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David Wilson
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A Concatenative Analysis Of Diachronic Afro-Asiatic Morphology

Abstract

In this dissertation, we will propose a concatenative, non-templatic origin for the various templatic morphological phenomena attested across Afro-Asiatic. We will demonstrate that, starting with a concatenative morphological system (in the sense of a system consisting of simple affixation), we can generate the non-concatenative forms seen across the Afro-Asiatic daughters using an analysis based on syncope. We will demonstrate how this syncope gives rise to many of the characteristic alternations in root shape attested in both nominal and verbal morphology. In addition, we will use this syncope analysis to explain the distribution of templatic grammars within the Afro-Asiatic world, explaining why apparently templatic non-concatenation (particularly within the verbal system) is significantly weaker or has been lost altogether in Chadic, Cushitic (outside of Beha, Afar-Saho and a few other conservative holdouts), and Omotic.

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A CONCATENATIVE ANALYSIS OF DIACHRONIC AFRO-ASIATIC MORPHOLOGY

David Wilson

A DISSERTATION in Linguistics

Presented to the Faculties of the University of Pennsylvania in Partial
Fulfillment of the Requirements for the Degree of Doctor of Philosophy

2020

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The creation of this document has taken a substantial amount of work and far more time than I had envisioned when I initially embarked on the project. I am proud of the hard work that I put into furthering its completion, but like any undertaking of this magnitude, it is simply more than any one person can manage on their own. As such, there are a great many thanks in order now that we have reached the point of its completion.

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I was talking about when I went on about something in my dissertation, but I know you had my back 100 percent. And I'll never forget that.

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ABSTRACT

A CONCATENATIVE ANALYSIS OF DIACHRONIC AFRO-ASIATIC MORPHOLOGY

David Wilson

Donald Ringe

In this dissertation, we will propose a concatenative, non-templatic origin for the various templatic morphological phenomena attested across Afro-Asiatic. We will demonstrate that, starting with a concatenative morphological system (in the sense of a system consisting of simple affixation), we can generate the non-concatenative forms seen across the Afro-Asiatic daughters using an analysis based on syncope. We will demonstrate how this syncope gives rise to many of the characteristic alternations in root shape attested in both nominal and verbal morphology. In addition, we will use this syncope analysis to explain the distribution of templatic grammars within the Afro-Asiatic world, explaining why apparently templatic non-concatenation (particularly within the verbal system) is significantly weaker or has been lost altogether in Chadic, Cushitic (outside of Beha, Afar-Saho and a few other conservative holdouts), and Omotic.

Contents

| | | |
|-----------|---|----------|
| 1 | Introduction to Afro-Asiatic | 1 |
| 1.1 | Afro-Asiatic Languages and Speakers | 1 |
| 1.1.1 | Semitic | 2 |
| 1.1.2 | Egyptian | 8 |
| 1.1.3 | Berber | 10 |
| 1.1.4 | Chadic | 13 |
| 1.1.5 | Cushitic | 15 |
| 1.1.6 | Omotic | 17 |
| 1.2 | Afro-Asiatic Cladistics | 18 |
| 1.3 | Morphology of Proto-Afro-Asiatic | 19 |
| 1.3.1 | Nominal Morphology | 22 |
| 1.3.1.1 | Reconstructable Nominal Morphemes | 23 |
| 1.3.1.2 | Gender Inflection | 27 |
| 1.3.1.3 | Number Inflection | 32 |
| 1.3.1.4 | Case Inflection | 42 |
| 1.3.1.5 | Nominal Derivation | 47 |
| 1.3.2 | Verbal Morphology | 48 |
| 1.3.2.1 | Reconstructable Verbal Morphemes | 48 |
| 1.3.2.2 | Eventivity | 50 |
| 1.3.2.2.1 | Eventive – Prefix-Conjugation | 50 |
| 1.3.2.2.2 | Suffix-Conjugation – Stative | 59 |
| 1.3.2.3 | Aspect | 69 |
| 1.3.2.3.1 | Perfective Stem | 69 |
| 1.3.2.3.2 | Imperfective Stem | 72 |
| 1.3.2.3.3 | Summary of Aspect Stem Formation | 79 |
| 1.3.2.4 | Verbal Derivation – Derived Stems | 79 |
| 1.3.2.4.1 | S-Stem | 80 |
| 1.3.2.4.2 | T-Stem | 86 |
| 1.3.2.4.3 | N-Stem | 91 |
| 1.3.2.4.4 | Combined Stems | 97 |
| 1.3.2.4.5 | Other Derived Stems | 98 |
| 1.3.2.5 | Summary of Verb Stems | 98 |

| | | |
|-----------|--|------------|
| 2 | Syncope Analysis | 100 |
| 2.1 | Syncope Rule – Formulation and Cross-Linguistic Analysis . . . | 101 |
| 2.1.1 | Syncope in Akkadian | 102 |
| 2.1.1.1 | Traditional Analysis | 102 |
| 2.1.1.2 | Bacovcin and Freeman (2015) | 106 |
| 2.1.2 | Syncope in Afar-Saho | 109 |
| 2.2 | Syncope in Reconstructed Afro-Asiatic Forms | 111 |
| 2.2.1 | Verbal Morphology | 111 |
| 2.2.1.1 | G-Stem | 112 |
| 2.2.1.2 | Derived Verbal Stems | 114 |
| 2.2.2 | Nominal Morphology | 117 |
| 2.2.2.1 | Gender Inflection | 117 |
| 2.2.2.2 | Number Inflection | 119 |
| 2.2.2.2.1 | Changes in Vowel Quality/Quantity | 120 |
| 2.2.2.2.2 | Changes in Root Shape | 120 |
| 2.2.2.3 | Case Inflection | 122 |
| 2.2.2.4 | Nominal Derivation | 123 |
| 2.3 | Syncope and Vowel Apophony | 127 |
| 2.3.1 | The Necessity of Conflating Stem/Root Allomorphy and Vowel Apophony | 127 |
| 2.3.1.1 | Vocalic Stability – Vowels Present in Underlying Forms | 129 |
| 2.3.1.1.1 | Grammatical Morphemes | 129 |
| 2.3.1.1.2 | Nominals | 129 |
| 2.3.1.1.3 | Verbal Theme Vowels | 131 |
| 2.3.1.1.4 | Summary of Vocalic Stability | 134 |
| 2.3.2 | Template vs. Vowel Apophony | 134 |
| 2.3.2.1 | Vowel Alternations in "Grammatical Morphemes" | 134 |
| 2.3.2.1.1 | *yu- vs. *yi/*ya Alternation | 134 |
| 2.3.2.1.2 | Barth's Law | 135 |
| 2.3.2.1.3 | Anceps Vowels | 137 |
| 2.3.2.2 | Vowel Alternations in "Lexical Roots" | 138 |
| 2.3.2.2.1 | Verbal Apophony | 139 |
| 2.3.2.2.2 | Apophony in Verbal Derivations | 142 |
| 2.3.3 | Further Discussion of Apophony | 148 |
| 2.4 | Syncope and Prosody | 148 |
| 3 | Afro-Asiatic to Semitic | 150 |
| 3.1 | Nominal Morphology | 150 |
| 3.1.1 | Gender Inflection | 150 |
| 3.1.2 | Case Inflection | 153 |
| 3.1.2.1 | Nominal Biforms | 158 |
| 3.1.2.2 | INST/NOM Case – Fossilized Adverbals | 160 |
| 3.1.3 | Derived Nominals | 162 |
| 3.1.3.1 | 'a- | 162 |
| 3.1.3.2 | *mṽ- | 163 |

| | | |
|-----------|-------------------------------------|------------|
| 3.1.3.3 | *tǃ- | 164 |
| 3.1.3.4 | Other Prefixes | 165 |
| 3.1.3.5 | *-ān | 166 |
| 3.1.3.6 | *-iy/iyya | 167 |
| 3.1.4 | Number Inflection | 169 |
| 3.1.4.1 | Sound Plural | 169 |
| 3.1.4.2 | Broken Plurals | 171 |
| 3.1.4.2.1 | Overview of Broken Plurals | 171 |
| 3.1.4.2.2 | Elements of Broken-Plural Formation | 173 |
| 3.1.4.2.3 | On the Origin of Broken Plurals | 180 |
| 3.2 | Verbal Morphology | 180 |
| 3.2.1 | Inherited Verbal Stems | 181 |
| 3.2.1.1 | Suffix-Conjugation | 181 |
| 3.2.1.1.1 | G-Stem | 181 |
| 3.2.1.1.2 | Derived Stems | 184 |
| 3.2.1.2 | Prefix-Conjugation | 186 |
| 3.2.1.2.1 | G-Stem | 186 |
| 3.2.1.3 | Š-Stem | 189 |
| 3.2.1.4 | N-Stem | 191 |
| 3.2.1.5 | T-Stem | 192 |
| 3.2.2 | Innovative Verbal Stems | 194 |
| 3.2.2.1 | D-Stem | 195 |
| 3.2.2.2 | ŠT-Stem | 196 |
| 3.2.2.3 | L-Stem | 198 |
| 4 | Afro-Asiatic to Berber | 200 |
| 4.1 | Nominal Morphology | 200 |
| 4.1.1 | Case Inflection – State Prefixes | 201 |
| 4.1.2 | Gender Inflection | 204 |
| 4.1.3 | Number Inflection | 207 |
| 4.1.3.1 | Sound Plural – Class I | 208 |
| 4.1.3.2 | Broken Plurals | 209 |
| 4.1.3.2.1 | Class II | 210 |
| 4.1.3.2.2 | Class III | 211 |
| 4.1.3.2.3 | Class IV | 212 |
| 4.1.3.2.4 | Class V/VI | 213 |
| 4.1.3.2.5 | Class VII | 215 |
| 4.1.3.2.6 | Class VIII | 216 |
| 4.1.3.2.7 | Class IX | 217 |
| 4.1.3.2.8 | Class X | 217 |
| 4.1.3.2.9 | Class XI | 217 |
| 4.1.4 | Derived Nominals | 217 |
| 4.1.4.1 | *mǃ- Prefix | 218 |
| 4.1.4.2 | *sǃ- Prefix | 220 |
| 4.1.4.3 | Derivational Suffixes | 221 |
| 4.2 | Verbal Morphology | 223 |

| | | |
|----------|--|------------|
| 4.2.1 | Inherited Verbal Stems | 224 |
| 4.2.1.1 | G-Stem | 225 |
| 4.2.1.2 | S-Stem | 227 |
| 4.2.1.3 | N-Stem | 230 |
| 4.2.1.4 | T-Stem | 232 |
| 4.2.2 | Combined Verbal Stems | 234 |
| 5 | Afro-Asiatic to Egyptian | 237 |
| 5.1 | Nominal Morphology | 237 |
| 5.1.1 | Case Inflection | 238 |
| 5.1.2 | Gender Inflection | 238 |
| 5.1.2.1 | CVCVC Roots | 241 |
| 5.1.2.2 | CVCVC Roots | 243 |
| 5.1.2.3 | CVCVC Roots | 244 |
| 5.1.2.4 | Irregular or Problematic Classes | 244 |
| 5.1.3 | Plural Formation | 245 |
| 5.1.4 | Nominal Derivation | 247 |
| 5.1.4.1 | Prefix *mṽ- | 248 |
| 5.1.4.2 | Suffix -i "Nisba" | 251 |
| 5.1.5 | Suffix Pronouns | 252 |
| 5.2 | Verbal Morphology | 254 |
| 5.2.1 | Suffix-Conjugation – Stative | 255 |
| 5.2.2 | Suffix/Clitic "Conjugation" | 257 |
| 5.2.3 | Derived Verbs | 260 |
| 5.2.3.1 | S-Stem | 260 |
| 5.2.3.2 | N-Stem | 261 |
| 6 | Afro-Asiatic to Cushitic (and Omotic) | 264 |
| 6.1 | Nominal Morphology | 265 |
| 6.1.1 | Gender Inflection | 265 |
| 6.1.2 | Case Inflection | 267 |
| 6.1.3 | Number Inflection | 269 |
| 6.1.4 | Derived Nominals | 275 |
| 6.2 | Verbal Morphology | 277 |
| 6.2.1 | Suffix-Conjugation | 277 |
| 6.2.2 | Strong Verb | 279 |
| 6.2.2.1 | G-Stem | 280 |
| 6.2.2.2 | Derived Stems | 284 |
| 6.2.3 | Weak Verb | 289 |
| 6.2.3.1 | G-Stem | 289 |
| 6.2.3.2 | Derived Stems | 292 |

| | | |
|----------|--|------------|
| 7 | A Brief Discussion of Chadic | 294 |
| 7.1 | Nominal Morphology | 295 |
| 7.1.1 | Case Inflection | 295 |
| 7.1.2 | Number/Gender Inflection | 296 |
| 7.2 | Verbal Morphology | 299 |
| 8 | Conclusions | 303 |
| 8.1 | Regarding Afro-Asiatic | 303 |
| 8.1.1 | Afro-Asiatic and the Development of Templatic Morphology | 303 |
| 8.1.2 | Synchronic Syncope? | 304 |
| 8.2 | Beyond Afro-Asiatic | 306 |
| 8.2.1 | Other Non-concatenative Languages | 306 |
| 8.2.2 | Synchrony vs. Diachrony | 307 |

Chapter 1

Introduction to Afro-Asiatic

1.1 Afro-Asiatic Languages and Speakers

Afro-Asiatic is one of the major language families spoken on the planet. Coming in behind the goliaths of Indo-European and Sino-Tibetan, as well as its African neighbor Niger-Congo, Afro-Asiatic is the fourth-most widely spoken family, whose approximately 499 million speakers constitute roughly 6.4% of the world's population. The 365 recognized Afro-Asiatic languages are spoken primarily (and traditionally) throughout Northern Africa and the Near East, although the growth of Islam within the last two millenia has spread Afro-Asiatic, in the form of Arabic, as far afield as India, Indonesia, Central Asia, the Iberian Peninsula, and the Philippines.

Afro-Asiatic languages are, today, the second-most widely spoken languages within the African continent, after Niger-Congo, and represent the overwhelming bulk of languages spoken north of and throughout the Sahara and Sahel regions. In modern times, Arabic is by a wide margin the most widely spoken Afro-Asiatic language, clocking in at roughly 315 million native speakers, and dwarfing other widely spoken Afro-Asiatic languages such as Hausa (33 million), Amharic (25 million), Oromo (17 million), Somali (16 million), or Hebrew (8 million). In addition to these prominent contemporary languages, Afro-Asiatic languages are well represented among the important languages of the ancient and classical world, such as Hieroglyphic Egyptian, Akkadian, Biblical Hebrew, Classical Arabic, Old Aramaic, and Punic-Libyan.

The family is itself regarded as consisting of six major-order sub-branches, ranging from the widely known Semitic and Egyptian¹, to lesser-known branches such as Berber, Cushitic, Chadic, or the quite poorly attested Omotic. Afro-Asiatic is the oldest attested demonstrable family, with Afro-Asiatic written records dating from as early as the 31st century BCE and continuing until

¹Though unambiguously Afro-Asiatic, the Egyptian branch has been dead as a spoken language since approximately the 16th century. Its Bohairic survives in the usage of Coptic as a liturgical language among many Coptic Christians.

present. As will be discussed in further detail below, there is great disparity in the relative time periods associated with the attestation of the differing Afro-Asiatic sub-branches, with a maximum time span of approximately 5,000 years separating the attestation of written Egyptian and the written attestation of the first Omotic languages.

The Afro-Asiatic languages are characterized by and share a number of features common to the family². There is relatively consistent attestation of verbal subject agreement affixes, both suffixed and prefixed, with the split between the two apparently reflecting verbal eventivity. The languages likewise typically share a three-way phonemic opposition between voiceless, voiced, and so-called "emphatic" stops, typically realized with some type of secondary glottal articulation, but also occasionally as pharyngealization. The nominal system is characterized by a binary system of essentially arbitrary grammatical gender, noticeably distinct both from the three-way system of gender opposition attested in Indo-European, or the semantically-driven noun-class gender system found in the nearby Niger-Congo languages of sub-Saharan Africa. Most importantly for this investigation, many languages in the family are quite strikingly characterized by a system of morphological inflection and derivation which, along with the addition of simple affixes, makes use of apparently non-concatenative stem manipulations consisting of vowel alternations and the direct manipulation of the so-called consonantal root³.

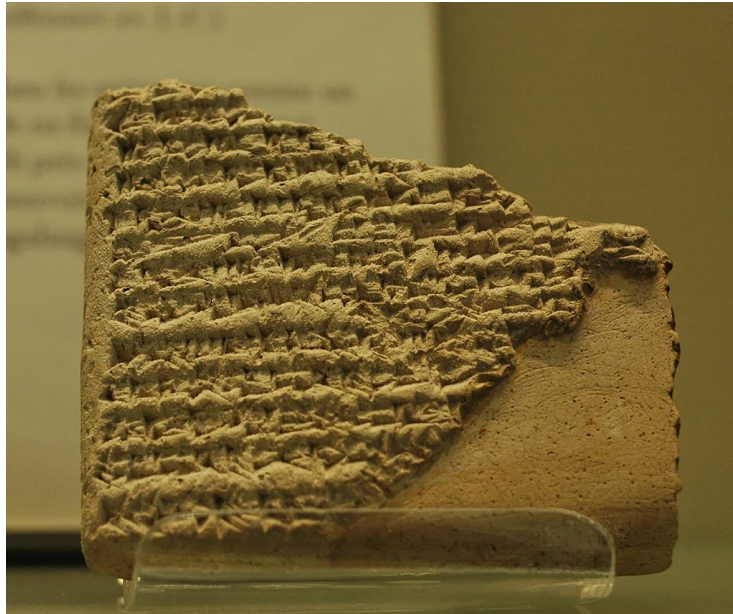
In the remainder of section 1.1, we will provide a brief overview of the major-order Afro-Asiatic branches and a quick introduction of the relevant internal groupings, history and attestation, contact phenomena, and important differences between each of the families.

1.1.1 Semitic

Semitic is by a wide margin the best attested, most widely spoken, and most thoroughly studied of all of the Afro-Asiatic branches. The earliest attestations of a Semitic language occur throughout the first half of the 3rd millennium, and come almost exclusively from the East Semitic branch. In the earliest attestations, these take the form of Semitic names appearing in Sumerian texts, such as the likely Semitic names or phrases appearing in the Sumerian King List (*Kullasina-bel* or *Kal(i)bum*), or Semitic loanwords pertaining to economics and mathematics in finds from Abu-Salabikh (<mi-ad? **mi*'at "hundred" or li-im **lim* "thousand")Hasselbach (2005). The oldest historically verifiable individual with a Semitic name is Sargon the Great (c. 2334–2284 BCE), and it is with his kingship that the full attestation of East Semitic writing begins properly, as he strongly encouraged the use of Akkadian in royal inscriptions. Our first full, unambiguous utterances in Semitic languages therefore come from this period.

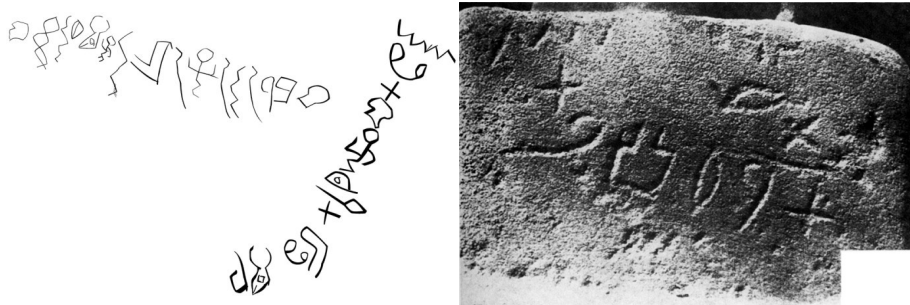
²With the exception of Omotic, which is the most typologically divergent branch of the family. Scholars disagree as to whether this divergence reflects Omotic internal innovation or the retention in Omotic of extreme archaism.

³For more, see the introduction to section 1.3.



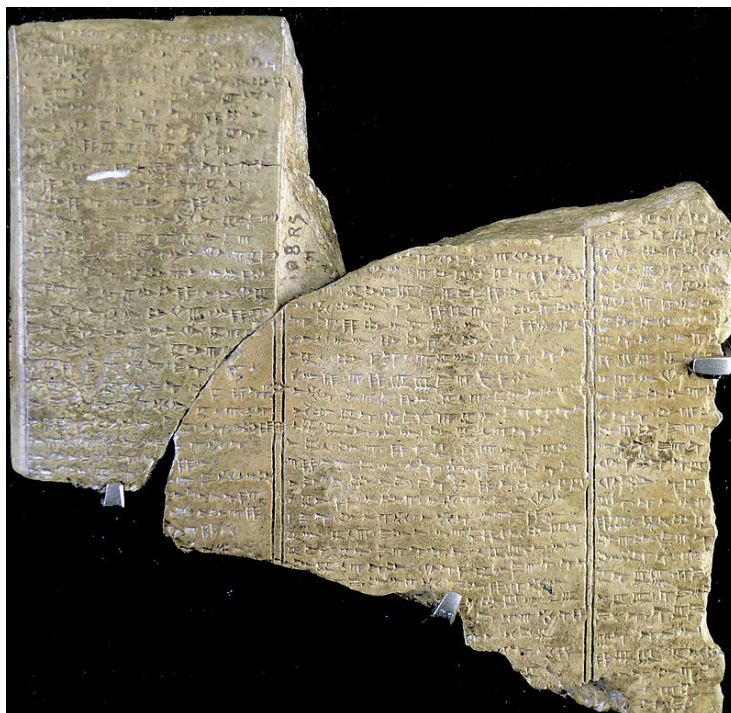
Tablet Detailing Quarrel between King Sargon and Ur-Zababa c. 23rd Century BCE

The next oldest attested Semitic branch is Central Semitic. As was the case with East Semitic, the absolutely oldest attested forms consist of names appearing in texts of older literate languages: in this case, Amorite names appearing in cuneiform Akkadian. The oldest native attestation comes between the 19th and 16th century BCE, in the form of so-called Proto-Sinaitic inscriptions. These inscriptions, consisting primarily of graffiti and other small, partial, and incomplete writings, are recovered from the western Red Sea coast, the Sinai peninsula, and the Levantine coast. The oldest inscriptions in the Sinaitic script come solidly from within Egypt from Wādī al-Hawl (Wadi el-Hol) between Thebes and Abydos. These inscriptions show the greatest graphical similarities to hieroglyphic Egyptian, but the interpretation of the inscriptions is not yet completely secure. It is commonly regarded as writing a Semitic or Canaanite language, though the value assigned to each of the signs varies between different interpretations. The later inscriptions recovered from Sarābīṭ al-Ḳādim (Serabit el-Khadim) are far more abstract in terms of the appearance of the graphical signs, but are typically regarded as more easily intelligible, with the late Egyptologist Alan Gardiner identifying an inscription graffiti'd on the a statue of Hathor as rendering <1 b'lt>, **li ba'lati* "for the lady" (depicted below).



