believes that the Semitic languages are split across his two principle branches of Afroasiatic.
 10 Lexa believes that Egyptian came about by a merger of two different languages, one of which was related more closely to Hausa and the other one to the remainder of Afroasiatic.
 11 Lottner only speaks of different degrees of similarity and may not have had a genetic tree in mind.
 12 Blench's focus is on the Chadic-Cushitic-connection. While he adopted Ehret's peripheric positioning of Omotic in 2001, he appears to question this in his 2008 paper.
 13 Bleek opposes the three branches Indo-Europeans (omitted here), Egyptians and a third group for which he coins the term "Semitic-Africaner".



(Lipiński 1997: 41)

(Ehret 1995: 483-490 and
2000: 291)(Fleming 2006: 173)¹⁴

We observe, first, that the proposals differ fundamentally. Second, almost none of these trees has been arrived at by focussing on shared innovations. The arguments for establishing the trees were rather, more or less explicitly, of a quantitative nature. Some have counted grammatical isoglosses (e.g. Diakonoff 1965) or cognates in a Swadesh word list (e.g. Fleming, Militarev 2005a). Others simply based their trees on one or a few shared features which seemed particularly impressive to them, such as the presence versus absence of the prefix conjugation (used by Mukarovsky, Diakonoff 1988) or the predominance of triconsonantal vs. biconsonantal roots which was taken as characteristics of Semitic and “Hamitic” respectively (Vycichl and others).

A remarkable exception is Ehret (1995) who justifies his classification exclusively by shared innovations. These are largely of morphological or phonological nature, such as the introduction of grammatical gender in [*Eg-Se-Be-Ch-Cu*], the development of an instrument-agent-prefix *m-* in [*Eg-Se-Be-Ch*], or the loss of tone and the rise of consonant incompatibility rules in [*Eg-Se-Be*]. However, I believe that Ehret did not succeed in proving the directionality of his presumed innovations and in ruling out that there could have been, conversely, a development of tone, or a loss of grammatical gender, the *m*-prefix and consonant incompatibility rules.

I hope it has become clear that quantitative arguments, in whichever shape they may appear, are inappropriate for the purpose of genetic grouping. Their use is prone to lead to typical artefacts. The early scholars tended to set Egyptian apart, presumably because its then incomplete state of exploration revealed only few similarities with the other branches. In the more recent classifications, Omotic tends to be put in a peripheral position, or is even excluded from the Afroasiatic family,¹⁵ since it shares relatively few cognates with the other groups. But here again, the low number of common features shared by Omotic might be due to factors which are irrelevant to the issue of genetic grouping, namely: (1) incomplete documentation, (2) lack of early records, (3) possibly an accelerated rate of language change due to intense contacts with non-Afroasiatic languages.

Why, then, is there such a wide-spread gap between theory and practice? The answer is easy: It is hard to tell whether a shared feature is an innovation or an

¹⁴ In addition, he assumes Ongota as a branch coordinate with Cushitic.

¹⁵ As suggested e.g. by Theil (2007 and 2012), Newman (1980: 22 note 36, no detailed argumentation) and Vycichl (1990/1: 104, no detailed argumentation); also Diakonoff (1998: 216) and Sasse (1981: 129) consider this possibility.

archaism. There would be obvious ways to do so if we had immediate historical records of the Afroasiatic proto-language – which is, alas, not the case –, or if we could venture some predictions about Proto-Afroasiatic based on a reconstruction of a higher order (Proto-Nostratic or the like),¹⁶ which is likewise not feasible at present. This problem has, of course, been noticed before. Hetzron (1988: 115) felt at a loss saying: “Distinguishing archaisms and innovations, the main criteria for subbranching, is extremely delicate, if possible at all, on the main branch level [= if no higher order reconstruction is available, C.P.]”, with the consequence that he saw no way of determining the position of Omotic within Afroasiatic.

This dilemma is not specific to Afroasiatic linguistics. In fact, most attempts at subclassifying languages all over the world have disregarded the innovation requirement and have, instead, been based on some variety of quantitative approach. Some seem to have hoped that, if lots of data are used, the sheer number of cumulated evidence will eventually level out the methodological fault. But such an approach can be detrimental particularly when word lists are used. As the word list used for the purpose of comparison is expanded, the list will include an increasing proportion of items which are less basic and more borrowable. This will create a second problem which adds upon the first methodological fault.¹⁷

What, then, is the right way to establish a family tree of languages? I argue that historical linguists should consider the methods for establishing a family tree of manuscripts that have evolved in the discipline of textual criticism. The two tasks are essentially the same: Linguists can point out differences in vocabulary among related languages but will find it hard to tell which term is the inherited and which is the innovated one, just as philologists can point out different readings in manuscripts but have a hard time telling which is the original and which is the corrupted one. But textual criticism has found a method to solve this problem, which was described in a very accessible way by Salemans (2000) and which I have adopted and applied to the manuscripts of the Sinuhe story in another paper in this volume (Peust 2012), to which I refer the reader for more details. In short, the reconstruction task is split into two steps.

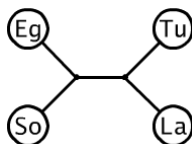
Constructing an unrooted tree

In the first step of the procedure, we simply drop the requirement of making an originality judgement. This will lead to the reconstruction of an unrooted tree rather than of a rooted tree. Working out an unrooted tree is comparatively easy and secure. My evidence consists of lexical replacements within the basic vocabulary. For this purpose, vocabulary items must be collected that have two distinct lexical expressions, each of which is attested in at least two languages (corresponding to the so-called “type-2 variations” in textual criticism as discussed in Salemans 2000: 24).

16 This method has been called “out-group comparison” by taxonomists.

17 This is an important restriction to consider while establishing a linguistic subgrouping. By contrast, the expansion of data does not have comparable negative effects on taxonomy in other disciplines such as textual criticism or evolutionary biology.

Consider the item “cold” as an example. It is realized in four selected languages as follows: Egyptian *qbb*, Somali (Cushitic) *qabow*, Tuareg (Berber) *ismad*, and Lagwan (Chadic) *səmaadə*. This provides evidence for a fragment of an unrooted family tree which comprises two subgroups [*Eg-So*] and [*Tu-La*]:



under the following assumptions:

- (1) We are able to make correct cognacy statements concerning this item. In this case, it is assumed that *qbb* is etymologically related to *qabow*, as is *ismad* to *səmaadə*.
- (2) All these words were transmitted by genetic inheritance and not by borrowing (at least within the timeframe of interest here, that is between Proto-Afroasiatic and present).
- (3) We are reasonably sure that the distribution is disjunct, which means that $\sqrt{\text{QBB}}$ does not exist as another term for “cold” in Tuareg or Lagwan, nor does $\sqrt{\text{SMD}}$ in Egyptian or Somali.
- (4) The development of the root $\sqrt{\text{QBB}}$ or $\sqrt{\text{SMD}}$ into the standard term for “cold” is arbitrary enough to be significant and could not easily have occurred more than once independently.

