Comparative and Historical Semitic Linguistics
An Introduction

John Huehnergard

a work in progress, to be published in

Cambridge Semitic Languages and Cultures

(https://www.openbookpublishers.com/series/2632-6914/cfp)

PART I: COMPARATIVE AND HISTORICAL LINGUISTICS

(draft, 2023: please do not cite without author's consent)

With thanks to
Benjamin W. Fortson IV, W. Randall Garr,
Jo Ann Hackett, Geoffrey Khan, Na'ama Pat-El,
Aaron D. Rubin, and Juan-Pablo Vita

I. COMPARATIVE AND HISTORICAL LINGUISTICS

1. Language Change

1.1. Introduction

All languages change over time. This is obvious when we compare the English of today with that of Shakespeare or Chaucer or Beowulf, or when we compare an Akkadian text from the time of Hammurapi with one from the time of Nebuchadnezzar. HISTORICAL LINGUISTICS is the study of how languages change through time.

How a language will change in the future is not usually predictable; if groups of speakers of a language become separated and lose regular contact with each other, their speech patterns will change in different ways, leading to distinct dialects of their language. If enough time passes without regular contact between these groups, they will no longer be able to understand each other; in other words, they will speak distinct languages.[1] These observations account for the fact that certain languages, even though they are mutually unintelligible, share many features in their structure and in their vocabulary: the shared features are

[1] While mutual intelligibility is a common criterion for distinguishing "dialect" from "language," those terms are not scientific, and the dividing line between the two is fuzzy.

due to a shared ancestry. COMPARATIVE LINGUISTICS employs the COMPARATIVE METHOD, the procedures of which will be described throughout this chapter, to determine that two or more such languages are in fact related to each other, that is, that their perceived similarities are both so numerous and so systematic that they cannot be due to chance or to borrowing, but because they derive from a common ancestor.[2] The comparative method is also employed to describe and account for the differences and similarities among related languages, and to reconstruct the ancestral language, called a PROTO-LANGUAGE, from which they have descended.

1.2. Sound Change

Speakers do not pronounce their language in precisely the same way as those from whom they learn it. And although, as noted just above, changes that a language may undergo cannot be predicted in advance, a remarkable fact about changes in the *sounds* of a language is that, once they have occurred, they can be shown to have occurred uniformly, or *regularly*, in specific circumstances. The regularity of sound change is a fundamental tenet of historical linguistics. As an example, consider the Old English words *bāt* 'boat' and *stān* 'stone'; the change of Old English "long *ā*" to modern English "long *ō*" is regular (even though the spellings of the modern English "o" vowel differ): Old English words containing *ā* that survived into modern English have *ō* where their ancestors had *ā*.

Next we may consider a sound change that is familiar to

[2] Garr 2005b.

students of Hebrew and Aramaic. Study the following groups of words (the Akkadian and Arabic case-endings, *-um* and *-un*, as well as the Aramaic article *-ā*, may be ignored in this and the following examples):

	‘house’	‘father’
Akkadian (Babylonian)	*bītum*	*abum*
Mehri (MSA)	*bayt*	*ḥ-ayb*
Ethiopic (Gəʕəz)	*bet*	*ʔab*
Classical Arabic	*baytun*	*ʔabun*
Hebrew	*báyiṯ*	*ʔāḇ* ([ʔɔv])
Aramaic (Syriac)	*baytā*	*ʔaḇ* ([ʔav])

These two groups of words are called CORRESPONDENCE SETS, and the fact that many such sets can be compiled rules out any likelihood that the similarity of the words in the sets is due to chance or to borrowing. The words in each correspondence set are called COGNATES, that is, they are related to one another in form and meaning. That the words for ‘house’ all begin with *b* allows us to reconstruct the PHONEME **b* also for Proto-Semitic (PS), the parent language from which these languages are descended. PHONEMES are the smallest phonetic units in a language that convey a distinction in meaning (such as *b* and *v* in English in the words *ban* and *van*; those two words are called MINIMAL PAIRS, since they are distinguished only by the sounds *b* and *v*). We might also conclude, on the basis of the words for ‘house’ alone, that in each of the descendant languages the REFLEX of PS **b* is unchanged (i.e., appears as *b*). The words for ‘father’ force us to modify the latter conclusion slightly, however. For while we find *b* again in the first four languages, the Hebrew and Aramaic

words show a spirant, pronounced [v] and transcribed as *b̲*. A comparison of other words in which *b* appears in the first four languages would show that, with some exceptions to be explained later, *b* and *b̲* appear in both Hebrew and Aramaic in mutually exclusive ENVIRONMENTS: the spirant *b̲* occurs after vowels, the stop *b* in other environments. Thus, minimal pairs distinguished only by *b* vs. *b̲* do not occur in Hebrew and Aramaic (unlike English *ban* and *van*), and so *b* and *b̲* are not distinct phonemes; rather, they are said to be ALLOPHONES of one phoneme. We are therefore correct in reconstructing a single phoneme **b* for PS. That phoneme appears unchanged in all environments in most of the languages; in Hebrew and Aramaic, however, an allophone *b̲* has arisen as the result of a CONDITIONED CHANGE, namely, the spirantization of *b* after a vowel. This change may be expressed as the following RULE for Hebrew and Aramaic:

(1) $b > \underline{b} \ / \ V \_\_$

which is read "*b* [in Hebrew and Aramaic] becomes/goes to *b̲* after a vowel." The slash denotes "in the following environment"; *V* denotes "any vowel"; the blank (_) indicates the position of the phoneme in question.

Next, consider two more groups of words (note that *p̄* is pronounced the same as *f*):

	'to inspect'	'spirit/breath'
Akkadian	*paqādum*	*napištum*
Mehri (MSA)	*fəḳáwd*	*nōf* (< **nafh* < **nafs*)
Ethiopic (Gəʕəz)	*faqada*	*nafs*
Classical Arabic	*faqada*	*nafsun*
Hebrew	*pāqaḏ*	*nép̄eš* [nɛ́fɛʃ]
Aramaic (Syriac)	*pqaḏ*	*np̄eš* [nəfeʃ]

Again, the words in each column are cognate with one another. In the left column, the words begin with *f* in three of the languages, but *p* in three others. In the right column, the middle consonant is *f/p̄* in five of the words, *p* in one.

The occurrence of *p̄* in Hebrew *nép̄eš* and Syriac *np̄eš* must be compared with the occurrence of *b̲* in *ʔāb̲*, *ʔab̲*, discussed above. For *p* and *p̄* in Hebrew and Aramaic are merely positional allophones, like *b* and *b̲*; the voiceless spirant *p̄*, like its voiced counterpart *b̲*, occurs after vowels. The distribution of *p* and *p̄* is paralleled not only by that of *b* and *b̲*, but by four other pairs of allophones: *d/d̲*, *g/ḡ*, *k/k̲*, and *t/t̲*. In each of the latter cases, as with *b/b̲*, the evidence of the other languages indicates that it is the spirant allophone that has developed secondarily (after vowels). Thus it is unlikely that the stop *p* has arisen from a rule that caused the spirant (*p̄*) to become a stop when not following a vowel; rather, *p̄* is another case of the spirantization of stops after a vowel, and the stop *p* is the original form of the phoneme in Hebrew and Aramaic. We may, incidently, now rewrite our rule (1) above in a more general fashion:

(2) (non-doubled, non-glottalic[3]) stop > spirant / *V*__ .

There are, then, three languages in which the reflex of the PS phoneme in question is *f* in all environments, one in which it is always *p*, and two in which it is *p* with secondary post-vocalic allophone *p̄* ([f]). It is not possible to decide with certainty

[3] That is, non-“emphatic”; the rule thus does not apply to the Hebrew and Aramaic consonants *q* and *ṭ*, which were probably glottalic stops, that is, pronounced as [k’] and [t’], respectively. The Semitic “emphatic” consonants are discussed in detail in §III.2.

whether to reconstruct **p* or **f* for PS. Since, in languages generally, stops become spirants more often than the reverse process, **p* is more likely;[4] but **f* may not be ruled out. Whichever it was, in several of the languages it underwent an UNCONDITIONED CHANGE (either spirantization of **p* to *f* in Mehri, Ethiopic, and Arabic, or despirantization of **f* to *p* in Akkadian, Aramaic, and Hebrew); an unconditioned sound change is one that occurs without a conditioning factor (such as the preceding vowel in *b* > *b̲*, *p* > *p̄* in Hebrew and Aramaic), and thus is effected on a sound no matter where it occurs in a word, throughout the language.

Sound change also affects vowels, as in Old English *stān* > Modern English *stone*, mentioned above. A similar instance in Semitic may be cited, as illustrated by the following correspondence sets:

	'female donkey'	'inspecting'	'good (F PL)'
Akkadian (Bab.)	*atānum*	*pāqidum*	*ṭābātum*
Arabic	*ʔatānun*	*fāqidun*	*ṭayyibātun*[5]
Aramaic (Targumic)	*ʔəṯānā*	*pāqeḏ*	*ṭāḇāṯ*
Hebrew	*ʔāṯôn*	*pōqēḏ*	*ṭôḇōṯ*

As these forms show, where other Semitic languages have a long

[4] Another factor in favor of **p* as the original PS consonant is that it yields a more symmetrical reconstruction of the PS inventory, since **b* must be reconstructed as a stop, as we have just seen (see also Campbell 2013: 134, where is it noted that languages with *p*, *t*, *k* are common, whereas very few have *f*, *t*, *k* but no *p*); but this factor too is not decisive.

[5] The base of this Arabic adjective shows a nominal pattern different from that of the other languages; on noun patterns in general, see §IV.4.2.

ā, Hebrew has *ō*. The change of **ā* > *ō* also took place in other Canaanite languages, and is called the Canaanite Shift. It was probably an unconditioned change; that is, all instances of **ā* became *ō* regardless of their position in a word.[6]

Finally, let us examine several more sets of cognates:

	'to cover/clothing'	'ten'	'to hear'
Hebrew	*kāsā*	*ʕéśer*	*šāmaʕ*
Sabaic (ASA)	*ks*^{3}*w* (*kśw*)	*ʕs*^{2}*r* (*ʕšr*)	*s*^{1}*mʕ* (*smʕ*)
Jibbāli (MSA)	*ksé*	*ʔōśər*	*šīʕ*
Aramaic	*ksā*	*ʕsar*	*šmaʕ*
Akkadian (Bab.)	*kusītum*	*ešer*	*šemûm*
Arabic	*kiswatun*	*ʕašrun*	*samiʕa*

The pronunciations of the Sabaic phonemes are not known (the traditional symbols *s* and *š* having been adopted merely to mimic the sounds in Arabic cognates). Hebrew *ś*, as in the word for 'ten', is traditionally pronounced as *s*, the same as the consonant in the word for 'cover' (written ס), the pronunciation of the two consonants having merged at some point, as also happened in Aramaic. But Hebrew *ś* must have been pronounced differently in the ancient period, since it was consistently written not with the symbol for *s* (ס) but with the same symbol as *š* (שׁ), and then marked by the pointers of biblical texts (the Masoretes) with a special diacritical dot (שׂ) to distinguish it from *š* (שׁ). In Jibbāli

[6] Some Semitists consider the Canaanite Shift to have occurred only when the original **ā* was stressed, and thus to have been a conditioned change. The Hebrew and Aramaic forms of 'female donkey' and 'inspecting' also exhibit conditioned changes of originally short vowels (**a* > *ə* in Aramaic and > *ā* in Hebrew; **i* > *e*/*ē*), for which see below, §III.5.

and other MSA languages, the "s"-sound in words cognate to Hebrew words with *ś* is a voiceless fricative lateral, [ɬ],[7] and certain lines of evidence indicate that that was the pronunciation of the both the early Hebrew *ś* and the PS phoneme **ś* as well.[8]

These correspondence sets are most economically resolved if we reconstruct for PS three distinct non-glottalic (non-"emphatic"), voiceless "s"-like phonemes, as in Hebrew, Ancient South Arabian, and Jibbāli. Recent research has suggested that in early Semitic, one of these phonemes was a regular [s], one was an affricate [t͡s], and the third was a lateral [ɬ].[9] In the present textbook, these three PS phonemes are represented as follows:[10]

---

[7] To hear this sound in MSA words, go to http://semarch.ub.uni-heidelberg.de/en.html#archive.

[8] See §III.2.

[9] The evidence for the PS ancestor of Hebrew *sāmeḵ* (and *ṣāḏe* and *zayin*) as affricate is quite robust, as is the evidence that the PS ancestor of Hebrew *sîn* was a lateral. The internal Semitic evidence as to whether the ancestor of Hebrew *šîn* in words such as *šēm* 'name', *šāmaʕ* 'he heard' was dental–alveolar [s] or palatal [ʃ] is less clear (the languages are about evenly split in showing [s] or [ʃ]). If we posit that it was [ʃ], however, PS would have no regular [s], a very unlikely situation typologically. Further, in West Semitic, PS **s* changes to *h* in some forms, and [s] > [h] is much more common cross-linguistically than is [ʃ] > [h]. Finally, morphological counterparts to PS forms with *s* in other Afro-Asiatic languages, such as 3rd-person pronouns and the causative marker, have [s].

[10] Traditionally in Semitic scholarship, our PS **s* has been represented by *š*, and our PS **t͡s* by **s*.

[s] as **s*
[t͡s] as **ʦ*
[ɬ] as **ś*

In Babylonian, in Jibbāli, and in Northwest Semitic, PS **s* was palatalized to *š* [ʃ].[11] The affricated pronunciation of PS **ʦ* is suggested by Akkadian evidence as well as Egyptian transcriptions of Northwest Semitic words. In most languages, however, PS **ʦ* was eventually deaffricated to simple *s* [s] (although in the Assyrian dialect of Akkadian, it became [ʃ]); thus, in Arabic and in Ethiopic, PS **ʦ* merged with PS **s*, to *s*. An additional factor here is that the rules describing the two changes **s* > *š* and **ʦ* > *s* in later Babylonian, in Jibbāli, and in Northwest Semitic must be ORDERED RULES:

(1) **s* > *š*
(2) **ʦ* > *s*

For if the rule **ʦ* > *s* had operated first, then the resulting instances of *s* would have been affected by the rule *s* > *š* in the same way as instances of PS **s* > *š*. Since those languages do have *s*, the rule **ʦ* > *s* must have operated *after* the rule **s* > *š* had ceased to have effect.

1.2.1 Non-Phonemic and Phonemic Change

NON-PHONEMIC CHANGE, or ALLOPHONIC CHANGE (also called phonetic SHIFT), is change in the pronunciation of a phoneme that

[11] On palatalization, see below, §1.2.3. The widespread nature of the palatalization of PS **s* to *š* may indicate that the PS phoneme itself had a palatalized allophone, perhaps before high vowels. Compare the pronunciation of *s* in words like *sure*.

does not alter the number of phonemes in a language. Non-phonemic changes may be CONDITIONED, that is, occur in a specific environment; or UNCONDITIONED, that is, independent of a particular phonetic context. The change of *b* to *b̲* in Hebrew and Aramaic, discussed in the preceding section, is a non-phonemic change that is conditioned, in that *b̲* arises only after a vowel; the change results in a new allophone of *b*, but does not result in a new phoneme.[12] The change of PS **p* to *f* in Arabic and other languages is also a non-phonemic change, but unconditioned: **p* has become *f* everywhere, but that change too has not changed the number of phonemes of those languages.

PHONEMIC CHANGE does alter the phonemic inventory of a language. It too may be conditioned or unconditioned. The most common unconditioned phonemic changes among the Semitic languages are MERGERS, in which one phoneme comes to be pronounced the same as another phoneme, and the two then become indistinguishable. In both Akkadian and Hebrew, for example, the PS affricate **ʣ* underwent an unconditioned, non-phonemic deaffrication, becoming *z*; but the PS interdental **ð* also underwent an unconditioned change to *z*, and the two original PS phonemes merged to a single phoneme, /z/, in both languages. An example of a conditioned phonemic change may be cited from Babylonian Akkadian, where a new vowel *e* arose

[12] Allophones of a phoneme may not be noticed by speakers; English /t/, for example, is pronounced with aspiration at the beginning of a word, as in *top* [tʰɔp], without aspiration elsewhere, as in *stop* [stɔp]; but English speakers do not usually notice the difference, since the allophones (by definition) do not convey distinctions in meaning.

from an allophone of *a*:[13] in early Babylonian, PS **a* was pronounced [e] around the pharyngeal[14] consonants **ʕ* and **ḥ*; note the following early Babylonian forms and their pronunciations:

'hired'	**ʔagrum*	[ʔagrum]
'hire'	**ʔigrum*	[ʔigrum]
'twisted'	**ḥagrum*	[ħegrum]

In these forms, [e] in **ḥagrum* = [ħegrum] is simply an allophone of /a/; that is, [e] is the way the phoneme /a/ is pronounced after **ḥ*. But at some point in the history of Babylonian, the consonants **ʔ* and **ḥ* were lost at the beginning of a word, a change that yielded the forms [agrum], [igrum], and [egrum]; those forms were now distinguished only by their initial vowels, and so the allophone [e] had now become a distinct phoneme, /e/. This type of change—/a/ > /a/, /e/—is referred to as a phonemic SPLIT.[15]

---

[13] Some instances of *e* also arose from an allophone of *i*; for details see Huehnergard 2013.