Sinaitic Inscription from Wādī al-Hawl (left) and Sarābīṭ al-Kādim (right)

But the first attestation of a central Semitic language on a massive scale comes in the form of the cuneiform inscriptions from Ugarit. In addition to the expected legal, political, and economic texts, we find a number of long, literary texts from Ugarit. These texts, such as the Epic of King *Keret*, the incomplete stories of the folk hero *Dan-ʿel/Dan-ʿil* and his son *Aqhat*, and the *Baʿal Cycle*, depicting the mythic background and activities of *Baʿal/Hadad*, lack the pervasive influence of larger external cultural groups, such as the Sumerians in the case of Akkadian/Babylonian, or the Egyptians in the case of the more southerly Canaanites. For this reason, the Ugarite texts give us our clearest surviving look at early, pre-Abrahamic Semitic polytheism.



Fragmentary Ugaritic Inscription containing the Baʿal Cycle

The remaining Central Semitic languages are attested thereafter, with both Phoenician and Hebrew texts being recovered from the late 2nd millennium, early 1st millennium BCE, and Arabic appearing first in the form of various onomastic forms recoverable from Neo-Assyrian texts of the 9th century BCE, and subsequently with Nabataean inscriptions beginning around 200 BCE⁴.

Our discussion of the attestation of the Central Semitic languages would not be complete without mentioning the work of Richard Steiner (2011). Steiner has claimed to have identified otherwise untranslated and indecipherable portions of the Egyptian Pyramid Texts, which represent spells and incantations in an early Canaanite, Northwest Semitic, or Central Semitic language. Steiner identifies Pyramid Text 232-238, 281, and 286, a section detailing a protective charm against snakes, as containing Semitic sequences of the sort given below, along with Steiner's suggested reconstructions and translations.

(1) Pyramid Text 235

nt itti iiii
 *niṭē yā-dōdī yā-'aryu

'Turn aside, O my love, O lion!'

(2) Pyramid Text 236

kbbh iti iti biti
 *qabōbuhu: 'itē 'itē baytī

'His spell (is): Come, come to my house!'

(3) Pyramid Text 286

'bšw m:~:~ šw tmt iṭhnww
 *'ubuṣū min-Rīr-Rīr, tawo tamītu yaduhinnō

'Hurry you (pl.) away from Rīr-Rīr, those ones who deal death with their hand'

Steiner's decipherment and reconstructions are fairly compelling. For one thing, the Semitic translations which he offers fit quite well with the surrounding Egyptian text, which had until this point resisted a coherent translation or narrative. Additionally, the Egyptian hieroglyphic symbols frequently match those known to be used to represent Semitic words as attested in other unambiguous instances such as in the Amarna letters. If Steiner's assertion is true, then these sections of the Pyramid Texts represent not only the oldest attestation of a Central/Northwest Semitic language, but also likely the oldest attestation of *any* Semitic language. The Pyramid of Wenis <wnis>, in which

⁴The Nabataeans themselves wrote in Aramaic, which was the dominant international language of the area at the time. However their texts show both significant L1 on L2 interference in the form of Arabic loanwords or Arab-isms within the normal Aramaic. Occasionally, Aramaic legal or technical terms are glossed in Arabic to ease communication (Al-Jallad (2017))

the Pyramid Texts are first attested, is dated to the mid-24th century BCE, approximately contemporaneous with our oldest East Semitic cuneiform writing. But scholars (Allen (2001), Strudwick (2005), Baines (2004)) regard the texts themselves as likely significantly older, with Baines remarking,

...material in all the Pyramid Text collections bears signs of depth of written transmission, in the form of errors of transmission and redaction....These features could imply centuries of development or rather less; the point of reference back should be the early 5th dynasty, with the attestation in the pyramid Temple of Sahure....If a long estimate is plausible, the written composition of Pyramid Texts-like materials could go back to the date from which speeches of the gods are first attested, that is, the late 2nd or early 3rd Dynasty.

Although plausible and well-argued, Steiner's hypothesis has not been confirmed or accepted within the Egyptological or comparative Semitic communities. We will therefore regard the Sinaitic inscriptions as the earliest confirmed attestation of Central Semitic languages.

The South Semitic languages are the last major branch to be attested, appearing in the historical record close to 1000 years later than either our earliest East or Central Semitic languages. The oldest South Semitic form probably comes from the Old South Arabian inscriptions, dating at their earliest to the 9th century, scattered throughout Yemen, Oman, and Eritrea. The Ethiopic branch is attested even later, with the earliest Ethiopic attestation coming in early Ge'ez inscriptions on the Hawulti obelisk from the early Aksumite period in the early 4th century AD (depicted below).



Epigraphic South Arabian (left) and Ethiopic (right) Inscriptions

The Semitic languages are, unsurprisingly, the best-attested and most widely studied languages within Afro-Asiatic. We have excellent descriptive and generative grammars of almost every Semitic language, both ancient and modern, for which attestation is adequate. This includes tremendous scholarship of Arabic (both Classical and the modern vernaculars), Hebrew (both Classical and Modern), Akkadian (both Babylonian and Assyrian), and quite impressive scholarship on the Ethiopic languages generally. Semitic has also been subject to excellent comparative and reconstructive work, and it is perhaps unsurprising that Proto-Semitic is the intermediate major-order Afro-Asiatic proto-language for which we have the most complete, most secure reconstructions in terms of both phonology and morphology. Because of the comparative security of these reconstructions, we will use Proto-Semitic forms in our discussions wherever such forms can be posited without controversy or issue.

We may remark finally on the internal cladistics of Semitic as a family. Effectively all scholars regard East Semitic as a distinctive and early-branching grouping within Semitic. The existence of South Semitic and Northwest Semitic are also likewise regarded as largely uncontroversial, though the membership in each of those groups varies in different theories. We have here reproduced a plausible Semitic family tree effectively adapted from Hetzron (1976).

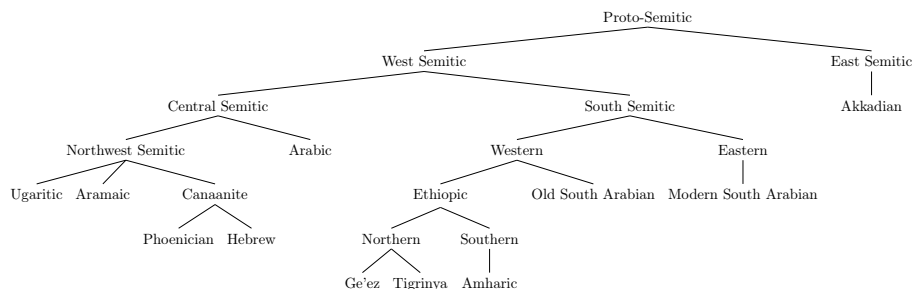


Figure 1.1: Semitic Family Tree Adapted from Hetzron (1976)

While the internal cladistics of Semitic will not bear greatly on the analysis that is to follow, one important point resulting from this tree and others like it is that for any given word, morpheme, or grammatical feature to be securely and incontrovertibly reconstructable for Proto-Semitic, we must find evidence for it in Akkadian. Data from any other two Semitic languages in principle only allows for reconstruction to the common ancestor of the non-East-Semitic languages. In practice, of course, we can make use of out-group analysis to confirm the presence of features in Proto-Semitic which appears outside of East Semitic as well as in some non-Semitic Afro-Asiatic language. But it is important to remember the significant and meaningful position that East Semitic holds within the family.

1.1.2 Egyptian

The Egyptian family is the oldest attested Afro-Asiatic family, with early proto-literate glyphic symbols in use in the Nile River Valley as early as the mid 4th-millennium BCE in the form of partial inscriptions such as the labels of Scorpion I or the Palette of Narmer. The first unambiguous complete sentence attesting the Ancient Egyptian languages comes from a seal impression recovered from the tomb of the second dynasty pharaoh Seth-Peribsen ($\langle st\bar{h} pr \bar{i}b sn \rangle$ "Set is the hope of all hearts"), containing the sentence $\langle dmd.n.f t\bar{3}w\bar{i} n z\bar{3}.f nsw.t-b\bar{i}.t(i) pr \bar{i}b sn \rangle$ "He has united the Two Lands for his son, the dual king, hope of all hearts," as illustrated below.



Seal Impression of Seth-Peribsen c. 28th Century BCE

From that point, Egyptian enjoys one of the longest periods of continuous attestation of any language or family of languages in human history, covering approximately 4400 years from the second dynasty until about the 16th century when Coptic falls out of use as a native spoken language⁵.

Unsurprisingly, the spoken and written Egyptian language(s) undergoes a tremendous amount of change over the course of this vast attested history. Scholars typically divide the diachronic variation into distinct eras or phases of the Egyptian language, beginning with Old Egyptian, which is dated from the earliest attested Egyptian inscriptions until approximately 2000 BCE. The next stage is Middle Egyptian, which is typically taken to last until roughly the 14th century BCE. Middle Egyptian is the most widely attested form of any Egyptian language, since it was the form in use during the classical period of the Egyptian civilization, and has the largest body of extant texts. Middle Egyptian also survived as a literary and liturgical language within Egypt following its displacement as a spoken language, a role in which it continued to function until the Christianization of Egypt as a Roman province around the 4th century. Middle Egyptian gave way to Late Egyptian, which functioned as

⁵It should be mentioned that there have been sporadic claims throughout the 19th and 20th centuries that isolated pockets of native Coptic speakers remain throughout Egypt and Sudan. We are agnostic about the validity of these assertions until such time as sufficient research can be conducted as to either confirm or refute these claims

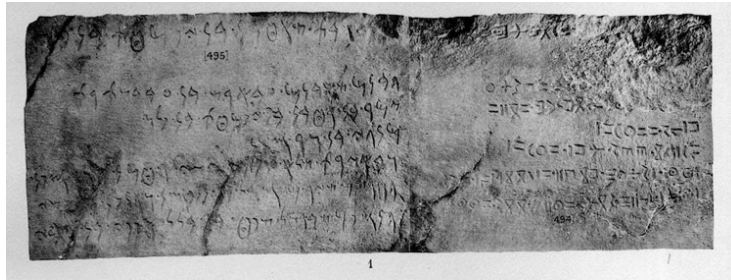
the spoken language of the last native Egyptian dynasties and kingdoms. It is also the likely source of Egyptian loanwords appearing in Semitic texts including the Canaanite of the Amarna letters, and likely Egyptian borrowings into Hebrew. The Egyptian of the subsequent Late and Ptolemaic periods is commonly referred to as Demotic, a term originally used by the Greek historian Herodotus to distinguish it from the literary usage of hieroglyphic Middle Egyptian, with which Demotic was contemporaneous. The final diachronic stage of the Egyptian language is referred to as Coptic. Coptic is typically taken to have arisen approximately during the period of Christianization in the 3rd and 4th centuries CE, and survived in some spoken form until approximately the 15th century. It remains in common use as a liturgical language for the numerous Coptic Christians in Northern Africa and spread throughout the world.

With such an extensive attested history, we would expect the Egyptian language(s) to likewise be subject to a great deal of internal diversification not unlike that seen with the Semitic family. Although the phonetically underspecified nature of hieroglyphic writing conceals some such diversity, it must certainly have been present, because when Coptic begins to appear in the written record, numerous dialects likewise simultaneously appear, effectively already fully formed. Sahidic (from the region around Thebes) and Bohairic (from Memphis) are the two best known Coptic dialects, due to Sahidic being the most widely attested dialect during the pre-Islamic Christian era, and Bohairic being the dialect in most common use among Coptic Christians today. In addition to these well-known dialects, Coptic also diversified into lesser known dialects such as Akhmimic (from Panopolis), Lycopolitan, Fayyumic, and Oxyrhynchite.

The Coptic dialects play an important role in our ability to recover information about the phonological structure of Egyptian words during the earlier periods of Egyptian linguistic history, as the development of Middle Egyptian into Coptic was acutely conditioned by the syllable structure and vowel quantity of the Middle Egyptian words. This fact allows us to reconstruct the phonotactic shape of Middle Egyptian words (at least those words which survive into Coptic) with remarkable accuracy, and therefore either confirm or reject our theory of syncope as it applies to Egyptian words.

1.1.3 Berber

The Berber languages of Northern Africa are attested far later than either Semitic or Egyptian. All of the most ancient attestations in a Berber language come in the form of the so-called Libyco-Berber "Numidian" inscriptions. The oldest such inscription for which a firm and uncontroversial date can be established is the bilingual Phoenician/Numidian inscription from the Mausoleum of Dougga in modern-day Tunisia, whose construction can be dated securely to 146 BCE.



Punic-Libyan Inscription from the Mausoleum of Dougga, 146 BCE

There are, however, a number of additional inscriptions for which secure dates cannot be identified, and it is therefore likely that some of these inscriptions predate the Mausoleum of Dougga. For example, a number of inscriptions from the Atlas Mountain regions of Morocco have been supposed to date far earlier, as early as the 6th or 7th centuries BCE, on the basis of accompanying engraved rock art characteristic of that period. The incomplete nature of the inscription, lack of explicit dating, as well as uncertainty as to whether the rock art and Libyan-Berber inscriptions were carved at the same time make it impossible to confidently confirm the early 6th or 7th century dates, but they remain plausible given the partial data available.



Rock Art with Libyan-Berber Inscription from the Atlas Mountains, Morocco

The usage of the original Libyco-Berber Tifinagh script declined among northern Berber populations following the spread of Christianity and the subsequent spread of Islam throughout Northern Africa, but it remained in relatively continuous use among the Tuareg populations further to the south, where it is commonly used in games, personal notes, and traditional Tuareg poetry. Among the Tuareg tribes, the use of Tifinagh, in contrast to Arabic script, has a particular association with women, and women often exhibit higher rates of Tifinagh literacy and frequency of use.

The internal cladistics of the Berber languages is not a well-researched area of scholarship, and there is one major confound to its further study. Namely, the Berber languages are remarkably similar to one another, far more so than is characteristic of Semitic, Cushitic, Chadic or Omotic. Indeed, Kossmann and Vossen (2011) regard the Berber languages as exhibiting approximately the same degree of internal diversity to be found in Romance or Germanic (this despite presumably being far older as a family). Given this, Kossmann and Vossen divide the family up into seven primary groupings:

- Zenaga
- Tuareg
- West-Moroccan: Tashelhiyt/Tamazight
- Zenati
- Qabyle
- Ghadames
- Awjila

Despite identifying these groupings, Kossmann and Vossen make no further claims as to the relationships between these groupings or the reconstruction of intermediate sub-families between these groups and Proto-Berber itself. Indeed, the authors remark that:

As a consequence, one may doubt whether the tree model is suitable for the description of the Berber language family. Its continuous history of convergence and differentiation along new lines makes any definition of branches arbitrary. Moreover, mutual intelligibility and mutual influence render notions such as “split” or “branching” rather difficult to apply, except, maybe, in the case of Zenaga and Tuareg.

Despite this reticence, the authors do include a reference to a cladistic study of Berber from Blažek (2010) which generates the following tree.

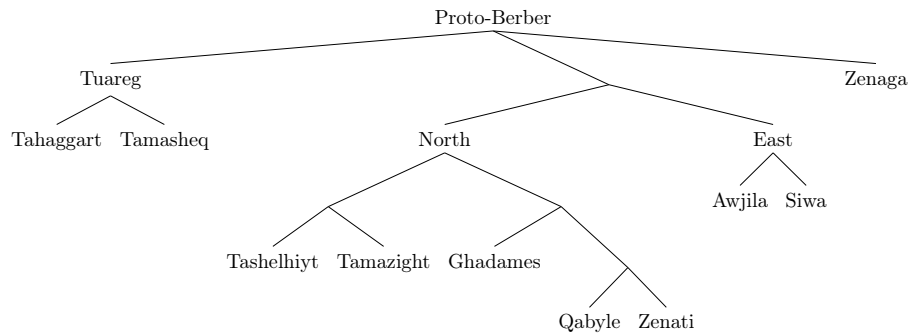


Figure 1.2: Berber Family Tree Adapted from Blažek (2010)

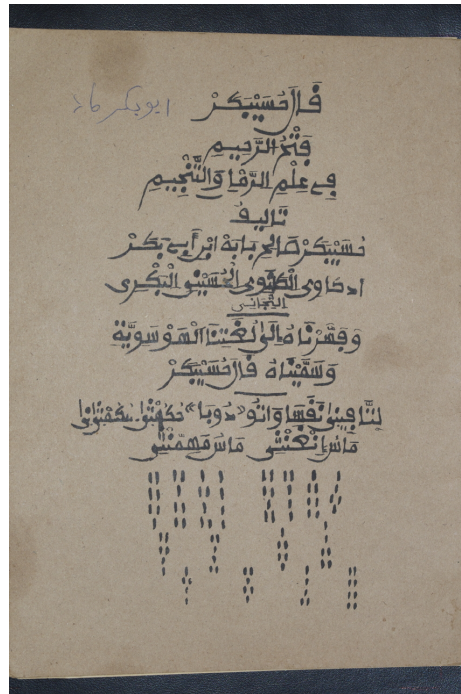
Healthy skepticism should be applied to Blažek's result. His tree is produced solely through a lexico-statistical algorithm, and is therefore subject to all methodological issues and shortcomings inherent in that technique. However, as Kossmann and Vossen point out, Blažek's method does correctly identify a number of valid groupings, such as setting Zenaga and Tuareg apart as distinctive groups, placing Tamazight and Tachelhit together, and identifying the Zenatic block, so it is possible that it may be identifying some of the signal present in the cladistic grouping of the Berber languages.

One final remark about the internal structure is that the relative position of Old Numidian (as either a language or a grouping of dialects), as well as the quite divergent Guanche language of the Canary Islands, cannot be properly identified. In the case of the Old Numidian forms, this results from the way in which the Tifinagh script may conceal dialect-relevant information, such as changes in vowels, or the lenition of consonants in specific positions. In the case of Guanche, it results from the poverty of the attestation beyond word lists and place names. In each case, we cannot say whether these languages are early divergences from the family, or rightly belong in the nuclear core with other dialects, although Kossmann and Vossen (2011) have noted that the Guanche language may plausibly even be a member of the Berber family and may have simply undergone borrowing from an otherwise unattested Berber language. We remain agnostic regarding this possibility.

1.1.4 Chadic

In contrast to the far older Semitic, Egyptian, and Berber branches, Chadic is attested only relatively recently. As is common, the earliest attested Chadic languages take the form of Chadic onomastics or toponyms, typically Hausa, appearing in Arabic texts from the introduction of Islam and Arabic writing (referred to as *Ajami*⁶ writing) into the Lake Chad basin in about the 11th century. Despite this medieval attestation of the presence of Chadic languages in the region, the first uninterrupted text in a Chadic language is not reliably dated until the 17th century when 'abd 'allāh Suka, a Nigerian scholar authored the *Riyawar Annabi Musa* (The Testament of Moses the Prophet).

⁶Ajami is a term borrowed from Arabic 'ajamiyy "Persian/non-Arab" which has come to refer to the use of the Arabic script for writing non-Arabic languages.



Hausa Ajami Writing from the Littaafin Ḳasa

Our understanding of the internal cladistics of Chadic as a family is significantly less developed than that of Semitic, but we are nevertheless able to recover a great deal more about the history of the family than is the case for Berber. A minimum of three primary phylogenetic groupings are apparent within Chadic: West, Central, and East Chadic. A fourth grouping, referred to as Masa, is recognized by some scholars, such as Newman (1977) and Blench (2006), and treated as a constituent member of Central Chadic by others, like Stolbova (2016). Within these major groupings smaller subfamilies have been identified: the rather uncreatively named A and B groupings within both West and East Chadic, along with the more descriptive Gongola-Higi, Hill, and Riverain groups within Central Chadic. Recent work by Olga Stolbova at the University of Moscow has likewise provided our first tentative groupings among the major-order groupings. Based on lexical inheritance and innovation, along with the phonological development and reflexes of Proto-Chadic segments, Stolbova has argued that the initial division within Chadic was between the speakers of the Proto-West-Chadic, who migrated westward into their current locations throughout northern Nigeria and southern Niger, and the speakers of the language ancestral to East and Central Chadic, who presumably remained more centrally located around the Lake Chad basin, primarily in Chad and Cameroon. A hypothetical phylogenetic tree of Chadic appears below.