Admittedly, each of these assumptions brings in some amount of uncertainty. (1) presupposes a sound knowledge about Afroasiatic historical phonology which is not always available. As we focus on basic vocabulary, assumption (2) may arguably be probable, but never to the limit of certainty. (3) depends on our knowledge about the individual languages, which may be fragmentary. As for (4), we make the assumption that Proto-Afroasiatic did not have both $\sqrt{\text{QBB}}$ and $\sqrt{\text{SMD}}$ as standard terms for “cold” but only (at most) one of them, whereas the other term either did not yet exist or was at least so different in function that the semantic shift to “cold” would not be too trivial.

If we accept these assumptions and along with them the unrooted tree fragment, this will not yet tell us which of the terms is an innovation. It would be wrong to conclude at this point that both [*Eg-So*] and [*Tu-La*] form subgroups within Afroasiatic. But the unrooted tree expresses the assumption that *at least one* of the terms represents a common innovation, so that *at least one* of the two couples must form a genetic subgroup. As we agree on a number of non-contradictory tree fragments, they will eventually combine to an unrooted tree of the whole Afroasiatic language family. This is where the second step of the procedure comes in. At this point, we need to find one single directionality argument by which the whole unrooted tree can be suspended from one point. The tree is being “oriented” and becomes a real family tree. The fundamental advantage of this procedure is that the delicate directionality argument is required only once rather than over and over again during the whole process of building the tree.

My method is very similar also to the so-called “parsimony analysis” as employed in evolutionary biology.¹⁸ In that method, the tree is preferred on which “state” changes of “characters” are minimized (for me: on which vocabulary changes for semantic concepts are minimized). There are, however, significant differences between applications in biology and in linguistics. For example, biologists typically rely on “characters” (features) that have few or even only two possible “states” (values), such as “has hair”, which can be either true or false. This fact strongly increases the risk for equal values to arise by chance and thus requires considering a large number of features. By contrast, as was explained above, it is better for historical linguists to rely on few but well selected features, as the quality of additional, less basic vocabulary decreases. On the other hand, originality decisions do not usually pose a major problem to biologists because prehistorical animals are often well attested, in contrast to prehistorical languages.

While every approach has its shortcomings – and four potential shortcomings of the present approach have been enumerated above –, I see one big advantage of this method as against any kind of statistical approach, namely the transparency of its material basis. Every scholar is free to evaluate the quality of each lexical item, dismiss one or the other of them and replace them by alternative items which (s)he considers more secure. If different choices of lexical items lead to competing trees, it will be easy for everyone to make his own mind about which tree to prefer. In contrast to this method, statistical approaches typically involve so many data and computational logic that it is difficult to understand how a resulting tree comes about, let alone to compare alternative trees.

While I am arguing here that essentially the same methods of tree construction can and should be used in both textual criticism and historical linguistics, the results reached in historical linguistics will always attain a lower degree of certainty. This is because the genetic tree is a worse model of reality in historical linguistics than it is in textual criticism (or in biology). Manuscripts were usually copied from one single ancestor, “contamination” of manuscripts more or less being an exception. In contrast to that, language contact is the norm, and every language has been influenced by others, which means that evidence will typically be conflicting, and it may become a matter of definition which pieces of evidence to take as representing the “genetic” relationship and which to consider as “borrowed”.

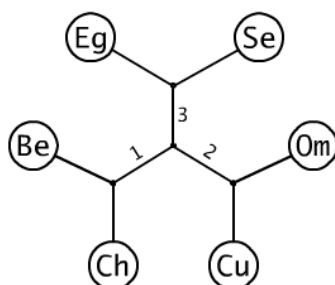
Which lexical items are best for establishing genetic relationships? Alongside the famous Swadesh lists, numerous alternative basic vocabulary lists have also been proposed. I am undogmatic in this respect and select my items from what can reasonably be called basic vocabulary without sticking to one particular list. I try to focus on items which are well represented in the respective subfamilies and not just found in one or a few scattered languages.

In order to limit the scope of the present paper, I agree on some assumptions which would actually be worthy of reassessment: I take the existence of six subfamilies of Afroasiatic for granted, namely Berber, Chadic, Cushitic, Egyptian,

18 The article “Maximum parsimony (phylogenetics)” in the English Wikipedia is a useful introduction.

Omotiic and Semitic. This goes with majority opinion these days, even though some doubts have been raised about the validity of one or another of these groupings.¹⁹ I will not discuss the various ideas about extending the Afroasiatic family or the attempts to merge Afroasiatic with Indo-European or other language families, nor the rare opinion that an Afroasiatic language family might not exist (Basset 1935). Finally, I leave some lesser-known languages out of consideration which have been claimed to constitute separate branches of Afroasiatic, such as Kujarge (Blench 2008), Kuliak (a group composed of three languages in Uganda, Lamberti 1988), or Ongota (Fleming 2006, cf. also Militarev 2005b).

To begin with the result, I propose the following unrooted family tree:



Each of the three internal connection lines (numbered in the figure), which represent the subbranches Berber-Chadic(1), Cushitic-Omotiic(2) and Egyptian-Semitic(3) respectively, needs to be justified by a lexical item which shows one term on one side of the line and another term on the other. In theory, a single reliable item would suffice for establishing each subbranch. I will propose three items each that I consider to be relatively secure. Cognates are only provided from a selection of well-documented languages; many others often exist but are not listed here. Most of the etymological connections are well-known. Facing the immense amount of etymological literature, I cannot provide a complete bibliography but cite a single reference for each connection. Neither can I explicitly refute all the alternative etymologies which have been proposed by others.

(1) The Berber-Chadic subgroup

- “cold”, “to be cold”:

Root 1 √QBB (Takács 1999a: 213):

- Eg: *qbb* (since Old Kingdom), Bohairic-Coptic ⲕⲃⲠ

- Cu: (Central:) Bilin *kamba*, Kemant *kämba*; (Eastern:) Oromo *qabbanaaʔa*,

Rendille *xóbò*, Somali *qabow*

¹⁹ There has been dispute in particular about whether Beja belongs to Cushitic or constitutes a separate branch of Afroasiatic. Two studies by Voigt (1998) and Appleyard (2004) conclude that Beja does belong to Cushitic but represents the earliest off-shoot of this family. My conclusions about Cushitic that I will give below do not heavily rely on Beja and will remain intact if evidence from this language is left aside. Those who prefer not to include Beja into Cushitic may still accept my positioning of Cushitic and only have to regard the position of Beja as being unresolved.

Root 2 $\sqrt{\text{SMD}}$ (Rössler 1979: 25):

- Be: Ghadamsi *sāmməd*, Kabyle *ismiḍ*, Tuareg *ismaḍ*, Wargli *əsməd*, Zenaga *šāmmuḍ*

- Ch: (Western:) Hausa *sányii*, Miya *šində* “cold weather”, Pa’anci *səndī*, Tangale *yìbàt* “wind”, Zodi *šindi*; (Central:) Lagwan *səmaadə* “Wind, Kälte”, Margi *yámádə* “wind, cold”²⁰; (Eastern:) Kera *sāye*²¹; (Masa:) Lamé *símbəd* “cold, wind”

Both reconstructions seem secure even though the individual Chadic languages show different degrees of erosion of the root $\sqrt{\text{SMD}}$. This Chadic root more precisely means “cold of weather”; many Chadic languages possess a different term for “cold to touch”.