[14] The pharyngeal consonants *ʕ* and *ḥ* and the laryngeal consonants *ʔ* and *h* are traditionally subsumed under the label "guttural" (sometimes including the velar/uvulars *ḫ* and *ǧ*), a tradition that we will also follow in this book when they undergo the same processes.

[15] Loss of a conditioning factor sometimes leads to "marginal" phonemic distinctions; an example occurs in Targumic Aramaic: 'your (M SG) slave' is *ʕaḇdāḵ*; the plural 'your (M SG) slaves' originally had the base **ʕabad-* (see below, §§IV.4.6) plus the pronominal suffix *-āḵ*; the postvocalic *b* and *d* of **ʕabad-* became *ḇ* and *ḏ*, thus *ʕaḇaḏ-āḵ*, which then underwent regular vowel syncope, yielding **ʕaḇḏāḵ*, in which *ḏ* in the plural form is now all that distinguishes the plural from the singular *ʕaḇdāḵ*, and the two forms constitute a minimal pair.

1.2.2 Assimilation

ASSIMILATION refers to the process of one sound becoming more similar to another sound. There are several types, classified according to three categories:

TOTAL vs. PARTIAL: in total assimilation, a sound becomes identical to another; in partial assimilation, a sound acquires only some of the features of another sound.

CONTACT vs. DISTANT: in contact assimilation, the affected and affecting sounds are immediately adjacent; in distant assimilation, the affected and affecting sounds are separated by other sounds. Most instances of distant assimilation in Semitic involve vowels.

REGRESSIVE vs. PROGRESSIVE: in regressive assimilation, a sound farther along in a word affects one before it (*nt* > *tt*); in progressive assimilation, a sound earlier in a word affects one farther along (*nt* > *nn*).[16]

Examples:

TOTAL CONTACT REGRESSIVE: Common to several Semitic languages is the total assimilation of *n* to an immediately following consonant, as in Hebrew **yintin* > *yittēn* 'may he give'; Akkadian **tanṭul* > *taṭṭul* 'you (M SG) looked'.

[16] There are also cases of MUTUAL ASSIMILATION, in which sounds affect each other; examples are Neo-Babylonian Akkadian forms such as *indaḫar* < *imtaḫar* 'he received', in which the labial *m* has undergone regressive assimilation to the following dental consonant and that dental consonant has undergone progressive assimilation to the preceding voiced nasal.

TOTAL CONTACT PROGRESSIVE: In Akkadian, the infixed *-t-* of verb forms assimilates to preceding dentals and sibilants, as in **yadtamiḳ* > *iddamiq* 'it has become good' and **yaśtabaṭū* > *iṣṣabtū* 'they (M) seized each other'; similarly in Classical Arabic, as in **yaṭtaliʕ* > *yaṭṭaliʕ* 'may he observe'. In Classical Ethiopic, *-k-* in the 1CS and 2nd-person suffix-conjugation assimilates to root final *g* and *q*: **ʕarag-kĭ* > *ʕaraggi* 'you (F SG) went up'; **wadaḳ-kŭ* > *wadaqqu* 'I fell'.[17]

PARTIAL CONTACT REGRESSIVE: A likely example is Central Semitic **n-s-y* 'to forget' from Proto-Semitic **m-s-y* (Akkadian *mašûm*), with *m* assimilating to the following dental *s* in forms like the prefix-conjugation **ʔamsi(y)* > **ʔansi(y)* 'may I forget', and the *n* then extended throughout the root.

PARTIAL CONTACT PROGRESSIVE: In Akkadian, the infixed *-t-* partially assimilates to a preceding *g*, becoming voiced *d*, as in **yagtamar* > *iḫdamar* '(s)he has finished'. In Arabic, similarly, the infixed *-t-* is velarized after velar *ṣ* and *ḍ*, as in **yaṣtaḥib* > *yaṣṭaḥib* 'may he accompany'.[18]

TOTAL DISTANT REGRESSIVE: In Assyrian Akkadian, short **a* in an open, unstressed syllable assimilates to a high vowel in the following syllable: *iṣbat* 'he seized', but *taṣbitī* 'you (F SG) seized' and *iṣbutū* 'they (M) seized'. In both Arabic and Ugaritic, the PS noun pattern **ḳattīl* has become **ḳittīl*, with the assimilation of **a* to the **ī* of the following syllable. The PS word for 'three' may be reconstructed as **śalāθ-*; the Central Semitic

---

[17] Note also Hebrew forms such as **gamalat-hŭ* > *gəmālátt*û 'she weaned him', **yilḳaḥ-an-hā* > *yiqqāḥénnā* 'let him marry her'.

[18] Likewise in Hebrew *hiṯpaʕēl* forms in which the *-t-* appears after the first radical by metathesis (see §1.2.10), the *-t-* partially assimilates in forms such as *niṣṭaddāq* 'we justify ourselves'.

form **θalāθ-* reflects distant regressive assimilation of **ś* to the following **θ*.[19]

TOTAL DISTANT PROGRESSIVE: In Classical Arabic, the 3MS suffix *-hu* becomes *-hi* after a form ending in *-i* (or *-ay*), as in GEN *kalbi-hi* vs. NOM *kalbu-hu* 'his dog' (similarly 3MP *-hum* > *-him* and 3FP *-hunna* > *-hinna*).[20]

PARTIAL DISTANT REGRESSIVE: In Old Babylonian Akkadian, the D stem PRET has the form *ušallim* 'I delivered'; in Middle Babylonian, the form is usually *ušellim*, with raising of *a* to *e* before *i* in the following syllable; similarly in the PRET of the Š stem, as in *ušaknis* > *ušeknis* 'I subjugated'. Note also Ethiopic **lahiq* > *ləhiq* 'old' and **raḥib* > *rəḥib* 'broad' with partial vowel assimilation around guttural consonants (cf. *ṭabib* 'wise').[21]

PARTIAL DISTANT PROGRESSIVE: In some forms of Arabic, pharyngealization spreads; when it moves forward in a word, as in Lebanese Arabic *ṣalla* = [sˤallˤa] 'he prayed', it is progressive assimilation.

1.2.3 Types of Assimilatory Changes to Consonants

VOICING is the addition of the feature [+voice] to a voiceless consonant, as in *t* > *d*, *p* > *b*, *ḥ* > ʕ; it usually occurs between

---

[19] Faber 1984: 215–20.

[20] Such assimilation of one vowel to another may also be called VOWEL HARMONY; see below, §1.2.9.

[21] Classical Ethiopic also exhibits total, rather than partial, regressive vowel assimilation around guttural consonants in forms such as *yəsəʔʔəl* 'he asks' and *yaʕaqqəb* 'he guards' vs. *yəgabbər* 'he acts'; see Part III, §3.5.2(f).

vowels or other voiced segments. DEVOICING, of course, is the opposite process; an example is Akkadian *šuptum*, which occurs alongside the expected form *šubtum* 'dwelling' (root *w-š-b*).

NASALIZATION refers to the addition of a nasal component to the pronunciation of a sound. Examples are Babylonian Akkadian *inaddin* > *inandin* '(s)he gives' and *zumbu* alongside *zubbu* 'fly'; Biblical Aramaic *tiddaʕ* > *tindaʕ* 'you (M SG) may know'.[22] These changes may also be considered types of dissimilation (§1.2.4).

PALATALIZATION is a process that makes a sound move closer to the hard palate of the mouth; it most often occurs before or after a high front vowel such as *i* or the palatal glide *y*. This is a regular process in Amharic, as in the F SG IMPV **kVpatī* > *kəfäč* 'open!' (pronounced [kɨfɛt͡ʃ])[23] vs. M SG *kəfät* ([kɨfɛt]).

GEMINATION refers to the doubling of consonants, as in the D stem of the Semitic verb, or the result of total assimilation, as in Hebrew *mattān* < **mantan-* 'gift'. DEGEMINATION denotes the simplification or reduction of a doubled consonant, for example, at the end of a word, as in Akkadian *dan* < **danna* 'he is strong', Aramaic and Hebrew *raḇ* < **rabbu(m)* 'great (M SG)'. In some languages, degemination is more general, as in Jibbāli (MSA) *ém-í* < **ʔimm-ī* 'my mother'.[24]

SPIRANTIZATION (or FRICATIVIZATION) is a process by which a stop becomes a fricative (spirant). As already noted at the beginning of §1.2, a well-known example among the Semitic languages is

---

[22] See Garr 2007.

[23] The original final *i* may also remain: *kəfäči* ([kɨfɛt͡ʃi]).

[24] Rubin 2014b: 40.

the spirantization, in Hebrew and Aramaic, of non-doubled, non-glottalic stops after vowels, as in Hebrew **kataba* > *kāṯaḇ* (pronounced [kɔˈθav]) 'he wrote', **bigad-āt-ay-kă̆* > *bəgāḏōṯéḵā* (pronounced [bəɣɔðoˈθɛxɔ]) 'your (M SG) garments'.

MONOPHTHONGIZATION. In general phonological parlance, a diphthong is a sequence of two vowels.[25] In Semitic studies, however, since sequences of vowels are disallowed in most of the languages, the term DIPHTHONG is used instead to refer to the sequences *aw* and *ay*.[26] Similarly, TRIPHTHONG refers to the sequences *VwV* and *VyV*. MONOPHTHONGIZATION, then, denotes the collapse of a diphthong or a triphthong to a single vowel, as in **mawt-ī* > Hebrew *môṯî* and Akkadian *mūtī* 'my death'; **bayt-ī* > Hebrew *bêṯî* and (Babylonian) Akkadian *bītī* 'my house'; Hebrew **tistayu* > *tište* 'you (M SG) drink'; (Babylonian) Akkadian **taḫduwī* > *taḫdî* 'you (F SG) rejoiced'; Arabic **laqiyū* > *laqū* 'they (M) met'.

1.2.4 Dissimilation

DISSIMILATION, as the name suggests, is the opposite of assimilation: a sound becomes less like another.[27] Dissimilation is often a sporadic or ad hoc process, as in Hebrew *qarqaʕ* 'floor' < **qarqar-* (compare Arabic *qarqar* 'smooth ground'; also Akkadian *qaqqarum* 'ground', with assimilation). There are, however, some

[25] Specifically, a sound that begins with one vowel and changes to another vowel in the same syllable, as in English *time* [taɪm], *house* [haʊs].

[26] The pronunciations of *aw* and *ay* are, to be sure, similar or identical to [au] and [ai], that is, to traditional diphthongs.

[27] See in general Růžička 1909; Edzard 1992.

instances of regular dissimilation in Semitic. For example, in Akkadian, the labial consonant *m* of the nominal prefix *ma-* regularly dissimilated to *na-* in roots that also contain a labial radical (*b*, *m*, *p*), as in **markabtum* > *narkabtum* 'chariot'.[28] In Proto-Canaanite, the first of a sequence of two *u*-vowels dissimilated to *i*, as in Hebrew **sullūm-* > *šillûm* 'requital'; **gubūl-* > **gibūl-*, which then > *gəḇûl* with reduction of **i* > *ə* in open, unstressed syllables.

1.2.5 Types of Sound Deletion

SYNCOPE is the deletion of a vowel within a word. It is a regular process in Akkadian, as in **damiḳum* > *damqum* 'good (M SG)' vs. **damiḳatum* > *damiqtum* 'good (F SG)'; in Aramaic, as in **malakīna* > *malḵin* 'kings' (which also shows apocope; see the next paragraph); and in Hebrew, as in CST **malakay* > *malḵê* 'kings of'.

APOCOPE is the loss of a sound from the end of a word. Early Semitic singular nouns ended in a short case vowel followed by *-m*; in several of the languages, first the *-m* was lost (e.g., in most of Northwest Semitic; Ugaritic preserves this stage), and then the newly-final case vowels were also eventually lost, a loss that resulted in the demise of the case system (e.g., in Hebrew

---

[28] Barth 1887. Similarly in Amharic, the noun prefix *mä-* is dissimilated to *wä-* in some roots that contain a labial consonant (*b*, *f*, *m*): *mäsnäq* 'bag' but *wämbär* < *wänbär* < **manbar* 'seat'; Leslau 1995: 228. Another regular dissimilatory process in Akkadian is Geers's Law, by which one of two glottalic ("emphatic") consonants in a root becomes non-glottalic, as in *qaṣārum* > *kaṣārum* 'to bind' (compare Hebrew *qāṣar* 'to reap'); see §III.5.

and Aramaic; also in most modern forms of Arabic and in the latest dialects of Akkadian). Proto-Central Semitic distinguishes an imperfective verb **yaḳtulu* from a perfective verb **yaḳtul*; the apocope of short final vowels in Hebrew and Aramaic resulted in the merging of these two forms for sound verbs.[29]

APHAERESIS refers to the loss of a word-initial sound. A few Semitic examples involve the loss of initial *ʔ* and a short vowel in an open syllable, as in Aramaic *ḥaḏ* < **ʔaḥad* 'one'. Initial **y* is present in Old Akkadian, but lost in later dialects, as in Old Akkadian *yuballiṭ* > Old Babylonian *uballiṭ* 'he kept alive'.

1.2.6 Types of Sound Insertion

A general term for sound insertion is EPENTHESIS. In Semitic studies, vowel epenthesis is often called ANAPTYXIS. Examples are found in several languages, e.g., Hebrew **kalb-* > **kɛlb* > *kéleḇ* 'dog'; Akkadian CST **kalbu* > **kalb* > *kalab* 'dog of'.

PROTHESIS refers specifically to the insertion of a sound at the beginning of a word, as in Hebrew **ðirāʕ-* > **ðiroʕ-* > **zərōʕ* > *ʔezrōaʕ* 'arm' (alongside a form without prothesis, *zərōaʕ*); in Arabic, phrase-initial imperatives have a prothetic vowel, as in *uktub* 'write! (M SG)' (vs. *wa-ktub* 'and write!').

PARAGOGE is the addition of a sound to the end of a word, as in Tigrinya *kälbi* < **kalb* 'dog', Akkadian CST *napišti* 'life of' < **napist*.

[29] See §IV.7.2.3.

1.2.7 Vowel Lengthening and Shortening

COMPENSATORY LENGTHENING refers to the lengthening of a vowel to "compensate" for the loss of a consonant. Examples are common in Semitic languages in which the guttural and/or glide consonants may be lost, as in Babylonian Akkadian **taʔkul* > *tākul* 'you (M SG) ate';[30] Hebrew **raʔs-* > **rās-* > *rō(ʔ)š* 'head'. Already in PS, **uw* and **iy* were equivalent to **ū* and **ī*, respectively, as in **ruwm-* ~ **rūm-* 'height' and **diyn-* ~ **dīn-* 'judgment'.[31]

VOWEL SHORTENING usually occurs because of a widespread constraint, in PS and some descendant languages, that prohibits long vowels in closed syllables. For example, in another instance of compensatory lengthening, in PS the sequences **CwV*$_1$ and **CyV*$_1$ became **C$\bar{V}$*$_1$,[32] as in **yakwunū* > **yakūnū* 'they (M) became stable'; in Central Semitic, however, the expected singular form **yakūn* became **yakun* with shortening of **ū* to **u* in the closed syllable.

1.2.8 Vowel Raising and Lowering, Fronting and Backing

The articulation of vowels can be charted in a diagram like the following, with the front of the mouth on the left, and vowel

---

[30] The lost consonant need not have followed the vowel immediately; forms such as *pītum* < **piṯum* 'opening' and *ḫūdum* < **ḫudwum* 'happiness' are common in Babylonian Akkadian.

[31] Compensatory lengthening may also take place with the loss of other consonants, as in Omani Mehri *gēd* < **gald* 'skin'.

[32] The subscript in **CwV*$_1$ and **CyV*$_1$ > **C$\bar{V}$*$_1$ indicates that the same vowel quality is preserved; e.g., **Cwa* > **Cā*, **Cyi* > **Cī*, **Cwu* > **Cū*.

height reflecting the relative height of the tongue:[33]

	FRONT	CENTRAL	BACK
HIGH	i		u
MID-HIGH	e	ə	o
MID-LOW	ɛ		ɔ
LOW	a		ɑ

Thus, for example, the vowel [i] is a high front vowel, while [ɑ] is a low back vowel.

The terms VOWEL LOWERING and VOWEL RAISING refer to changes in the height of the tongue in the pronunciation of vowels. In West Semitic languages, vowel lowering is common before guttural consonants, as in Hebrew **ðibbiḥa* > *zibbaḥ* 'he offered sacrifices' (vs. **biqqiθa* > *biqqēš* 'he sought'), Aramaic *šāmaʕ* 'hearing' (vs. *kāteb* 'writing'). In Akkadian, conversely, **a* was raised to *e* around pharyngeals, as in **yiptaḥ* > **yipteḥ* > *ipte* 'he opened'.