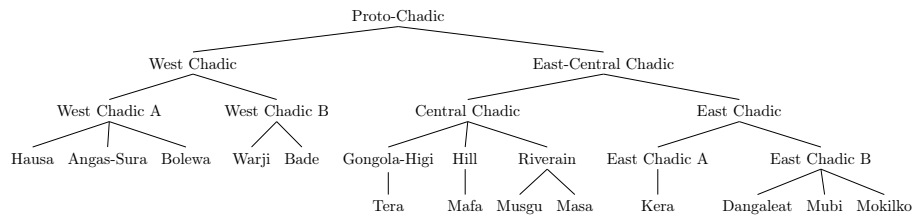
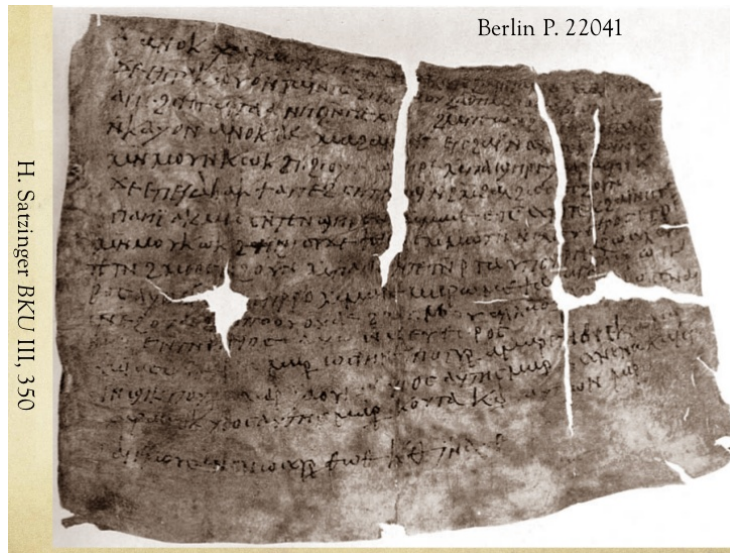


Figure 1.3: Proposed Chadic Family Tree Adapted from Stolbova (2016)

1.1.5 Cushitic

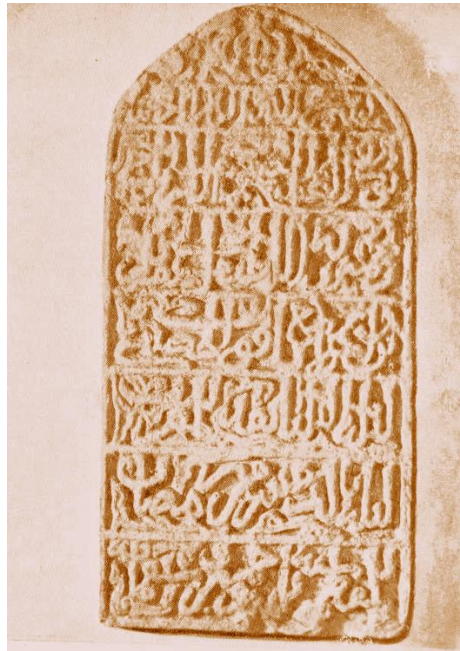
The oldest attestations of Cushitic languages take the form of onomastics and other words recovered from Egyptian, Coptic, and Greek texts from Northern Africa during the 1st millenia BCE and CE. The earliest such form comes from an Egyptian papyrus text from approximately 1000 BCE, which contains a spell that may begin with a cognate of Beja *sigi* "be gone" (Vanhove (2016)), though this is somewhat speculative. Far more secure are the various names recovered from Greek and Coptic ostraca containing names of Blemmyes origin. Browne (2003) has argued rather convincingly that a large majority of these names contain Cushitic, and specifically Beja, lexical roots and morphemes, and that the languages of the Blemmyes people should be regarded as an ancient linguistic ancestor of the modern Beja populations.



Coptic Papyrus Text Containing Blemmyes Onomastics of Beja Origin

From that point, there is a large gap in the attestation of Cushitic languages, lasting until approximately the 13th century, when the Arabic script was introduced into the Horn of Africa by the Islamic scholar *Yūsuf 'ibn 'ahmad*

'al-Kawneyn, spreading throughout the Sultanates of Mogadishu, Ifat, Adal, and Ajuran. Originally, this took the form exclusively of the creation of a native Somali vocabulary for Arabic grammatical and orthographic terminology, but it soon gave rise to the use of the Arabic script for the writing a relexified, Somali-fied form of Arabic traditionally referred to as *Wadaad* writing and *Wadaad* Arabic⁷, and eventually to the full-fledged writing of the Somali language, which continued until the introduction of the Latin alphabet and its adoption as the official written script of Somali in 1972.



14th Century Somali Inscription Containing Wadaad Writing

The remaining Cushitic languages are attested throughout the 19th and 20th centuries, although attestation and documentation in this family can be quite disparate from language to language, with some, such as Somali and Beja, having decent scholarship and attestation to other languages like Dahalo or Iraq^w, which are not particularly well-described and have been subject to little rigorous or theoretically inclined research.

The internal cladistics of the Cushitic family are likewise poorly studied and understood. As with Berber, a number of distinct groupings within Cushitic have been identified, including Lowland East Cushitic, Highland East Cushitic, the Agaw languages, the Southern or Rift languages, and Beja (as a grouping unto itself)⁸. There are also a number of Cushitic languages (or possibly

⁷A *Wadaado* is a Somali cleric or scholar.

⁸The Omotic languages were once considered to be a Western branch within the Cushitic family, but have been regarded as a distinct family since the work of Fleming (1969) and Bender (1971); contra Theil (2010), who regards Omotic as a non-Afro-Asiatic family.

Cushitic languages) which resist easy classification into larger phyla, such as Yaaku, Dullay, or Ongota. There are therefore numerous proposed groupings of Cushitic languages, with several reproduced below

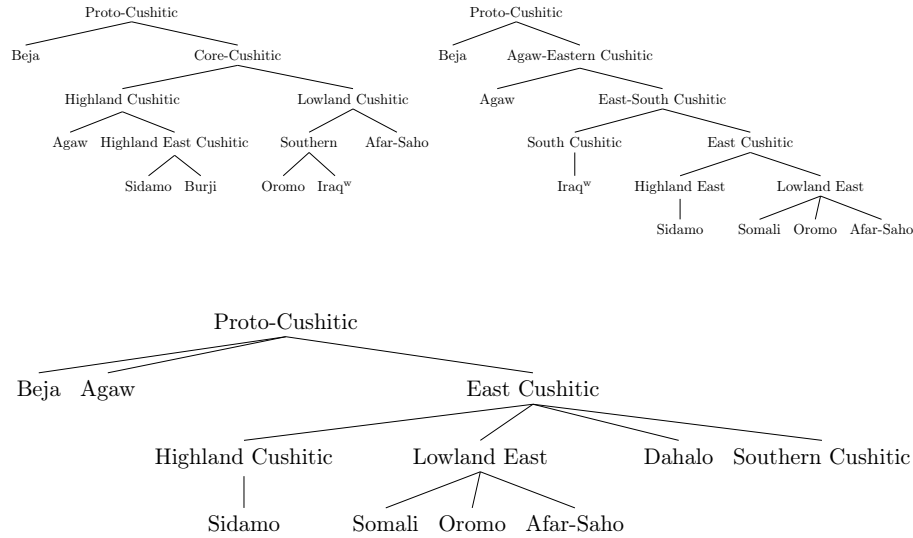


Figure 1.4: Cushitic Family Trees from Hetzron (1980), Ehret (2011), and Tosco (2000)

1.1.6 Omotic

The Omotic languages are the Afro-Asiatic subfamily which remains the most poorly attested, most poorly studied, and generally most mysterious in terms of its precise relationship with the remainder of the macro-family. Omotic languages are first attested in any capacity in the form of onomastics and toponyms appearing in Ethiopic Wadaad writing during the middle ages, such as the Kafa Kingdom, whose name derives from the Kafa language/people, or the various proper names recoverable from the hagiography of the Ethiopic saint and prosyletizer *Täklä Hāymānot*. More substantive attestation of Omotic texts are not found until the late 19th and 20th centuries, either following the expansion of the Kingdom of Ethiopia under Menelik II, or in early descriptive works from British East Africa. Many Omotic languages are only attested or written in any capacity during the 20th century.



Wolaytta Writing from the 20th Century

The situation regarding the internal cladistics of the Omotic family is far from clear. Effectively all modern groupings of the Omotic languages recognize the presence of a North/South or *Aroid/Non-Aroid* split, but the proposals can differ significantly as it pertains to other groupings such as the Mao group or the Ometo languages. Two proposed Omotic groupings are presented below.

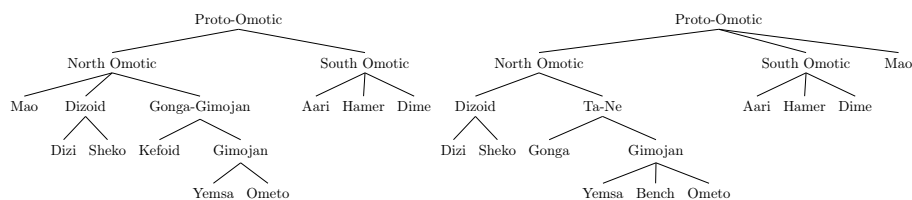


Figure 1.5: Possible Omotic Trees from Bender (2000) and Hayward (2000)

1.2 Afro-Asiatic Cladistics

Finally, a few remarks should be made on the cladistics of the Afro-Asiatic family as a whole, at least insofar as it pertains to our analysis or reconstructions presented here. The internal relationships among the Afro-Asiatic sub-families are hardly a settled matter within the field. Even basic facts such as the initial branching of the proto-language or which languages form major groupings with one another can vary significantly from one proposal to the next.

The historically initial grouping of Afro-Asiatic languages into major groupings was the so-called Hamito-Semitic divide, which supposed that the Semitic languages formed a coherent subgroup to the mutual exclusion of the African branches of the family, which were supposed to go together into a cladistic grouping of "Hamitic" languages. This basic grouping, which, as its name suggests, was based on a racial conception originating in the Biblical sons of Noah, persisted for a remarkably long time. It remained in common citation until Greenberg (1950) demonstrated that the Hamitic vs. Semitic divide had no methodological validity in terms of linguistic features present in the various families, and proposed the replacement of the linguistically misleading and arguably racist term Hamito-Semitic with one of his own coinage, Afro-Asiatic or

Afrasian. Greenberg, who had no further claims about the cladistics of the family, suggested that Afro-Asiatic be treated as consisting of five co-equal branches (Semitic, Egyptian, Berber, Chadic, and Cushitic⁹), with the relationships among those branches to be determined by later scholarship.

Since that time, a number of proposed groupings have arisen. The Soviet scholar Igor Diakonov (1988) favored a grouping of Egyptian and Chadic on the one hand, and Semitic, Berber, and Cushitic on the other (effectively predicating his grouping on the presence (Semitic-Berber-Cushitic) or absence (Egyptian-Chadic) of the prefix-conjugation). Christopher Ehret (1995) and Roger Blench (2001) both favor the analysis whereby Omotic, clearly the most distinctive sub-family, is also the most divergent branch, and constitutes one-half of the family in its entirety. Carsten Peust (2012) uses lexical information to generate an unrooted tree featuring the groupings Egyptian-Semitic, Cushitic-Omotic, and Berber-Chadic.

In this dissertation, we will adopt the model of internal Afro-Asiatic cladistic relationships as proposed in Bacovcin and Wilson (2018). We will therefore propose that Proto-Afro-Asiatic initially bifurcated into distinct "Northern" and "Southern" groupings, as illustrated in the tree below.

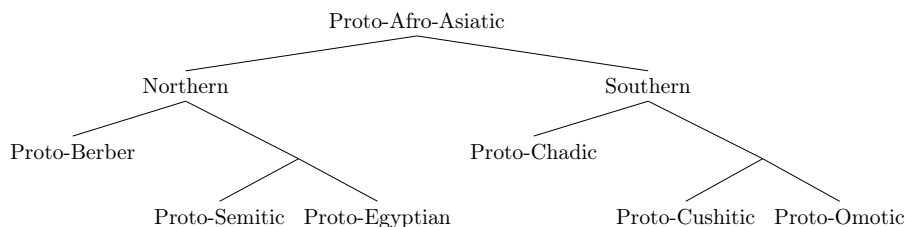


Figure 1.6: Afro-Asiatic Tree from Bacovcin and Wilson (2018)

Adopting this view of the family has important consequences in terms of what we can rightly reconstruct to Proto-Afro-Asiatic proper, and the kind of evidence necessary to project a given word or structure onto the proto-language. According to this tree, a lexical item, morpheme, phonological property, or syntactic construction need only occur in one of Berber-Egyptian-Semitic and one of Chadic-Cushitic-Omotic in demonstrably cognate form in order to be rightly considered an inheritance from common Afro-Asiatic. This is the position we will adopt in the course of this analysis.

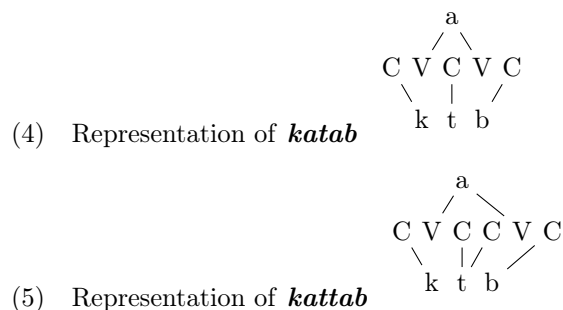
1.3 Morphology of Proto-Afro-Asiatic

One of the most striking and well-known features of the Afro-Asiatic family is its so-called "templatic" morphological structure, consisting of discontinuous

⁹In Greenberg's time, Omotic was regarded as the westernmost branch of the Cushitic family, and therefore only five major Afro-Asiatic branches were recognized.

consonantal roots. In many (though not all) languages within the family, content words and other major lexical items, along with some function morphemes, appear at least at a superficial level to be derived from root morphemes consisting of one, two, or three consonants¹⁰ interleaved with vowels expressing inflectional or derivational information. This generalized property is so starkly apparent to speakers of such languages that it was even well-known to ancient speakers. Ancient Egyptian hieroglyphic writing, for instance, included phonetic signs capable of writing one, two, and three consonant root forms. The medieval Semitic grammarians, both Hebrew and Arabic, likewise identified a discontinuous consonantal root as a distinct abstract entity in the grammar, referred to as *šoreš* (Hebrew) and *jīdr* (Arabic) respectively, both approximately meaning "root."

Although such concepts seemed quite simple to the medieval Semitic grammarians, who operated largely at the level of description of surface facts and patterns, "templatic" morphology of this sort has required special attention from modern theorists of morphology in order to be incorporated into generative theories. Most critically, languages with morphological structures of this type have forced morphologists to develop theories that allow them to instantiate a preformed prosodic "template" somewhere within the grammar. McCarthy (1981), in his pioneering work on the templatic morphology of Arabic, for example, uses the autosegmental theoretical framework in order to locate the consonantal "root" on a single autosegmental tier, and the sequence of vowels (termed a "pattern" or "melody") on another. Each is then interleaved into a prefabricated "template" consisting of a prosodic structure into which the consonants and vowels are fit. For McCarthy, when we encounter two related words, such as the Arabic verbal stems *katab* (G-Stem, Form I) and *kattab* (D-Stem, Form II), we may rightly say that each consists of three constituent morphological elements: a lexical root consisting of discontinuous consonants (k-t-b), a vocalic pattern (a), and a prespecified association between these strings of segments and a template consisting of what McCarthy refers to as "C and V slots." The representation of *katab* and *kattab* under such an analysis is given below (adapted from McCarthy 1981).



¹⁰Roots consisting of a single consonant, or even as many as four or five consonants are also attested, but are rare and seem not to be productive in the Afro-Asiatic languages.

Although McCarthy's proposal is notable for being one of the first serious generative treatments of "templatic" morphology, and for establishing the now conventional autosegmental root-and-template approach to such languages, it is hardly the only theory which has been proposed to account for these peculiar morphological formations. Optimality-theoretic approaches, for example, such as those devised by Kastner (2018) or Wallace (2013), have proven quite capable of dealing with the unique issues presented by templatic morphology, since the constraints on outputs can be arranged to "conspire" to produce the specified template form, without having to directly build the template itself into the grammar as an object. Of particular interest to our inquiry and proposed analysis are those theories of templatic morphology which are termed "word-based" theories. Pioneered by scholars such as Jeffrey Heath (1987), Bill Darden (1992), Robert Ratcliffe (1997), and Outi Bat-El (1991, 2003b,a), these theories reject the notion of the Semitic lexical root as a purely consonantal abstraction, and rather take as their underived root form an articulable and fully vocalized syllable or sequence of syllables. Although the theory presented here is fundamentally different from those of these scholars – in that it is a diachronic explanation, rather than an analysis of the synchronic grammar of any single language – it shares with each the idea that we will begin with an at least partially vocalized root morpheme which needs no templatic interdigitation to be articulable¹¹.

While theories of this sort have shown varying degrees of promise in terms of understanding and analyzing the distinctive synchronic morphological structures common to Afro-Asiatic family, such approaches have no diachronic component by design. If we suppose, for example, that McCarthy's theory is a perfectly accurate representation of the state of knowledge possessed by a given native speaker of Arabic, we are left with no answers to questions about the diachronic trajectory of this native-speaker knowledge. Has a McCarthy-type theory always provided the correct framework to describe the knowledge of speakers of Arabic? Of Proto-Semitic? Of Proto-Afro-Asiatic? If not, what does the correct model of the knowledge of speakers of these earlier languages look like? When and how did we move from one to the other?

None of these questions can be answered within the framework of McCarthy's theory, which effectively assumes its own synchronic stability, and contains no mechanism to describe how or why such a system could have arisen in the first place. This is the topic of inquiry in this dissertation. We will not attempt to propose a synchronic theory of the grammar of any given Afro-Asiatic daughter language or family. Rather, our focus is on providing a diachronic understanding of the history and trajectory of the morphological system of Afro-Asiatic as a whole. We hope to answer questions of how such a morphological system could have arisen; what changes it was subject to over time; and how, when, and if it was subject to reinterpretation as a grammaticalized morphological sys-

¹¹Note, as discussed previously, this does not mean that such morphemes must always be articulable given the surface constraints of the language. Rather, it simple means that they contain segmental material which can be articulated without the need for the distinctly templatic process of interdigitation.

tem rather than an originally phonological alternation. If, for example, a truly templatic morphological system arose at some point within the reconstructable history of the Afro-Asiatic family, we may ask how it did so from a presumably concatenative predecessor. We might also ask why it arose to such frequency and commonality in those branches of the family which exhibit extreme non-concatenative behavior (Semitic, Berber), and not in those branches for which such processes are less common and less exaggerated in their effects (Chadic, Omotic). Alternatively, if Afro-Asiatic must be reconstructed with a templatic morphological structure as far back as the proto-language, we must ask how and why it has atrophied in branches such as Chadic and Omotic, and why it has remained so robust in, for example, Semitic. These are questions we will attempt to answer.

As a first step to finding these answers, we must build as clear a picture of the synchronic grammar of Proto-Afro-Asiatic as our reconstructions allow. We will then argue that the apparently templatic behavior of the family was, in its earliest stages, fundamentally an epiphenomenon of phonology. We will argue and demonstrate that we can generate such alterations in root and stem shape using a simple system of concatenative affixation in conjunction with a phonological rule of syncope, which operated iteratively from left to right on all syllables within the word. We will demonstrate how such a rule can produce the forms which we must or might reconstruct for Afro-Asiatic. Once we have established this proposal at the synchronic level of Afro-Asiatic, we will trace the development of these morphological and phonological processes along their lines of descent into the Afro-Asiatic daughters, describing how these rules are inherited, lost, and modified, and how they interact with other changes which have arisen within the development of the daughter languages.

1.3.1 Nominal Morphology

At its most basic, we propose to characterize the morphological structure of Afro-Asiatic as consisting not of discontinuous strings of consonants, but rather as consisting of simple morphemes, both roots and affixes, which contained lexically specific vocalism in their underlying forms. Under this analysis, Proto-Afro-Asiatic appears much more similar not only to other reasonably well-reconstructed proto-languages (such as Proto-Indo-European, or Proto-Uralic), but also, critically, to the host of contemporary languages in which root morphemes and affixes consist of sequences of consonants and vowels, often directly articulable, and frequently syllabified. As we will demonstrate in Chapter 2, the transition from this clearly concatenative system of fully vocalized roots and affixes has been rendered historically opaque by the confluence of both our proposed rule of syncope, and an originally unrelated system of apophonic transformations capable of altering the quality of the vowels originally present in these underlying forms. We will argue that this combination of syncope and vowel apophony, each individually distinct in origin, is the process which gives rise to "templatic" morphological structures when subject to reanalysis and grammaticalization.

As we begin with the reconstructable nominal morphology of Afro-Asiatic, we must begin with the basic, but somewhat contradictory, observation that the nominal morphology of Afro-Asiatic is significantly more difficult to reconstruct than the verbal morphology. And yet, at the same time, the nominal morphology we can reconstruct is significantly simpler than that of verbs. It seems clear that "nominals," broadly speaking (nouns, deictics, and perhaps adjectives), inflected for two grammatical genders, masculine and feminine, with the masculine commonly unmarked, and feminines marked by a suffix **-t*. There were also, as expected, morphologically unmarked feminines, which showed no overt affix but clearly retained the grammatical category. The marker of other nominal features, such as case and number, is far less clear, as will be elucidated in the discussion below.