● “come!”:

Root 1 $\sqrt{\text{M}}$ (Takács 2008a: 131-134):

- Eg: *mj* (since Old Kingdom), Bohairic-Coptic $\lambda\mu\omicron\gamma$

- Cu: (Northern:) Beja *mʔaa*; (Eastern:) Afar *am*, Sidamo *amo*²²

Root 2: $\sqrt{\text{Y}}$ (Newman 1980: 21f.):

- Be: Kabyle *əyya*, Tuareg *əyyǎw*, Wargli *iyya*

- Ch: (Western:) Bade *yaii*²³, Hausa *yáá-kà*, Ngizim *yén*²⁴

I am very restrictive here in that the cited items are all suppletive imperatives of a verb for “to come”. In Egyptian, *mj* serves as the imperative of the verb *jwj* > *jyj* “to come” (which is only very rarely used as an imperative, too, see Schweitzer 2008).

The neat distribution would vanish if we included other grammatical forms into the comparison. I assume that both the roots $\sqrt{\text{M}}$ and $\sqrt{\text{Y}}$ are of Proto-Afroasiatic origin (for the latter cf. Beja *yiʔaa*, Wolaytta *y-* “to come”), but the restriction of either of them to the function of an imperative happened differently in different subsections of Afroasiatic. I also have to assume that the Arabic interjection *hayyā* “up!; come on!; let’s go!”, which is not a grammatical imperative form (forms no plural, etc.), is unrelated to the Berber and Chadic terms.

● “navel”:

Root 1 $\sqrt{\text{XNPR}}$ (Cohen 1969: 102):

- Eg: *hpʔw* (since Old Kingdom), Bohairic-Coptic $\beta\epsilon\lambda\pi\iota$

- Se: Geez *hənbərt*, Hebrew *ṭabbūr*

- Cu: (Central:) Kemant *gwəmbəra*; (Eastern:) Afar *hundub*, Oromo *handuuraa*, Rendille *hənduur*, Somali *hundur*, Tsamakko *handura* “umbilical cord”

20 Hoffmann (1963: 26).

21 Glossed as “fresh”, but also in the phrase *ko sāye* “it is cold”.

22 Kawachi (2007: 426).

23 Schuh (2007: 48).

24 Schuh (1981: 177).

Root 2 √BD (Jungrathmayr & Ibrizimov 1994, I: 125):

- Be: Ghadamsi *tamet*, Kabyle *θimit*, Tuareg *tābutut*, Wargli *tmidt*, Tashelhit *abud*²⁵, Zenaga *tṡadd*
- Ch: (Western:) Miya *bàdà*, Ron-Daffo *mató(h)*; (Central:) Gude *zimbàdā*²⁶

Although there are phonetic irregularities in the first root, I accept this connection, adding also the Hebrew term which is not usually included here. The original root seems to have been preserved particularly well in Central Cushitic (Kemant), while Egyptian (where ⟨ʕ⟩, as is well known, represents spoken /r/) lost the nasal, Hebrew modified the first and Eastern Cushitic the third consonant. The Geez term might either be inherited or (more probably) borrowed from some ancient Central Cushitic language. Note also that there is a strikingly similar root in Indo-European (**Hnb^hl-*, e.g. English *navel*, Latin *umbilicus*, Greek ὀμφαλός).

(2) The Cushitic-Omotc subgroup

• “head”:

Root 1 √QP (Peust 2006):

- Eg: *dp* (since Old Kingdom)²⁷
- Be: Ghadamsi *eyǎf*, Kabyle *ixǎf*, Tuareg *eyǎf*, Wargli *iyǎf*, Zenaga *iʔf*

Root 2 √MTH (Zaborski 1989: 582f.):

- Cu: (Central:) Awngi *ɲári*²⁸; (Eastern:) Oromo *mataa*, Rendille *mátàh*, Somali *madaḥ*, Tsamakko *muga^s-te*²⁹, Yaaku *miteh*. Possibly add also (Northern:) Beja *mat* “Scheitel” (only in Reinisch 1895: 175).
- Om: Aari *matá*³⁰, Dime *mátè*

There are alternative terms which could be used to support an Egyptian-Semitic connection, but of inferior quality: (1) Egyptian *ʕjs* “brain” (medical term of the New Kingdom) = Semitic **rʔs* “head”; both the late attestation and the fact that this is a technical term suggest that this is a loan from Semitic. (2) Egyptian *dʕdʕ* “head” (the dominant term from the Middle Kingdom on) has been compared to Akkadian *qaqqadu* and other Semitic terms, but I prefer Quack’s (2002: 184) inner-Egyptian derivation from *dʕdʕ* “pot”.

• “tongue”:

Root 1 √LS (Takács 1999a: 133f.):

- Eg: *ns* (since Old Kingdom), Bohairic-Coptic λλϸ

25 Destaing (1920: 199).

26 Hoskison (1983: 298). I assume that this is a compound *zim-bàd á*.

27 The reading of this noun is disputed. I assume with Werning (2004) that the traditional reading *tp* must be corrected to (New Kingdom) *dp* despite Schweitzer (2011: 133-142) who defends the old reading. This leaves us with either *dp* or *dp* as possible readings in the Old Kingdom, from which time no phonetic spelling has so far become known. I have opted for the reading *dp* in Peust (2006).

28 **m > ɲ* is regular in Central Cushitic, cf. the item “two” below.

29 Tsamakko *g* can correspond to *d* of other languages.

30 Hayward (1990b: 436).

- Se: Akkadian *lišānu*, Arabic *lišān*, Geez *læssan*, Hebrew *lišōn*
- Be: Ghadamsi *eləs*, Kabyle *iləs*, Tuareg *iləs*, Wargli *iləs*, Zenaga *əčši*
- Ch: (Western:) Bole *lišim*, Hausa *háršèè*, Ron-Daffo *lís*; (Eastern:) Mokilko *ilzé*, Mubi *lèésí*³¹

Root 2 √^ςNRB (Lamberti 1987: 534f.):

(- Se: Amharic *andäbät*)

- Cu: (Eastern:) Afar *arraaba*, Oromo *arraba*, Sidamo *arrawo*, Rendille *hàrràb*, Somali ^ς*arrab* (standard language) ~ *anrab* (dialectal, Ehret & Ali 1984: 245), Tsamakko ^ς*arraf-ko*
- Om: Aari *admi*³², Sheko [?]*yārb*, Shinassha *albeerá* (with metathesis)

There has been much discussion as to whether Egyptian *ns* might be a spelling for an actual spoken /ls/ (in view of the Coptic form). I do not believe so, but the etymological connection is nevertheless quite safe. As for the second root, I follow Lamberti who reconstructs *^ς*an-rab-*. This root also appears in some modern Ethiosemitic languages such as Amharic, where it is most probably a borrowing from Cushitic.