Vowels may also undergo FRONTING and BACKING, that is, movement toward the front or back of the oral cavity, respectively, sometimes concomitantly with raising and/or lowering. For example, the change of *i* to *a* in Hebrew described in the preceding paragraph may also be considered an instance of backing.

1.2.9 Vowel Harmony

When vowels undergo (distant) assimilation, in some or all of their features, to vowels elsewhere in a word, the process may be referred to as VOWEL HARMONY. In Babylonian Akkadian, forms of

[33] The vowel symbols in this chart are those of the IPA.

certain roots have an *e* vowel in their stems, often resulting from the prior existence of one of the pharyngeal consonants, **ʕ* or **ḥ*, as noted in the preceding section. In such forms, affixes also tend to have *e* rather than the *a* found in forms of other roots; examples: *te-šme* 'you (M SG) heard' vs. *ta-bni* 'you (M SG) built'; *me-lqētum* 'income' vs. *ma-šqītum* 'irrigation'; *ell-et* 'it (F) is clean' vs. *dann-at* 'it (F) is strong'; *bēl-ēku* 'I am lord' vs. *šarr-āku* 'I am king'.

1.2.10 Metathesis

METATHESIS refers to the transposition of sounds within a word. Regular metathesis of the derived verb stem prefix *t* occurs in Northwest Semitic in roots in which the first radical is a sibilant, as in Hebrew **ni-t-ṣaddVḳu* > *niṣṭaddāq*[34] 'we justify ourselves', Aramaic **yi-t-ʦallaḳ* > *yistallaq* 'he goes up', and Ugaritic **yi-t-saʔʔal* > /yišta^{ʔʔ}al/ (written <*yštʔl*>) 'may he investigate'. Regular metathesis of a consonant and vowel takes place in geminate verbs in Central Semitic: **yaʦbubu* > **yaʦubbu* 'he surrounds'. Metathesis is usually a sporadic process, however; examples of the metathesis of root consonants include Ethiopic *m-ḥ-r* 'to have mercy' for *r-ḥ-m* in other languages; West Semitic *b-r-k* 'to bless' for Akkadian *k-r-b*.

1.3. Analogy and Morphological Change

Another major factor in language change is analogy, which brings about morphological change on the basis of a model or pattern. Morphology is the study of word formation; a MORPHEME

[34] Also with partial contact progressive assimilation of the *t* to *ṭ*.

is a distinctive or minimal unit of meaning, a unit that cannot be divided into smaller meaningful units. Sometimes, a morpheme is a word, as in English *book* or Hebrew *sûs* 'horse'; sometimes, a morpheme is a unit that does not stand on its own, like the plural markers *-s* in English and *-îm* in Hebrew. Words like *book-s* and *sûs-îm*, then, consist of two morphemes, and some words may consist of several morphemes, as in Akkadian *tuṣiānim* 'you (PL) came out', which is composed of four morphemes:

t	*uṣi*	*ā*	*nim*
2	go out.PRET	PL	VENT

that is, 2ND PERSON, PRETERITE of 'to go out', PLURAL, VENTIVE (a directional marker)

Semitic verbal roots, such as **s-m-ʕ* 'to hear', and meaningful vowel patterns, such as *ā...i* for the G active participle, are referred to as DISCONTINUOUS MORPHEMES.

The regular English plural morpheme has three pronunciations: [s] as in *cats* [kɑt-s], [z] as in *dogs* [dɔg-z], and [əz] as in *roses* [roz-əz]. Variant forms of a morpheme, such as these, are called ALLOMORPHS. Similar examples of allomorphs may be cited from various Semitic languages:

the Classical Arabic 1CS possessive suffix has two allomorphs, *-ī* ~ *-ya*, the latter attached to a form ending in a long vowel or a diphthong (*kitābā-ya* 'my two books'), the former otherwise (*kitāb-ī* 'my book');

many Hebrew nouns exhibit allomorphs, for instance *dɔḇɔr* 'word' ~ *dəḇar* 'word of' ~ *dəḇār-* (in *dəḇār-î* 'my word');

Hebrew noun plurals exhibit the allomorphs *-îm* and *-ōṯ*, as in *sûs-îm*

'horses', *ʔāḇ-ōṯ* 'fathers';[35]

the Akkadian ventive morpheme, as in the example *tuṣiānim* given just above, has three allomorphs, *-am* ~ *-m* ~ *-nim*, depending on the person and number of the verb to which it is attached.

As noted at the beginning of this section, MORPHOLOGICAL CHANGE occurs as the result of analogy. Unlike sound change, analogy is always motivated, prompted by a perceived relationship between forms. The task for the historical linguist is to identify the analogy that has produced a new form. When, for example, English speakers say *brang* rather than *brought*, it is because they are (unconsciously) making an analogy along the lines of the following proportion:

sing : *sang* :: *bring* : *X,*

that is, "*sing* is to *sang* as *bring* is to ...," and *X* represents the new form created by the analogy. This is called a FOUR-PART ANALOGY, which may also be written

A : *B* :: *A′* : *B′,*

in which both *A* and *B* are morphologically equivalent apart from one feature (as in *sing : sang*), and *A* and *A′* are also morphologically comparable apart from one other feature (as in *sing : bring*);

---

[35] The regular English plural allomorphs [s] ~ [z] ~ [əz] are phonetically conditioned; that is, which one occurs depends on the phonetic environment to which it is attached. Similarly in the preceding two Semitic examples, the allomorphs are phonetically determined. The Hebrew plural allomorphs *-im* ~ *-oṯ*, on the other hand, are not phonetically conditioned, but lexical; that is, which one occurs must be learned. Cf. irregular English plurals such as *ox-en*, *child-ren*, *f-ee-t*.

B′ may then be seen as arising from *A′* by the same process that, in the speaker's mind, yields *B* from *A*. In our example, a single sound (*i* versus *a*) differentiates the present and past forms on the left of the proportion, and so the similarly shaped present form *bring* on the right of the proportion is changed analogously (*i* to *a*) to create a new past tense *brang* instead of the inherited, or learned, form *brought*.[36] In a four-part analogy, both form and meaning correspond.

As a Semitic example of four-part analogy, we may consider the 3FP form of the suffix-conjugation: in most of the languages, the marker of the 3FP is *-ā*: e.g., (Targumic) Aramaic *qərîbā*, Ethiopic *qarbā*, and Akkadian (Assyrian) *qarbā* 'they (F) approached, are near'.[37] In Arabic, however, the marker of the 3FP is *-na*, as in *qaribna*; that form results from analogy with 3PL forms of the jussive, in which the 3FP ending **-na* is original (cf. Hebrew *tiqrábnā* < **tiḳrabnă̄*):

jussive 3MP *yaqrabū* : 3FP *yaqrabna*
:: suffix-conj. 3MP *qaribū* : 3FP X = *qaribna*.

Also examples of analogy are Rabbinic Hebrew forms of the infinitive construct with the preposition *l-*, such as *littēn* 'to give' and *lēḏaʕ* 'to know', rather than the Biblical Hebrew *lā-ṯēṯ* and *lā-*

[36] Proportional analogies can involve complex components; consider the online definition of the baseball term *hanger* as *a ball that's action has stopped*, which may have arisen from an analogy such as this: *the ball has stopped : the ball that has stopped :: the ball's action has stopped : X*, in which *that's* replaces the more common *whose*.

[37] In Biblical Hebrew, the inherited 3FP ending **-ā* has been replaced by the 3MP ending *-ū*, an example of levelling, for which see §1.3.1, below.

ḏáʕaṯ. The Rabbinic Hebrew forms result from speakers' perception of a close relationship between the imperfect and the infinitive construct with *l-*, as in *yišmōr* 'he hears' and *lišmōr* 'to hear', which prompts the following analogy:

yišmōr : *lišmōr* :: *yittēn* : *X* = *littēn*
:: *yēḏaʕ* : *X* = *lēḏaʕ*

Thus, analogy acts on morphemes, and affects morphology.[38] Unlike sound change, analogy is not a regular process. The potential for an analogy to be made by a speaker—the availability of three of the first four parts of an analogical proportion, for example—does not necessarily produce a new form.[39] The infinitive construct of Biblical Hebrew *q-b-r* 'to bury' has the form *qəḇōr*, with the second radical spirantized because it follows a vowel (see above, §1.2.3); when a form like *qəḇōr* follows the

[38] Analogy also affects syntax; see below, §1.4.

[39] Thus, linguists have pointed out that "sound change is regular and causes irregularity; analogy is irregular and causes regularity" (Campbell 2013: 96). Inherited words and forms that are used frequently, being learned earlier and more firmly, tend to be more resistant to analogically created regular patterns; note, for example, the persistent irregularity of forms of the verb 'to be' in English and other languages.

The relationship between sound change and analogy is complex. Analogy may, for example, override or block synchronic phonological processes; the Akkadian form *libbašunu* 'their (M) heart', for instance, flouts the regular syncope of the second of two short vowels in open syllables (as in **damiqum* > *damqum*), because of analogical pressure: *bēlšu* ('his lord') *: bēlšunu* ('their (M) lord') *:: libbašu* ('his heart') *: X* = *libbašunu*. For constraints on analogical change, see Fertig 2013: chapter 7.

preposition *l-*, the form is usually *li-qbōr*, without the spirantization of the second radical, by the same process that led to the Rabbinic Hebrew infinitives discussed earlier in this section (namely, analogy with the "imperfect" *yiqbōr* < **yaḳburu*); but because analogy is not a regular process, there are exceptions, such as *li-ṣb̲ōʔ* 'to wage war' (Num 4:23), which preserve the phonologically expected form (originally **la-ṣubuʔi*), alongside the analogically re-formed *li-ṣbōʔ* (Isa 31:4).

1.3.1 Levelling

A common result of analogy is LEVELLING, by which a paradigm becomes more uniform through the elimination of alternations. An example of levelling in the history of English is the replacement of *old~elder~eldest* by the more regular *old~older~oldest*. The *e* in the first syllable of *elder* and *eldest* came about through a sound change, the raising of the vowel in the first syllable when there was a high vowel in the following syllable. The resultant vowel alternation in *old~elder~eldest* was later levelled out on the analogy of other adjectives where no alternation occurred, such as *wise~wiser~wisest*. The forms *elder* and *eldest* are still extant in English, of course, but they are of restricted meaning and use, rather than functioning as the regular comparative and superlative of *old*. It is generally the case that when a new, analogical innovation (such as *older*) appears, the inherited form (such as *elder*), if it does not disappear completely, will become restricted in its meaning or function.[40]

[40] This is referred to as Kuryłowicz's fourth law of analogy (Kuryłowicz 1945: 30–31). See below, §1.3.4 with n. 54 on Akkadian *ṣuḫărum*.

A Semitic example of levelling is the reduction of distinct case forms in several of the languages. In Hebrew and Aramaic, for instance, the loss of short final vowels erased the inherited case distinctions of singular nouns and adjectives: thus, Proto-Aramaic M SG NOM **ṭābu*, GEN **ṭābi*, ACC **ṭāba* all > **ṭāb* 'good', without case marking; in the Proto-Aramaic M PL forms, NOM *ṭābūna*, GEN-ACC *ṭābīna*, the loss of short final vowels would have left the case distinctions intact, **ṭābūn* vs. **ṭābīn*; but the lack of case in the singular led to the levelling in the plural of the GEN-ACC **ṭābīn* regardless of case.[41]

A more complex instance of levelling occurs in the paradigm of the suffix-conjugation of II–*w/y* ("Hollow") verbs in Hebrew and Aramaic; note the following forms of *q-w-m* 'to arise':

	Arabic	Hebrew	Aramaic
3MS	*qāma*	*qām* < **qama*	*qām* < **qāma*
2MS	*qumta*	*qámtā* < **qamtă̆*	*qāmt* < **qāmtă̆*

These forms are most economically accounted for by positing that the ancestral forms in Proto-Central Semitic were as in Arabic, with alternation of both the length and the quality of the stem vowel (3MS with long *ā* and 2MS with short *u*).[42] In the Hebrew and Aramaic paradigms, the alternation of the vowel quality has been levelled throughout the paradigm in favor of that of the 3MS, to *ă̆*. Further, both languages have also levelled the vowel length throughout the paradigm, but in different directions,

[41] Similar levelling of plural case-endings occurred in the history of Akkadian, Arabic, and Hebrew. Compare the *extension* of a case marker to plural forms in Gəʕəz, discussed in the following section.

[42] See below, §IV.6.4.3.

Hebrew to short **a* and Aramaic to long **ā*.[43] The Hebrew and Aramaic paradigms are thus more regular, more like the paradigms of sound verbs such as Hebrew *kāṯaḇ* ~ *kāṯáḇtā*.

Another example of levelling is found in the 1CS and 2nd-person endings of the suffix-conjugation:

	Akkadian	Arabic	Ethiopic
1CS	*qerbē-ku*	*qarib-tu*	*qarab-ku*
2MS	*qerbē-ta*	*qarib-ta*	*qarab-ka*
2FS	*qerbē-ti*	*qarib-ti*	*qarab-ki*

The Akkadian paradigm, with *-k-* in 1CS and *-t-* in the 2nd-person forms, is hetergeneous, and heterogeneity is often a good indicator of a more archaic paradigm.[44] Thus, (Classical) Arabic has levelled the *-t-* of the 2nd-person forms (as have Hebrew and Aramaic), while Ethiopic has levelled the *-k-* of the 1CS forms.

As a final example of levelling, consider the vowel of the prefix in Arabic *yaktubu* vs. Hebrew *yiḵtōḇ* < **yiktubu*, both meaning ‘he writes’. There is no regular sound rule in Hebrew that changes an earlier **ya-* to *yi-*, nor, conversely, a rule in Arabic that changes an earlier **yi-* to *ya-*. But note the following Hebrew forms from I–guttural roots, geminate roots, and II–weak roots:

yeḥĕzaq < **yiḥzaqu* ‘he is strong’
yēmar < **yimarru* ‘it is bitter’
yēḇōš < **yibāθu* ‘he is ashamed’
yaʕămōḏ < **yaʕmudu* ‘he stands’
yāsōḇ < **yatsubbu* ‘he surrounds’
yāqûm < **yaḳūmu* ‘he rises’
yāśîm < **yaśīmu* ‘he sets’

[43] See Huehnergard 2005a: 176–78.

[44] Hetzron 1976: 92–95. Note also, as corroborating evidence, the endings of the PS independent pronouns, reconstructed as 1CS **ʔanāku̯* (alongside **ʔanāku̯*) and 2MS **ʔanta̯*, 2FS **ʔanti̯*; see below, §IV.3.1.2.1.

In these forms, the vowel of the prefix depends on the theme vowel: the prefix vowel is **i* when the theme vowel is an *a* vowel, as in the forms in the left-hand column, but **a* when the theme vowel is a *u* or *i* vowel, as in the forms on the right. This heterogeneous system, i.e., **yaqtul-* and **yaqtil-* vs. **yiqtal-*, is also known to obtain in Ugaritic, in *all* G verbs, and it may probably be reconstructed as a feature of Proto Semitic.[45] The heterogeneity was levelled out both in Classical Arabic, where *ya-* became the prefix for all G verbs,[46] and in Hebrew, where *yi-* became the prefix for most G verbs, although the earlier **ya-* was preserved vestigially in certain root types with phonological peculiarities.

1.3.2 Extension

Analogical extension refers to extending an alternation that exists in a paradigm to other paradigms that did not previously exhibit that alternation; thus extension is, in a sense, the opposite of levelling.[47] In Old English, *dȳfan*, the ancestor of *dive*, formed its past tense with the ending *-ed*; the form *dove* in present-day English rather than the inherited form *dived* is due to analogy

[45] This is referred to as the Barth–Ginsberg law, after J. Barth, who described its effect in Hebrew (Barth 1894: 4–6) and H. L. Ginsberg, who noted that it also obtained in Ugaritic (Ginsberg 1932: 382–83).

[46] Except for rare vestiges, such as *ʔiḫālu* 'I suppose' (root *ḫ-y-l*); see Bloch 1967, also for ancient dialectal forms.

[47] "From the point of view of the speaker, analogical levelling and extension may not be different, since in both the speaker is making different patterns in the language more like other patterns that exist in the language" (Campbell 2013: 95).

with verbs such as *drive* ~ *drove*, in which the past tense with *-o-* was inherited from earlier Germanic. A Semitic example is the extension of the singular accusative marker *-a* to plural forms in Classical Ethiopic: in Ethiopic the original singular case-endings of the nominative (**-u*) and genitive (**-i*) were lost, while the accusative (**-a*) remained, and so the singular noun had a two-case system, unmarked non-accusative vs. accusative in *-a*; the singular system was then extended to plurals (*gadām* 'wilderness', PL *gadāmāt*):

NON-ACC *:* ACC *:: gadām : gadāma :: gadāmāt : X = gadāmāta.*

A more complex example of extension is found in the paradigm of the causative verb in Hebrew, the *hiP̄ʕîl*. Only in Hebrew do causative forms of the triradical verb exhibit a long vowel, e.g., the long prefix-conjugation (imperfect) form *yaqrîḇ* < **yuhaḳrību* 'he brings near' with long **ī*, vs. Aramaic *yaqreḇ* and Arabic *yuqribu*, both < **yuhaḳribu* with short **i*. The long **ī* of the Hebrew form has been extended from the causative forms of II–*w/y* ("Hollow") verbs, where the long vowel between the first and third radicals was inherited from earlier Semitic, as in the long prefix-conjugation form

> **yusaḳyimu* > **yusaḳīmu* > **yuhaḳīmu* > **yaḳīmu* > *yāqîm* 'he raises'.