1.3.1.1 Reconstructable Nominal Morphemes

When we consider the forms of nominal roots which we can reconstruct for Proto-Afro-Asiatic, we are confronted immediately by one of difficulties of using reconstructed data to ascertain the structure of prehistoric languages. Namely, it is that the forms which we reconstruct are themselves surface-level phonetic realizations, and need not be direct or accurate representations of the underlying structure of the words and morphemes in question. Consider the simple of example the reconstructed pair of Indo-European nominal forms **léymō~limnéy*. As demonstrated by Noyer (2013), although the surface forms of this nominative and dative singular pair are reconstructed as such **léymō* and **limnéy*, the underlying forms must be rightly regarded as **/leymons/* and **/leymonéy/* respectively. As we can see, simple facts such as whether or not syllables are accented, the presence or absence of vowels, and the basic prosodic structure of the underlying word are not faithfully reflected in the reconstructed surface forms.

In the case of Indo-European, we know enough about the phonological and morphological grammar and history of the family to be able to recover the underlying forms which give rise to our reconstructions, but our knowledge about Afro-Asiatic is significantly more fragmentary. What then are the surface forms of nominal roots which we can recover in Afro-Asiatic, and what can we recover about the underlying forms of such roots?

The surface syllabic constraints and prosodic structure of Afro-Asiatic appear to be remarkably stable components of the family, as the basic facts about allowable and disallowable syllable types and weight constraints on syllables are often quite strongly cognate between daughter branches, with only minor variation. From a comparison of these daughters, and from the reconstruction of the intermediate Afro-Asiatic proto-daughter-languages, we may conclude that Afro-Asiatic was characterized by the following surface constraints:

- Obligatory onsets
- No complex onsets

- Optional codas
- No complex codas
- Two-mora syllable weight constraint
- Word-final consonant extrasyllabicity

Given these constraints, the possible shapes of surface syllables were rather limited, with all syllables effectively taking the forms CV , CVC , or $C\bar{V}$, with additional forms $C\bar{V}-C$ and $CVC-C$ permitted by extrasyllabicity at word end. The corresponding array of possible surface root and morpheme shapes is similarly limited. On the basis of comparative data, we can reconstruct the following root and morpheme shapes at the surface level. In each case, we will discuss as much as possible what can be recovered about the possible underlying forms which give rise to these recoverable shapes.

$C\bar{V}$ Morphemes of this shape, which we might traditionally refer to as "monoconsonantal" or "uniconsonantal" under the traditional terminology of Afro-Asiatic (in which morphemes are categorized by the number of consonants which must be projected into the underlying "template") are common for suffixes, clitics, deictics, question words, and other "functional" morphemes, but are vanishingly rare for lexical or content words. Morphemes of this sort are reflected in the cognate sets: Arabic *mā* "what," Egyptian <m/mi> "who, which, what," Tuareg *ma/mi* "who/what," Hausa *mè* "what," Beja *naa* "what" "who/what," or Akkadian *-šu*, Egyptian <-f>, Tuareg *-s*, Hausa *shì*, Somali *-iis*, Mao *ʔiš*, all approximately meaning "3rd. M. Sg."

As it pertains to the relationship between this reconstructable surface form and any underlying representation which we can recover, the primary question is whether or not there exist roots/affixes which have no onset consonant, and whose surface compliance with the constraint of mandatory onsets is the result of the so-called "prosthetic aleph." To use a concrete example: is the morpheme which marks the 1st Sg. of the prefix-conjugation in fact $*ʔ\bar{v}$ -, or could we more simply assume that the morpheme is $*/\bar{v}/$, with the initial $*ʔ$ - supplied by phonological rule? The answer here is...possibly. There are numerous Afro-Asiatic daughter languages which lose the requirement that all syllables begin with an onset consonant. Unsurprisingly, in such languages, the form of the 1st Sg. prefix-conjugation affix is \bar{v} -. But the nature of the causation here is muddled. Have such languages lost this syllable structure constraint, meaning that vowel-initial morphemes are no longer supplied with a prosthetic aleph? Or alternatively, have such languages lost underlying phonemic aleph, resulting in syllables which now can begin without an onset consonant and therefore violate this original syllable structure constraint. What is clear is that if V lexical roots coexist along with CV ones, then they must be relatively fewer in number.

It is also clear, however, that morphemes without onset consonants unambiguously must be constructed for at least some stages of the Afro-Asiatic family. Due to the surface level constraints, we can only clearly recover such forms

when they appear either as suffixes or as some other word-internal element. Derivational suffixes such as the Semitic, Egyptian, possibly Berber nisba formative seem to be underlyingly vowel initial, as does the shared Semitic-Berber suffix $*-\bar{a}n$, which forms derived adjectives¹². It can at times be difficult to project these morphemes back beyond the intermediate stages of Afro-Asiatic (the common ancestor of Berber and Semitic for $*-\bar{a}n$, the common ancestor of Cushitic-Omitic and Chadic for $*-VC$ type reduplication). Nevertheless, it seems clear that morphemes of this type are common enough in Afro-Asiatic languages that we should regard them as, if not original, clearly widespread.

CVC The so-called biconsonantal or biliteral morpheme, *CVC*, is the most common surface nominal morpheme shape which is reconstructable in Afro-Asiatic. It is reflected in pronouns and deitics, such as the 1st Sg. independent pronoun: Arabic $\bar{a}n\bar{a}$, Coptic/Egyptian $\Delta\pi\sigma\kappa$ <ink> $*\bar{a}n\bar{a}$, Tuareg *nāk*, Hausa *nī*, Beja $\bar{a}ni$, and possibly Dizi *yin* or Hamar $\bar{i}nta$. It is also by far the most common in basic underived nouns shared by the majority of branches in the family: Arabic $\bar{a}b$, possibly Egyptian <ḥb.t>, Izayan *ibba*, Hausa *ūbà*, Agaw *abaa*, possibly Dizi $\bar{y}ab$, all "father," except Egyptian "family," Arabic *qas̥* "shinbone, joint," Coptic/Egyptian $\kappa\Delta\epsilon$ <qs> $*qis$, Siwa *īḡəs*, Hausa *kàshí*, Daasanach *kas*, Dime *kos*, all "bone" except Arabic "shinbone, joint," or Hebrew *šēm*, Egyptian <sm.t>, Tahaggart *isəm*, Hausa *súná* all meaning "name," except Egyptian "ears."

As with the $\check{C}\check{V}$ morphemes, we can question whether non-consonant-initial $\check{V}\check{C}$ morphemes exist, and again, the answer is that it is possible, for the same reasons as discussed previously. Perhaps more interesting is the question, given the commonality of using root-and-template grammatical theories to describe Afro-Asiatic languages, of whether the underlying form of *CVC* morphemes is truly vocalized, or if such forms might be better described with an underlying form /CC/, with the medial vowel supplied by epenthesis or some other process or surface-level constraint. Here we should likely conclude that the answer is no. On the one hand, the vocalism of these basic, underived *CVC* nouns is remarkably stable across the family as a whole despite what must certainly be considered a vast time depth. If such vowels were supplied by epenthesis, we might expect them to display a greater variability. Additionally, we might suppose that if the vowels of the reconstructed *CVC* roots were epenthetic, then they should be absent from derived or alternate forms in which the syllable structure does not demand them. There is minor evidence for such a change, mostly from Classical Arabic, in the form of nouns such as $\bar{i}bn$ "son" and $\bar{i}sm$ "name." In this last example, we might suppose that Proto-Semitic $*\bar{s}im$ was in fact $*\bar{s}m$ underlyingly, and that therefore in Arabic, where the prosthetic aleph has developed, no epenthesis occurs, and the underlying non-vocalized nominal root surfaces $\bar{i}sm$. While possible, we find this analysis lacking. For one, this phenomenon is generally restricted to Arabic nouns containing /i/ as

¹²Arabic *rahmān* "merciful" from *rahīma* "to have mercy on," Berber *abərkan* "black" from *ibərrik* "to be(come) black" Chaker (1995).

the root medial vowel. It seems simpler to suppose innovation on the Arabic part rather than to claim the archaic inheritance of zero-vocalized nominal roots in only this branch. Moreover, parallel forms in other Afro-Asiatic daughters show no such zero-vocalized root, as in the clearly cognate Tuareg noun *isəm*, in which the synchronic root vowel /ə/ is not the result of epenthesis, but the clear reflex of Proto-Berber *i. Given these data, it seems that the vocalism of *CVC* morphemes in Afro-Asiatic was a necessary part of the underlying form. For more information, see section 2.3.1.1 below.

CVCVC Despite the commonality and familiarity of the so-called triconsonantal root from Semitic and Egyptian, it appears to have been the less common type for underived nouns in Afro-Asiatic more generally. It is nevertheless clearly recoverable in the form of cognate sets such as: Arabic *waḍamat* "intestines," Tahaggart *ādân* "bowels," possibly Egyptian <wzmw> "unidentified body part from pyramid texts," Daba *wènji* "intestines," Somali *wadna* "heart," Ometo *wazena* "heart" or Arabic *yamīn* "right hand, South," possibly Izayan *imna* "direct," Egyptian <imn> "right hand, West," Hausa *yammā* "West." Some triconsonantal roots are themselves clear derivatives from their simpler biconsonantal cousins. Consider, for example, Proto-Semitic **lišān*, which seems to reflect rather clearly the biconsonantal root attested in Coptic/Egyptian $\lambda\alpha c$ <ns> **lis*, Qabyle *iləs*, Dangaleat *lēsé*, possibly Kafa *mi-laso*¹³, all with the meaning "tongue," extended with the Semitic derivational suffix *-ān, which forms denominal adjectives.

Here, however, we can say a great deal more about the difference between superficially reconstructable surface forms and possible underlying ones. To begin, many of the same caveats we have voiced to this point are still relevant. We may question whether any triconsonantal nominal roots which begin with the consonant *ʾ on the surface are in fact vowel initial, and the same conclusions can likewise be reached here as for superficially *CV* and *CVC* morphemes. Of far greater interest is the number of novel root structure now possible given the three distinct root consonants present. We may ask, for example, whether superficially *CVCVC* roots may in fact be underlied by prosodic shapes such as *CCVC*, *CVCC*, or even more unconventional forms.

In the case of nominal morphemes, there is evidence that just such underlying forms do exist. The best evidence comes to us in the form of the so-called segolate nouns of Semitic. These are triconsonantal nouns which appear on the surface with consonant clusters word-finally, such as **bayt* "house," **arṣ* "earth," or **ʾudn* "ear." Under a templatic analysis, the difference between typical Semitic triconsonantal *CVCVC* segolate *CVCC* nouns is effectively reducible to which template happens to apply to each. In fact, we do see variability between the two, such as Akkadian and Arabic *malik* contrasted with Hebrew *melek* **malk*. A more striking example, perhaps, comes to us from Ancient Egyptian. Egyptian, from what we can reconstruct, no longer seems to allow

¹³Though here, a borrowing of Amharic *məlas* "tongue," seems just as plausible, if not moreso, than direct cognation.

surface, word-final clusters, and therefore presumably has no segolate templates into which nominal roots can be fit. Despite this, there is at least some evidence that certain Egyptian nominal patterns, and the variations that exist between them are best accounted for by supposing the existence of underlyingly segolate nominal roots, even if such forms can never overtly surface in the synchronic grammar. For further discussion, see section 5.1.4.1 below.

For this reason, it seems likely to us that the traditional "triconsonantal" nominal category should rightly be divided between the more conventional *CVVCV* forms and the segolate *CVCC* nouns, not as a projection of a prosodic template, but rather as a distinction which exists between underlying root types present throughout the family.

CVCCVC The status of so-called "quadriliteral" *CVCCVC* morphemes is an open question within the Afro-Asiatic family. They are relatively uncommon compared either to biconsonantal *CVC* morphemes, or to the triconsonantal morphemes, whether segolate (*CVCC*) or non-segolate (*CVVCV*). It is likewise difficult to recover forms which are shared between any substantial number of daughter languages. Such forms which are recoverable at all tend to be either simple reduplications, such as Egyptian <tftf> and Hausa *tàftaf* both meaning either "henna," the substance, or "henna tree": alternatively, they also commonly take the form of derivations from originally triconsonantal roots (nouns or verbs) in languages in which the original root has been lost. Consider, for example, forms like Arabic *minjal*, Hebrew *maggāl*, and possibly Akkadian *niggallu* all meaning "sickle." Each has the superficial form of an instrumental **mǝ*-prefixed noun, but there is, for example, no corresponding Arabic verb *najala*, meaning something like "reap" or "cut," from which the nominal could be formed, and we are left with an apparently quadriliteral *CVCCVC* noun. Any confusion is quickly resolved, however, when we consider parallel nouns in the Chadic languages. For example, the East Chadic Migama *ʾângùl* "sickle," clearly related to and derived from verbs such as Mafa *ngəl* "cut."

Considering the scarcity of apparently "quadriliteral" nominal morphemes which are not derived, either synchronically or in origin, we would conclude that, at the older stages of Afro-Asiatic, there were likely no morphologically simplex roots which we could rightly describe as quadriliteral.

1.3.1.2 Gender Inflection

The status of gender as a grammatical in Proto-Afro-Asiatic would appear to be beyond question¹⁴. Grammatical gender as an active category on nominals is attested in all major-order branches, present at the very least on both pronouns and independent nominals. Gender is likewise commonly expressed via agreement on adjectives, determiners, and sometimes finite verbs. In all branches, the grammatical system attested is one which reflects only two gender categories:

¹⁴Note, however, that Ehret (1995) considers nominal gender to be an innovation of the non-Omotc languages.

masculine and feminine. Although the grammatical genders of Afro-Asiatic can have some semantic component (grammatical gender often corresponds to biological sex or social gender, feminines are commonly used as diminutives, etc.), these classes are, as in the gender systems of modern Indo-European languages, largely semantically opaque and function much more as morphological concord classes than as true semantic noun classes.

Gender is most transparently visible in Berber, where (almost) all nouns are double-marked for gender, in the form of both gender suffixes and gender-specific case prefixes (see section 1.3.1.4). The masculine gender is unmarked, both in its gender suffix and in its prefix, while the feminine is marked most often with a suffix *-t* (**-t*), which is appended directly to the nominal stem, along with an additional allomorph *-ät* (**-at*), which appears following super-heavy syllables *CVC* or *CVCC*, along with a handful of lexically specified nouns. While the feminine is decidedly the marked gender in Berber, there are also a number of morphologically unmarked but grammatically feminine nouns which trigger feminine agreement despite the absence of the characteristic **-t* ending. A summary of Tuareg and reconstructed Proto-Berber gender marking is illustrated below, adapted from Prasse (1974).

| | Masculine | Feminine | |
|--------------|-----------|----------------------|----------|
| | | Marked | Unmarked |
| Tuareg | a-rgäz-∅ | ta-nkəb-t/səmmus-ät | ma |
| Proto-Berber | *ā-rgaz-∅ | *tā-nkub-t/sammūs-at | *mah |

Figure 1.7: Gender Marking in Berber

In Semitic, we find a nominal gender system, which bears a strong similarity to that of Berber. Semitic nouns lack the gender-specified case-prefixes of Berber, but the suffixes are almost identical in both form and function. The masculine gender is again unmarked, while the feminine bears overt marking. The precise form of the feminine suffix varies across and within Semitic languages between a bare **-t* appended directly to the stem, as in Akkadian *bēltu* "lady" or Phoenician *qart* "city," and a suffix **-ūt* containing one of the three Semitic vowels, as in Ge'ez *bə'əsīt* "woman, wife," Hebrew *malkūt* "kingship" or Arabic *malikat* "queen." As discussed in section 3.1.1 below, there is some reason to suppose that the **-t* variant is original, with the **-ūt* form arising, as in Berber, as an allomorph following super-heavy syllables. In Semitic, like Berber, there are also a number of grammatically feminine nouns which trigger explicit feminine concord despite lacking overt feminine suffixation, like Akkadian *ummu* "mother" or Arabic *'ard* "earth." We may therefore reconstruct the system of grammatical marking in Semitic as fundamentally akin to that of Berber, as in the table below, adapted from Lipiński (2001).

| | Masculine | Feminine | | |
|---------------|-----------|------------------------|----------|----------|
| | | Marked | | Unmarked |
| | | *-t | *-ṽt | |
| Proto-Semitic | *ʾaḥ | *ba ^ˈ al-tu | *kalbatu | *ʾimm |

Figure 1.8: Reconstructable Gender Marking in Proto-Semitic

The same pattern is largely recoverable in Ancient Egyptian. Again, two genders (masculine and feminine) are present, with the masculine being morphologically unmarked. The feminine is again the morphologically marked gender, exhibiting the characteristic Afro-Asiatic **-t* morpheme. The data from Coptic, however, suggest that the form of this suffix in Middle Egyptian was always **-ṽt*, with a fully present vowel. The unmarked feminine category is still present in Egyptian, but it is increasingly a relic class, as more and more feminine nouns are marked with overt feminine morphology. Examples are provided below, adapted from Osing (1976)

| | Masculine | Feminine | |
|---------------|-----------|----------------------|----------|
| | | Marked | Unmarked |
| Coptic | ⲱⲗⲧ | ⲟⲩⲟⲟⲩⲉ | ⲉⲗⲱⲧ |
| Hieroglyphic | <ʒpd> | <wh ^ˈ .t> | ʒbdw |
| Reconstructed | *ʒapvd | *wah ^ˈ ṽt | *ʒabadṽw |

Figure 1.9: Gender Marking in Coptic and Middle Egyptian

While the three northern Afro-Asiatic branches clearly and robustly attest to approximately the same gender system, the category of gender is somewhat more complicated in the southern members of the family. In Chadic, the gender system is no less robust than in its northern cousins, but it is distinctly different in both the overt form of the marking morphemes, and the structure of the gender system. In Semitic, Egyptian, and Berber, gender and number are independent morphological categories with each noun being *both* masculine/feminine *and* singular/dual/plural. The Chadic system is structurally distinct, as masculine, feminine, and plural are each mutually exclusive nominal categories. Moreover, gender categories are not explicitly marked on the nouns themselves, but rather often come to be marked by deictics or determiners, which are often affixed to nouns. In some cases, this unstable system of morphologically unmarked grammatical gender is lost altogether as the gender system collapses. Consider the comparison of gendered nouns and gender marking below, adapted from Schuh (2019).

| | Bare Noun | | | Determined Noun | | |
|---------|-----------|---------|----------|-----------------|-------------------------|------------------|
| | Masc. | Fem. | Pl. | Masc. | Fem. | Pl. |
| Hausa | rǎgò | tunkiyà | tumākì | rǎgò-n | tunkiyà-ř ¹⁵ | tumākì-n |
| Miya | mbòrgu | tómáku | tómakwiy | ná-kən mbòrgù | tá-kən tómáku | níy-kin tòmakwiy |
| Mokilko | kùlé | 'éròwó | kùlí | kùlé 'ényó | 'éròwó 'óttíyó | kùlí 'ényó |
| Musey | gàmlà | tímí | tímígí | gàmlà-nà | tímí-ra ¹⁵ | tímígí-na |

Figure 1.10: Gender Marking Across Chadic Languages

Despite the apparent weakness of gender as an overt morphological category in the Chadic languages, the gender of a given cognate noun is remarkably stable across Chadic, pointing to a shared inheritance of gender from Proto-Chadic. Indeed, both Stolbova (2016) and Schuh (2019) consider gender to be an inherited feature of Proto-Chadic from Proto-Afro-Asiatic, despite similarly reconstructing the absence of clearly detectable gender marking morphemes. In this sense, we may consider the category of gender in Chadic as akin to grammatical gender in German, in which much of the overt nominal marking of the more archaic language (Proto-Germanic, Proto-Indo-European) has been lost, but gender remains as a robust inflectional category across the noun phrase.

The gender system of Cushitic resembles that of Chadic in a number of respects. Most notably, gender is frequently zero-marked on nouns, such that the gender of any given noun is difficult or impossible to determine simply from the surface structure and is only revealed through concord. A distinctly marked feminine gender is nevertheless detectable in Beja, both in the form of the gender-agreeing case-prefixes/articles, as well as in the form of a true feminine suffix, surviving as *-t*, and in the Agaw languages, where it is marked with *-t*, though only on the accusative-absolute form of the noun. The corresponding masculines are unmarked. Another feature which is shared with Chadic is the fact that in many Cushitic languages, number and gender are not independent features of nominals. In Chadic, we have seen that plurality behaves as an exclusive class with respect to masculine/feminine, whereas in Cushitic, plurality instigates what is commonly referred to as "gender polarity," a phenomenon wherein the gender of a noun is inverted when it is pluralized (M→F, F→M). Thus gender polarity perhaps reflects a time when Cushitic, like Chadic, had a nominal system in which gender and number were conflated as values within a single system of nominal inflection. Several Cushitic gender systems are presented below, adapted from Appleyard (2011).