● “two”:

Root 1 √SN (Takács 1999a: 198):

- Eg: *sn.wj* (since Old Kingdom), Bohairic-Coptic *CHNAΥ*
- Se: Akkadian *šina*, Arabic *itnān*, Geez *sanəy* “the next day”, Hebrew *šnayim*
- Be: Ghadamsi *sən*, Kabyle *sin*, Tuareg *əssin*, Wargli *sən*, Zenaga *šinän*

Root 2 √LM? (Lamberti & Sottile 1997: 483):

- Cu: (Northern:) Beja *asa-rama* “7”³³; (Central:) Awngi *laŋa*, Bilin *läŋa*, Kemant *liŋa*; (Eastern:) Afar *nammay*, Oromo *lama*, Rendille *lammà*, Sidamo *lame*, Somali *laba*
- Om: Basketo *nam?*³⁴, Bench *nám*, Maale *lam?*³⁵, Mao-Hozo *dombo*, Wolaytta *na?*³⁶

Although not even the word for “two” is immune against borrowing (cf. Maltese *zewġ* “two” < Greek ζεύγος “pair”), Starostin (cited by Militarev 2005b: 573) has claimed it to be the globally second most stable term after “we”. Chadic has a wide-spread root √SR “two” (Jungrauthmayr & Ibriszimov 1994, I: 171) which some (e.g. Blažek 2001: 16) have identified with √SN. A representation also in Chadic would strengthen my point, but I prefer to ignore it here to be on the safe side.

31 Jungrauthmayr & Ibriszimov (1994: 329).

32 Bender (2003: 218).

33 All Beja numerals from 6 to 9 begin with *as-* and are transparent compounds of the form 5 + *x*, which gives us **-rama* “2”. The term *malu* “2” is an innovation.

34 Cerulli (1938: 108).

35 Amha (2001: 134).

36 This language still preserves the original *l-* in *laa-ppuna* “7” = “2+5”.

(3) The Egyptian-Semitic subgroup

● “ear”:

Root 1 √DN(H) (not previously proposed to my knowledge)

- Eg: *ʿnh.wj* “ears” (always with dual suffix *.wj*; since Middle Kingdom)

- Se: Akkadian *uznu*, Arabic *uḥn*, Geez *əzn*, Hebrew *ozān*

Root 2 √KM (Mukarovsky 1987: 43f.):

- Ch: (Western:) Bole *kùmó*, Hausa *kùnnéé*, Miya *kúmáý*, Ron-Daffo *hwám*, Tangale *kùmò*, Zodi *kəm*; (Masa:) Lamé *húm*

- Cu: (Eastern:) Tsamakko *qaan-te* (root **qaam-* as evidenced by the plural form *qaamme*)

- Om: Aari *qaami*³⁷, Dime *qáámè*, Kafa *waamoo*

Traditional etymology (e.g. Takács 1999a: 83f.) has compared the Semitic root to an Egyptian item **jdn*, which is not an actually attested word but was reconstructed from the fact that the word *jdn* “to represent, to replace” is written with an ear-hieroglyph. However, I prefer the explanation that this spelling is due to influence from the word *jd* “to be deaf”,³⁸ so that there is no longer any base for postulating that term for “ear”. I propose an alternative Semitic-Egyptian connection involving Egyptian *ʿnh.wj* “ears”. As the first two consonants match perfectly (according to the Rösslerian system, in which Egyptian *ʿ* derives from **d*), I tolerate the fact that the third Egyptian consonant has no match in Semitic. While *ʿnh.wj* is common as a dual form, an even more frequent Egyptian term for “ear”, and the only one available as a singular, is *msdr* (Bohairic-Coptic ⲙⲗⲁⲓⲁⲛ). This is usually considered a derivation from *sdr* “to lie down; to spend the night”. But this derivation does not seem to have appeared very suggestive to the Egyptians themselves because they never spelt *msdr* with the bed-hieroglyph usually found with *sdr*. Considering the fact that a connection between “ear” and “to hear” is found in so many languages (cf. only Jungraitmayr & Ibrizimov 1994, I: 53), I suggest that *msdr* might rather be an instrumental *m*-prefix derivation of *sdm* “to hear”, whose final *-m* was modified by dissimilation. The change *-m* > *-r* is exceptional, but so is the later change *-r* > *-c* which affected this very noun during the New Kingdom.

● “one”:

Root 1 √WHD (Schenkel 1990: 55):

- Eg: *wʿw* (since Old Kingdom), Bohairic-Coptic ⲟⲮⲁⲓ

- Se: Akkadian *wēdu* “single, alone”, Arabic *wāḥid*, Geez *āḥādu* “one” ~ *waḥəd* “unique, only, one”, Hebrew *āḥād* “one” ~ *jāḥīd* “only”

Root 2 √TK (Mukarovsky 1987: 26):

- Ch: (Western:) Ron-Daffo *dāngat*, Hausa *ták* (ideophone)³⁹, Tangale *dǝk*; (Central:) Mofu-Gudur *ték* (only in counting), Lagwan *tkú*; (Eastern:) Dangla *rákki*⁴⁰

37 Bender (2003: 208).

38 Suggested by Kaplony (1966: 82), Quack (2002: 181) and Schenkel (1993: 141 note 18).

39 Exclusively in the combination *dáyá ták* “only one” to emphasize *dáyá* “one”.

- Cu: (Eastern:) Oromo *tokko*, Rendille *tákkay* “one at a time, one by one”, Tsamakko *dookko*
- Om: Kafa *tok* “to be together, to be united”

The first root again presupposes Rösslerian correspondences (see Schenkel for details). If correct, it implies that the Semitic forms without initial *w-* are innovations. The second root is somewhat dubious because similar words for “one” are found in several other language families of the world (cf. Bengtson & Ruhlen 1994: 322f.; Lamberti 1987: 539), so that we perhaps have to consider the possibility of some kind of sound symbolic motivation for this item.

- “red”, “to be red”:

Root 1 √DHR (Schneider 1997: 208):

- Eg: *dšr* “red, yellow”, Bohairic-Coptic ⲉⲟⲣⲁ
- Se: Arabic *šahrāʾ* “desert” ~ *ašhar* “desert-coloured, sand-coloured”, Hebrew (post-Biblical) *šāhōr* “white”, Syriac *šhar* “to blush”

Root 2 √SWQ (Takács 2000: 268f.):

- Be: Ghadamsi *əzəɣ*, Kabyle *izwiɣ*, Tuareg *izway*, Wargli *əzəwɣ*, Zenaga *žobḥä*; possibly also Canarian *azuquahe* “brown” (Wölfel 1965: 425f.)
- Ch: (Western:) Hausa *jáá*; (Central:) Lagwan *zɛy*
- Cu: (Southern:) Iraqw *sugee* “red soil, ocre”
- Om: Aari *zeymi*⁴¹, Bench *zok*, Wolaytta *zoʔuwa*, Yemsa *šeʔä*⁴² ~ *zeʔu*⁴³

I find Schneider’s Egyptian-Semitic comparison attractive despite some semantic variability. The second equation seems reasonably convincing at least between the Berber and Omotic branches.