In the short prefix-conjugation (preterite–jussive) form of II–*w/y* verbs, however, the vowel between the first and third radicals was shortened in the closed syllable (see above, §1.2.7):

> **yusaḳyim* > **yusaḳim* > **yuhaḳim* > **yaḳim* > *yāqēm* 'may he raise'.

The short :: long vowel contrast of the long vs. short prefix-

conjugation forms of II–*w/y* verbs, **yaḳim :: *yaḳīmu*, was extended analogically in Hebrew to sound verbs:[48]

**yaḳim : *yaḳīmu :: *yaḳrib : X = *yaḳrību.*[49]

Analogical extension is also a mechanism of syntactic change; see below, §1.4.1.

1.3.3 Reanalysis

Another product of analogy is REANALYSIS (also called METANALYSIS), in which speakers interpret a linguistic form or construction as consisting of something other than its inherited structure, because of some ambiguity.[50] In English conversation, for example, one may hear a phrase such as 'a whole nother story', in which *nother* derives from reinterpretation of the morpheme boundary in the word *another* as *a* + *nother* rather than *an* + *other*,

---

[48] The long **ī* was also extended to the suffix conjugation, likewise on the analogy of II–*w/y* verbs, where, e.g., 2MS **hVḳimtă̆* with short **i* contrasted with 3MS **hVḳīma* with long **ī*; then

**hVḳimtă̆ : *hVḳīma :: *hVḳribtă̆ : X = *hVḳrība*,

ultimately yielding *hēqámtā* ~ *hēqîm* and *hiqráḇtā* ~ *hiqrîḇ*.

[49] As another example of the irregularity in analogical processes, it may be noted that the contrast in the *hip̄ʕîl*, "preterite–jussive" **yaḳim* ~ "imperfect" **yaḳīmu*, which was extended to the sound verb as just described, also existed in the G forms, **yaḳum* ~ **yaḳūmu*, but the latter contrast was not extended to the G of sound verbs. Thus, some scholars doubt the plausibility of the traditional explanation of the *hip̄ʕîl* long **ī* presented here; a quite different explanation is proposed by Garr 2020.

[50] Crowley and Bowern 2010: 239: "[T]he process by which a form comes to be treated in a different way grammatically from the way in which it was treated by speakers in previous stages of the language."

as in

a story : another story :: a whole story : X = a whole nother story.[51]

In the Semitic languages, reanalysis sometimes results in new roots. As an example, consider the root *n-p-ḫ* 'to blow, breathe', which is attested throughout the Semitic languages, including the Central Semitic languages such as Arabic and Hebrew. The Central Semitic languages, however, also attest a II–*w* root *p-w-ḫ*, which shares the last two radicals of common Semitic *n-p-ḫ* and has a meaning very similar to the latter. Central Semitic *p-w-ḫ* is an innovation that arose through reanalysis of a form such as **yinpaḫ*, the G preterite-jussive of *n-p-ḫ*, which could also be, and was, analyzed by speakers as an N form of a II–*w/y* root, which thereby entered the lexicon. Another example is offered by Akkadian, in which several roots I–*w* have byforms with initial radical *t*, such as Old Akkadian *wamāʔum* and later Akkadian *tamāʔum/tamûm* 'to swear'; the byform roots with *t* originated in forms with an infixed *t*, to which the original first radical *w* underwent total assimilation (i.e., **wt* > *tt*),[52] as in **yVwtamaʔ* > **yVttamaʔ*. The latter form is ambiguous: it could derive from a root I–*w* or from a root I–*t*, and some speakers opted for the latter choice, to the extent that the original verb *wamāʔum* eventually disappeared from the language.

---

[51] The same process has also yielded, for example, the form *newt* from *ewt* (earlier *efete*, still attested as *eft*) and, in reverse, *an apron* from *a napron*; here too the inconsistency of analogy may be seen, in that *a napkin* has not become ***an apkin*.

[52] This is a Proto-Semitic sound rule; see Huehnergard 2006a and below, Part III, §2.2.

In other instances, reanalysis has resulted in a root shifting to a different paradigm; in Old Babylonian Akkadian, for example, certain forms of the II–*ʔ* root *m-ʔ-d* lost the medial *ʔ*, with compensatory lengthening, as in **yamʔid* > *imīd* 'it became numerous' and *maʔdum* > *mādum* 'numerous'; these were reinterpreted as deriving from a II–*y* root (cf. *iṭīb* and *ṭābum* from *ṭ-y-b*), and then the entire root *m-ʔ-d* was reanalyzed as II–*y*, with a new infinitive *miādum* replacing the inherited *maʔādum*, a new durative form *imīad*, etc.

Reanalysis is also involved in syntactic change, for which see below, §1.4.2.

1.3.4 Other Analogical Processes

A less common type of analogy is called IMMEDIATE or DIRECT ANALOGY, in which the model for an analogy appears in the same speech context, as in a frequently repeated phrase or sequence. The pronunciation of English *female*, earlier *femelle* [fɛˈmɛl], was altered because of its frequent appearance in the phrase *male and female*. The Akkadian adverb *amšāli* 'yesterday' is cognate with Arabic *ʔamsi* 'yesterday' and Hebrew *ʔémeš* 'yesterday evening'; the Akkadian form has acquired its *-al-* by direct analogy with the semantically similar word *timāli* 'yesterday'. Basic numbers are learned as a sequence and may affect one another; in Hebrew, the forms of the numerals 'five' and 'six' have influenced each other: the unexpected *-šš-* in *ḥămiššā* 'five' is due to analogy with *šiššā* 'six' (< **sidθ-at-*) and conversely the unexpected single *-š-*

in *šḗšeṯ* is due to analogy with *ḥămḗšeṯ* (< **ḫamis-t-*).[53]

BACK-FORMATION is the removal of an affix (actual or perceived) from a word to create a new word. When the Old French singular word *cheris* was borrowed into English, the final *s* was interpreted as a plural marker, and a new singular, *cherry*, was produced. The Central Semitic singular form *ʔilāh-* 'god' (cf. Hebrew *ʔĕlōah*) is probably a back-formation from *ʔilāhūma* (Hebrew *ʔĕlōhîm*), an old plural of *ʔil-* 'god' in which **-āh-* is an ancient Semitic plural marker. The Akkadian noun *ṣuḫărum* 'lad' is probably back-formed from the plural *ṣuḫărû*, which was originally a broken plural of the adjective **ṣaḫir-* 'young, small'.[54]

HYPERCORRECTION refers to a pronunciation or construction resulting from a desire to produce a standard or "correct" form but "overshooting the target"[55] as in *for you and I*. Semitic examples of hypercorrection often involve etymologically incorrect spellings, such as Official Aramaic *ẓyn w-ẓbb*, which occurs once for correct *dyn w-dbb* 'suit and process'; in Official Aramaic, Proto-Semitic **ð*, which had been written <Z>, was merging

---

[53] In Akkadian, the numbers 'six', 'seven', 'eight' begin with *s*, but *š* is expected on etymological grounds; it is likely that the initial *s* in 'six' is the result of dissimilation, and then the *s* in 'seven' and 'eight' arose by direct analogy with 'six' (Streck 2008).

[54] Huehnergard 1987: 181–88. The adjective *ṣaḫrum* (Babylonian *ṣeḫrum*) also exhibited paradigmatic plural forms, as in Babylonian M PL *ṣeḫrūtum*; the old broken plural *ṣuḫărû* was then restricted in meaning to 'lads', an example of Kuryłowicz's fourth law of analogy; see above, §1.3.1 with n. 40.

[55] Campbell 2013: 99.

with **d*, and so spellings of etymological **ð* with both <Z> and <D> coexisted for a time; but in *dyn w-dbb*, both words derive from etymological **d*, not **ð*, and the spelling with <Z> is a hypercorrection.[56]

FOLK ETYMOLOGY accounts for changes in words, or the formation of new words, on the basis of perceived linguistic associations in speakers' minds, for example, the eastern US term *sparrowgrass* for *asparagus* (originally from Greek). A likely Semitic example is Hebrew *ḥāsîl* 'locust'; in other Semitic languages the root of this word is *ḥ-s-n*, and so an original Hebrew form ***ḥāsîn* was probably altered to *ḥāṣîl* because of a perceived connection to the root *ḥ-ṣ-l* 'to destroy'.[57]

1.4. Syntactic Change

Most examples of syntactic change are also the result of analogical processes, especially extension and reanalysis.

1.4.1 Extension

Syntactic change as a result of analogical extension may be illustrated by the Hebrew and Aramaic use of construct forms before prepositions, as in Hebrew *yōšəḇê b-āh* 'those dwelling (CST M PL) in it (F)'. Such constructions arose through an analogy such as the following; the first three parts of the proportion would

[56] Blau 1970: 47.

[57] Another Hebrew example is the reinterpretation of **ṣalmūṯ* 'darkness' as *ṣal-māweṯ* 'shadow of death' (thanks to W. R. Garr for this example).

have been inherited from Proto-Northwest Semitic:[58]

	**yāθibūna*	*θūtu*	*ʕīri*	:	**yāθibū*	*ʕīri*
	dweller.M.PL.NCST	REL.M.PL	CITY	:	dweller.M.PL.CST	CITY
::	**yāθibūna*	*θūtu*	*bi-ʕīri*	:	*X* = **yāθibū*	*bi-ʕīri*
	dweller.M.PL.NCST	REL.M.PL	in-CITY	:	dweller.M.PL.CST	in-CITY

(That is, 'dwellers of the city' : 'dwellers who are in the city'.)

Another example of extension is the use of prepositions and construct-form nouns as subordinating conjunctions in various Semitic languages, an extension that was possible because construct forms (including prepositions) could govern clauses in PS.[59]

1.4.2 Reanalysis

Classical Ethiopic offers an instance of syntactic change resulting from reanalysis. In most Semitic languages, in a sentence such as 'the king granted (to) me the book', only the direct object 'the book' may be made the subject of a passive transformation, as 'the book was granted (to) me'. But in Classical Ethiopic, as in English, both direct and indirect objects may be made the subject of a passive transformation; in Ethiopic, this possibility arises from the fact that both direct and indirect pronominal objects may appear as object suffixes on the verb, with ambiguity resulting as to the syntactic status of the suffix; thus, *maṭṭawa-ni nəguś maṣḥafa* 'the king granted (to) me the book' may be passivized either as *tamaṭṭawa-ni maṣḥaf* 'the book was granted

[58] See Pat-El and Treiger 2008; Pat-El and Wilson-Wright 2018: 793–94; Pat-El 2020b: 283.

[59] See Pat-El 2020a.

(to) me' or as *tamaṭṭawku maṣḥafa* 'I was granted the book'.[60]

In Classical Arabic, the clause *jāʔa bi-l-kitābi* means literally 'he came (*jāʔa*) with (*bi-*) the book (*l-kitābi* GEN)', and thus 'he brought the book'. With the loss of final short vowels and, in some dialects, the loss of the now-final *ʔ* of *jāʔ*, this becomes *jā bi-l-kitāb*, which has been reanalyzed by speakers as *jāb il-kitāb*, and a (new) transitive verb *jāb* meaning 'to bring' is now common in several modern forms of Arabic.

1.4.3 Grammaticalization

Other examples of reanalysis include certain prepositions and prepositional phrases that arose out of noun phrases, such as English *beside* from *by (the) side (of)*, which can of course be used with things that do not have sides. Similarly Hebrew *li-p̄nê* 'before', originally 'at the front/face of', may be used, for example, with an infinitive, as in *li-p̄nê šaḥēṯ yahwe* 'before Yahweh's destroying'; and in Akkadian the construct form of *muḫḫum* 'skull, top' may appear in prepositional phrases, as in *ina muḫḫi dullim* 'concerning the work'. In these examples, the nouns *pānîm* and *muḫḫum* have lost some, or much, of their original concrete meaning. Such semantic bleaching, as that is called, is a feature of GRAMMATICALIZATION, a common process in which "lexical items and constructions come in certain linguistic contexts to *lose their lexical meaning* and serve grammatical functions, or ... whereby a grammatical item develops a new grammatical

[60] The last sentence may also be translated 'I received the book'; Dillmann 1907: 440–41.

function."[61] Another frequent aspect of the process is irregular phonetic reduction, as in English *going to* > *gonna* when used as a future marker, an example that also illustrates that the source word(s) may coexist with the grammaticalized form:[62]

I'm going to school vs. *I'm gonna read.*

The Semitic languages exhibit many examples of grammaticalization in addition to the prepositional phrases noted in the preceding paragraph. A sample:

In Biblical Hebrew, the regular relative marker *ʔăšer* is a phonetically reduced form of a PS noun, **ʔaθar-*, meaning 'place'; the semantic development is 'place' > 'place of/where' > 'where' > REL.[63]

Like English *going to*, modern forms of Arabic use reduced forms of the verb *r-w-ḥ* 'to go' as a future prefix, as in Levantine *raḥ-n-ṣalli* FUT-1CP-pray 'we will pray'.[64]

In Jewish Babylonian Aramaic, the particle *qā*, which marks durative aspect, is a reduced form of the participle *qāʔem* 'standing': *<ʔynšy d-*

[61] See in general Rubin 2005, and ibid.: 2 for this definition.

[62] We can observe this process happen in Akkadian: the phrase *ana šumi*, literally 'to/for the name of', is used as a prepositional phrase meaning 'on account of'; *ana šumi* becomes *aššumi*, with *ana* losing its final *a* and assimilation of *n*; this development of *ana* is regular in some dialects of Akkadian, but *ana šumi* becomes *aššumi* even in dialects in which it is not; *aššumi* becomes *aššum*, the loss of *-i* being a normal development; and finally, *aššum* becomes *aššu* in later dialects in which final *-m* is lost in grammatical endings. The noun *šumu(m)* 'name', meanwhile, continues its independent existence, and does not lose the final *-m* of its base.

[63] Huehnergard 2006b.

[64] Brustad and Zuniga 2019: 416.

qʔ krby wzrʕy > ‘men who were plowing and sowing’.[65]

In Amharic, a reduced form of the verb *allä* ‘to be’ (cf. Gəʕəz *hallawa*) is a clitic that marks non-negated main clause imperfect verbs, as in *yəsäbr-all* ‘he breaks’ (vs. negated *a-ysäbr-əmm* ‘he does not break’ and subordinate *s-isäbr* ‘when he breaks’).[66]

In several Semitic languages, an active participle and an independent personal pronoun may constitute a clause, as in Biblical Hebrew *ʔānōḵî hōlēḵ* ‘I am going (M SG)’ and Biblical Aramaic *yādaʕ ʔănā* ‘I know (M SG)’; in later Aramaic dialects, as this construction became more common as a regular “tense,” reduced forms of the independent pronouns could be added directly to the participle as enclitics, as in Targumic Aramaic *yādaʕnā*.

Historical linguists generally view grammaticalization as a kind of reanalysis rather than a separate process, a convenient way to capture and summarize the development of content words into grammatical forms, and the phonetic reduction that often accompanies such developments.

1.4.4 Borrowing

Another mechanism of syntactic change is borrowing as a result of language contact. An example is the verb-final word order of Akkadian clauses: Proto-Semitic may be reconstructed as a verb-initial language;[67] the shift to verb-final in Akkadian is due to prolonged contact between speakers of Akkadian and

---

[65] Bar-Asher Siegal 2016: 183.

[66] Leslau 1995: 300–8, 341–45.

[67] See below, §V.2.

speakers of Sumerian, a verb-final language.[68] On language contact and borrowing generally, see below, §3.

1.5. Semantic and Lexical Change

1.5.1 Semantic Change

In §1.4.3 above, it was noted that some words may lose their specific meaning over time, becoming grammatical forms. But words may also simply change their meaning in the course of time, a process called SEMANTIC CHANGE. An English example is the verb *prevent*, which used to mean 'to come before' rather than 'to keep from happening', as Psalm 88:14 in the King James translation of the Bible: "in the morning shall my prayer prevent thee." The most prominent types of semantic changes are widening or generalization and narrowing or specialization. Examples of widening, which often involves change from the concrete to the abstract, are the following:

The Akkadian verb *banûm* < **banāyum* means 'to build, form' and its verbal adjective *banûm* < **baniyum* originally meant 'built, formed'; in early Babylonian texts it generally means 'well-formed, of good quality', but its meaning widens over time to 'fine, beautiful' and then simply

[68] A similar change has taken place in the history of Ethiopian Semitic: whereas Classical Ethiopic is verb-initial, Amharic, Tigre, and Tigrinya are verb-final as a result of contact with Cushitic languages. Other changes in these modern languages include the placement of adjectives and relative clauses before the head noun, and the use of postpositions rather than prepositions (Crass and Meyer 2011; Zhang 2021). Such features are common in verb-final languages, but they did not arise in Akkadian.