¹⁵In which both the Hausa article *-ř* [r] and the Musey article *-ra* reflect a Proto-Chadic **-ta*, which has been tapped intervocally.

| | Masc. | Fem. | Pl. |
|-----------|------------|--------|------------|
| Afar-Saho | áwka | awká | irri (M) |
| Somali | ínan | inán | ínammo (F) |
| Oromo | nama | lafa | namōta (M) |
| Bilin | gərwä | gänä-t | gərəw (C) |
| Beja | Bare | tak | yās-t |
| | Determined | ’ō-tak | ti-yās |

Figure 1.11: Gender Marking Across Cushitic Languages

The category of gender requires the most discussion as it pertains to Omotic. The Omotic languages are often described by scholars, such as Ehret (1995), as completely lacking the category of nominal gender. Indeed, this is one of the arguments that Ehret musters in support of his positioning of Omotic as the first and most divergent branch of Afro-Asiatic, suggesting that the other branches innovated the gender system together at some point in their common, non-Omotic lineage. It must be noted, however, that when scholars refer to the lack of Omotic gender, they are referring to the absence in Omotic of the characteristic **-t* suffix indicating feminine gender, for gender as a morphological category is alive and well within the Omotic family. Nominal gender is reflected in verbal agreement affixes for 3rd Sg., in agreement with various deictics and determiners, and even on the noun itself in the case of animate nouns with biological sexes.

We may even question the notion that Omotic lacks the common Afro-Asiatic feminine marker **-t*, as Bender (1989) notes that many Omotic languages, including Kulla (*-to, -ta, -tu*), Konta (*-tu*), Zayse (*-ti*), and Kore (*-ita, -itte, -atse*) all attest feminine gender markers, which would appear to be fine potential reflexes of the original **-t* form. Given these facts, we might more rightly consider Omotic, as it pertains to gender, to be quite similar to Cushitic. Omotic inherited the system of gender differentiation from Proto-Afro-Asiatic but has either partially or completely lost the morphemes which originally signaled this distinction on nouns. Nevertheless, the category is still active on the marking of verbs and on deictic elements throughout the noun phrase.

Considering the state of gender marking across the various daughter branches, we may reconstruct the gender system of Proto-Afro-Asiatic with comparative clarity. Two grammatical genders are securely reconstructable, with the masculine being morphologically unmarked and functioning as the default gender in nouns¹⁶. The feminine gender, meanwhile, was overtly marked. The forms attested in the daughters allow for two possible shapes for this feminine morpheme (**-ūt* or **-t*). It is possible that both shapes occurred in Proto-Afro-Asiatic,

¹⁶Despite this, there is a semi-strong tendency in Afro-Asiatic languages for grammatically feminine forms to become default in plural marking, likely due to the cross-contamination of the feminine suffix in **-t* and the collective suffix in **-t*

but we consider the reconstruction of $*-t$ to be more primary, for a number of reasons. First, this is the form recoverable on pronouns and deictics in the persistent $n/t/n$ system of number and gender marking which occurs throughout Afro-Asiatic as demonstrated by Greenberg (1960). It would also appear to be the more basic of the morphological forms recoverable from Berber, Semitic, and Cushitic, where the original, unaltered system is presumably retained. Sample reconstructed Proto-Afro-Asiatic nominals are presented below.

| | Masculine | Feminine | |
|--------------|-----------------------------|------------------------------|------------------------------|
| | | Marked | Unmarked |
| Afro-Asiatic | *ʔab ¹⁷ "father" | *ʔam-t ¹⁸ "woman" | *ʔvmm "mother" ¹⁹ |

Figure 1.12: Reconstructable Gender Marking in Proto-Afro-Asiatic

1.3.1.3 Number Inflection

In contrast to nominal gender, inflection for number is significantly more difficult to reconstruct in its precise form for Proto-Afro-Asiatic. Number is present as an active category of nominal inflection in all Afro-Asiatic daughters, and appears as a category in verbal inflection in all daughters which retain an explicit form of finite verbal inflection. Singular vs. plural categories are recoverable from all branches, while duals are attested in Semitic and Egyptian, and sporadically in the Chadic pronominal system²⁰. Despite the commonality of the number as a category, the distinct forms of the plural morphemes are quite difficult to reconstruct, being rather disparate across the branches.

We may begin our investigation of number in Semitic, where the forms of nominal pluralization are most well-known. Traditionally, Semitic plurals are referred to as belonging to one of two basic types; "sound plurals" and "broken plurals." The sound plurals, which we might today call the concatenative plurals, are those plurals formed with distinct pluralizing suffixes. For masculine nouns, plurality is bound up with case marking, as the plurals are formed by the lengthening of the characteristic case marking vowel²¹. The feminines are also formed by lengthening, but not of the case vowel. Rather, they are formed by

¹⁷Arabic ʔab, possibly Egyptian <ɜb.t> "family," Izayan *ibba*, Hausa *ūbà*, Agaw *abaa*, possibly Dizi ʔyab

¹⁸Akkadian *amtu*, Egyptian <imɜ.t> "female animal," Warji *ámái*, Kambatta *amta*

¹⁹Akkadian *ummu*, Tahaggart *ma*, Egyptian <mw.t> extended with .t, Kilba *amà*, Sidamo *ama*

²⁰Northern Berber languages also attest to a morphological dual ending, but it is rather transparently a borrowing of the Arabic dual ending reanalyzed as a word-level clitic meaning "two." Such forms are not commonly reconstructed for Proto-Berber.

²¹Or by the apparent retention of a lengthened suffix which is originally a case-vowel in function in those languages which lose case marking, as in the case of the Hebrew plural *-im*.

the lengthening of the $*(a)t$ feminine suffix to $*\bar{a}t$, regardless of case. In addition to these simple concatenative plurals, Semitic languages, like Afro-Asiatic more generally, are characterized by "broken plurals," which are formed not by the addition of suffixes, but by the apparent non-concatenative manipulation of the nominal stem. A number of such broken plural "patterns" are attested throughout Semitic. For more information, see section 3.1.4. Reconstructions of nominal plural formations are presented below, adapted from Lipiński (2001).

| | Sound Plural | | Broken Plural |
|------|--------------|-------------|----------------------|
| | Masc. | Fem. | |
| Nom. | $*\bar{u}$ | $*\bar{a}t$ | $*kalb \sim *'aklāb$ |
| Obl. | $*\bar{i}$ | | |

Figure 1.13: Plural Formation in Semitic

The formation of plurality is likewise quite easy to reconstruct in Proto-Berber, where the distinction between sound plurals and broken plurals is similarly attested. However, the Berber sound plurals are not directly related in form to their Semitic counterparts. Berber sound plurals are not intermeshed with case-marking as in Semitic, although the Berber case marking prefixes do have distinct singular and plural forms which agree with the number of the noun to which they append. Masculines form their plurals by the affixation of a $*-an$ suffix, while feminines are formed with $*-in$. The broken plurals are again formed by the manipulation of the nominal stem directly. For more information on the broken plural patterns of Berber, consult section 4.1.3.2. The basic plural forms of Proto-Berber are presented below, adapted from Prasse (1974).

| Sound Plural | | Broken Plural |
|--------------|--------|-------------------------------------|
| Masc. | Fem. | |
| $*-an$ | $*-in$ | $*\bar{a}-dkir \sim \bar{i}-dukran$ |

Figure 1.14: Plural Formation in Berber

Approximately the same system, that of sound plurals mixed with broken plurals, is attested in Ancient Egyptian. In hieroglyphic Egyptian, it is entirely clear that the sound plural of masculine nouns is formed by the addition of a suffix written as $\langle.w\rangle$, while feminines are formed by the transparently derived suffix $\langle.wt\rangle$. To identify the precise shape of these plural affixes, however, we must again rely primarily on the attestation of Coptic. And here the situation is further complicated, because the original Egyptian system of pluralization does not survive into Coptic as such. Rather, only a few archaically pluralized

nouns survive, and we must use this sparse attestation to recover a picture of the form of the Middle Egyptian plural morphemes. Consider the Coptic forms presented below.

| | Hieroglyphic | | Coptic | |
|-------|--------------|-----------|--------|-------|
| | Sg. | Pl. | Sg. | Pl. |
| son | <ḥq̣' > | <ḥq̣'.w > | ϩⲱⲱⲕⲉ | ϩⲟⲟⲕⲉ |
| god | <ntr > | <ntr.w > | ⲛⲟⲩⲧⲉ | ⲛⲧⲏⲣ |
| woman | <ḥim.t > | <ḥim.wt > | ϩⲓⲙⲉ | ϩⲓⲟⲙⲉ |

Figure 1.15: Sound Plurals in Coptic and Hieroglyphic Egyptian

Due to their unstressed position at the ends of words, the Middle Egyptian plural suffixes themselves do not survive directly into Coptic. There is general agreement that the form of the feminine sound plural must have been something like **-wöt*. As revealed by alternations such as ϩⲓⲙⲉ/ϩⲓⲟⲙⲉ, corresponding to Middle Egyptian **ḥimöt/*ḥimawöt*, the addition of the feminine suffix <.wt > did not create an open syllable and must therefore have been consonant initial. The form of the masculine sound-plural suffix is somewhat more difficult to recover. Scholars have proposed varying forms, including **-aw* (Loprieno, 1995), **-uw* (Callender, 1987), **-wu* (Vergote, 1969), and **-ū* (Vycichl, 1955). For this paper, we remain relatively agnostic regarding the precise nature of the Egyptian sound-plural suffix, aside from the observation that, on the basis of Coptic, *it must not have been consonant initial*.

In the southern Afro-Asiatic languages, by contrast, the marking of plural is considerably more variable, and it is far more difficult to reconstruct a single ending even for each family respectively. In some Chadic languages, particularly those in Central Chadic and in the Bole-Tangale group of Western Chadic, nominal plurality is largely unmarked. Schuh (2019) notes that in Bole, for example, only 165 of 2400 surveyed nouns attest overt morphological plural forms, and nearly all of these represent animates, either human or animal. He likewise notes a "nearly exhaustive" list of morphologically plural nouns in Kapsiki, which totals 15.

More common are those languages which exhibit common morphological plurality, and these point to a few distinctive Proto-Chadic markers, though only a few bear close resemblance to forms outside Chadic. Newman (1990) divides the Chadic plural morphemes into 4 rough categories:

- Consonantal Suffixes
- Vocalic Suffixes
- Vocal Infixation/Apophony
- Reduplication/Gemination

Of consonantal suffixes, Newman reconstructs three for Proto-Chadic, with the most common and best-attested being the **-aki* plural suffix. Another is a plural in **-n*, bearing a certain similarity to like plurals attested in Berber. Finally, there is a plural morpheme in **-ḍ(i)* of uncertain origin. Attestations of these plurals across the four major Chadic branches are presented below, adapted from Newman (1990).

| | West Chadic | Central Chadic | East Chadic | Masa |
|---------------|----------------|----------------|--------------|--------------------------|
| <i>*-aki</i> | Hausa: -àkī | Podoko: -áki | Mukulu: -àgi | Musey: -ṽgi |
| <i>*-n</i> | Hausa: -an(n)ī | Gude: -nyī | Kera: -a/əŋ | Masa: -nai ²² |
| <i>*-ḍ(i)</i> | Ngizim: -ḍ | Gidar: -ḍe/i | Mukulu: -ḍi | – |

Figure 1.16: Consonantal Suffixed Plurals in Chadic

Newman likewise notes four common vowel-suffix plurals, though he mentioned that the lack of solid reconstructions of Proto-Chadic vowels, taken together with the general instability of vowels diachronically, makes these forms more difficult to reconstruct. Newman reconstructs only two with any degree of certainty to Proto-Chadic; the **-i* plural and the **-ay* plurals.

| | West Chadic | Central Chadic | East Chadic | Masa |
|-------------|-------------|----------------|----------------|-----------|
| <i>*-i</i> | Hausa: -ī | Margi: -i | Migama: -i | Musey: -i |
| <i>*-ay</i> | Hausa: -ai | Gude: -əyə | Dangaleat: -ai | Masa: -ai |

Figure 1.17: Vocalic Suffixed Plurals in Chadic

Chadic is known to have a number of non-concatenative, "internal" plurals. Despite the superficial similarity with Berber and Semitic, however, they are typically regarded as Chadic internal developments, and few are conventionally reconstructed for the common Chadic period. One such form which is reconstructed for Proto-Chadic, and which does bear a striking resemblance to other AA plural formations, is the so-called "internal <a>" plural. We may characterize this plural form, depending on our theoretical orientation, either as the infixation of an <ǎ> morpheme, or the templatic interdigitation of a /ṽ/ into the root skeleton. Sample internal <a> plurals from Chadic are provided below, adapted from Newman (1990).

²²This form survives in only a few words in the Masa group, as part of suppletive plural formations.

| | Sg. | Pl. |
|-------------------------|--------|-------|
| West Chadic (Ron) | shôm | shwám |
| Central Chadic (Logone) | hlin | hlan |
| East Chadic (Dangaleat) | tapirò | tapàr |
| Masa | – | |

Figure 1.18: "Internal <a>" Plurals in Chadic

Although reduplication is rather common as a process for plural formation in the languages of the world, the Chadic languages attest a particular type of reduplicative plurals which is shared with their Cushitic and Omotic sisters to the east. Chadic plural reduplication takes the specific form of $*-VC(V)$ in which the C represents the final stem consonant, while the vowel(s) of the suffix is/are either copied from a prior vowel in the word, or simply fixed as part of the suffix (this is particularly true of the reduplicated plurals of Hausa). Reduplicated plurals often co-occur with other plural morphemes, such as the plural suffixes. This leaves open the question (discussed further in section 1.3.1.5 below) of whether reduplication began as a derivational process, such as for the formation of collective nouns, which were then subject to normal affixing pluralization, or whether this co-occurrence is simply an instance of redundant double marking of the sort seen with some regularity in diachronic linguistics. Examples of reduplicated plurals are provided below, again from Newman (1990).

| | Sg. | Pl. |
|------------------------|------|--------|
| West Chadic (Ron) | gùl | gùlal |
| Central Chadic (Mbara) | yômo | yômómó |
| East Chadic (Bidiya) | ’úcô | ’ucác |
| Masa | – | |

Figure 1.19: Reduplicated Plurals in Chadic

Plural formation in Cushitic is similar in a number of respects to that of Chadic. Both affixing and internal plurals are attested, though both come in a dizzying array of distinctive formations. Many are particular to a single branch of Cushitic, or indeed even to a single language. Nevertheless, several are common or distinctive enough to be postulated for Proto-Cushitic. In his discussion of Cushitic nominal plurality, Zaborski (1986) does not utilize Newman’s categorization of plural morphemes, but they are appropriate for Cushitic as well. Consonantal suffixes show a number of Afro-Asiatic cognate forms. $*-t$ plurals likely represent old derived collectives (as attested in Semitic, for example) which have become incorporated into the nominal paradigm. The $*-n$ plural

may be shared with Berber, Chadic, and possibly Semitic, and may represent the ancestor forms of the Cushitic *-*m* plurals. The plurals in *-*k* are likely cognate with the *-*aki* plurals of Chadic. Consonantal plurals are presented below, adapted from Zaborski (1986).

| | Beja | Agaw | Rift | East Cushitic |
|-----|------|-------------|-------------------------------------|----------------|
| *-t | – | Qimant: -ti | – | Afar-Saho: -ta |
| *-n | – | Agaw: -än | Iraq ^w : -en | Somali: -an |
| *-m | – | – | Iraq ^w : -emu | Sidamo: -ma |
| *-k | – | Awngi: -ka | Iraq ^w : -k ^w | Dahalo: -eka/i |

Figure 1.20: Consonantal Suffixed Plurals in Cushitic

Vocalic suffixes are somewhat fewer in number, but they include many of the suffixes which show some of the best cognation with outside plural affixes. The plural in *-*ɨw* evokes the <.w> and (possibly) the *-*ū* masculine plurals of Egyptian and Semitic respectively. The *-*ɨy* plural appears to be a dead ringer for the *-*ay* plural of Chadic, and the *-*a* plural may be cognate with similar formations in Omotic. Examples of vocalic plural suffixes are presented below, again from Zaborski (1986).

| | Beja | Agaw | Rift | East Cushitic |
|-----|------|--------------|------|----------------|
| *-w | – | Qimant: -ū/w | – | Afar-Saho: -wa |
| *-y | – | Khamir: -tay | | Afar-Saho: -ay |
| *-a | -a | – | | Oromo: -a |

Figure 1.21: Vocalic Suffixed Plurals in Cushitic

Reduplicated plurals are also quite strongly attested in Cushitic, and here we see arguably the strongest cognation between two Afro-Asiatic plural formatives, as the Cushitic reduplicated plurals show precisely the same final consonant reduplication, with optional vowel copying, which is seen in Chadic. Moreover, the reduplicative plural is far better attested in Cushitic than any of the "sound" affixing-plurals, appearing in three of the four major branches of Cushitic, excepting Beja, which has a simpler system of nominal pluralization, as seen below (again from Zaborski (1986)). Beja attests reduplicated plurals on adjectives only, and these appear to be of a different sort, reduplicating the initial consonant/syllable, such as *di*ʹ vs. *dáde*ʹ.

| | Sg. | Pl. |
|------------------------|-----|----------|
| Beja | | – |
| Agaw (Bilin) | il | ilil |
| Rift (Gorowa) | áko | ākókí' i |
| East Cushitic (Somali) | af | afaf |

Figure 1.22: Reduplicated Plurals in Cushitic

Cushitic languages are also strongly characterized by a distinctive internal plural formation involving alternations of vowel length within the nominal stem. This "broken" plural form has been speculatively linked with the "internal <a>" plural of Afro-Asiatic, though the connection is far from clear. More interestingly, although the long vs. short alternation is widely-attested within the family, there is clade-internal disagreement over the use of the forms. Beja, for instance, contrasts singulars with long, stem-internal vowels and plurals with short vowels. In Afar-Saho, however, the roles are reversed, with short vowels in singular stems and long vowels in their corresponding plurals. Iraq^w may attest evidence of both such formations.

| | Sg. | Pl. |
|---------------------------|--------|--------|
| Beja | yām | yam |
| Agaw | | – |
| Rift (Iraq ^w) | mūna | mune |
| Rift (Iraq ^w) | digima | digēmi |
| East Cushitic (Afar-Saho) | ḥutuk | ḥutūka |

Figure 1.23: Vowel-Length Internal Plurals in Cushitic

The Agaw languages have been left absent here as they do not directly attest the length-alternation plural formations which characterize the remainder of Cushitic. They do, however, directly attest the internal a-plurals, which we have noted for Chadic, as in *mändäq* "wall" vs. *mānadiq* "walls" in Bilin. Indeed, it is the presence of these internal a-plurals in the Agaw languages that leads scholars to postulate that this form underlies the lengthened plurals of the other languages, supposing, for instance, that Beja *yam* goes back to an original **yaam*, Iraq^w *mūna* and *digēmi* go back to original **mauna* and **digaimi*, and Afar-Saho *ḥutūka* reflects an original **ḥutauka*. For the purposes of our analysis, we remain agnostic regarding the origin of the lengthened plurals of Cushitic, as this has no bearing on expected syncope.

To close out our discussion of plurality in Cushitic, we may note that Cushitic languages also attest to the formation of plurals by the shifting of accent from

its position in the singular stem. Plurals of this sort are attested in forms such as Beja *haḏāb* "lion" vs. *hāḏāb* "lions" or Afar-Saho *ayró* "day" vs. *áyro* "days." Despite the relative commonality of such plural forms across Cushitic, the pattern itself is not typically reconstructed for the proto-language, as most scholars regard plurals of this sort as the vestige of old affixed plurals, in which the presence of the original affix triggered a recalculation of accent placement before being lost due to subsequent sound changes.

Finally, we can turn our attention to plural marking in Omotic. As one might expect, data from Omotic is the poorest for any Afro-Asiatic branch. Nevertheless, we can discuss plurality in Omotic to the extent that it has been analyzed. Bender (2000), in his discussion of plurality notes:

As is true of many Ethiopia-area languages, in Omotic the sg. form is often used for pl., especially with numerals and other quantifiers. Singular nouns end in terminal vowels (TVs), while plurals are unmarked or have suffixes which are usually more than simple V. There is no pervasive Omotic plural suffix.

Of the many plural morphemes which occur across Omotic, those most relevant to our discussion would appear to be the forms in **-n* and in **-t*. Bender notes these as both the most common of the plural formatives found within the family, and those which are the most likely to show potential cognation outside of it. The **-n* plural, he notes is quite common and bears strong resemblance to its counterparts in Berber, Chadic, etc. The **-t* plural looks like a strong cognate with the similar forms of Cushitic. Examples of these plural morphemes from the major Omotic branches are provided below, adapted from Bender (2000).

| | *-t Plural | *-n Plural |
|-----------------|-------------------------|-------------|
| Ometo | Wolaytta: -ati | Malé: -ansi |
| Gimira-Yem-Kafa | Bench: -nd | Bench: -nd |
| Dizoid | Dizi: -el ²³ | |
| Aroid | – | Hamer: -na |
| Mao | | – |

Figure 1.24: *-t and *-n Plurals in Omotic

It is likewise important to note that the internal or broken plurals which elsewhere characterize Afro-Asiatic are, on the whole, absent from Omotic. Newman remarks on the absence of the internal a-plural from the family, and likewise mentions that reduplication as a plural formation process is rather uncommon.

²³Speculated by Bender to result from the lenition or tapping of an originally intervocalic *t.

Further, to the extent that reduplication does occur in Omotic, it is typically full reduplication (as in Shinasha *bolla* "mule" vs. *bollobollá* "mules," from Hayward (2012)) and it is therefore unlikely that we should group these plural formations with their more morphologically distinctive Cushitic and Chadic counterparts. He does mention the sporadic presence of Chadic/Cushitic-type reduplicative plurals in the Kefoid and Yem languages, citing examples like Yem *asa/asusa* "man/men." Because such forms are relatively uncommon in Omotic, it is unclear whether these represent true cognate forms, or merely convergent but independent developments.