Orienting the tree

As an unrooted family tree has now been constructed, we need an additional assumption for orienting it. This assumption must involve a directionality statement, a decision about a common innovation. This statement may be based on data different from those that were used to establish the unrooted tree. It might be a good idea to rely on a morphological feature at this second step since morphology may, because of its system character, allow for directionality statements more easily than the lexicon.⁴⁴

40 Shay (1999: 115).

41 Hayward (1990b: 460); *-mi* is known to be an adjective derivation suffix in this language.

42 Lamberti (1993b: 375).

43 Cerulli (1938: 88).

44 Cf. Hetzron (1976) who suggests some relevant principles, stating e.g. that if one language has an irregular paradigm and a related language has a more regular paradigm, the irregular paradigm is likely to be the original one.

In language families whose sound correspondences are well-known, phonological innovations might be employed as well.⁴⁵

One single statement will suffice to orient the unrooted tree that we have established. I believe that a plausible directionality statement can be gained from the domain of verbal morphology. My argument is that the Afroasiatic prefix conjugation, which is found in most branches but not in Egyptian, is likely to be an innovation. I am exploiting here the extra-linguistic fact that Egyptian is the earliest attested Afroasiatic language, which makes it unlikely that a key feature of this family should have been lost already by that time.

Let me present this argument in more detail. There are two major conjugation patterns in Afroasiatic, which are known under the headings *suffix conjugation* and *prefix conjugation*. The suffix conjugation (in Egyptian: *pseudo-participle* or *stative*), which in Egyptian has endings such as *-k* (1st sg.), *-t* (2nd sg.), *-Ø* (3rd sg. masc.), *-t* (3rd sg. fem.) etc., belongs to the most impressive links between Egyptian and Semitic and has served as one of the core pieces of evidence for an Egyptian-Semitic relationship since the days of Erman (1889: 80f.).⁴⁶ It poses no problem that the suffix conjugation was lost in later stages of both Egyptian (only traces survive into Coptic) and Semitic (it was lost in the Northeastern Neo-Aramaic branch). Berber retains clear traces of the suffix conjugation, too. The dominating conjugation pattern of Berber blends elements of both the prefix and the suffix conjugations. Some Berber languages have even preserved an immediate successor of the suffix conjugation, called *qualitative*, which is used specifically with adjective verbs.⁴⁷ Much more dubious remnants of the suffix conjugation have been claimed for Cushitic,⁴⁸ while Chadic and Omotic appearantly have not preserved it.⁴⁹ Nevertheless, the suffix conjugation is well attested in all ancient Afroasiatic languages and is commonly, and I think rightly, regarded as a feature of the proto-language. The well-known fact that words tend to be eroded particularly at their ends certainly contributed to the disappearance of this tense in many of the more recent languages.

45 For example, if two phonemes in one language correspond to a single phoneme in another, we may assume an innovation in the second language because phonological mergers are possible but unconditioned phonological splits are usually not.

46 This connection was put into doubt – independently, but with similar arguments – by three scholars, namely Cohen (1922), Lefebvre (1936: 282f.) and Klingenberg (1956: 238-241) (still followed by Cohen 1988: 25). They saw a problem in the *-j* suffix which often forms part of the Egyptian pseudo-participle endings. This objection can be regarded as outdated because *-j* is no longer being considered as an integral part of these endings (cf. Borghouts 2001 for a recent discussion).

47 E.g. Ghadamsi, Kabyle and Zenaga, see Taine-Cheikh (2003).

48 A tense with stative meaning best preserved in Saho where it shows the endings 1st sg. *-iyó*, 2nd sg. *-itó*, 3rd sg. *-á*, 1st pl. *-inó*, 2nd pl. *-itín*, 3rd pl. *-ón*. See Banti (2001: 6-21) for a detailed treatment. I consider an origin from the Afroasiatic suffix conjugation possible but not certain enough. Banti rejects this connection, too, and suggests a connection with the Egyptian *sdm=f* tense instead, which seems to me even more inferior.

49 The subject suffixes of the East Chadic language Mubi have certainly nothing to do with the suffix conjugation as believed by Diakonoff (1988: p. 32 note 10 and p. 93). I will discuss the Chadic subject suffixes below.

Let us now proceed to the prefix conjugation.⁵⁰ The prefix conjugation is, overall, attested even better than the suffix conjugation, presumably because word beginnings are less subject to phonetic erosion than word ends. The prefix conjugation is well alive in Semitic (with the exception, again, of Northeastern Neo-Aramaic). A pure prefix conjugation has also been preserved in the future tense of Ghadamsi (Berber) (cf. Kossmann 2000), whereas all other Berber languages have at least preserved an amalgam of the Afroasiatic prefix and suffix conjugations, as said above. This time, we find clear attestations also in Cushitic, where the prefix conjugation is recessive but is still used in the conjugation of particular verbs of various languages.⁵¹ The globally most common conjugation type of Cushitic is an innovated suffix conjugation which, as is widely agreed upon, is composed of the verb stem plus an originally prefix-conjugated auxiliary (cf. Hetzron 1980: 40-53).⁵²

The following overview of the prefix conjugation of the verb “to die” (Afroasiatic $\sqrt{\text{MWT}}$) in selected languages shows the striking formal similarity:⁵³

	1st sg.	2nd sg. = 3rd sg. fem.	3rd sg. masc.	1st pl.	2nd pl.	3rd pl.
Old Akkadian (Semitic) ⁵⁴	<i>amūt</i>	<i>tamūt</i>	<i>imūt</i>	<i>nimūt</i>	<i>tamūtā</i>	<i>imūtū</i>
Ghadamsi (Berber) ⁵⁵	<i>əmmăt</i>	<i>təmmăt</i>	<i>immăt</i>	<i>nəmmăt</i>	<i>təmmătām</i>	<i>əmmătān</i>
Rendille (Cushitic) ⁵⁶	<i>àmùut</i>	<i>tàmùut</i>	<i>yàmùut</i>	<i>nàmùut</i>	<i>tàmùutīn</i>	<i>yàmùutīn</i>

The conjugation system of Chadic needs some discussion. Chadic verb stems tend to have distinct plural and occasionally feminine forms but never any kind of inflection for person. Instead, subject clitics, which may sometimes be separable from the verb,⁵⁷ are attached either in front of the verb (most commonly) or after the verb (particularly in some East Chadic languages). The following chart shows the subject clitics of some selected Chadic languages:

50 For the sake of simplicity, I speak here of one prefix conjugation although there may have been more than one prefix-conjugated tenses distinguished by internal modifications of the root.

51 The northern languages Beja and Afar still preserve numerous prefix conjugated verbs, while the other Cushitic languages retain only few such verbs or none at all.

52 Banti (2001: 39-43) suggests a radically different view that the Cushitic suffix conjugation in fact continues the Afroasiatic suffix conjugation. I decide to stay with the traditional interpretation, but this issue is in any case irrelevant to my argument.