'good'. At that point it begins to displace the earlier word for 'fine, good', *damqum*.[69]

In Classical Arabic the D verb *sawwā* is 'to make equal, even'; in modern Syrian Arabic, its meaning is more general, 'to make, prepare'.[70]

In the early biblical books of Samuel and Kings, the Hebrew noun *ḥḗp̄eṣ* means 'desire'; in the later book of Ecclesiastes, its meaning has become more general, 'matter, thing'.[71]

The following are examples of semantic narrowing or specialization:

In some dialects of Aramaic, the D of the root *ḥ-w-r* 'to be(come) white' comes to mean 'to launder', a narrowing of 'to make white'.

In Biblical Hebrew the noun *māḇōʔ* means 'coming, opening'; its Mishnaic Hebrew successor *māḇôy*, however, has the restricted meaning 'small street between rows of houses'.[72]

---

[69] A secondary verb *banû(m)* 'to be(come) pleasant', D *bunnû(m)* 'to beautify' is also then derived from the adjective.

[70] Behnstedt and Woidich 2005: 188.

[71] Hendel and Joosten 2018: 37; as the authors point out, *ibid.*, the semantic development of Hebrew *ḥḗp̄eṣ* is paralleled by that of the Classical Arabic noun *šayʔ*, which is a general word for 'thing', but derives from a root, *š-y-ʔ*, that means 'to wish, desire'. In modern Arabic colloquials, *šayʔ* has undergone grammaticalization; in Egyptian Arabic, for example, in the reduced form *-š*, it is, among other things, part of a discontinuous negation marker, as in *mā b-a-ḥibb-ū-š* (NEG CONT-1CS-love-3MS-NEG) 'I don't love him' (Leddy-Cecere and Schroepfer 2019: 452).

[72] Bar-Asher 2014: 167–74.

The Akkadian adjective *qallu(m)*, which in early dialects means 'light, of low standing', is a substantive meaning 'slave' in later dialects.[73]

Another source of semantic innovation is metaphor; a Proto-Semitic example is **ʕayn-* 'eye', which also meant 'spring (of water)'.

Metonymy refers to supplementary senses of a word that are related to its original meaning; a few examples follow (all of which are also instances of semantic extension, and of the addition of abstract meanings to concrete):[74]

In all of the Semitic languages, and thus probably also in Proto-Semitic, **lisān-* 'tongue' also means 'language'.

Also probably Proto-Semitic is the use of **raʔs-* 'head' to mean 'top' and 'beginning'.[75]

Akkadian *qātum* 'hand' also means 'authority, control'; Aramaic and Hebrew **yad-* 'hand' also means 'power' and 'possession'.

Semantic change is also responsible for the divergent meanings that individual words and roots often exhibit from one Semitic language to another. Here too we may point to instances

---

[73] See Streck 2010 for this and many other examples of semantic change in Akkadian.

[74] See Dhorme 1923 for the extended use of words for parts of the body in Hebrew and Akkadian.

[75] The phrase **raʔsu sanatim* 'beginning of the year, new year' can be reconstructed to Proto-Semitic, and is of course still well known in the Hebrew phrase *rō(ʔ)š haš-šānā*. In Akkadian, *rēšum* usually denotes more abstract meanings, and is replaced by *qaqqadum* for 'head', a meaning extended from 'top of head, skull'.

of both semantic widening and semantic narrowing, in relation to earlier Semitic. Examples of widening:

The Semitic root **ḥ-l-l* originally meant 'to be clear, clean'; in Hebrew, it came to mean 'to be(come) profane', and in the causative, 'to make profane, use for the first time', which was extended to the general meaning 'to begin'.[76]

Aramaic *ʕabdā* 'servant, slave' preserves the original semantics of the root ʕ-*b-d*, as seen in Hebrew *ʕāḇaḏ* 'to serve, work'; but the meaning of the verb in Aramaic has widened to 'to do, make'.

Amharic *näbbärä* may mean 'to settle, live', like its cognates in other Ethio-Semitic languages, but also means 'to be' (and in the reduced form *näbbär* functions as an auxiliary verb, a result of grammaticalization).

Examples of semantic narrowing:

In Classical Arabic, the common Semitic verb **h-l-k* 'to go' (Akkadian *alākum*, Hebrew *hālaḵ*, Ugaritic *hlk*) has the restricted meaning 'to perish, vanish'.

In West Semitic languages, the reflex of PS **ʔanθat-* means 'woman' or 'wife', but in Akkadian it usually means only 'wife', while another word, *sinništum*, carries the more general meaning 'woman'.

In view of the common Semitic verb **l-ḥ-m* 'to eat', the Proto-Central Semitic noun **laḥm-* probably meant simply 'food'; its meaning has narrowed to 'bread' in Northwest Semitic and to 'meat' in Arabic.

There are also numerous examples that exhibit more extreme semantic change than those just cited, and in such cases it can be very difficult to establish the original, or PS, meaning of a word

[76] Hackett and Huehnergard 2021.

or root, especially given the great time depth involved in the development of the various branches; some sample roots:[77]

**ʔ-m-r* 'to see' in Akkadian, Ugaritic, but also 'to say' in Ugaritic, as well as elsewhere in Northwest Semitic, 'to command' in Arabic, 'to know, tell' in Classical Ethiopic;[78]

**p-ḳ-r* 'to claim, contest' in Akkadian, 'to love' in Ethio-Semitic, 'poor' in Arabic, 'free' in Aramaic;[79]

**x̣-ʦ̣-ʦ̣* 'to cut, break' in Akkadian and Arabic, 'to decrease' in Classical Ethiopic, 'to divide' in Hebrew.

1.5.2 Lexical Change

By LEXICAL CHANGE is meant the replacement of a word or root by another, often a result of semantic change. Above, it was noted that in Akkadian the adjective *banû(m)* underwent semantic widening, from 'built, formed' to 'fine, good', and that in the latter meaning *banû(m)* eventually displaced the earlier word *damqum*. Another example from Akkadian is the replacement of the basic verb for 'return, go/come back', which is *târum* in Old Babylonian (and other early dialects) but *naḫāsu* in Neo-Babylonian. In early Biblical Hebrew texts, 'west' is expressed by the word for 'sea', *yām* (among other possibilities), but in later texts, *yām* means only 'sea' (semantic narrowing), and 'west' is expressed by *maʕărāḇ*.[80]

---

[77] See in general Huehnergard 2011b; Kogan 2015.

[78] See Kogan 2015: 331.

[79] Huehnergard 2014.

[80] Hurvitz et al. 2014: 173–75.

Lexical change may also occur when a particular morphological pattern comes to be associated with a particular semantic range; for example, Classical Arabic exhibits various words with the pattern *ḳitl* that denote young animals, words that are not attested (in that pattern) in other Semitic languages.[81] In Modern Standard Arabic, patterns for nouns of instrument, such as *miqtal*, have been used in the creation of new words for new objects, as in *miṣʕad* 'elevator' (*ṣaʕada* 'to climb');[82] similarly in Amharic, as in *mänäṭṭər* 'glasses, telescope' (*näṭṭärä* 'to become clear', *anäṭaṭṭärä* 'to aim at').

Another process that affects lexical items is BLENDING (or CONTAMINATION or AMALGAMATION), in which elements of two (or more) forms combine to yield a new form, as in English *smog* from *smoke* + *fog*, and *not* from *ne* + *ā(wi)ht* 'not anything'.[83] The Ugaritic verb *mġy* 'to come' may be a blend of two Semitic roots, *m-ḏ-ʔ* and *m-ṣ́-y*.[84]

Finally, a major source of lexical change is borrowing, for which see below, §1.5.4.

1.5.3 Suppletion

Sometimes a word or form is replaced by another in only part of a paradigm; SUPPLETION refers to paradigms that consist of forms from two (or more) earlier roots. Familiar English examples are

---

[81] W. Heinrichs *apud* Fox 2003: 144.

[82] See, e.g., Holes 2004: 311–12.

[83] Campbell 2013: 103–5, 242–43.

[84] Huehnergard 2022. For other possible examples of blending, see Blake 1920.

go with past tense *went*, and *be*, *am*, *was*.[85] Semitic examples:

In Arabic, Hebrew, and Aramaic, the plural of the word for 'woman' has a different root than the singular: Classical Arabic SG *imraʔatun*, PL *nisāʔun* (and other forms); Biblical Hebrew SG *ʔiššā* < **ʔanθat-*, PL *nāšîm* < **nasīma*; Syriac SG *ʔattṯā* < **ʔanθat-*, PL *nešším* < **nis(s)īna*.

In some Aramaic dialects, such as Biblical Aramaic, 'to give' is *y-h-b* in the suffix-conjugation and imperative, but *n-t-n* in the prefix-conjugation and infinitive.

Throughout West Semitic, the forms of the demonstrative are suppletive, singular forms deriving from **ðə̄-* and plural forms deriving from **ʔvl(l)-* (e.g., Hebrew M SG *ze*, F SG *zō(ʔ)t̲*, PL *ʔélle*).[86]

The ordinal numbers have the same roots as the cardinal numbers, as in Arabic *θalāθ-* 'three', *θāliθ-* 'third'; but words for 'first' in most of the languages are from different roots than 'one', as in Arabic *wāḥid-* 'one', *ʔawwal-* 'first'.[87]

In Amharic, *mäṭṭa* 'to come' has a suppletive imperative, *na* 'come!'.[88]

---

[85] Cf. 'to go' in Semitic: Groen 2021, pointing to the forms of *h-l-k* that behave as if from *w-l-k*, such as Hebrew IMPV *lēḵ*, IMPF *yēlēḵ*, INFIN CST *léḵeṯ*, and Akkadian Gt PRET *ittalak*, suggests that *h-l-k* and *w-l-k* may be considered suppletive roots. In Modern Standard Arabic, two nearly synonymous verbs meaning 'to come', *ʔatā* and *jāʔa*, tend to be inflected for different aspects, the former for imperfective and the latter for perfective, and thus tend to be suppletive; further, there is another suppletive verb, *taʕala*, for the IMPV of 'come' (Abdulrahim 2013).

[86] Huehnergard and Pat-El 2018b.

[87] C. Bezold and Th. Nöldeke, comments on suppletion in Semitic, in Osthoff 1899: 75–78; see also Wilson-Wright 2012.

[88] Leslau 1995: 516.

1.5.4 Borrowing

Speakers of all languages borrow words from speakers of other languages with whom they come in contact.[89] (Language contact in general is discussed below, §3.) In Akkadian, for example, long-term, extensive contact with Sumerian resulted in the borrowing of over a thousand nouns from the latter language; some are highly technical, but others are very common words for every-day things, such as *kirûm* 'orchard', *pišannum* 'basket'.[90] Aramaic in turn attests several hundred words from Akkadian,[91] and both Hebrew and Arabic borrowed a large number of words from Aramaic.[92] The nature of lexical borrowing, such that new words often arrive along with a new object or concept, means that most such borrowings are nouns.[93] But other parts of speech may also be borrowed: verbs, as in Biblical Aramaic *šeziḇ* 'to save' from the Akkadian causative form *šūzubu(m)*; numerals, as in Amharic *ši(h)* 'thousand' from the Cushitic language Agaw;[94]

---

[89] Lexical borrowing is so common that we can point to words in English that ultimately come from Akkadian, such as *sesame* and *semolina*; see Huehnergard 2021.

[90] Lieberman 1977.

[91] Kaufman 1974.

[92] For Aramaic to Hebrew, see, e.g., Wagner 1966; for Aramaic to Arabic, see Fraenkel 1886, Retsö 2011, Weninger 2011a.

[93] Note, for example, the various nouns related to scribal tools borrowed into Hebrew from Egyptian; see Zhakevich 2020, esp. p. 166.

[94] Appleyard 1977: 100, q.v. also for the uncertain origin of the Amharic word for 'nine', *zäṭäñ(ñ)*.

prepositions, as in late Akkadian *la-pan* 'before' from Aramaic.[95]

In a CALQUE, also called a LOAN TRANSLATION, the meaning, but not the form, of a foreign word or phrase is borrowed. An early English example is *al-mighty*, based on Latin *omni-potens*. Various scientific terms in Modern Standard Arabic are calques of European terms (which were themselves coined from Greek roots), for instance, *ʕilmu ṣ-ṣarfi* 'morphology' (literally, 'science of inflection'). Syriac *ʔiṯaw(hy)* '(there) is', is a grammatical calque of Greek *estín*.[96]

2. Reconstruction

Among the goals of historical and comparative linguistics is the reconstruction of earlier stages of individual languages and the reconstruction of aspects of the ancestor, the proto-language, from which genetically related languages descend.[97] By reconstructing earlier stages and proto-languages, we account for

---

[95] Occasionally a language may borrow enough words with a particular morpheme that the morpheme itself may become part of the borrowing language; the English suffix *-able* is originally from Latin and French, but is now a productive morpheme that can be attached to inherited English roots, as in *doable*. In Biblical Hebrew, several words with the pattern *qətîl* are borrowed from Aramaic, such as *məḥîr* 'price' (originally Akkadian) and *ḥăṣîn* 'strong'; but some Hebrew *qətîl* forms, such as *kəpîr* 'young lion', may be internal derivations once the pattern became sufficiently established (Huehnergard 2007: *30–*33).

[96] Butts 2016: 153–73.

[97] Note that proto-languages are not deficient or "primitive" in any way; they are just as complex as their attested descendants, although we are generally unable to reconstruct their complexity in full, since we must

changes that have occurred in the individual languages and for the concomitant differences that the languages exhibit.

2.1. Internal Reconstruction

By considering allomorphs and other alternations of forms in a language, it is possible to postulate earlier stages of that language. Internal reconstruction involves the assumption that at an earlier stage of a language, morphemes and paradigms were more regular, that is, they exhibited less allomorphism.[98] As an example, consider the Hebrew allomorphs of 'kings', construct *malḵê* and non-construct *məlāḵîm*. The spirantized *ḵ* in *malḵê* indicates that at an earlier stage there was a vowel between *l* and *k*, since spirantization occurred after a vowel (as seen above in §1.2); that in turn suggests the operation, at some point, of a rule that reduced or deleted vowels in open syllables, a rule that would also account for the lack of a full vowel between the *first* two radicals of *məlāḵîm*. Positing such a rule thus allows us to reconstruct a more uniform pair of forms originally, along the lines of CST **malakē* and NON-CST **malakīm*.[99] (Note again the use

---

assume some features to have been lost over time across a family. Interchangeable with "Proto-" is "Common," as in Common Semitic, equivalent to Proto-Semitic (for most scholars; see, however, n. 119, below).

[98] Campbell 2013: 199 conveniently lists four steps in internal reconstruction: (1) identify alternations, such as allomorphs; (2) posit a single original form without alternations; (3) posit changes to account for the alternations identified; (4) check results to make sure the posited changes do not also result in unattested forms.

[99] Note the relative chronology of the rules (that is, they are ORDERED RULES): vowel syncope must have occurred *after* spirantization. (If vowel

of an asterisk, *, to mark a reconstructed form.)

As another example of internal reconstruction, consider the following forms of the Classical Arabic suffix-conjugation:

	'wrote'	'met'	'threw'
1CS	*katabtu*	*laqītu*	*ramaytu*
3MS	*kataba*	*laqiya*	*ramā*
3MP	*katabū*	*laqū*	*ramaw*

The forms *laqiya* and *ramaytu* suggest that the paradigms of these III–*y* verbs were at one time like the regular paradigm of *kataba* and that they have become less regular as a result of sound changes, in particular the following, which can also be observed to operate elsewhere in Classical Arabic (note that _# means word-finally):[100]

iy > *ī* / _*C*; thus, *laqītu* < **laqiytu*;
iyū > *ū* / _#; thus, *laqū* < **laqiyū*;
aya > *ā* / _#; thus *ramā* < **ramaya*;
ayū > *aw* / _#; thus *ramaw* < **ramayū*.

Thus, internal reconstruction suggests that these verbs exhibited regular paradigms at an earlier stage of the language:[101]

---

syncope preceded spirantization, the CST form would be **malakē* > ***malkê*, not *malḵê*.)

[100] See further below, §IV.6.4.4.

[101] The same reasoning leads us to conclude that Babylonian Akkadian III–weak forms, such as *ibnī-šu* 'he built it (M)' and *ibnû* 'they (M) built', when compared with non-alternating paradigms such as *išriq-šu* 'he stole it (M)' and *išriqū* 'they (M) stole', may be reconstructed as **ibniy-šu* and **ibniyū*.