Despite this prevalence of plurality as a nominal category across Afro-Asiatic, the data from the daughter languages makes it quite difficult to reconstruct either a single plural affix or a set of plural affixes to the Proto-Language. The so-called broken or internal plurals are, outside of Omotic, ubiquitous throughout the family and it would appear that plurals of this form can likely be projected back to Proto-Afro-Asiatic. The specific forms of these broken plurals, including the internal a-plural, are difficult to reconstruct as their precise forms can appear quite distinct across the daughter branches. For the sound plurals, the situation is even less clear. All daughters attest to plurality as a nominal category, to a greater or lesser degree, but few of the morphemes used in the formation of these sound plurals show strong cognation beyond a single branch or two.

The most common of the sound-plural affixes is without question the plural in **-n*, being attested as a noun-plural suffix in Berber, Chadic, Cushitic, possibly Omotic, and even Semitic in the plurals of, for example, the South Semitic languages. We are nevertheless reluctant to reconstruct this morpheme as the clear sound-plural affix of Proto-Afro-Asiatic, as it seems likely that this morpheme began as the plural marker of the deictic/pronominal n/t/n system of number/gender marking, as first proposed by Greenberg (1960). Consider the following determiners or pronouns from various Afro-Asiatic daughters.

| | M. | F. | Pl. |
|-----------------|--------------------|---------|----------|
| Semitic (Ge'ez) | zən-tu | zət-ti | 'əlōn-tu |
| Egyptian | <pn> ²⁴ | <tn> | <nn> |
| Berber (Wargla) | wiḍiḍən | tiḍiḍət | iḍiḍənin |
| Chadic (Masa) | -na | -ta | -na |
| Cushitic (Beja) | ben | bet | balin |
| Omotic | | – | |

Figure 1.25: n/t/n Agreement System in Afro-Asiatic Pronouns/Deictics

²⁴The origin of the <p> element of the masculine form is unclear, as it is elsewhere unattested in Afro-Asiatic. It may represent an attempt on the part of native speakers to differentiate the masculine and plural forms. Regardless, it has little bearing on the prevalence of the n/t/n system more broadly.

While it is possible that this $*-n$ form was the plural marker of both the deictic/determiner paradigm and of bare nominals, the fact that it is attested sporadically as a plural marker across the daughters suggests that has been shifted over from the pronominal system into nouns independently along each line of descent. This hypothesis is supported by the fact that while $*-n$ is attested as a plural marker in Chadic, it is frequently only so for determined nouns. We are therefore reluctant to reconstruct this morpheme as the sound plural marker of nominal in Proto-Afro-Asiatic.

The other plural affixes attested in the daughters are typically confined to only a few branches, making their secure reconstruction to Proto-Afro-Asiatic effectively impossible. The Egyptian and Semitic masculine plurals ($\langle .w \rangle$ and $*-\bar{u}$ respectively) make a plausible cognate pair, but are generally unattested outside of these two branches. Cushitic and Chadic show plurals in $*-k$, but again, these are practically unseen elsewhere in the family, including in Omotic, with which Cushitic has had substantial contact and may be more closely related. Likewise, Cushitic and Omotic share a plural in $*-t$ ²⁵, but this form is both unattested elsewhere, and is likely better analyzed as the outcome of the collective suffix in $*-t$, as in Semitic numerals such as $*\acute{s}al\bar{a}t-at$ "three, a triad" or Egyptian collectives like $\langle sb \rangle$ "star" vs. $\langle sb \rangle.t$ "constellation," which has been reinterpreted by speakers as a maker of plurality. Even among the broken plurals, where we find the stem-final consonant reduplication of Chadic and Cushitic, we are perhaps better-served as treating this plural formation as the reanalysis of some older derivational process of reduplication, the same process which gave rise to the large numbers of reduplicated $C_1-C_2-C_2$ roots in the Northern Afro-Asiatic daughters, as well as independently within Cushitic.

Taking into consideration the great variability and contradictory nature of the evidence from the Afro-Asiatic daughter languages with respect to the shape of nominal plural morphemes, one is almost tempted to conclude that Proto-Afro-Asiatic, like Proto-Sino-Tibetan, lacked true morphological plurality on nouns²⁶. Such a conclusion is likely unwise, however, in the case of Afro-Asiatic. In Sino-Tibetan, the absence of plurality is conserved in a number of daughter languages, such as Mandarin or Tibetan, and is likewise absent from any agreement or concord morphemes throughout the grammar. In Afro-Asiatic this is not so. As we have discussed, all Afro-Asiatic daughters reflect an active plural category, and plurality is deeply enmeshed in the pronominal system, agreement with deictics and adjectives, and even on agreement morphemes indicating the subjects of finite verbs.

We consider it, therefore, more likely that Proto-Afro-Asiatic nominals did indeed have morphological plural forms, but that due to the time depth which separates the Proto-Afro-Asiatic language from the present day, the precise form of such a morpheme or morphemes is unrecoverable. For the purposes of our proposed syncopation analysis, we will return to our discussion of plural formation as we trace the development of the Afro-Asiatic morphological system along its

²⁵Connections with the Chadic plural in $*-d$ are unclear.

²⁶Or, if we grant the presence of the broken-plural formations, that it lacked true plural affixes for nominal inflection

various lines of descent, where plural morphemes appear with far greater clarity.

1.3.1.4 Case Inflection

Finally, we may discuss whether the Afro-Asiatic noun was inflected for case. Outside of the pronominal system, which attests a possessive, an objective and a seemingly elsewhere-used "independent" form, nominal-case marking is completely unattested in Ancient Egyptian. The lack of reliable vocalization for older stages of Egyptian, combined with the well-known loss of word-final short vowels in Egyptian²⁷ means that any case-marking vowels which might originally have been present would have been expected to be lost.

The Chadic languages are likewise commonly regarded as being a caseless branch of Afro-Asiatic, but this is not entirely true. While largely absent from the family, distinct case-marking for direct objects is attested in the Central-Chadic-A languages Gude and Lamang. These languages share a common accusative case marking prefix, taking the form of *tš-* (Gude) and *t-* (Lamang). This system of case marking does not appear to be particularly deeply embedded within the grammatical structure of either language, being neither an obligatory case marker nor permissible at all with semantically indefinite direct objects. This latter fact has led to the conclusion that this form began as an original deictic and has since switched its function to that of case marking. We may rightly regard this case-marking prefix as an innovation of the Central-Chadic-A branch and, indeed, neither Stolbova (2016) nor Schuh (2019) reconstruct any case marking to the common Proto-Chadic stage.

In the Cushitic branch, in contrast to Egyptian and Chadic, we find that case marking is far more widely attested, appearing in all major Cushitic branches except South Cushitic. The Cushitic case systems are, in general, characterized by a distinctive marked-nominative system in which the accusative case form is unmarked and functions as the citation form of the noun, while the nominative form receives overt case marking and is used solely as the subject of verbs²⁸.

Although the rather striking marked-nominative alignment seems to be quite securely reconstructable to the Cushitic family as a whole, the actual morphemes or morphological processes which mark case do not point cleanly to a single secure reconstruction of case marking in Proto-Cushitic. In several East Cushitic languages, such as Sidamo or Afar-Saho, we find systems in which the nominative is marked by a *-i/-u*, while the accusative is unmarked. In these systems, case is typically marked only on masculine nouns, and only those masculine nouns ending in vowels. It is not entirely clear that it is possible to reconstruct

²⁷The stage at which word-final short vowels was lost in Egyptian is uncertain. They are clearly absent from Coptic, and they would appear to have been absent from the Late Egyptian of the Amarna letters as well. Whether this means they were lost in Proto-Egyptian itself, or at some point in the development from Proto-Egyptian to Late Egyptian is impossible to recover.

²⁸In the literature regarding case marking in Cushitic, this system is sometimes misrepresented as an ergative-absolutive system, due to the distributional similarities between the true absolutive case of the ergative system and the citation accusative of the marked nominative. Despite this confusion, the Cushitic languages are decidedly **not** ergative.

this system even to the level of Proto-East-Cushitic, however, as other East Cushitic languages attest quite different systems with obviously different origins. Oromo, a Lowland East-Cushitic language like Afar-Saho, rather attests a system in which the accusative is unmarked, but the nominative is marked on both masculine and feminine nouns by suffixes *-ni* and *-tí* respectively. Somali, another Lowland East-Cushitic language, attests an entirely different system, one in which the marking of the nominative case involves the change of tone from H to L on the last syllable of the noun, though this tonal displacement does not occur if the noun is marked by a definite determiner. The Central Cushitic languages attest a different system, one in which the accusative is no longer unmarked, but rather, indicated by an *-s* suffix, while the nominative is either unmarked or shows the same *-i/-u* marking as in East Cushitic. Beja, the most divergent Cushitic branch, likewise attests the most divergent case-marking system, with both nominative and accusative being indicated by case marking prefixes for both masculine and feminine nouns. A summary of these case systems is presented below, adapted from Hasselbach (2013) and Appleyard (2011).

| | | Masc. Sg. | Fem. Sg. |
|-----------|------|------------------------|----------|
| Beja | Nom. | ³ ū-/wi- | ti- |
| | Acc. | ³ ō-/wi-/-b | ti- |
| Sidamo | Nom. | -i/-u | -∅ |
| | Acc. | -∅ | -∅ |
| Afar-Saho | Nom. | -i/-u | -∅ |
| | Acc. | -∅ | -∅ |
| Oromo | Nom. | -ni | -tí |
| | Acc. | -∅ | -∅ |
| Somali | Nom. | inan | naagi |
| | Acc. | inán | náág |
| Bilin | Nom. | -∅ | -∅ |
| | Acc. | -s | -t |
| Qimant | Nom. | -i/-a | -t |
| | Acc. | -s | -t |

Figure 1.26: Case Marking Across Cushitic

These attested forms make the reconstruction of a Proto-Cushitic case system somewhat difficult. Sasse (1984) suggests that way may reconstruct, on the basis of similarities among East Cushitic, Agaw, and Beja, a system of nominal case marking as follows,

| | | |
|---|-------|-----|
| | M. | F. |
| A | *-a | *-a |
| N | *-u/i | *-a |

Figure 1.27: Proto-Cushitic Case System from Sasse (1984)

This reconstruction is not without difficulty, however. Tosco (1994), for example, regards the case-marking function of these affixes as secondary, and suggests, given their striking usage often with definite nouns only, that the original function of the **-i/*-u* marker was as a topic or focus discourse marker and that Proto-Cushitic had no overt marking of case on nominals.

Although they are more poorly attested, the case systems of the Omotic languages should rightly be discussed alongside their Cushitic counterparts as they appear to be quite similar in form, function, and origin, and may possibly represent a component of the grammar common to an Cushitic-Omotic group. Within Omotic, most nouns end with what are commonly referred to as terminal or thematic vowels. These terminal vowels are separable from the nominal root and are clearly distinct affixes, but, like the theme vowels of Romance verbal classes, provide little to no semantic or grammatical content. The accusative case in most Omotic languages corresponds to this nominal form marked with the terminal vowel. The nominative case forms of the various Omotic languages show some similarities with their Cushitic counterparts. In many of the Omotic languages, the nominative case forms are marked by a *-i/-y* suffix whereas Aari and Dizi attest nominative-case marking in **-n*, like Oromo. A summary of some Omotic case-marking forms is provided below, adapted from Hasselbach (2013).

| | Nom. | | Acc. | |
|-------|---------------|-------|---------|-------|
| | DEF | INDEF | DEF | INDEF |
| Zayse | -i/-y | | -∅ | |
| C'ara | -i/-y | | -a | |
| Aari | -(i)na/-(i)ne | -∅ | -(i)nam | -∅ |
| Male | -í | kaní | -i | kani |

Figure 1.28: Example Case Marking in Omotic

In Berber, unlike in Cushitic or Omotic, we find a much clearer picture of the case marking across the daughters, and a much cleaner reconstruction for Proto-Berber. The Berber case system was traditionally described using terminology borrowed from the Arabic grammatical tradition, with the two Berber cases referred to as the "free state" and the "construct/annexed state." This re-

flects the fact that the case system of Berber was known, even in pre-theoretic terms, to be quite different from the case system of Arabic and Semitic at large. Much like that of Cushitic, the Berber case system is sometimes erroneously described as an ergative-absolutive alignment, as its so-called "free state" can be used as the citation form of nouns, to mark the subjects of predication, and to mark the objects of transitive verbs. This description is not accurate, since, as noted by Satzinger (2000) and König (2008), the construct state, which is supposed to correspond to the ergative under this analysis, is used not only to indicate the subject of transitive or agentive verbs, but also for the subjects of any finite verb, though not subjects of predication. Consider the examples from Qabyle below, adapted from König (2008).

- (6) inɣa wergaz aqcic
kill.3rd-Sg.Perf man.CONST boy.FREE
‘A man killed a boy’
- (7) yewwet weqcic
beat.3rd-Sg.Perf boy.CONST
‘A boy has beaten’
- (8) aqcic a o emmi-k
boy.FREE this COP son.your.FREE
‘This boy is your son’

Given these facts, we may rightly suggest that the Berber case system is cognate in structure with the system of Cushitic; namely that it is a marked-nominative or so-called nominative-absolute system, with the "construct state" corresponding to a true nominative or subjective case, and the "free state" representing the absolute or generalized accusative. As illustrated in the simple example sentences provided above, the case markers of Berber are prefixed rather than suffixed, and this state of affairs is reconstructable all the way back to Proto-Berber, where Prasse (1974) reconstructs the following case markers.

| | Free | | Construct | |
|---|------|------|-----------|------|
| | Sg. | Pl. | Sg. | Pl. |
| M | *ā- | *ī- | *wa- | *wi- |
| F | *tā- | *tī- | *ta- | *ti- |

Figure 1.29: Proto-Berber Case-Marking "State Prefixes"

Case is securely reconstructable for Proto-Semitic, although it is distributionally somewhat rare among attested Semitic languages. The full Semitic case system is attested in East Semitic in the form of Akkadian. It is reconstructable

for Ugaritic, on the basis of nominals stems ending in *’ where vocalism is indicated in the written tradition. Arabic clearly once retained this Proto-Semitic case system, as it is correctly described by the Classical Arabic grammarians and prescribed in formal written Arabic. Nevertheless, there is evidence from the writing of Arabic names in Nabataean Aramaic inscriptions as early as the 2nd century CE that the case system had either collapsed entirely or was collapsing as an active part of the grammar of spoken or vernacular Arabics. A remnant or partial case system survives in the Ethiopic branch. Otherwise, in the Modern Arabics, in Hebrew, Phoenician, and Aramaic, in the Modern South Arabian languages, case is unattested.

Those Semitic languages which *do* attest to case point to a single system inherited from Proto-Semitic. This Semitic case system is essentially nominative-accusative, with the addition of a genitive case, which effectively functions as an all-purpose oblique. Nouns are divided into two inflectional classes typically referred to as triptotes and diptotes. Triptotic nouns decline for all three (NOM, ACC, GEN) of the cases reconstructable for Proto-Semitic, while the diptotic nouns reflect a reduced case system featuring a full nominative, and a combined ACC-GEN. The reconstructable case system of Proto-Semitic is presented below, adapted from Lipiński (2001).

| | Triptote | | | Diptote | | |
|-----|----------|------|-----|---------|------|-----|
| | Sg. | Dl. | Pl. | Sg. | Dl. | Pl. |
| Nom | *-u | *-ā | *-ū | *-u | *-ā | *-ū |
| Acc | *-a | *-ay | *-ī | *-a | *-ay | *-ī |
| Gen | *-i | | | | | |

Figure 1.30: Proto-Semitic Case Marking

Although the attested Semitic languages clearly reflect a more conventional nominative-accusative alignment, there is some reason to believe that this system may have arisen from an older marked nominative system more akin to that of Berber or Cushitic/Omotc. The most striking piece of evidence is the presence and behavior of the so-called "absolute state" in archaic Semitic languages like Akkadian and Eblaite. The absolute state was a zero-case-marked form of the noun, which appeared to have been used as a citation form (as in Akkadian *ištēn* "one" or *Aššur*), the form of the vocative (Akkadian *šar!* "Oh king!"), the subject of predication (*Ea rabi/Ištar rabiāt* "Ea/Ištar is great,") as well as possibly originally the object of prepositions, as in frozen Akkadian expressions such as *ultu rēš adi kīd* "from beginning to end," or *ana dār* "for eternity." These forms are consistent with an analysis in which the Proto-Semitic marked accusative arose from an originally unmarked accusative with the additional, non-argument roles of the unmarked accusative surviving in the zero-marked absolute state. Although the absolute state does not survive as such into Clas-

sical Arabic, we should probably regard the usage of the accusative (or more generally the non-nominative in plural and diptote inflection) as the case form associated with some archaic copular constructions in Classical Arabic as a vestige of the originally marked nominative status.

To summarize, case marking is quite common throughout Afro-Asiatic; is completely absent from only one family, Egyptian; largely absent from another, Chadic; and otherwise well-attested in the remaining four branches. These case systems tend to point towards an otherwise cross-linguistically uncommon marked-nominative or nominative-absolute system being common to the family as a whole. However, the individual morphemes which indicate case across each branch, and indeed within each branch, often appear to be non-cognate or difficult to trace to any obviously cognate morphological system of Proto-Afro-Asiatic case marking. Given this data, it seems likely that case was, in some capacity, present at the common Afro-Asiatic stage, but we cannot directly reconstruct individual case-marking morphemes, and we therefore cannot evaluate their potential impact on syncopation.

1.3.1.5 Nominal Derivation

It seems clear that Proto-Afro-Asiatic possessed a system of nominal derivation which included simple prefixes ($*C\check{V}-$) and suffixes ($*-\check{V}C/*-\check{c}\check{V}$). A few of these derivational affixes are securely reconstructable to the common Afro-Asiatic period, such as the $*m\check{v}$ - prefix which forms agent, location, instrument or deverbal nouns (Takács (2007)), while others, such as the denominal adjectival formative $*-iy$, the so-called nisba formation of Semitic, Egyptian, and possibly Berber (Vycichl (1952)) have a more limited distribution throughout the family.

The status of infixes in nominal derivation is unclear. Unlike the verbal system, which seems to have clearly infixed morphemes, the system of nominal derivation does not exhibit any obviously cognate infixed morphemes short of the usage of infixed verbal forms in the creation of deverbal nouns. Finally, we may discuss reduplication in nominal derivation. We have previously mentioned the role reduplication plays in the formation of plurals in Chadic and Cushitic, but reduplication is also attested in nominal formation, though its role is unclear. Complete reduplication is attested in various forms such as Arabic *kawkab* "star" (from $*kabkab$) or Akkadian *galgaltu* "hunger." Partial reduplication is also attested in the formation of three-consonant root forms from original biliterals, as in Egyptian <qbb> vs. Somali *qabō*, or Akkadian *libbu*, and Kilba *libibi* vs. Egyptian <ib>, Somali *lāb* or Anfillo *yibō*. It is unclear whether this partial reduplication was originally a distinctive derivational process (perhaps the same one which gave rise to the Chadic and Cushitic plurals), or simply whether this was a semantically vacuous process which was used to create morphologically manipulable three-consonant roots.

1.3.2 Verbal Morphology

The verbal morphology of Proto-Afro-Asiatic is significantly more robust than its nominal counterpart. Finite verbs inflect for a much larger number of distinct morphological categories than do nouns, and more of those forms are marked with overt morphemes. In addition, this verbal morphology is a great deal easier to reconstruct. Distinct verbal affixes survive very much intact across many daughter branches, and these morphemes show a much greater degree of cognation than do the affixes appended to nouns. As we shall see, the reconstructable Afro-Asiatic verb inflected at its most basic for eventivity, aspect, person/number/gender of the verbal subject, as well as the transitivity of the verb by means derivational affixes.

1.3.2.1 Reconstructable Verbal Morphemes

The surface forms of verbal roots and morphemes must of course conform to the same strict constraints on syllable structure which gave rise to the comparatively restricted set of apparent nominal-morpheme shapes. But again we may wonder whether verbal roots might exhibit more variant underlying forms beneath these surface-level constrictions. Using comparative evidence, we can reconstruct the following surface-morpheme shapes, and try to probe their underlying representations.

C \check{V} Surface *C \check{V} morphemes are remarkably common in verbal inflection and derivation, but they appear to be restricted to a specific subset of such morphemes. They are characteristic, for example, of the affixes which mark the prefixing conjugation in languages which retain the inflectional category, as well as a number of the suffix-conjugation affixes (at least in the so-called short form). It is likewise characteristic of the derivational prefixes which form the derived verbal stems found throughout the family (the S-, T-, and N-Stems). Despite the allowability and relative commonality of verbal morphemes of this sort, it is striking that it is rather difficult to identify lexical root morphemes even with this apparent surface form, much less underlying form. Some cognate sets, such as Egyptian <ʕ> with Diri ʕá and Somrai há, all meaning "go," do appear synchronically with this form, but such forms are better analyzed as originally biconsonantal CVC roots which have lost weak final consonants.

Regarding the underlying form of such morphemes, we may again say more. As with nominal morphemes, it seems likely that not all such morphemes have true initial-onset consonants and are supplied with one via the epenthesis of *ʔ. More interestingly, it seems likely that at least some of the vowels present in such morphemes may not be a part of their true underlying representation. Consider, for example, the variation between the prefix-conjugation featuring vocalisms in *i/*a and the form featuring *u in Semitic (see section 2.3.2.1 below for further details). One possible explanation for this alternation is that the prefix-conjugation affixes themselves are morphologically complex, featuring a consonant which indicates person, number, and gender, and a vowel that

indicates something about verbal valency. This is not the only possible interpretation, but if true, it would imply the existence of morphemes *C-V*, which only superficially behave as if they were a single *CV* morpheme. We will discuss this possibility in greater detail in section 2.3.2.1.1.