53 Some less basic forms such as those of 2nd person / 3rd person plural feminine omitted.

54 Past tense.

55 Future tense, forms from Lanfry (1968: 243 and 301).

56 Present tense, forms from Pillinger & Galboran (1999: 42 and 64).

57 Newman (2000a: 721) gives examples for this from Hausa.

	Hausa ⁵⁸	Hausa ⁵⁹	Karekare ⁶⁰	Kulere ⁶¹	Tangale ⁶²	Bidiya ⁶³
1st sg.	<i>náa-</i>	<i>-ní</i>	<i>nà-</i>	<i>nì-</i>	<i>na-</i>	<i>-nó</i>
2nd sg. masc.	<i>káa-</i>	<i>-ká</i>	<i>ká-</i>	<i>yá-</i>	<i>ka-</i>	<i>-kíŋ</i>
2nd sg. fem.	<i>kin-</i>	<i>-kí</i>	<i>čí-</i>	<i>kí-</i>	<i>sɾ-</i>	<i>-káŋ</i>
3rd sg. masc.	<i>yáa-</i>	<i>-ší</i>	<i>sà-</i>	<i>ši-</i>	<i>yi-</i>	<i>-yí</i>
3rd sg. fem.	<i>táa-</i>	<i>-tá</i>	<i>tà-</i>	<i>tí-</i>	<i>ta-</i>	<i>-tí</i>
1st pl.	<i>mún-</i>	<i>-mú</i>	<i>mú-</i>	<i>ŋgyá-</i>	<i>min-</i>	<i>-yáŋ</i>
2nd pl.	<i>kún-</i>	<i>-kú</i>	<i>kú-</i>	<i>kú-</i>	<i>ma-</i>	<i>-kún</i>
3. pl.	<i>sún-</i>	<i>-sú</i>	<i>sú-</i>	<i>sí-</i>	<i>hin-</i>	<i>-yó</i>

Earlier scholars were aware only of the forms of Hausa and were struck by the similarity of the subject proclitics of the 3rd person sg. (*yáa-*, *táa-*) to the corresponding forms of the Afroasiatic prefix conjugation. The traditional view therefore took the subject proclitics of Hausa as somehow related to the prefixes of the Afroasiatic prefix conjugation, or, more precisely, as derived from a prefix-conjugated auxiliary (thus e.g. Klingenberg 1956: 255f.; still defended by Voigt 1986 and 2008: 356). This analysis was questioned first by Newman & Schuh (1974: 6 and 11f.) and then in more detail by Mukarovsky (1981), who considered Hausa *y-* as an erosion of a former **s-* (or **š-*), which lead to an accidental similarity with the Afroasiatic verbal prefix.

Taking a fresh view on the data that are available nowadays, Mukarovsky's position is clearly to be preferred. Consider first that the formal match does not extend beyond the two forms of the 3rd person singular. Second, a marker *š* for the 3rd person sg. masc. is attested even in Hausa, namely in the only verb that is conjugated with subject suffixes (second column of the table above) as well as in the independent pronoun *šii* 'he'. This consonant also survives in the subject clitics of Karekare and Kulere. On the other hand, there are languages (Tangale, Bidiya) that show how an original presumable **s-* could be weakened even in the 3rd person plural. Finally, the 3rd person subject clitics of many Chadic languages are not used in the presence of a nominal subject.⁶⁴ This alone shows that the subject clitics are not former auxiliaries but noun phrases, more precisely personal pronouns. These pronouns have well-known Afroasiatic connections (compare the roots *k-* and *s-* of the 2nd and 3rd person subject clitics with the independent pronouns *ṭw.t* < **kw.t* and *sw.t* of Old Kingdom Egyptian). The modern Chadic verb forms thus turn out to be composed from a personal pronoun and an infinite verb stem, presumably a former participle,⁶⁵ in much

58 Completive tense, forms from Newman (2000a: 569).

59 Subject suffixes after the verb *zâ* 'to go', forms from Newman (2000a: 585).

60 Perfect tense, forms from Lukas (1970/1: 247).

61 Forms from Jungraithmayr (1970: 309).

62 Subjunctive tense, forms from Jungraithmayr (1991: 35).

63 Forms from Alio (1986: 196).

64 Some Chadic languages including Hausa require a subject clitic even in the presence of an explicit nominal subject. We may assume that this represents a more advanced stage of grammaticalization of the subject clitics.

65 This seems evident from the fact that the verb stem tends to inflect for number and gender, but I have not seen this explanation in the literature. Herrmann Jungraithmayr (personal communication) informs me that also Otto Rössler considered Chadic verb stems as former participles. By contrast,

the same way as the present tense of Modern Hebrew. As not even a single Chadic language has retained the original prefix conjugation, it seems probable that it had been lost already by Proto-Chadic.

I have little to say about the conjugation systems of Omotic. Omotic languages have suffix conjugations which do not obviously resemble the Afroasiatic prototype. While Böhm (1987b) thinks that they are eroded outcomes of something similar to the innovated suffix conjugation of Cushitic, Hetzron (1988: 111f.) and Hayward (1998) see evidence that they include former personal pronouns. Rapold (2007: 85) considers it possible that Proto-Omotic had no person inflection on verbs at all. For the time being, I would take the position that Omotic has lost all traces of both the prefix and the suffix conjugations of Proto-Afroasiatic.

We can summarize that the prefix conjugation is well preserved in Semitic, Berber, and Cushitic. While it is no longer found in Chadic and Omotic, it must have existed in earlier stages of these branches since, as will become obvious from the oriented family tree below, Chadic forms a subgroup with Berber, as does Omotic with Cushitic.⁶⁶ This means that the prefix conjugation can be established for all branches of Afroasiatic but one. This notable exception is Egyptian, where no trace of a prefix conjugation has been detected. I can only subscribe to Thacker's (1954: 224) observation: "There is not the slightest trace of any such formation [= prefix conjugation, C.P.] in the oldest-known inscriptions, nor in any idiomatic phrase, nor in any of the combinations and constructions where archaisms are wont to linger." It was claimed by Hommel (1894: 345 and 355-358) and – independently of him – by Janssens (1972: 8 and 51f.) that traces of a former prefix conjugation survive in the *j*-augment found in Egyptian verb forms. This idea is far-fetched because there is neither a formal match (the Egyptian transliteration symbol <j> primarily represents /ʔ/ rather than /j/) nor a functional match (the augment of Egyptian is no person marker but appears in a number of different verbal forms provided that they belong to specific root types, see Allen 1984: Tables 1-18).

Accepting the fact that Egyptian has no prefix conjugation, we are left with two possible explanations:

- (1) The prefix conjugation belonged to the proto-language but was lost in Egyptian at an early date. This is the assumption of scholars such as Blažek (2002: 126), Calice (1931: 31), Edel (1955/64: § 461), Gardiner (1957: 3), Hodge (1987: 155f. and 160), Klinghenben (1956: 255f. and 269), Rubin (2004: 476), Sasse (1981: 138f.), Sethe (1918: 98), Voigt (1989: 269) and Vycichl (1959: 34 and 1991: 427).
- (2) Egyptian branched off from the Afroasiatic family before the prefix conjugation came into existence. I found this scenario being supported by the following scholars: Bender (2007: 732), Böhm (1987a: 122-125), Castellino (1962: 147-149),

Voigt (1987a: 340 and 1989: 276f.) suggests that Chadic verb stems are remnants of former prefix conjugated verbs that lost their prefixes. In Voigt (2004), he indeed reports examples of a loss of personal prefixes in Semitic, such as the loss of *t*- in some verbs of Soqotri, or even of all prefixes but *t*- in a dialect of Tigrinya. Nevertheless, such a loss is overall rare, and no example of a loss of the whole paradigm of prefixes has been documented.