	‘wrote’	‘met’	‘threw’
1CS	*katabtu*	**laqiytu*	*ramaytu*
3MS	*kataba*	*laqiya*	**ramaya*
3MP	*katabū*	**laqiyū*	**ramayū*

Internal reconstruction can also be applied to reconstructed languages themselves. For example, comparison of forms of the suffix-conjugation of stative roots allows us to reconstruct Proto-Semitic 3MP **ḥadaθū* ‘they are new’ and 1CP **ḥadaθnŭ* ‘we are new’ alongside 3MP **ṭābū* ‘they are good’ and 1CP **ṭibnŭ* ‘we are good’; internal reconstruction suggests that the latter forms were originally more regular, **ṭayabū* and **ṭayabnŭ*, but have undergone sound changes that collapsed the sequence **-aya-* (to **ā* in open syllables but to **i* in closed syllables).

In the examples given thus far in this section, the allomorphism or other alternation to which we have applied internal reconstruction is the result of conditioned sound changes. Internal reconstruction cannot, however, recover earlier forms that have undergone unconditioned changes, since the latter do not result in allomorphs. For example, as we saw above in §1.2, Proto-Semitic is reconstructed with three voiceless sibilants, **s*, **ś*, and **ṯ*, the first and third of which have merged to *s* in Arabic; it is not possible to reconstruct the existence of the third consonant solely within Arabic, since the merger has left no trace of such a consonant.

Internal reconstruction may also provide clues to syntactic change. Especially useful in this regard are grammatical RELICS (or ARCHAISMS). Many relics are features that have survived in specialized speech, such as proverbs and literary quotations, as

in *thou dost protest too much, methinks*, echoing Shakespeare. Other relics are forms that have escaped analogical processes such as levelling. English examples are irregular plurals like *oxen* and *mice*. Similarly, Northwest Semitic plurals of *qVtl* nouns in which *-a-* is inserted between the second and third radicals, as in (NOM) **malku* 'king', PL **malakūna*, are vestiges of the earlier Semitic system of pattern replacement for noun plurals. As an example of a syntactic archaism, we may note the phrase *yomā den* 'today' (literally, 'day this') in Jewish Palestinian Aramaic; in that dialect, the demonstrative normally precedes its noun, as in *hahi? qartā* 'that city', rather than following the noun as in *yomā den*. Internal reconstruction suggests a more homogeneous situation, in which demonstratives only precede or follow, not both; since *yomā den* is a common phrase that might well have escaped a syntactic change, it is more likely to preserve the original word order, NOUN–DEMONSTRATIVE, an inference that is confirmed when we consider earlier dialects of Aramaic.[102]

Ideally, internal reconstruction of individual languages is carried out before those languages are compared with one another, as described in the following section, so that what is compared is the earliest recoverable stage of each language.[103]

2.2. Comparative Reconstruction

With the COMPARATIVE METHOD, cognate forms and paradigms of languages that descend from a common ancestor are compared

[102] Pat-El 2012b: 95–103.

[103] In practice, both internal reconstruction and the comparative method are usually employed simultaneously, with much going back and forth.

in order to reconstruct aspects of the phonology, morphology, lexicon, and even syntax of that common ancestor, in other words, to reconstruct the proto-language from which the languages descend. We will first consider a few examples of phonological reconstruction.

Compare the following pairs of Ethiopic (Gəʕəz) and Aramaic (Syriac) words:

	‘to grind’	‘to precede’
Ethiopic	*daqaqa*	*qadama*
Aramaic	*daq(q)*	*qḏam*

	‘to play music’	‘to cut’
Ethiopic	*zammara*	*gazara*
Aramaic	*zammar*	*gzar*

In Aramaic *qḏam*, the spirant *ḏ* ([ð]) is a secondary, post-vocalic allophone of *d* (*qḏam* derives from **ḳadama* and is pronounced [k’əðam]), just as *b̲* and *p̄* are allophones of *b* and *p* (see above, §1.2). Thus, both Aramaic and Ethiopic exhibit in these roots the phoneme *d*, as first radical in *d-q-q* and as second radical in *q-d-m*; and the phoneme *z*, as first radical in *z-m-r* and as second radical in *g-z-r*. A check of cognates of these (and other) roots in the related languages allows us to reconstruct the same or similar phonemes for PS (in fact, for the PS ancestor of Aramaic and Ethiopic *z*, it is likely that an affricate, **ʣ*, is to be reconstructed; see below §III.2.1), and to say that the reflexes of both are retained in Ethiopic and Aramaic (with the allophone *ḏ* in the latter and with **ʣ* > *z* in both).

But now consider the following pairs of cognates:

	‘to mention’	‘ear’
Ethiopic	*zakara*	*ʔəzn*
Aramaic	*dkar*	*ʔeḏnā*

These and other words, in which *d* (or its allophone *ḏ*) in Aramaic contrasts with *z* in the Ethiopic cognates, lead us to seek conditioning factors that might have caused either PS **d* to become *z* in some Ethiopic words or PS **ḏ* to become *d* in some Aramaic words, or both. But no such conditioning factors are evident. Thus, a more radical solution is necessary: we must assume the existence of a third phoneme in PS, and posit that that phoneme merged unconditionally with *d* throughout Aramaic and with *z* throughout Ethiopic.[104] A good estimate of the nature of this phoneme would be a voiced interdental spirant, **ð*. Our hypothesis is confirmed when we turn to the evidence of other languages, for (Omani) Mehri and Arabic exhibit this phoneme unchanged:

	‘to mention’	‘ear’
Mehri	*ðīkər*	*ḥ-ayðēn*
Arabic	*ðakara*	*ʔuðnun*

The existence of the third PS phoneme **ð* described in the preceding paragraph does not, however, depend on our finding it in any of the descendant languages. The sound systems of many proto-languages are reconstructed with phonemes that are unattested in their descendants, having undergone changes in all of

[104] It is possible that the merger of PS **ð* and **d* in Aramaic may be related to the beginning of spirantization in that language. See below Part III, §2.3.10(2).

them. Such is probably the case with one PS phoneme as well; note first these sets of cognates:[105]

	‘five’	‘to shout’
Arabic	*ḫamsun*	*ṣaraḫa*
Akkadian (Old Bab.)	*ḫamiš*	*ṣarāḫum*

	‘field’	‘to open’
Arabic	*ḥaqlun*	*fataḥa*
Akkadian (Old Bab.)	*eqlum*	*petûm* < *patāʔum* < **patāḥum*

In these examples, where Arabic has *ḫ*, Akkadian likewise has *ḫ*, whereas *ḥ* in the Arabic roots has been lost in Akkadian. Arabic *ḫ* also corresponds to *ḫ* in Ethiopic, ASA, MSA, and Ugaritic, allowing us to reconstruct a Proto-Semitic phoneme **ḫ* that remained unchanged in all of these languages; similarly, Arabic *ḥ* corresponds to *ḥ* in Ethiopic, ASA, MSA, and Ugaritic, and so we may also reconstruct a Proto-Semitic phoneme **ḥ* that remained unchanged in the West Semitic languages but was eventually lost in Akkadian.[106] Thus, in schematic form,

Proto-Semitic	>	Proto-West Semitic	Akkadian
**ḫ*		**ḫ*	*ḫ*
**ḥ*		**ḥ*	∅ (lost)

Now consider the following sets of cognates:

---

[105] See Huehnergard 2003.

[106] In Hebrew and Aramaic, Proto-Semitic **ḫ* and **ḥ* eventually merged to a single consonant, *ḥ*, although they remained distinct for much of the early history of those languages as well; see below, §III.2.3.9.

	‘to set apart’	‘to wash’	‘to spread’
Akkadian (Old Bab.)	*ḫarāmum*	*raḫāṣum*	*sapāḫum*
Ethiopic (Gəʕəz)	*ḥarama*	*rəḥṣa*	*safḥa*
Sabaic (ASA)	*ḥrm*	*rḥḍ*	—
Arabic	*ḥaruma*	*raḥaḍa*	*safaḥa*
Mehri (MSA)	*ḥōrəm*	*rəḥāṣ́*	—
Ugaritic	—	*rḥṣ*	—

In these examples, the West Semitic languages exhibit *ḥ* where Akkadian has *ḫ*. Since, as we have just seen, Proto-Semitic **ḥ* was preserved in these West Semitic languages but lost in Akkadian, whereas Proto-Semitic **ḫ* was preserved unchanged in both Akkadian and West Semitic, and since it is not possible to identify a plausible conditioning factor that might have caused some Proto-Semitic **ḥ* to become *ḫ* in Akkadian, or some Proto-Semitic **ḫ* to become **ḥ* in the West Semitic languages, we may reconstruct a third Proto-Semitic consonant that merged with *ḫ* in Akkadian but with **ḥ* in Proto-West Semitic, and is accordingly unattested in any of the descendant languages. This consonant was probably a glottalic (“emphatic”) velar [x’] or uvular [χ’], and may thus be represented by **x̣*. Schematically, then:

Proto-Semitic	>	Proto-West Semitic	Akkadian
**ḫ*		**ḫ*	*ḫ*
**x̣*		**ḥ*	*ḫ*
**ḥ*		**ḥ*	∅ (lost)

The preceding two examples of phonological reconstruction have concerned consonants. As an example of reconstructing vocalism, note the following sets of Arabic and Hebrew cognates:

	‘dog’	‘male slave’
Arabic	*kalbun*	*ʕabdun*
Hebrew	*kéleḇ*	*ʕéḇeḏ*

How do we determine which of these (if either) exhibits a more original form? Or, which of these have undergone changes from earlier Semitic? One course of action is to check the other languages: ‘dog’ in Akkadian is *kalbum* and in Ethiopic it is *kalb*. It is obviously most economical to reconstruct the PS word for ‘dog’ as **kalb-*,[107] and to posit that in Hebrew **kalb-* > *kéleḇ* via a series of sound changes.[108] Akkadian and Ethiopic do not preserve cognates of Arabic *ʕabdun* and Hebrew *ʕéḇeḏ*; for the sake of economy, however, and because sound change is regular, we may also conclude that the Arabic form of ‘male slave’ is the more original and that the Hebrew form has undergone the same set of sound changes as in ‘dog’. Another line of inquiry is to consider allomorphs of these words, as we saw above in §1.3: ‘my dog’ in both Arabic and Hebrew is *kalb-ī*, while ‘my male slave’ in both is *ʕabd-ī*. Again, economy of reconstruction, even without the evidence of the other languages, argues for positing **kalb-ī* and **ʕabd-ī* as the original forms.

A simple example of comparative *morphological* reconstruction is offered by the forms of the active participle of the basic stem of the verb (the G stem) in the various languages; examples from the PS root **p-ḳ-d* ‘to inspect, miss’:[109]

---

[107] As an aside, we may note that a PS word for ‘cat’ is not reconstructible.

[108] See Part III, §3.5.7(4).

[109] Morphological reconstruction is also implicit in some of the examples

Akkadian	*pāqidum*
Biblical Hebrew	*pōqēḏ*
Aramaic (Syriac)	*pāqeḏ*
Classical Arabic	*fāqidun*
Tigre	*fāqəd*
Classical Ethiopic	*faqādi*
Mehri	*fəḳdōna*[110]

As we saw in §1.2, the Hebrew form *pōqēḏ* derives from earlier **pāḳid-* by regular sound rules; the *e* in Syriac *pāqeḏ* and the *ə* in Tigre *fāqəd* likewise derive from earlier **i*. We have also seen that *f* in Arabic, Ethiopian Semitic, and Modern South Arabian languages regularly corresponds to *p* in the other languages. Thus, the forms of first five languages in the above list all reflect an earlier form **pāḳid*. Since those five languages represent several branches of the Semitic family (see below, §II.2), it is reasonable to reconstruct **pāḳid-* as the Proto-Semitic form of the active participle of the basic verbal stem.[111] Thus, the use of the pattern

---

of analogical change that are described above in §1.3, such as the Central Semitic paradigm of the suffix-conjugation of II–*w/y* verbs, and the PS endings of the suffix-conjugation, 1CS **-kŭ* and 2MS **-tă*, 2FS **-tĭ*.

[110] This form has traditionally been called an active participle, but, although it declines as a noun (i.e., exhibits nominal feminine and plural forms), it functions as a future tense; see Rubin 2018: 178.

[111] A principle that is sometimes invoked to reconstruct a proto-form is "majority wins," that is, all other things being equal, the form (or sound) that appears in the most descendant languages is the one to be reconstructed (e.g., Campbell 2013: 114–15). In this instance, obviously, five of the seven languages listed reflect earlier **pāḳid-* and majority does win. But other factors must also be weighed; for example, since Hebrew and Aramaic are fairly closely related, should they both count?

faqādi as participle in Classical Ethiopic, and the use of the pattern *fəḳdōna* as participle in Mehri, constitute morphological innovations in those languages, in which the inherited, PS form of the active participle has been replaced.[112]

For a more complex example of comparative morphological reconstruction, we may consider the singular and dual forms of 'eye' in Old Akkadian and Classical Arabic:[113]

	SINGULAR		DUAL		
	Old Akk.	Arabic		Old Akk.	Arabic
NOM	*ʕēnum*	*ʕaynun*	NOM	*ʕēnān*	*ʕaynāni*
GEN	*ʕēnim*	*ʕaynin*	GEN-ACC	*ʕēnēn*	*ʕaynayni*
ACC	*ʕēnam*	*ʕaynan*			

In Old Akkadian, the diphthong **ay* > *ē*, and so the base of 'eye' may be reconstructed as **ʕayn-*, as in Arabic. The vowels of the cases in the singular are the same in Akkadian and Arabic, and thus, in the absence of any indication to the contrary in the other

---

Conversely, since Akkadian, along with Eblaite, constitutes the sole representative of one of the two major branches of the Semitic family, it should normally be given weight equal to that of the rest of the languages combined.

[112] The reflex of PS **pāḳid-* continues to exist in Classical Ethiopic, but it has become a rather infrequent adjective pattern, as in *ṣādəq* 'righteous'; additional evidence that Classical Ethiopic *faqādi* is an innovation as the active participle is the continued use of **pāḳid-* as a participle (*fāqəd*) in the closely related Tigre.

[113] Although ʕ is not indicated in the cuneiform orthography, there is good evidence that it was still preserved in some Old Akkadian dialects; see Hasselbach 2005: 82–85.

Semitic languages, those three cases, with those vowels, may be reconstructed to PS. As for whether we are to reconstruct the final *-m* of Akkadian or the final *-n* of Arabic, the fact that the dual forms in both languages have *-n* suggests that Arabic has levelled an originally heterogeneous system, i.e., that *-m* as in Akkadian is more original.[114] In the dual forms, the genitive and accusative comprise a single case; again, since **ay* > *ē* in Old Akkadian, the dual GEN-ACC may be reconstructed with **ay* as in Arabic. The Arabic forms end in *-ni*, whereas the Old Akkadian forms end in simple *-n*. We might suggest that an original final **-i* was lost in Old Akkadian, but in fact Old Akkadian preserves final **-i*. Old Akkadian does lose final **-a*, however, and there is evidence in Arabic of dissimilation of **-a* to *-i* after *ā*. We may therefore posit that the dual endings were originally NOM **-āna* and GEN-ACC **-ayna*.[115] Our PS paradigm for singular and dual forms may therefore be reconstructed thus:

	SINGULAR		DUAL
NOM	**ʕaynum*	NOM	**ʕaynāna*
GEN	**ʕaynim*	GEN-ACC	**ʕaynayna*
ACC	**ʕaynam*		

Note that the reconstructed paradigm is not attested exactly as such in any descendant language, each of which has undergone a number of changes.

---

[114] This is supported by Ancient South Arabian, where singular NON-CST nouns end in *-m* and dual nouns end in *-n*, as in Akkadian.

[115] This **-na* of the dual endings thus aligns with that on external MASC plurals, NOM **-ūna* and GEN-ACC **-īna*; see §IV.4.6.2.3.

As an example of comparative *syntactic* reconstruction, consider the constructions for noun–noun modification in several of the ancient Semitic languages, as in 'the house of the king':

Akkadian	*bītum ša šarrim*	or	*bīt šarrim*
Classical Ethiopic	*bet za-nəguś*	or	*beta nəguś*
Syriac	*baytā d-malkā*	or	*beṯ malkā*
Biblical Hebrew			*bêṯ ham-meleḵ*
Classical Arabic			*baytu l-maliki*

Since Akkadian, Ethiopic, and Syriac represent distinct branches of the Semitic family, it is likely that the option of using either a marker for 'of' (called a GENITIVE EXPONENT) or a construct chain to express 'x of y' may be reconstructed to Proto-Semitic, and that the first option has been lost in standard Biblical Hebrew and Arabic.[116] In fact, Biblical Hebrew attests a few vestigial examples of the first option, such as *ʔĕlōhîm ze sînay* 'god of Sinai' (Ps 68:9) and *la-m-mōʕēḏ ʔăšer šəmûʔēl* 'at Samuel's appointed time' (1 Sam 13:8).[117]

---

[116] Late Biblical and post-biblical Hebrew exhibit the genitive exponent *šel*, from *še*+*l*-, REL + '(belonging) to'.