CVC As in the case of nominal morphology, apparently CVC "biconsonantal" roots are the most common which we can reconstruct for the basic, underived verbal vocabulary of Afro-Asiatic. They appear sometimes in inflectional or derivational morphemes, as in the 2nd Pl. of the suffix-conjugation: Arabic -tum/-tunna, Egyptian <.twn(i)>. But morphemes with this surface shape are far more common as the roots of lexical verbs in Afro-Asiatic: Semlal *firri*, Egyptian <pʔ>, Hausa *fírà*, Beja *fir* "fly," or Akkadian *banû*, Ghadames *əbni*, Egyptian <bnbn> "stela," Mubi *béni* "build," or Arabic *yasmū*, Qabyle *səmmi*, Egyptian <smi> "inform," Migama *semsimo* "whisper," Oromo *sima* "welcome." originally likely meaning "call/name." A quick review of attested nominal roots reveals that some of these forms (**sim* "name" **sim* "speak call"), are shared between the verbal and nominal roots, and are clearly related in meaning. We consider the *CVC* root to be the most basic and possibly default surface verbal root shape reconstructable for Proto-Afro-Asiatic (though this was subject to change in each daughter branch).

As it pertains to the underlying forms of such verbal roots, the biggest concern outside of the likelihood of *ʔ epenthesis is the question of the underlying presence of a vowel. In the case of nouns, we could plausibly reconstruct the vowels of forms such as **dam* "blood" or **sim* "name" because of their remarkable stability across the family (see section 2.3.1.1). For verbal roots, however, this position is more difficult to maintain, precisely because verbs tend to be subject to significantly more root-and-stem-internal vowel apophony than do nouns. This makes the recovery of underlying verbal vowels a more difficult proposition. We will pick up this matter again in the case of triconsonantal roots, where more clarity might be possible.

CVCVC Triconsonantal *CVCVC* morphemes are similarly easy to reconstruct for Proto-Afro-Asiatic, but as in the case of nouns, they are effectively limited to lexical verbal roots. Cognate sets such as Arabic *yamūtu*, Tahaggart *immət*, Egyptian <mwt>, Hausa *mūtù*, Somali *mōt* "die" are widespread enough in the family to secure the reconstruction of this root to the common Afro-Asiatic period. It is also worth mentioning that a number of reconstructable triconsonantal *CVCVC* forms are in fact derived from original CVC roots. For example, Arabic *yanfusu*, Izayan *inəffəs*, Hausa *númfāsā*, Saho *nafse* "breathe," all appear to be extended from an original root still reflected in Egyptian <nf> and Oromo *nafa* also meaning "breathe." As with nouns, the *CVCVC* verb root proceeds to become the default verbal root form in Semitic and Berber, as well as likely Egyptian and several of the individual Cushitic daughters.

The situation regarding the underlying forms of so-called triconsonantal verbs is the most interesting and revealing of any of the morpheme shapes

which we have discussed until now. In the various Afro-Asiatic daughters, these verbs surface in a number of distinctive root/stem shapes, varying from *CVCVC* to *CCVC*, *CVCC*, *CVC₂C₂VC*. But which, if any, of these represents the underlying form? Here we may turn to Semitic for at least a partial answer. As discussed in section 2.3.1.1.3, while it is true that most vowels in a Semitic verb are morphophonological in nature, and ought not to be projected onto the underlying form, the vowel which separates the second and third root-consonants in the G-Stem perfective (the vowel Kuryłowicz refers to as the "theme vowel") is lexically specific. By contrast, the vowel that appears between the first and second root-consonants is *always* controlled morphophonologically. This leads to the conclusion that the underlying form of Semitic verbs (which are all tri-consonantal in their inflection) is neither a purely templatic *C-C-C*, nor a fully vocalized *CVCVC*, but rather, a surface inarticulable *CCVC*, and that the form with which the phonology of archaic Semitic languages actually deals directly is *CäCVC*, with an epenthetic vowel supplied²⁹. This conclusion is true of Semitic, but whether it is true for other Afro-Asiatic languages requires a more detailed analysis of the sort Kuryłowicz provided for Semitic. In either case, it suggests that Afro-Asiatic verbs consist of both underlying vowels as well as morphophonologically supplied epenthetic vowels.

CVC(V)CVC As with nouns, *CVCCVC* "quadriliteral" morphemes are exceptionally rare; consist almost exclusively of lexical verbs; and are typically the result of either reduplication, as in Tigre *tämtäma* "strike," Egyptian <tmtm> "press/crush" (which is likely related to verbs such as Hausa *tuma* "thresh," Oromo *tuma* "beat") or fossilized extensions of *CVCVC* root morphemes, such as S-Stems in Coptic like **Ⲙⲏⲗⲏ**, reflecting Middle Egyptian **sa'naḥ*, an S-Stem derivative of **ⲏⲏⲗ** **'ānaḥ*. For our purposes, we will treat any *CVCCVC* verbal "root" as in fact resulting from some derivational process.

1.3.2.2 Eventivity

The most basic opposition reconstructable for the Proto-Afro-Asiatic verb is a distinction between eventive verbs and stative verbs. In languages which retain this distinction, or remnants of this distinction, we find that the eventive class indicated true dynamic or action verbs often involving agentivity on the part of the subject, while the stative class indicated that the subject of the verb was either the patient or experiencer of the basic verbal meaning.

1.3.2.2.1 Eventive – Prefix-Conjugation

The eventive verbal conjugation was the most basic verbal inflection in Proto-Afro-Asiatic. Eventive verbs were inflected by the addition of subject-agreement prefixes, uniformly taking the form **CV-*, to the verbal stem. The prefix-conjugation is best known to us today from the Semitic languages, where it

²⁹This epenthetic vowel is visible in forms such as the Akkadian imperfective *iparras/irappud/ipaqqid/iṣabbat*.

is attested in all branches. In Akkadian, the original function of the prefixing conjugation is most apparent, as it is the conjugation of true eventive verbs, regardless of their relative temporal position. Outside of East Semitic, as the relative values of the prefix and suffix-conjugation shift, there is a strong tendency for the prefix-conjugation to lose its eventive semantics, and rather to become the conjugation of the present-future tense, as has occurred in Arabic, Aramaic, and the South Semitic languages.

Additionally, the prefix-conjugation of Semitic has gained further suffixes (of clearly secondary origin), which serve to disambiguate otherwise morphologically identical forms. For instance, the 2nd singular feminine has gained an $*-\bar{i}$ suffix to distinguish it from its masculine counterpart. This $*-\bar{i}$ seems clearly to arise in the $*-\bar{i}$ which characterizes with the feminines of the pronominal system. Likewise, the 2nd and 3rd plurals have gained suffixes $*-\bar{u}$ (M) and $*-\bar{a}$ (F), which are transparently the same $*-\bar{u}$ and $*-\bar{a}$ suffixes that form nominal plurals. Since these forms are not shared with other Afro-Asiatic languages, we may consider them Semitic innovations. A summary of Semitic prefix-conjugation forms, along with a Proto-Semitic reconstruction, adapted from Lipiński (2001) is provided below.

| | Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez | Mehri |
|---------|--------------------------|-------------|------------------|-----------------|--------------|---------|
| 1st Sg. | $*\text{'a-/*'u-}$ | a-/u- | 'a-/'u- | 'e-/'ä | 'ə- | ə- |
| 2nd Sg. | M $*\text{ta-/*tu-}$ | ta-/tu- | ta-/tu- | ti-/tə- | tə- | tə- |
| | F $*\text{ta-/*tu...-ī}$ | ta-/tu...-ī | ta-/tu...-ī | ti-/tə...-ī | tə...-i | tə...-i |
| 3rd Sg. | M $*\text{ya-/*yu}$ | i-/u- | ya-/yu- | yi-/yə- | yə- | yə- |
| | F $*\text{ta-/*tu}$ | ta-/tu- | ta-/tu- | ti-/tə- | tə- | tə- |
| 1st Pl. | $*\text{ni-/*nu-}$ | ni-/nu- | na-/nu- | ni-/nə- | nə- | nə- |
| 2nd Pl. | M $*\text{ti-/*tu...-ū}$ | ti-/tu...-ā | ta-/tu...-ū | ti-/tə...-ū | tə...-u | tə...-u |
| | F $*\text{ti-/*tu...-ā}$ | ti-/tu...-ā | ta-/tu...-na | ti-/tə...-nā | tə...-a | |
| 3rd Pl. | M $*\text{yi-/yu...-ū}$ | i-/u...-ū | ya-/yu...-ū | yi-/yə...-ū | yə...-u | yə...-u |
| | F $*\text{yi-/yu...-ā}$ | i-/u...-ā | ya-/yu...-na | yi-/yə...-nā | yə...-a | |

Figure 1.31: Prefix-Conjugation in Semitic

Although the forms are quite clearly cognate, special comment is required for the vowels associated with the prefixed morphemes. First, the prefixes are divided into two sets by the characteristic prefix vowel which runs through the paradigms. Roughly speaking, we may speak of the *Ca-/Ci-* prefix class on the one hand, and the *Cu-* prefix class on the other. Although the distributions become somewhat cluttered across the Semitic daughters (particularly with respect to the T-Stem and its derivatives), it seems clear that in the original paradigm, the *Cu-* prefix class characterized D-Stem and Š-Stem forms, while the *Ca-/Ci-* class characterized the remaining stems. Since the D-Stem, which is factitive in meaning, and the Š-Stem, which is causative in meaning, are the two derived verb forms of Proto-Semitic which serve to add valence, this distribution has led some scholars to suggest that the *Cu-* prefix class was originally used

for the inflection of transitive verbs, while the *Ca-/Ci-* class was originally used for intransitives. Such a proposal is plausible, but since it has little bearing on the syncopation analysis which follows, we remain agnostic on the issue.

Another comment is necessary regarding the prefix vowel of the *Ca-/Ci-* prefixes in Hebrew and Arabic (and indeed within the Central Semitic family at large, if we had included more such languages). In the Arabic forms presented above, we find that the prefixes occur exclusively with the vowel /a/. In the Hebrew forms, we find the opposite, with /i/ throughout. This variation is the result of leveling, in opposite directions, of the alternation between /a/~i/ caused by Barth's Law. According to this sound law, the vowel of the prefix in the *Ca-/Ci-* prefix set is governed by the corresponding thematic vowel of the verbal stem to which it is appended. If the prefix appends to a verbal stem with /a/ as the theme vowel, the prefix will exhibit *Ci-* vocalism, while if the theme vowel is /i/ or /u/, the prefix will exhibit *Ca-* vocalism (e.g. *yiqtal* vs. *yaqtil*). Barth's Law is known to operate in Hebrew, Syriac, Ugaritic, Amarna Canaanite, and sporadically in old Arabic forms (Khan et al., 2012). In Arabic, the prior variation has been leveled in favor of *Ca-* vocalism throughout, while in the Canaanite languages, such as Hebrew, *Ci-* leveling is common. The Akkadian form, with *Ca-* vocalism characterizing the singulars and *Ci-* vocalism characterizing the plurals, is typically regarded as more archaic.

Turning our attention to the Berber languages, we find that the prefixing eventive conjugation is well-preserved and closely matches the forms attested from Semitic. There is, however, an additional complication, as the Berber languages seem to have conflated the prefix and suffix-conjugation such that almost all³⁰ verbs are now inflected with both the prefixes of the prefix-conjugation and the suffix of the suffix-conjugation simultaneously. For such verbs, the eventive semantics of the prefixing conjugation have clearly been lost, as these morphemes have become default inflectional forms used on (almost all) verbs regardless of meaning. A comparison of Tuareg verbal inflection with reconstructed Proto-Berber forms is presented below, adapted from Prasse (1973) and Heath (2005).

| | | Tuareg | | Proto-Berber | |
|-----|---|----------|-----------|--------------|-------------|
| | | Sg. | Pl. | Sg. | Pl. |
| 1st | | ∅-...-äy | n-...-∅ | *a-...-aḡ | *na- |
| 2nd | M | t-...-äd | t-...-äm | *ta-...-aḡ | *ta-...-am |
| | F | | t-...-mät | | *ta-...-mat |
| 3rd | M | i-...-∅ | ∅-...-än | *ya-...-∅ | *∅-...-an |
| | F | t-...-∅ | ∅-...-näṭ | *ta-...-∅ | *∅-...-nat |

Figure 1.32: Verbal Conjugation in Tuareg and Proto-Berber

³⁰Though see more on true stative verbs bearing suffix-conjugation only in section 1.3.2.2.2 below.

In many cases, the prefix forms are straightforward in their transition from Proto-Berber to Tuareg (or to the other Berber daughters, for that matter) and in their similarity to Semitic. Nevertheless, a few require comment. The Berber daughters attest no overt prefix for the 1st singular form. We nonetheless feel confident reconstructing the **a-* form, cognate to the **'a-* of Semitic, as the initial glottal stop is a weak consonant that drops in Berber, and we would expect short, word-initial vowels to be lost from Proto-Berber anyway. More striking are the 3rd plural forms. Here, **yǃ-* prefixes ought to survive if they were present in Proto-Berber, as they do in the case of the 3rd M. Sg., and we therefore do not reconstruct such prefixes for Proto-Berber.

On phonological grounds, there is no reason to suppose that the **yǃ-* prefix ought to have been lost in Proto-Berber, as we see that it survives quite intact in 3rd M. Sg. We would therefore expect it to survive, if it was inherited without some other change. However, a compelling theory regarding the loss of the **yǃ-* prefixes in the 3rd plurals in Berber was presented to me by my advisor Rolf Noyer in personal correspondence. He suggests that, in contrast to the loss of 1st Sg. **'a-*, which is plausibly phonological in nature, resulting from the loss of weak sub-oral consonants in Berber, the loss of the **yǃ-* prefix in the 3rd plurals is to be interpreted as a case of pure morphological reanalysis. He notes that while it is descriptively true to state that the **yǃ-* prefix characterizes the 3rd M. Sg., in terms of the morphological features which each morpheme spells out, it is perhaps more accurate to state that **yǃ-* is in fact the default spellout of [masc] only. It therefore surfaces only in circumstances in which the [masc] feature is present, and for which there is no more specific morpheme. Considering the distribution and function of the morphemes, this naturally restricts its appearance solely to the 3rd M. Sg., creating its apparently restricted distribution. The difference between Semitic and Berber, then, is twofold. On the one hand, the development of distinctive suffixes **-an* and **-nat*, which appear in 3rd plural inflection, means that these forms already explicitly spell out both the number and gender features of the 3rd plural form. At the same time, in contrast to Semitic, where the **yǃ-* prefix functions more accurately as a default, in Berber, it has been reanalyzed due to the conflation of the prefix and suffix-conjugation as the spellout of [masc]. When both of these reanalyses have occurred, the **yǃ-* will naturally lose ground in its distribution, since the more specific suffixes **-an* and **-nat*, which are spellouts of [masc, pl] and [fem, pl] respectively, will effectively block their appearance with 3rd Pl. verb forms.

In Egyptian, the prefixing conjugation is wholly unattested, having instead been replaced by an innovative system whereby the basic non-stative verbal stem is not truly inflected for the person, number, or gender of its grammatical subject, but rather can co-occur with an enclitic pronoun. These pronouns are commonly referred to in Egyptological circles as the "suffix-conjugation", but they are not a true conjugation, as evidenced by the fact the these morphemes are blocked by the occurrence of an explicit nominal subject. Given the relative antiquity of Egyptian attestation, some scholars, such as Peust (2012), or by implication Diakonov (1988), take the absence of the suffix-conjugation in Egyptian as evidence that the prefixing conjugation is not original to Afro-

Asiatic, and that it represents an innovation on the part of Semitic, Berber, and Cushitic. We wholly reject this conclusion. At an empirical level, Egyptian is only attested a few hundred years before Semitic, where we find a fully functional and operational prefix-conjugation in East-Semitic, so it is unclear how much value should be placed on the fact that a branch without the prefix-conjugation is attested first. On a deeper methodological level, when confronted with two related language families, one of which (Semitic) contains a dizzyingly complex and morphologically opaque system of verbal inflection, and the second of which contains a comparatively simple and transparently derived system of affixing pronoun clitics onto verbs, it seems to us to stand the whole of historical linguistic science on its head to conclude that it is the simple pronoun clitic system which is the archaism, and the complex, morphophonologically conditioned system of vowel apophony and stem allomorphy is the more recent innovation.

The prefix-conjugation is preserved, but only precariously in the Cushitic languages, being instead commonly replaced by an innovative suffixing paradigm³¹. Nevertheless, the prefix-conjugation is still clearly attested. It survives as a distinctive, fully functional class of verb inflection only in Beja and Afar-Saho, where it is the inflection paradigm of so-called "strong verbs." Elsewhere in Cushitic, we find that the prefix-conjugation survives as a relic class of archaic and non-productive strong verbs: "bring," "come," "know," "remain" and "be" in Agaw, "be able to," "become," "come," "die," "drink," "eat," "kill," "lay down," "dwell, live," "run," "say," "stop (intr.)," "be" in East Cushitic. True prefix-conjugation forms from across Cushitic are provided below, adapted from Banti (2001) and Zaborski (1975).

| | | Beja | Rendille | Arbore | Awngi |
|---------|---|-----------|-----------|--------|------------|
| 1st Sg. | | ʼa- | ʼa- | ʼā- | a- |
| 2nd Sg. | M | ti-..-a | ta- | tā- | ti- |
| | F | ti-...-i | | | |
| 3rd Sg. | M | ʼi- | ya- | yā- | yi- |
| | F | ti- | ta- | tā- | ti- |
| 1st Pl | | ni- | na- | nā- | a-...-ne |
| 2nd Pl. | | ti-...-na | ta-...-īn | tā- | ti-...-ana |
| 3rd Pl. | | ʼi-...-na | ya-...-īn | yā- | yi-...-ana |

Figure 1.33: Prefix-Conjugation in Cushitic

As in Semitic, the prefix-conjugation in Cushitic, to the extent that it has survived as a stand-alone form of verbal inflection, has accumulated additional suffixes, though again these are of secondary origin. Beja has gained disambiguating suffixes *-a* and *-i* in the 2nd Sg. forms, which are clearly the same

³¹Distinct from the original Afro-Asiatic stative suffix-conjugation.

-a and -i forms which characterize the 2nd person pronouns throughout Afro-Asiatic more generally. Moreover, they are not attested throughout the rest of Cushitic. The plural suffixes are more likely candidates for common Proto-Cushitic forms, being attested throughout the surviving prefix-conjugations across the family. Moreover, they bear some similarity to the Berber 3rd Pl. suffixes *-an and *-nat. However, these suffixes are likely better seen as the spreading of the *-n plural of the nominal system into verbal paradigm, just as in the Berber and Semitic plural forms. Awngi has created an innovative 1st Pl. form, modeled on the 1st Sg., apparently with either the *-n ending of the common Cushitic plural, or the *-n suffix of the possessive pronouns. Since the remainder of the family shows the same prefix in *-n- as Semitic, it is clear that the Agaw forms are innovative.

Outside of Beja and the archaic verbs mentioned above, the prefix-conjugation was displaced in Cushitic by the novel Cushitic Suffix-Conjugation (SC1). This conjugation is not to be conflated with the archaic Afro-Asiatic suffix/stative conjugation, but has rather been understood as a Cushitic (and possibly Omotic) innovation. It is characterized by a number of unique attributes which distinguish it from the prefix-conjugation, including:

- (i) *The verbal stem remains the same in the non-past and past tenses.*
- (ii) *Tense distinctions are expressed by vowel alternations in the endings: *a or developments of *a in the non-past vs. a front vowel or a likely development of it in the past (e, i, and Somali ay).*
- (iii) *Subject agreement as expressed in the consonants of the endings bear a striking similarity to those not of the suffixed pronouns, but rather to the prefix-conjugation.*

Since the work of Reinisch (1878), Colizza (1889), and Praetorius (1893, 1894), scholars have regarded the SC1 as an originally *prefix*-conjugated periphrastic form, which has subsequently univerted with an originally non-finite verbal form, such as a participle or infinitive. We may therefore regard the Cushitic SC1 as evidence for the Afro-Asiatic prefix-conjugation. As we will argue more extensively in section 6.2.3, this originally periphrastic origin of the Cushitic SC1 or "weak verb" is critical in understanding its apparent lack of templatic or non-concatenative inflection. Examples of the SC1 along with a Proto-Cushitic reconstruction are provided below, again from Banti (2001) and Zaborski (1975).

| | Beja | Somali | Awngi | Proto-Cushitic |
|---------|-----------|----------|-----------|----------------|
| 1st Sg. | -an | -ā | -e | *-ʾv̄ |
| 2nd Sg. | M | -tā | -te | *-tṽ |
| | F | -tay | | |
| 3rd Sg. | M | -ya | -e | *-yṽ |
| | F | -ta | -te | *-tṽ |
| 1st Pl. | -na | nā | -ne | *-(a)tṽ |
| 2nd Pl. | -ta...-na | -tā...-n | -ta...-na | *-tṽn |
| 3rd Pl. | -ya...-na | -ā...-n | -a...-na | *-yṽn |

Figure 1.34: Cushitic Suffix-Conjugation (SC1)

In Omotic, we find that the prefix-conjugation is completely absent as a distinct inflectional class for verbs. In Omotic, verbal agreement with subjects takes the form almost exclusively of suffixes. As Bender (2000) notes, the suffixes are quite diverse and divergent across the family. There is, nevertheless, in the Yemsa language, a suffixed conjugation that bears a striking similarity to the SC1 of Cushitic. Compare the Yemsa forms with the Beja weak conjugation, as adapted below, from Bender (2000).

| | Beja | Yemsa |
|---------|------|-----------|
| 1st Sg. | -an | -na |
| 2nd Sg. | M | -tá |
| | F | -atè |
| 3rd Sg. | M | -é |
| | F | -à |
| 1st Pl. | -na | -ni |
| 2nd Pl. | M | -ta...-na |
| | F | |
| 3rd Pl. | M | -sone |
| | F | |

Figure 1.35: Yemsa and Beja "Weak" Conjugation

Excepting the 3rd persons, the Yemsa forms are solid potential cognates for their Cushitic counterparts and indeed many scholars, including Diakonov (1988) have supposed that the Yemsa suffix-conjugation represents the sole survivor of the Afro-Asiatic prefix-conjugation in Omotic, again in the form of an old verbal auxiliary univerbated to form a suffixing conjugation. The connection between the Yemsa inflectional paradigm and the Afro-Asiatic prefix-conjugation is plausible, but inconclusive. We will therefore treat the prefix-

conjugation as likely absent from Omotic.