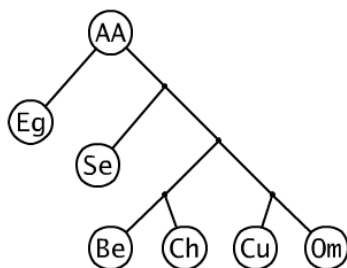
66 There is no way of orienting our unrooted tree so that exactly and only Semitic, Berber, and Cushitic would form a subgroup.

Mukarovsky (1966: 25), Petraček (1982 and 1988: 47-52) and Thacker (1954: 224).⁶⁷ A variation on this, which I will not discuss, was proposed by Schenkel (1975: 68-71; abandoned in his later works): He suggested that there were originally two distinct language stocks with suffix conjugation only (Egyptian) and with prefix conjugation only (e.g. Cushitic), which merged to produce the families of Semitic and Berber.

Diakonoff originally took the first position but later changed his mind (cf. Diakonoff 1965: 80 note 61 with Diakonoff 1988: 23). The same applies to Rössler, if I understand him right (cf. Rössler 1951: 489-491 with Rössler 1964: 199). Finally, there have been scholars who left the issue undecided (Brockelmann 1932: 816f., Erman 1889: 81, Lefebvre 1936: 284, Porkhomovsky 2008: 168f.).

I think that, considering the early attestation of Egyptian, the second alternative is the more realistic one. When the oldest representative of a language family lacks a feature which all younger branches possess, the default assumption should be that this feature is an innovation. I therefore assume that the prefix conjugation represents a common innovation of all branches of Afroasiatic but Egyptian, which means that we have to posit a common subnode covering all these branches. I call this grouping *Peripheral Afroasiatic* as opposed to Egyptian which, in geographical terms, can claim to be *Central Afroasiatic*. It seems probable that the prefix conjugation arose from the fusion of a personal pronoun with some prehistoric verb form, but I will not pursue this issue here (for which cf. Bar-Asher 2008).

To combine the unrooted tree from above with our hypothesis about a common innovation, we locate the root (“AA”) so that all branches possessing the prefix conjugation move under a common subnode. This gives us the following rooted tree of the Afroasiatic language family:



I suggest that another innovation can be ascribed to the “Peripheral Afroasiatic” subfamily. While *nomina loci* and *nomina instrumenti* formed by an *m*-prefix are common in most or all branches of Afroasiatic including Egyptian,⁶⁸ the situation is

67 Bender and Diakonoff see the prefix conjugation as an innovation of their assumed [Se-Ber-Cu] subgroup.

68 Some examples from Egyptian: *mʒq.t* “ladder” < *jʒq* “to climb”, *mrḥ.t* “unguent” < *wrḥ* “to anoint”, *mḥʒ.t* “balance” < *ḥʒi* “to measure”, *mḥq.t* “shaving razor” < *ḥq* “to shave”, *mḥn.t* “ferry” < *ḥni* “to row”, *msk.t* “evening bark of the sun” < *skj* “to disappear”, *msdm.t* “cosmetics” < *sdm* “to paint one’s eyes”.

quite different for *nomina agentis* or participles in *m*-. The few participle-like formations that have been adduced from Egyptian are all dubious. Typical candidates include Coptic ⲙⲚⲏⲃ “plant”, if < **m-dg*’ “planted” as Osing (1978, II: 828 note 1109) thinks; *mnhp*, a post-New Kingdom divine epitheton (Leitz 2002/3, III: 303), if “copulating one”; *mnhz*, divine epitheton, traditionally translated as “guardian” (Leitz 2002/3, III: 303), if derived from *nhzi* “to be awake”.⁶⁹ I think Petraček (1988: 45) is right in seeing that the *m*-participles are connected with the prefix conjugation and therefore did not yet exist when Egyptian branched off the family. The grammaticalization path of the agential nouns in *m*- still seems to be clear: As has long been recognized,⁷⁰ the *m*- prefix of the agential noun goes back to an original interrogative pronoun, so that e.g. Arabic *m-uqattil* originally meant “(he) who kills” (where *-uqattil* is the same verb form that went into the prefix conjugation) and *ma-qtūl* “(he) who (was) killed”.

Further conclusions

Assuming that the tree proposed here is correct, we can draw a number of further conclusions:

- Egyptian is the most important language for the purpose of reconstructing Proto-Afroasiatic. This should always have been the default assumption as it is the earliest attested language of that family, but it is only by its position in the tree that the crucial role of Egyptian is proven. It is difficult to claim any feature for Proto-Afroasiatic unless it is attested in Egyptian as well.
- When a feature is attested in Egyptian and in any other Afroasiatic language, this feature is a good candidate for being projected onto the Proto-Afroasiatic level, presumed that it is neither a borrowing nor an independent development. Without detailed argumentation, I will therefore enumerate here some grammatical features which may plausibly have been characteristic already of the proto-language:
 - VSO as basic word order: attested in (earlier) Egyptian, Semitic, Berber and a few Chadic languages (e.g. Lamang).⁷¹
 - Suffix conjugation of verbs: attested in (earlier) Egyptian, Semitic and Berber.
 - *s*-causative of verbs: attested in Egyptian, Semitic, Berber, Cushitic and parts of Omotic⁷². Chadic has lost this feature and replaced it by new causative formations.⁷³
 - Pluractional verbs: Specific verb forms, often characterized by gemination of a root consonant, that express a pluralic action and often appear together with plural subjects or objects. They are particularly characteristic of Chadic but can also be found in other languages such as Akkadian⁷⁴ and Egyptian⁷⁵.

69 See Edel (1955/64: 110) and Vycichl (1985) for more possible examples.

70 E.g. Brockelmann (1908/13, I: 375), Vycichl (1994: 247); rejected without detailed argumentation by Takács (2008a: 8).