In Classical Arabic the word *ðū* (GEN *ðī*, ACC *ðā*) is a bound form meaning 'possessor, master of', but its original function as a marker for 'of' (like Akkadian *ša*, Ethiopic *za*-, and Syriac *d*-) may be seen in expressions such as *imruʔun ðū mālin* 'a man of wealth'. Modern Arabic colloquials have innovated various words for 'of', as in Egyptian Arabic *il-ʔamīs bitāʕ sāḥb-u* (DEF-shirt OF friend-his) 'his friend's shirt' (Leddy-Cecere and Schroepfer 2019: 450).

[117] Pat-El 2010.

Related to the constructions for noun–noun modification are the constructions for relative clauses, for which several of the languages use the same marker, as in 'the house (that) he built':

Akkadian	*bītum ša īpušu*	or	*bīt īpušu*
Classical Ethiopic	*bet za-ḥanaṣa*		
Syriac	*baytā di-ḇnā*		
Biblical Hebrew	*hab-báyiṯ ʔăšer bānā*		
Classical Arabic	*al-baytu llaðī banâ*		

Although only Akkadian regularly uses a bound form as the head of a relative clause, relic examples may also be found in West Semitic languages:

Ethiopic	*ba-mawāʕəla*	*yəkʷennənu*	*masāfənt*	
	in-days.BND	they-rule	judges	
	'in the days (that) the judges were ruling' (Ruth 1:1)			
Hebrew	*śəp̄aṯ*	*lōʔ*	*yāḏáʕtî*	*ʔešmāʕ*
	tongue.BND	NEG	I-know	I-hear
	'I hear a language (that) I do not know' (Ps 81:6)			

These examples allow us to reconstruct both options, {house-NON-CST REL he-built} and {house-CST he built}, to Proto-Semitic, the latter option having become restricted in use in West Semitic.[118]

We may go a step further, and posit that Akkadian, in which the constructions for noun–noun modification and for relative clauses are parallel, the relative clause filling the same slot as a genitive noun, reflects the Proto-Semitic situation:

[118] Bar-Asher Siegal 2013; Pat-El 2014, 2017.

'house of the king'	house-NON-CST REL king-GEN	house-CST king-GEN
'house (that) he built'	house-NON-CST REL he-built	house-CST he-built

Reconstructed forms, and reconstructed languages more generally, can only be approximations of the actual spoken ancestors of genetically related languages. Some features may have been lost in all descendants, leaving no way to recover them. For example, Proto-Romance, the reconstructed ancestor of the Romance languages, is not the same as Latin, since, *inter alia*, the languages do not allow reconstruction of the Latin case system or of the neuter gender. Reconstruction may also compress or flatten features that may have existed in different phases of the proto-language. Further, a spoken language exists as a continuum of dialects, and it is usually difficult to capture dialectal distinctions in a proto-language. Nevertheless, a reconstructed proto-language does represent a useful summary of our understanding of the relationships between the descendant languages and the changes that they have undergone.[119]

3. Language Contact and Dialect Geography

When speakers of one language come into contact with speakers

[119] It was noted above, n. 97, that "Proto-Semitic" and "Common Semitic" are interchangeable terms. But some scholars prefer to use "Common Semitic" to refer to what can be reconstructed of the ancestral language from the evidence of its descendants, and "Proto-Semitic" to refer to the actual language spoken before its break-up; see also, e.g., Rinaldi 1954: 20–22, reminding us that we cannot recover all of the features of the ancestral language.

of another language, attempts to communicate between the groups may result in changes in one or both languages. Such changes may be relatively simple, such as the adoption of a new word for a new object of trade or a new concept (e.g., English *latte, sudoku, wiki*). But if there is prolonged contact, some speakers may learn more of the other language, achieving various levels of competence (that is, becoming partly or fully bilingual), and then more profound changes may take place, and on several linguistic levels.[120] The prolonged contact of Norman French and early English, for example, gave rise to enormous changes in English vocabulary and morphology. Similarly, the centuries-long contact between speakers of Sumerian and Akkadian resulted in significant changes throughout both languages:[121] in Akkadian, among other developments, not only does the lexicon contain many Sumerian words (see above, §1.5.4); on the phonological level, the laryngeal and pharyngeal consonants **ʔ*, **h*, **ḥ*, and **ʕ* were eventually lost; and on the syntactic level, the verb moved to the end of its clause. Research has indicated that there are very

[120] Much of the world is, and has been, bilingual or multilingual. In Yemen and Oman, for example, nearly all male speakers of Modern South Arabian languages also speak Arabic; in Ethiopia, many speakers of Tigre, Tigrinya, Gurage, and other languages also speak Amharic. In the Bible, at 2 Kings 18:26, Hebrew-speaking officials ask an Assyrian official to speak with them in Aramaic. A recent study of multilingualism in the Ancient Near East is Hasselbach-Andee 2020c.

[121] Recent studies of Sumerian–Akkadian contact are Zólyomi 2011, Streck 2014, Crisostomo 2020.

few, if any, aspects of a linguistic system that may not be borrowed (i.e., transferred) from one language to another.[122]

Sumerian and Akkadian are not related to one another — Sumerian is a linguistic isolate, that is, it is unrelated to any other known language — and so at least some of the changes that took place in Akkadian as a result of contact with Sumerian can be determined by comparing Akkadian with other Semitic languages. But languages that are related to each other may also be in contact enough to effect changes. In fact, contact between related languages is probably more common.[123] Certainly, speakers of various Semitic languages remained in contact with one another for long periods even after their speech patterns had emerged as distinct languages.[124] The closer two languages are to one another, the more difficult it can be to distinguish changes in those languages that are the result of contact from changes that are due to internal factors.[125]

---

[122] See, e.g., Thomason and Kaufman 1988; Labov 2007.

[123] See, e.g., the articles in Epps, Huehnergard, and Pat-El 2013.

[124] See Butts 2015.

[125] Borrowed vocabulary items may occasionally be identified on the basis of distinctive phonological developments. A classic example is Akkadian *sūqu*, Hebrew *šûq*, Aramaic *šuq*, Arabic *sūq*, all meaning ‘street, market-place’. Only in Akkadian does the word have a plausible etymology, deriving from the Proto-Semitic root **ṣ̌-y-ḳ* ‘to be(come) narrow’, with **ṣ̌* > **s* before **ḳ* by a regular Akkadian sound change; thus, the other languages have borrowed the word from Akkadian. Similarly, by regular sound changes, the Proto-Semitic root **r-ṣ̌-ṣ̌* ‘to shatter’ became *r*-ʕ-ʕ in Aramaic and *r-ṣ-ṣ* in Hebrew; thus the uncommon Biblical Hebrew root *r*-ʕ-ʕ meaning ‘to shatter’ may safely

The spread of features as a result of language contact, termed AREAL DIFFUSION, is a wave-like process. It is helpful to think about speakers of a particular village: The speech patterns of the villages with which they are in easy contact will be more similar (if it is the same language) than those of villages farther away, with whom they communicate less often, if ever. There may also be a prestige dialect in the region, perhaps of a politically important center; prestige dialects tend to be imitated, another source of changes in speech patterns.

The study of the interrelationships among such speech patterns is called DIALECT GEOGRAPHY. In a classic study[126] of the interactions of the Northwest Semitic languages of Syria–Palestine during the first half of the first millennium BCE, dozens of phonological, morphological, and syntactic features were examined, and the NWS dialects of the region were shown to constitute a DIALECT CONTINUUM (or DIALECT CHAIN), in which the languages at the far geographical points were the most distinct from one another, while between those points the dialects exhibited features that intersected in complex ways.[127] There are also

---

be labeled an Aramaic loan. Some Aramaic loans into Biblical Hebrew may be identified by their pattern; an example is the noun *kəṯāḇ* 'document' < **kitāb-*, which by regular sound rules would have become ***kəṯōḇ* in Hebrew. In the absence of such phonological clues, however, it can be difficult to determine whether similar words in two or more related languages are cognates or the result of borrowing.

[126] Garr 1985.

[127] Appraising the dialect geography of ancient languages can be difficult, since what is preserved, in many instances, are texts that reflect only the prestige dialects of major centers with scribal schools.

dialect-geography studies modern forms of Arabic.[128] These and other dialectological studies show the wave-like movement of innovations in speech patterns.

Language contact over a long period of time can also result in geographical regions in which genetically distinct languages have shared a wide range of diffused features. Such a region is termed a LINGUISTIC AREA (a German term, *Sprachbund*, is also used); the most famous example is a group of languages in the Balkans that are only distantly related to each other, but share a common phonology, a common word order, and much else.[129] Since, as we have already noted above, various Semitic languages remained in contact with one another, it is not surprising that some sets of them also occasionally constituted linguistic areas. An example is the group of languages that in earlier classifications of Semitic were called "South Semitic," namely, Arabic, Ancient South Arabian, Modern South Arabian, and Ethiopic; some of the features that these languages share, such as the unconditioned change of Proto-Semitic **p* to *f* and an expanded set of internal plurals, are due to diffusion resulting from close contact rather than to inheritance of shared innovations in a common intermediate ancestor.[130]

---

[128] E.g., Behnstedt and Woidich 2005, 2011. A fascinating presentation of the dialect geography of American English vocabulary is Cassidy et al. 1985–2013.

[129] See, e.g., Campbell 2013: 299–300.

[130] For more detail, see Huehnergard and Rubin 2011: 271–74. Ancient Hebrew and nearby Aramaic dialects probably also comprised a linguistic area for a time, given that they (a) exhibit the same phonological

4. Language Classification and Subgrouping

Another goal of comparative linguistics is an evaluation of the genetic interrelationships among a family's individual languages. Languages that are more closely related to one another separated from each other at a later time than they separated from other languages in the family, and that fact tells us something not only about the history of the languages but potentially also about the history of the speakers of those languages. But determining which languages are more closely related, and therefore shared more recent common ancestry, is difficult. Two or more languages may share a potentially significant feature for a variety of reasons:

(1) The most obvious, but actually the least common, reason for an apparently shared feature is coincidence. A famous example is English *have* and German *haben*, which look so much like Latin *habēre*, but are not in fact cognate with it.[131] In Semitic, Amharic *alä* and Egyptian Arabic *ʔāl*, both meaning 'he said', are unrelated; the former derives from the root *bhl*, the latter from the root *qwl*.

(2) The feature may have been inherited from an earlier ancestor; such a feature is called a SHARED RETENTION, and is generally not useful for subgrouping. For example, Akkadian, Hebrew, and Arabic all have a derived passive verbal form with prefixed *n*, the N stem, whereas Aramaic, Ethiopian Semitic, and the Modern South Arabian languages lack such a passive stem. But we would not therefore group together

---

rule by which non-geminated stops were spirantized post-vocalically, and (b) ultimately ended up with the same inventory of consonants. A recent study of Hebrew and Aramaic contact is Koller 2020.

[131] English *have* and German *haben* are from Proto-Indo-European **kap-* (cf. Latin *capere*); Latin *habēre* is from **ghabh-* (cf. English *give*).

Akkadian, Hebrew, and Arabic, since the N stem is undoubtedly a Proto-Semitic feature that has been lost independently in the other languages.[132]

(3) The feature may have developed independently in each language as a result of some inherited internal pressure for the change; this is referred to as PARALLEL DEVELOPMENT (or CONVERGENCE or DRIFT). Among such developments are analogical changes that are obvious to speakers and might therefore take place in several speech communities, such as the past tense form *brang* on the basis of *sing : sang*. A likely Semitic instance of this is the final *-ā* that marks the feminine plural forms of prefix-conjugation verbs in Akkadian, Ethiopian, and Aramaic.[133] In each of these, the ending *-ā* replaced an earlier ending, **-nă̄*, through an obvious analogy with the corresponding suffix-conjugation paradigm, and so it is not useful evidence that these languages shared a common recent ancestor.

(4) The shared feature may be the result of wave-like areal diffusion due to language contact, as described above in §3. Since many Semitic languages remained in contact with one another for much of their histories, such spreading of features is common. Because vocabularly is easily shared, for instance, similarities in the lexicon of subsets of related languages have traditionally not been assigned much weight in assessing genealogical relationships. Recently, however, it has been shown that large aggregations of vocabulary that is shared only among

---

[132] Nor would we group together those languages that have lost this form; a shared loss is not usually diagnostic for subgrouping.

[133] E.g., 3FP Akkadian *iqribā* 'they approached', Gəʕəz *yəqrabā* 'may they approach', Syriac *neqrḇān* 'they will approach' (the last with an additional *-n* by analogy with 3MP *neqrḇun*).

a few languages in a family are in fact indicative of shared ancestry.[134] Furthermore, as we observed in §3, phonological features can spread as well, and even morphological and syntactic features can be borrowed.
(5) Finally, a feature that appears in a subset of related languages may be the result of a SHARED INNOVATION, that is, a linguistic change that took place in an immediate common ancestor of the languages that exhibit the feature.

It is only the last of these sources of similarity, shared innovations, that are considered significant for establishing the genetic relationships among the languages in a family, and in particular, for establishing which members of a family are more closely related to one another and constitute a subgroup.[135] But it can be extremely difficult to identify which features that are shared by two or more languages are shared *innovations* rather than the result of one of the other sources of similarity just listed, especially parallel development and areal diffusion.[136] Thus, it is not surprising that the internal classification, or subgrouping, of some language families, including the Semitic language family, is vigorously debated by scholars.

A thorough review of shared innovations yields a set of

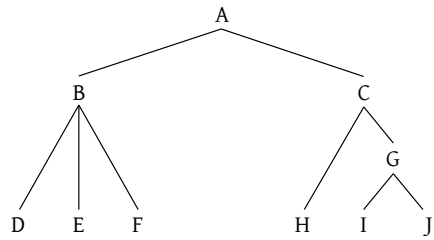
---

[134] See especially Kogan 2015.

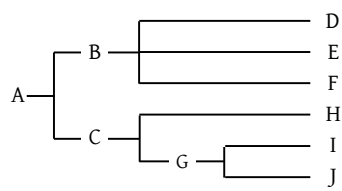
[135] More concisely: "The establishment of a linguistic subgroup requires the identification of innovations that are shared among all and only the members of that subgroup" (Faber 1997: 4).

[136] Historical linguist A. Dench (2001: 113) observes that "a statement of shared inheritance as explanation for a shared feature should only be made once all other possible explanations for the shared feature have been exhausted."

subgroups of languages that can be displayed as a tree diagram, such as the following generic example:



In this sample tree, attested languages (D, E, F, H, I, J) appear on the lowest level. Evaluation of shared innovations has suggested that languages D, E, and F share a common immediate ancestor, a proto-language labelled B; languages I and J share an immediate ancestor, G (also a proto-language), and G and language H in turn share an immediate ancestor, a proto-language labelled C. Proto-languages B and C themselves descend from proto-language A, the earliest reconstructable common ancestor of all the languages in the family. Another means of diagramming genetic relationships is with a clade, as in biology; our sample family subgrouping would then appear as follows:



Family trees or clades such as these samples, while useful summaries of linguistic history, show only part of that history. For if speakers of different languages in a family remain in contact, as if often the case, there will also be areal diffusion of

certain linguistic features, which, as noted above, may spread in a wave-like fashion through the languages, thereby blurring the neat lines of the family tree, lines that will also fail to capture linguistic areas that may have arisen.[137]

[137] Sociolinguist W. Labov (2007: 345) has written "that any general view of language descent must be prepared to integrate the two models of language change," namely, the family tree model and the wave model, both of which must be invoked in order to explain the relationships among the languages in a family.

References

Abdulrahim, Dana. 2013. A Corpus Study of Basic Motion Verbs in Modern Standard Arabic. Ph. D. dissertation, University of Alberta.

Appleyard, David. 1977. A Comparative Approach to the Amharic Lexicon. *Afroasiatic Linguistics* 5: 43–109.

Bar-Asher, Moshe. 2014. *Studies in Classical Hebrew*. Edited by Aaron Koller. Studia Judaica 71. Berlin: de Gruyter.

Bar-Asher Siegal, Elitzur A. 2013. Adnominal Possessive and Subordinating Particles in Semitic Languages. In *Morphologie, syntaxe et sémantique des subordonnants*, edited by Colette Bodelot et al., 133–50. Clermont-Ferrand: Presses Universitaires Blaise Pascal.

Bar-Asher Siegal, Elitzur A. 2016. *Introduction to the Grammar of Jewish Babylonian Aramaic*[2]. LOS III/3. Münster: Ugarit.

Barth, Jacob. 1887. Das Nominalpräfix *na* im Assyrischen. *Zeitschrift für Assyriologie* 2: 111–17.

Barth, Jacob. 1894. Zur vergleichenden semitischen Grammatik. *Zeitschrifte der Deutschen Morgenländischen Gesellschaft* 48: 1–21.

Behnstedt, Peter and Manfred Woidich. 2005. *Arabische Dialektgeographie: Eine Einführung*. Handbuch der Orientalistik I.78. Leiden: Brill.

Behnstedt, Peter and Manfred Woidich. 2011. *Wortatlas der arabischen Dialekte. Band I: Mensch, Natur, Fauna und Flora*. Handbook of Oriental Studies 100. Leiden: Brill.