71 On Chadic word order cf. Williams (1989) who suggests that Proto-Chadic had VS but SVO.

72 E.g. Dime, see Seyoum (2008: 141).

73 Frajzyngier (1985); cf. also Newman (2000a: 651) and Voigt (2008: 357).

74 The *D*-stem, see Kouwenberg (1997: 117-175).

75 Only for participles; cf. Allen (1984: 421-426) and Schenkel (2011).

- Two grammatical genders: attested in Egyptian and elsewhere, absent only from Omotic⁷⁶ and parts of Chadic.
- Nominal plural formation by internal vowel ablaut: attested in Egyptian⁷⁷, Semitic, Berber and Chadic.
- Dual of nouns and pronouns: attested in (earlier) Egyptian and parts of Semitic.
- Genitive linker *n*: attested in Egyptian, Berber and parts of Chadic (e.g. Hausa).
- Nisba derivation in *-y* (earlier Egyptian) / *-ī* (Semitic), which, as is often assumed (e.g. Hetzron 1973/9: 220f.), may be related to the genitive suffix *-i* (Semitic) / *-ii* (Beja, see Wedekind *et al.* 2007: 60f.). For more doubtful traces in Berber see Vycichl (1952).
- Pronominal indirect object clitics and direct object clitics after verbs in this order: attested in (earlier) Egyptian, Berber and Akkadian.
- *Main clause marking*, which is to say that basic verb forms express a dependent clause whereas an extension must be added to form an independent clause: attested in (earlier) Egyptian,⁷⁸ Berber,⁷⁹ parts of Cushitic,⁸⁰ parts of Omotic⁸¹.
- *Second tenses*, specific tenses used in clauses with focussed constituents: attested in Egyptian and parts of Chadic. Cf. Jungrathmayr (1994) to whose description other Chadic languages could be added (e.g. the West Chadic language Miya). Note that, since the last two points are also found in some African languages other than Afroasiatic, an areal rather than a genetic explanation is possible here as well.
- When a feature is reconstructable for the Peripheral Afroasiatic node but absent from Egyptian, it will generally be hard to decide whether this feature was lost in Egyptian or whether it was a Peripheral Afroasiatic innovation. I have favoured the latter alternative with regard to the prefix conjugation and the agential nouns in *m*-. There is another feature concerning which I am less confident, but which is at least a good candidate for being a Peripheral Afroasiatic innovation. Verbal root extensions are a common feature of most Afroasiatic languages. While the *s*-causative must have been inherited from Proto-Afroasiatic (see above), the stem extensions in *t* (mainly reflexive/reciprocal/middle)⁸² and *m~n* (mainly passive/reflexive)⁸³ are well attested only in Semitic, Berber and Cushitic. There have been attempts to find relics of such stems, particularly the *n*-stem, also in Egyptian,⁸⁴ but it appears

76 For possible traces of a former grammatical gender in Omotic see Hayward (1989).

77 The Egyptian evidence is limited due to the unvocalized spelling. Quack (2007) tries to prove most of the (superficially) ablauting plural forms of Coptic as secondary. The best example from Pre-Coptic Egyptian, which was overlooked by Quack, is a cuneiform transcription of the Egyptian weight unit *šn^c*, which goes *šī-na-ah* (sg.) – *šu-nu-uh* (pl.) (Edel 1975).

78 Cf. *sdm=f* “while he hears / that he hears” vs. *iw=f sdm=f* “he hears”.

79 The aorist, the formally simplest verbal tense, is used as a non-initial consecutive form in several Berber languages and requires a proclitic to become a main-clause tense.

80 Well known e.g. from Somali.

81 Hayward (1998) shows that main clause verbs are built upon converbs in a subbranch of Omotic.

82 See e.g. Voigt (1987b) on this morpheme.

83 *m*- is found in Berber and Cushitic, *n*- in Semitic. I could imagine that *m*- is original and *n*- might have developed out of *m*- by assimilation to following dental consonants. Lieberman (1986: 601) believes in a connection, too, but assumes the opposite direction of change.

84 E.g. Derchain-Urtel (1973), Feichtner (1932), Vernus (2009) and Zyhlarz (1932/3: 44).

to me that the evidence is weak and no consistent function can be extracted from the few presumed examples.

- When a feature is attested only in Egyptian, it may have been inherited from Proto-Afroasiatic or have been innovated in Egyptian with an a priori probability of 50% each.⁸⁵ It will generally be hard to decide the issue. One such feature is the *sdm=f* conjugation which is attested already in the earliest records of the language (Zeidler 1992: 200 note 46). While it is usually regarded as an innovation of Egyptian, it could equally well have existed in the proto-language and have been ousted by the innovated prefix conjugation of Peripheral Afroasiatic.
- Our tree, combined with the principle of least movements, favours a localization of the Proto-Afroasiatic homeland in Africa rather than in Asia. When assuming an African origin, we need only a single movement (namely by the speakers of Semitic), whereas we would need at least two movements when assuming an Asian origin (namely by the speakers of Egyptian as well as by the speakers representing the [*Be-Ch-Cu-Om*] subnode).

I wish to finish by comparing the conclusions proposed here with the current state of Indo-European subgrouping. When languages of the Anatolian branch, most notably Hittite, were discovered, scholars were struck by the fact that several presumed core features of Indo-European were missing from this archaic branch, such as the opposition of masculine and feminine grammatical gender, dual forms, and a number of tenses and modi of the verbal system. Discussion ran for decennia whether these features were lost early in Anatolian or whether Anatolian branched off from the rest of Indo-European before these features came into existence. The consensus seems now to be heading towards the second option.⁸⁶ The parallels with the scenario suggested here for Afroasiatic are striking: The earliest attested representatives of their respective language families (Hittite of Indo-European, Egyptian of Afroasiatic) are at the same time the first branches to split off their families, even though these languages are located in the geographical center in both cases. This early branch-off explains why Hittite, despite its age, is not so similar to the other parts of its family as one would have expected. It is equally striking that Egyptian, despite its age, shares rather few similarities with the remainder of Afroasiatic, notably in its vocabulary. The family tree proposed here may provide an explanation for that.

Language sources

Unless indicated otherwise, my lexical sources for lesser known languages were the following. I have done some normalization of transcriptions symbols.

Berber: *Ghadamsi*: Lanfry (1973); *Kabyle*: Dallet (1982); *Wargli*: Delheure (1987); *Zenaga*: Taine-Cheikh (2008)

85 This is what results from the tree. Note that it would be wrong to say that the feature was probably absent from the proto-language because 5 out of 6 branches lack it.

86 The literature is abundant. It may suffice here to refer to Kloekhorst (2008: 7-11), who further supports this position by pointing out lexical innovations common to all branches but Anatolian.

Chadic: *Bole*: Gimba *et al.* (2009); *Kera*: Ebert (1976); *Lagwan*: Lukas (1936); *Lamé*: Sachnine (1982); *Miya*: Schuh (2010); *Mofu-Gudur*: Barreteau (1987/8); *Pa'anci*: Skinner (1979); *Ron-Daffo*: Jungraithmayr (1970: 212-230); *Tangale*: Jungraithmayr (1991); *Zodi*: Caron (2002)

Cushitic: *Afar*: Parker & Hayward (1985); *Awngi*: Appleyard (2006); *Beja*: Wedekind *et al.* (2007; dictionary on the accompanying CD) and Roper (1928); *Bilin*: Appleyard (2006); *Kemant*: Appleyard (2006); *Iraqw*: Mous *et al.* (2002); *Oromo*: Gragg (1982); *Rendille*: Pillinger & Galboran (1999); *Sidamo*: Gasparini (1983); *Somali*: Zorc & Osman (1993); *Tsamakko*: Savà (2005); *Yaaku*: Heine (1975)

Omotic: *Bench*: Wedekind (1990: 97-116); *Dime*: Seyoum (2008); *Kafa*: Cerulli (1951); *Mao-Hozo*: Bender (2003: 266-282); *Sheko*: Hellenthal (2010); *Shinassha*: Lamberti (1993a); *Wolaytta*: Lamberti & Sottile (1997); *Yemsa*: Lamberti (1993b)

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