Bendjaballah, Sabrina and Aaron D. Rubin. 2020. The 3FS Perfect in Omani Mehri. *Journal of Semitic Studies* 65: 511–29.

Blau, Joshua. 1970. *On Pseudo-Corrections in Some Semitic Languages*. Jerusalem: Israel Academy of Sciences and Humanities.

Bloch, Ariel A. 1967. The Vowels of the Imperfect Preformatives in the Old Dialects of Arabic. *Zeitschrifte der Deutschen Morgenländischen Gesellschaft* 117: 22–29.

Brustad, Kristen and Emilie Zuniga. 2019. Levantine Arabic. In *The Semitic Languages*, 2nd ed., edited by John Huehnergard and Na'ama Pat-El, 403–32. London: Routledge.

Butts, Aaron Michael. 2016. *Language Change in the Wake of Empire: Syriac in Its Greco-Roman Context*. Linguistic Studies in Ancient West Semitic 11. Winona Lake, IN: Eisenbrauns.

Butts, Aaron Michael, ed. 2015. *Semitic Languages in Contact*. Leiden: Brill.

Campbell, Lyle. 2013[3]. *Historical Linguistics: An Introduction*. Cambridge, MA: MIT.

Cassidy, Frederic G., et al. 1985–2013. *Dictionary of American Regional English*. 6 volumes. Cambridge, MA: Belknap / Harvard University Press.

Crass, Joachim and Ronny Meyer. 2011. Ethiosemitic–Cushitic Language Contact. In *The Semitic Languages: An International Handbook*, edited by Stefan Weninger et al., 1266–75. Handbooks of Linguistics and Communication Science 36. Berlin: Mouton de Gruyter.

Crisostomo, C. Jay. 2020. Sumerian and Akkadian Language Contact. In *A Companion to Ancient Near Eastern Languages*, edited by Rebecca Hasselbach-Andee, 403–20. London: John Wiley.

Crowley, Terry and Claire Bowern. 2010. *An Introduction to Historical Linguistics*. 4th ed. Oxford: Oxford University Press.

Dench, Alan. 2001. Descent and Diffusion. In *Areal Diffusion and Genetic Inheritance: Problems in Comparative Linguistics*, edited by Alexandra Y. Aikhenvald and R. M. W. Dixon, 105–33. Oxford: Oxford University Press.

Dhorme, Paul. 1923. *L'emploi métaphorique des noms de parties du corps en hébreu et en akkadien*. Paris: Victor Lecoffre.

Dillmann, August. 1907. *Ethiopic Grammar*[2]. Revised by Carl Bezold. Translated by James A. Crichton. London: Williams & Norgate.

Edzard, Lutz. 1992. The Obligatory Contour Principle and Dissimilation in Afroasiatic. *Journal of Afroasiatic Languages* 3/2: 151–71.

Epps, Patience, John Huehnergard, and Na'ama Pat-El, eds. 2013. *Journal of Language Contact*, volume 6.2, special issue on contact among genetically related languages.

Faber, Alice. 1984. Semitic Sibilants in an Afro-Asiatic Context. *Journal of Semitic Studies* 29: 189–224.

Faber, Alice. 1997. Genetic Subgrouping of the Semitic Languages. In *The Semitic Languages*, edited by Robert Hetzron, 3–15. London: Routledge.

Fertig, David. 2013. *Analogy and Morphological Change*. Edinburgh Historical Linguistics. Edinburgh: University Press.

Fox, Joshua. 2003. *Semitic Noun Patterns*. Harvard Semitic Studies 52. Winona Lake, IN: Eisenbrauns.

Fraenkel, Siegmund. 1886. *Die aramäischen Fremdwörter im Arabischen.* Reinheim: E. Lokay. Reprint Hildesheim: Georg Olms, 1962.

Garr, W. Randall. 1985. *Dialect Geography of Syria–Palestine, 1000–586 B.C.E.* Philadelphia: University of Pennsylvania Press.

Garr, W. Randall. 2005b. The Comparative Method in Semitic Linguistics. *Aula Orientalis* 23: 17–21.

Garr, W. Randall. 2007. Prenasalization in Aramaic. In *Studies in Semitic and Afroasiatic Linguistics Presented to Gene B. Gragg*, edited by Cynthia L. Miller, 81–109. SAOC 60. Chicago: The Oriental Institute, 2007.

Garr, W. Randall. 2020. Hebrew Causative Morphology. In *Semitic, Biblical, and Jewish Studies in Honor of Richard C. Steiner*, edited by Aaron J. Koller, Mordechai Z. Cohen, and Adina Moshavi, *234–51. Jersualem: Bialik / New York: Yeshiva University.

Ginsberg, H. L. 1932. On the Epic of ʻAl'êyân Baʻl. *Tarbiẓ* 4: 106–9, 380–90 (Hebrew).

Groen, Jorik (F. J.). 2021. Frequency, Analogy, and Suppletion: √*hlk* in the Semitic Languages. In *New Perspectives in Biblical and Rabbinic Hebrew*, edited by Aaron D. Hornkohl and Geoffrey Khan, 75–96. Semitic Languages and Cultures 7. Cambridge: Open Book Publishers.

Hackett, Jo Ann and John Huehnergard. 2021. Purity and Profanation: The Root **ḥ-l-l* in Biblical Hebrew and Semitic. In

Ve-ʾEd Yaʿaleh (Gen 2:6): Essays in Biblical and Ancient Near Eastern Studies Presented to Edward L. Greenstein, edited by Peter Machinist, Robert A. Harris, Joshua A. Berman, Nili Samet, and Noga Ayali-Darshan, 269–83. Atlanta: SBL.

Hasselbach, Rebecca. 2005. *Sargonic Akkadian: A Historical and Comparative Study of the Syllabic Texts*. Wiesbaden: Harrassowitz.

Hasselbach-Andee, Rebecca. 2020. Multilingualism and Diglossia in the Ancient Near East. In *A Companion to Ancient Near Eastern Languages*, edited by Rebecca Hasselbach-Andee, 457–70. London: John Wiley.

Hendel, Ronald and Jan Joosten. 2018. *How Old Is the Hebrew Bible? A Linguistic, Textual, and Historical Study*. Anchor Yale Bible Reference Library. New Haven, CT: Yale University Press.

Hetzron, Robert. 1976. Two Principles of Genetic Reconstruction. *Lingua* 38: 89–108.

Holes, Clive. 2004. *Modern Arabic: Structures, Functions, and Varieties*. Rev. ed. Washington: Georgetown University Press.

Huehnergard, John. 1987. Three Notes on Akkadian Morphology. In *Working with No Data: Semitic and Egyptian Studies Presented to Thomas O. Lambdin*, edited by David Golomb, 181–94. Winona Lake, IN: Eisenbrauns.

Huehnergard, John. 2003. Akkadian *ḫ* and West Semitic **ḥ*. In *Studia Semitica* (Orientalia: Papers of the Oriental Institute, 3; Alexander Militarev volume), edited by Leonid Kogan, 102–19. Moscow: Russian State University for the Humanities.

Huehnergard, John. 2005a. Features of Central Semitic. In *Biblical and Oriental Essays in Memory of William L. Moran*, edited by Agustinus Gianto, 155–203. Biblica et Orientalia 48. Rome: Pontificio Istituto Biblico.

Huehnergard, John. 2006a. Hebrew Verbs I–*w/y* and a Proto-Semitic Sound Rule. In *Memoriae Igor M. Diakonoff*, edited by L. Kogan, N. Koslova, S. Loesov, and S. Tishchenko, 459–76. *Babel und Bibel* 2, Orientalia et Classica, Papers of the Institute of Oriental and Classical Studies 8, Russian State University of the Humanities. Winona Lake, IN: Eisenbrauns (2005, appeared 2006).

Huehnergard, John. 2006b. On the Etymology of the Hebrew Relative *šə-*. In *Biblical Hebrew in Its Northwest Semitic Setting: Typological and Historical Perspectives*, edited by Steven E. Fassberg and Avi Hurvitz, 103–25. Winona Lake, IN: Eisenbrauns.

Huehnergard, John. 2007. *qātîl* and *qətîl* Nouns in Biblical Hebrew. In *Sha'arei Lashon: Studies in Hebrew, Aramaic, and Jewish Languages Presented to Moshe Bar-Asher*, edited by A. Maman, S. E. Fassberg, and Y. Breuer, 1.*3–*45. Jerusalem: Bialik Institute.

Huehnergard, John. 2011. Appendix II: Semitic Roots. In *The American Heritage Dictionary of the English Language*, 5th ed., 2072–78. Boston/New York: Houghton Mifflin Harcourt.

Huehnergard, John. 2013. Akkadian *e* and Semitic Root Integrity. *Babel und Bibel* 7: 445–75.

Huehnergard, John. 2021. The Legacy of Akkadian. In *History of the Akkadian Language*, edited by Juan-Pablo Vita, 1481–

1531. 2 volumes. Handbuch der Orientalistik 152. Leiden / Boston: Brill.

Huehnergard, John 2022. Ugaritic *ǵ* from Proto-Semitic **θ̣*. In *"Like ʾIlu Are You Wise": Studies in Northwest Semitic Languages and Literatures in Honor of Dennis G. Pardee*, edited by H. H. Hardy II, Joseph Lam, and Eric D. Reymond, 137–45. Studies in Ancient Oriental Civilization 73. Chicago: Oriental Institute.

Huehnergard, John and Naʻama Pat-El. 2018b. The Origin of the Semitic Relative Marker. *Bulletin of the School of Oriental and African Studies* 81: 191–204.

Huehnergard, John and Aaron D. Rubin. 2011. Phyla and Waves: Models of Classification of the Semitic Languages. In *The Semitic Languages: An International Handbook*, edited by Stefan Weninger et al., 259–78. Handbooks of Linguistics and Communication Science 36. Berlin: Mouton de Gruyter.

Hurvitz, Avi in collaboration with L. Gottlieb, A. Hornkohl, and Emmanuel Mastéy. 2014. *A Concise Leixcon of Late Biblical Hebrew: Linguistic Innovations in the Writings of the Second Temple Period*. Supplements to Vetus Testamentum 160. Leiden: Brill.

Kaufman, Stephen A. 1974. *The Akkadian Influences on Aramaic*. Assyriological Studies 19. Chicago: The Oriental Institute of the University of Chicago.

Kogan, Leonid. 2015. *Genealogical Classification of Semitic: The Lexical Isoglosses*. Boston/Berlin: Walter de Gruyter.

Koller, Aaron J. 2020. Hebrew and Aramaic in Contact. In *A Companion to Ancient Near Eastern Languages*, edited by Rebecca Hasselbach-Andee, 439–55. Hoboken, NJ: Wiley Blackwell.

Kuryłowicz, Jerzy. 1945–49. La nature des procès dites «analogiques.» *Acta Linguistica* 5: 15–37.

Labov, William. 2007. Transmission and Diffusion. *Language* 83: 344–87.

Leddy-Cecere, Thomas and Jason Schroepfer. 2019. Egyptian Arbic. In *The Semitic Languages*, 2nd ed., edited by John Huehnergard and Na'ama Pat-El, 403–32. London: Routledge. In *The Semitic Languages*, 2nd ed., edited by John Huehnergard and Na'ama Pat-El, 433–57. London: Routledge.

Leslau, Wolf. 1995. *Reference Grammar of Amharic*. Wiesbaden: Harrassowitz.

Lieberman, Stephen J. 1977. *The Sumerian Loanwords in Old-Babylonian Akkadian.* Harvard Semitic Studies 22. Missoula, MT: Scholars.

Osthoff, Hermann. 1899. *Vom Suppletivwesen der indogermanischen Sprachen.* Heidelberg: J. Hörning.

Pat-El, Na'ama. 2010. On Periphrastic Genitive Constructions in Biblical Hebrew. *Hebrew Studies* 51: 43–48.

Pat-El, Na'ama. 2012b. *Studies in the Historical Syntax of Aramaic*. Perspective on Linguistics and Ancient Languages 1. Piscataway, NJ: Gorgias.

Pat-El, Na'ama. 2014. The Morphosyntax of Nominal Antecedents in Semitic, and an Innovation in Arabic. In *Proceedings of the Oslo–Austin Workshop in Semitic Linguistics, Oslo, May*

23 and 24, 2013, edited by Lutz Edzard and John Huehnergard, 28–47. Abhandlungen für die Kunde des Morgenlandes 88. Wiesbaden: Harrassowitz.

Pat-El, Na'ama. 2017. Digging Up Archaic Features: "Neo-Arabic" and Comparative Semitic in the Quest for Proto-Arabic. In *Arabic in Context, Celebrating 400 Years of Arabic at Leiden University*, edited by Ahmad Al-Jallad, 441–75. Studies in Semitic Languages and Linguistics 89. Leiden / Boston: Brill.

Pat-El, Na'ama. 2020a. On Shared Structural Innovations: the Diachrony of Adverbial Subordination in Semitic. In *Reconstructing Syntax*, edited by Jóhanna Barðdal, Spike Gildea, and Eugenio R. Lujan, 314–35. Brill's Studies in Historical Linguistics 11. Leiden: Brill.

Pat-El, Na'ama. 2020b. On the Alleged Unipartite Relatives in Semitic. *Zeitschrifte der Deutschen Morgenländischen Gesellschaft* 170: 279–88.

Pat-El, Na'ama and Alexander Treiger. 2008. On Adnominalization of Prepositional Phrases and Adverbs in Semitic. *Zeitschrifte der Deutschen Morgenländischen Gesellschaft* 158: 265–82.

Pat-El, Na'ama and Aren Wilson-Wright. 2018. Features of Aramaeo-Canaanite. *Journal of the American Oriental Society* 138: 781–806.

Retsö, Jan. 2011. Aramaic/Syriac Loanwords. In *Encyclopedia of Arabic Language and Linguistics*, edited by Kees Versteegh Leiden-Boston: Brill. Online at https://brill.com/view/serial/EALL.

Rinaldi, Giovanni. 1954. *Le lingue semitiche: introduzione generale storica e bibliografica*. La Sacra Bibbia Volumi Sussidiari. Torino / Roma: Marietti.

Rubin, Aaron D. 2005. *Studies in Semitic Grammaticalization*. HSS 57. Winona Lake, IN: Eisenbrauns.

Rubin, Aaron D. 2014b. *The Jibbali (Shaḥri) Language of Oman: Grammar and Texts*. Leiden: Brill.

Rubin, Aaron D. 2018. *Omani Mehri: A New Grammar with Texts*. Leiden: Brill.

Růžička, Rudolf. 1909. *Konsonantische Dissimilation in den semitischen Sprachen*. Beiträge zur Assyriologie und semitischen Sprachwissenschaft 6/4. Leipzig: J. C. Hinrichs.

Streck, Michael P. 2008 Die Kardinalzahl 'sechs' im Altbabylonischen und der analogische Ausgleich der Kardinalzahlen 'sechs'–'acht'. *Altorientalische Forschungen* 35: 246–53.

Streck, Michael P. 2010. Innovations in the Neo-Babylonian Lexicon. In *Language in the Ancient Near East: Proceedings of the 53e Rencontre Assyriologique Internationale*, edited by L. Kogan et al., 647–60. 2 volumes. Orientalia et Classica 30; Babel und Bibel 4. Winona Lake, IN: Eisenbrauns.

Streck, Michael P. 2014. Review of *The Assyrian Dictionary of the University of Chicago*, vol. 20: U/W. *Zeitschrift für Assyriologie* 104: 104–34.

Thomason, Sarah Grey and Terrence Kaufman. 1988. *Language Contact, Creolization, and Genetic Linguistics*. Berkeley: University of California Press.

Wagner, Max. 1966. *Die lexikalischen und grammatkalischen Aramaismen im alttestamentlichen Hebräisch*. Beihefte zur Zeitschrift für die Alttestamentliche Wissenschaft 96. Berlin: Alfred Töpelmann.

Weninger, Stefan. 2011a. Aramaic–Arabic Language Contact. In *The Semitic Languages: An International Handbook*, edited by Stefan Weninger et al., 747–55. Handbooks of Linguistics and Communication Science 36. Berlin: Mouton de Gruyter.

Wilson-Wright, Aren M. 2012. The Word for 'One' in Proto-Semitic. *Journal of Semitic Studies* 59: 1–13.

Zhakevich, Philip. 2020. *Scribal Tools in Ancient Israel: A Study of Biblical Hebrew Terms for Writing Materials and Implements*. History, Archaeology, and Culture of the Levant 9. University Park, PA: Eisenbrauns.

Zhang Hongwei. 2021. *When They Change the Way They Speak: Contact-Induced Word Order Shifts in Semitic*. Ph. D. dissertation, University of Chicago.

Zólyomi, Gábor. 2011. Akkadian and Sumerian Language Contact. In *The Semitic Languages: An International Handbook*, edited by Stefan Weninger et al., 396–404. Handbooks of Linguistics and Communication Science 36. Berlin: Mouton de Gruyter.