The situation pertaining to the prefix-conjugation in Chadic is unclear. It is apparent that the prefix-conjugation does not survive anywhere within Chadic as a stand-alone form of verbal inflection because the Chadic verb does not inflect according to either the inherited prefix or suffix-conjugations of Afro-Asiatic. Rather, as described by Jungraithmayr (2005), the finite Chadic verb is a periphrastic verbal phrase consisting of:

(Subject) – "Subject Pronoun" – (Tense/Aspect/Mood) – Verb Stem

Tense and aspect information can be (in the more archaic East Chadic languages) indicated by internal apophony or verbal stem allomorphy, but the person, number, and gender of the subject, if it is overtly marked at all, is commonly expressed by the so-called "subject pronouns," though these might be more rightly considered overt expression of syntactic T or some other part of an expanded TP, since they can co-occur with overt pronominal subjects without blocking them³². In the more innovative Chadic languages these "subject pronouns" often express the tense/aspect/mood information and the verbal stem is effectively invariant, as in the case of the simple Hausa examples below.

- (9) yāròn yā shā shāyī
boy.DEF 3rd.M.SG.PERF drink tea
The boy drank tea.

- (10) yāròn yanà shàn shāyī
boy.DEF 3rd.M.SG.IMPF drinking tea
The boy is drinking tea.

These "subject pronouns," clearly auxiliary verbs themselves, have been subject to scrutiny as to whether they may represent the still-freestanding prefix-conjugated auxiliaries hypothesized to underlie the Cushitic weak verb. This position is taken by Klingenberg (1956), Diakonov (1988), and Voigt (1986), considering the role of the subject pronouns in marking the person/number/gender of the subject, as well as aspectual information which they can encode. Unlike in Cushitic, however, the comparison here is not entirely straightforward. Consider the following elements of the Hausa subject pronoun paradigms (HSP), from Voigt (1986), in comparison with both the Semitic prefix-conjugation (SPC) and the Semitic possessive suffix pronouns (SPS).

³²In many Chadic languages, the 3rd person "subject pronouns" do not co-occur with nominal subjects, though they do in Hausa. It is unclear which configuration is more archaic.

| | | HSP | SPC | SPS |
|---------|---|------|------|-------------|
| 1st Sg. | | n(a) | *'a- | *-i/-ya/-ni |
| 2nd Sg. | M | ka | *ta- | *-ka |
| | F | ki | | *-ki |
| 3rd Sg. | M | ya | *ya- | *-šu |
| | F | ta | *ta- | *-ša |
| 1st Pl. | | mu | *ni- | *-na |
| 2nd Pl. | M | ku | *ti- | *-kun |
| | F | | | *-kin |
| 3rd Pl. | M | su | *yi- | *-šun |
| | F | | | *-šin |

Figure 1.36: Hausa Subject Pronouns vs. Semitic Prefix-Conjugation and Possessive Suffix Pronouns

While the 3rd Sg. forms of Hausa are strikingly similar to those of the prefix-conjugation, and the 1st Pl. is a plausible match with either, the 2nd person forms and the 3rd Pl are clear cognates of the possessive/object clitic pronouns. Presumably, scholars favoring the prefix-conjugation origins must suppose the gradual displacement of the prefixed forms by forms resembling the other pronouns. This analysis is not altogether improbable, since these forms exhibit much of the behavior of freestanding pronouns and speakers could easily conflate the two paradigms.

On the other hand, scholars such as Newman and Schuh (1974) or Mukarovsky (1983) reject the notion of a prefix-conjugated auxiliary, instead seeing in the Chadic "subject pronoun" an innovative variant of the otherwise present independent pronouns attested within the family. These forms, which are clearly cognate with the possessive/object suffixes of Semitic, match closely with all forms but the 3rd persons, particularly the 3rd masculine. To explain this discrepancy, Mukarovsky posits a $*s \rightarrow *y$ "weakening" or "lenition" in Hausa and other languages which attest the $*y$ - form. It is unclear if such a sound change is attested within the history of Hausa or West Chadic more generally, and it is uncertain what the phonetic motivation for such a sound change would be. Excluding the possibility of sound change, it is likewise unclear what the analogical model for morphemic change from $*s$ - to $*y$ - for the 3rd Sg. M could be, other than the morpheme of the prefix-conjugation.

In general, we will conclude that the prefix-conjugation does not unambiguously survive as such in Chadic, which is the most important element of our analysis using syncopation. As for the possibility that the subject pronouns of Chadic may retain traces of the original prefixing conjugation, we acknowledge the possibility, but find insufficient evidence for this claim at present.

On the basis of these data drawn from the Afro-Asiatic daughters, we may reconstruct the following prefix-conjugation affixes for Proto-Afro-Asiatic.

| | | <i>Sg.</i> | <i>Pl.</i> |
|------------|----------|------------------|------------|
| <i>1st</i> | | ^ʾ v̄- | n̄v̄- |
| <i>2nd</i> | | t̄v̄- | |
| <i>3rd</i> | M | ȳv̄- | ȳv̄- |
| | F | t̄v̄- | |

Figure 1.37: Proto-Afro-Asiatic Prefix-Conjugation

This is a rather asymmetrical system which requires further comment. The distinction of number is marked through overt morphological means in the reconstructable prefixes only in the 1st person, where the clearly distinct Sg. (^ʾv̄-) and Pl. (*n̄v̄-) morphemes can be securely reconstructed. In the 3rd person, the opposition between singular and plural is not directly indicated via the opposition between unambiguously singular and plural morphemes. However, if we take Noyer’s suggestion that the *ȳv̄- morpheme was functioning as a default in Afro-Asiatic, as it appears to be in Semitic and Cushitic, then we must conclude that the Sg./Pl. opposition is still operational, as the neutralization of grammatical gender which characterizes the plural in Afro-Asiatic has clearly occurred. This explains the use of the default *ȳv̄- prefix with all plural nouns, as the [fem] feature (of which *t̄v̄- of the Fem. Sg. is the spellout) is absent, having been neutralized by the exclusive feature [pl]. The 2nd person reflects no securely reconstructable oppositions of either number or gender. In the daughter languages, number and gender are typically indicated, but often as additional suffixed morphemes of clearly non-cognate status. The only group of languages which reflect a consistent opposition of number or gender in the prefixes of the 2nd person is East Semitic, where 2nd Sg. reflects *ta-*, and 2nd Pl. reflects *ti-*. Since there are no external comparanda, however, we cannot project this variation back to Proto-Semitic, much less Proto-Afro-Asiatic, and we are forced to conclude that the 2nd person in Afro-Asiatic initially had a single prefix morpheme *t̄v̄-.

1.3.2.2.2 Suffix-Conjugation – Stative

The stative verbal conjugation of Afro-Asiatic was indicated by a set of subject-agreement affixes quite distinct from those of the eventive conjugation, and likewise by a shift from prefixing to suffixing inflection-morphemes. These suffixes typically take the form of *-CV, though, as discussed below, there is some evidence for a lengthened form *-āCV, perhaps with a slightly different semantics. The stative conjugation was originally used in the inflection of verbal roots denoting states, attributes, positions, or conditions, in contrast to the eventives which denoted true verbal actions often involving agency on the part of the subject.

As with the prefix-conjugation, the suffix-conjugation is best attested and best known largely from Semitic, where it survives at least in form in every

daughter branch. The original stative semantics of the form survive productively only in East Semitic, in the form of the so-called "permansive" verbs of Akkadian, which we will hereafter refer to simply as statives. Outside of East Semitic, the suffix-conjugation survives as a distinct inflectional category, but it has shifted from the form of stative verbs rather to become the inflection of the past/perfect in the novel West Semitic tense/aspect system. Forms of the Semitic suffix-conjugation are presented below, adapted from Lipiński (2001)

| | | Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez | Mehri |
|---------|---|---------------|----------|--------|--------|--------|-------|
| 1st Sg. | | *-(ā)ku | -āku | -tu | -tī | -ku | -k |
| 2nd Sg. | M | *-(ā)ta | -āta | -ta | -tā | -ka | -k |
| | F | *-(a)ti | -āti | -ti | -tī | -ki | -š |
| 3rd Sg. | M | *-∅ | -∅ | -a | -∅ | -ä | -∅ |
| | F | *-at | -at | -at | -ā | -ät | -öt |
| 1st Pl. | | -(ā)nu/a | -ānu | -nā | -nū | -nä | -ən |
| 2nd Pl. | M | *-(ā)tun | -ātun(u) | -tum | -tem | -kəmmu | -kəm |
| | F | *-(ā)tin | -ātin(a) | -tunna | -ten | -kən | -kən |
| 3rd Pl. | M | *-ū | -ū | -ū | -ū | -u | -aw |
| | F | *-ā | -ā | -na | | -a | -∅ |

Figure 1.38: Suffix-Conjugation in Semitic

The forms attested in Semitic warrant a number of comments. The first and most obvious is that the attested forms are split between a short **-CV* form attested in West Semitic and a long **-āCV* form attested in Akkadian. From the Semitic data alone, it is difficult to know which form should be reconstructed for Proto-Semitic, or indeed if both should be. We will reconsider this long suffix-conjugation form in our discussion of Egyptian below.

The next comment regards the large amount of leveling which has occurred throughout the paradigm. In Akkadian, we find a 1st Sg. form reflecting **-k*, and 2nd persons of both numbers and genders in **-t*. Outgroup analysis with the other Afro-Asiatic branches confirms the East Semitic distribution is original, but it is otherwise unattested in West Semitic. The Central Semitic languages, here represented by Hebrew and Arabic but also including Ugaritic or Aramaic, have leveled the more common ending in **-t* into the 1st Sg. form, replacing the **-k* form. Inversely, the South Semitic languages have leveled the **-k* form into all 2nd person forms, displacing all forms in **-t*.

Finally, we may discuss the forms of the 3rd persons. It seems clear that the 3rd. M. Sg. form is either the **-∅* form reflected in Akkadian, or the **-a* form reflected in Arabic, Ge'ez, and Ugaritic³³. There is some evidence for a **-a* ending in East Semitic, particularly in names such as Akkadian <il-ba-na> **'il bana* "El is beautiful," but there is likewise evidence that the **-a* ending may

³³The Hebrew, Modern South Arabian, and Aramaic forms are in principle consistent with either ending, since these languages are prone to the loss of word-final short vowels.

have been innovated in the other branches. For example, while verbs tend to show 3rd. M. Sg. *-a* in Ugaritic, names, which tend to be archaic, often do not, as in <ba‘al-ma-lak> "Ba‘al is Lord." The ending is likewise mostly missing from the Northwest Semitic dialect attested in the Amarna letters (<ša-pár> *šapar "he sent"). The perfect in *-a does appear in our oldest vocalized Arabic texts, Greek representations of Arabic from roughly the 3rd or 4th century CE, as in αθαοα (*'atawa "he came") and can safely be regarded as present in Safaitic (Al-Jallad and al Manaser (2015)). It is, however, curiously absent from onomastics such as Safaitic <nzm'l>, Ναταμηλος, *nazam³⁴ 'il "God has ordered," or cuneiform Sabaic names such as <ka-ra-ab-il>, *karab³⁵ 'il, "God has grieved?," both from Al-Jallad (5/7/2017). Modern Ethiopic names also commonly lack the *-a marking of the perfect (*Šäwa raggäd* "Shoa trembled").

The remaining 3rd person forms are essentially attested across the entirety of Semitic and therefore can be reconstructed to the proto-language. Nevertheless, there are reasons to suppose that even these are not original at the Pre-Proto-Semitic stage. Outgroup analysis notwithstanding, where we see a generally different set of 3rd person forms, the 3rd Fem. and the 3rd Pl. suffixes are clearly drawn from the nominal paradigm, making them prime candidates for spread by analogy or leveling, especially in a nominal/predicative verb form such as the stative. Moreover, we may remark on their vowel-initial shape, in contrast to the *-CV form of the 1st and 2nd person forms, perhaps suggesting a different origin for this set of affixes.

Unlike the prefix-conjugation, the suffix-conjugation survives in Egyptian, and indeed, outside of Semitic, Egyptian is our best attestation of both the suffix-conjugation morphemes and its stative semantics. Regarding the forms of the morphemes, they are for the most part very strong cognates to their Semitic counterparts. Transcriptions of hieroglyphic forms are presented below, adapted from Gardiner (1950) and Satzinger (2002), with forms presented from the older Pyramid Texts as well as the more conventional Middle Egyptian from the Middle Kingdom.

| | | Pyramid Texts | | Middle Egyptian | |
|-----|---|---------------|---------------|-----------------|---------|
| | | Sg. | Pl. | Sg. | Pl. |
| 1st | | -k(i) | -nw(i)/-w(i)n | -k(w) | -w(i)n |
| 2nd | | -t(i) | -twn(i) | -t(i) | -twn(i) |
| 3rd | M | -i | -w(i) | -w | -w |
| | F | -t(i) | -t(i) | -t(i) | -t(i) |

Figure 1.39: Suffix-Conjugation in Egyptian

Egyptian attests to the same distribution of *-k in the 1st Sg. and *-t in the

³⁴As opposed to Classical Arabic *nazama*

³⁵As opposed to Classical Arabic *karaba*

2nd persons which, we saw in Akkadian, but which had been lost in the other Semitic branches by leveling in one direction or another, confirming its archaic nature. The 3rd persons again (particularly in the case of the masculine plural) appear to have been simply drawn in from the nominal paradigm.

It is clear that the Egyptian suffix-conjugation can and does have a stative semantics, but it has also been noted that, like its West Semitic counterparts, it can express a perfect or preterite meaning as well. Kammerzell (1990, 1991b,a) and Schenkel (1994) have both argued that the stative vs. perfect meaning are associated with a strong statistical tendency regarding the distribution of the variable writing of vocalic signs, with the shorter, "non-vocalized," signs corresponding strongly to usage with perfect semantics. This distribution is illustrated for 2nd M. Sg. forms below.

| | Perfect | | Stative | |
|-----------|-------------|--------|-----------|----------|
| | .t | .ti | .t | .ti |
| 2nd Sg. M | 100 (95% !) | 5 (5%) | 148 (64%) | 83 (36%) |

Figure 1.40: Long and Short Suffix Forms in Stative and Perfect Contexts

Unfortunately, we cannot directly ascertain what phonetic differences (if any) these two spellings represent, as the suffix-conjugation does not survive as such in the vocalized Egyptian of Coptic³⁶. Nevertheless, Schenkel makes a compelling analogical argument by looking at the spelling of the feminine nisba adjectives, which are, quite helpfully, also commonly spelled out as <.t> or <.ti>. Since the nisba adjectives *do* survive in Coptic, we may compare the spellings to their phonetic counterparts, where we can reconstruct forms that either append directly to the last consonant of the stem (...C \check{V} C-ti \check{i}), or are preceded by a stressed/long vowel (...C \check{V} -ti \check{i}).

| | ...C \check{V} C-ti \check{i} | | ...C \check{V} -ti \check{i} | |
|-----------|-----------------------------------|---------|----------------------------------|----------|
| | -t | -ti | -t | -ti |
| 2nd Sg. M | 140 (93% !) | 10 (7%) | 43 (47%) | 48 (53%) |

Figure 1.41: Long and Short Spellings of Feminine Nisba Adjectives

If we accept Schenkel's analogy between the two forms, we may suppose that the distribution of spellings in the suffix-conjugation likewise corresponds to two different shapes of the affix; a short form with perfect semantics, which appends

³⁶Though see section 5.2.1 below for a discussion of fossilized stative forms which have survived into Coptic.

directly to the (consonant final) verbal stem, and a long form with stative semantics, which is adjoined to the verb stem by a long vowel. Note that this match-up of long and short suffix-conjugation forms with stative and perfect semantics is likewise precisely what is found in Semitic, where the long-form Akkadian suffix-conjugation is stative in meaning, and the short-form suffix-conjugation of the West Semitic perfect/past tense is, of course, perfect in meaning. Even the stem shapes that emerge from this novel reconstruction with the lengthened vowel correspond almost perfectly with those of Semitic, as illustrated in the reconstructions below from Satzinger (1998).

| | | Stative | | Perfect | |
|---------|---|------------------|-------------|------------------|----------------|
| | | Egyptian Stative | Akkadian | Egyptian Perfect | Arabic Perfect |
| 1st Sg. | | *satpāk̄vī | parsāku | *satapk̄w | fa'altu |
| 2nd Sg. | M | *satpāt̄vī | parsāta | *satapt̄vī | fa'alta |
| | F | | parsāti | | fa'alti |
| 3rd Sg. | M | *satp̄vī | paris | *satp̄vī | fa'ala |
| | F | *satapt̄vī | parsat | *satp̄vt̄vī | fa'alat |
| 1st Pl. | | *satpān̄vī | parsanu | *satapn̄vī | fa'alnā |
| 2nd Pl. | M | *satpatūn̄vī | parsātun(u) | *sataptūn̄vī | fa'altum |
| | F | | parsātīn(a) | | fa'altunna |
| 3rd Pl. | M | *satp̄wvī | parsū | *satp̄wvī | fa'alū |
| | F | *satp̄vt̄vī | parsā | *satp̄vt̄vī | fa'alna |

Figure 1.42: Egyptian and Semitic Stative/Perfect Suffix-Conjugations

Since the long and short suffix-conjugation forms, if we accept the arguments for their presence in Egyptian, are attested solely in Egyptian and Semitic, it is unclear whether we should treat these forms as an archaic inheritance from Proto-Afro-Asiatic in two closely related branches, or as an innovation within a common Egypto-Semitic clade. For this dissertation, we will treat the long and short suffix-conjugation variants as if they were of the same antiquity as the prefix-conjugation for the purposes of syncopation, while acknowledging that the variants may have arisen at a much later, Egypto-Semitic stage, during which syncopation was still an active rule of the synchronic grammar.

The inherited suffix-conjugation has become a part of the default inflection of effectively all verbs in Berber. As Prasse (1973) reconstructs, verbal inflection for Proto-Berber attests to a mixed paradigm in which affixes from both the prefix and suffix-conjugation appear :

| | | Tuareg | | Proto-Berber | |
|-----|---|----------|-----------|--------------|-------------|
| | | Sg. | Pl. | Sg. | Pl. |
| 1st | | ∅-...-äy | n-...-∅ | *a-...-ay | *na- |
| 2nd | M | t-...-äd | t-...-äm | *ta-...-aḍ | *ta-...-am |
| | F | | t-...-mät | | *ta-...-mat |
| 3rd | M | i-...-∅ | ∅-...-än | *ya-...-∅ | *∅-...-an |
| | F | t-...-∅ | ∅-...-nät | *ta-...-∅ | *∅-...-nat |

Figure 1.43: Verbal Conjugation in Tuareg and Proto-Berber

In addition to this mixed paradigm, however, some Berber languages additionally attest to the survival of a true stative suffix-conjugation in the form of the so-called qualitative verbs (*verbes qualitatifs*). These forms, which appear in a number of Northern Berber languages, consist of verbal roots with attributive or qualitative meanings, including colors, body characteristics, physical ailments or infirmities, and other permanent or semi-permanent states³⁷. All such qualitative verbs are inflected exclusively with suffixes, lacking the inherited prefix-conjugation morphemes which have become common to all eventive verbs, as illustrated in the chart below, adapted from Taine-Cheikh (2003, 2008).

| | | Tuareg | Qabyle | Ghadames | Zenaga |
|---------|---|--------|--------|------------------|--------|
| 1st Sg. | | -y | -əǧ | -eʿ ⁱ | -äg |
| 2nd Sg. | | -d | -ḍ | -ət | -äd |
| 3rd Sg. | M | -∅ | -∅ | -∅ | -∅ |
| | F | -∅ | -ət | -et | -äd |
| 1st Pl. | | -∅ | -it | -it | -∅ |
| 2nd Pl. | M | -äm | -it | -it | -am |
| | F | -mät | | | -əmñäd |
| 3rd Pl. | M | -än | -it | -it | -an |
| | F | -nät | | -it | -əññäd |

Figure 1.44: Tuareg Verbal Suffixes and Berber *Verbes Qualitatifs*

Although some of the forms of the qualitative verb suffixes resemble their Semitic and Egyptian counterparts, there are a number of discrepancies. First, in the case of the 1st and 2nd persons Sg., the forms attest to the same *-k and *-t segments underlying these forms in Egyptian and Semitic with one notable alteration: each has undergone an unexpected and quite irregular sound shift

³⁷In the Northern Berber varieties in which this form appears, it is commonly used to translate the form Arabic IX 'if' *alla* verb stem as well as the corresponding 'af' *al* adjectives with which they have great semantic overlap though no direct formal cognation.

from the voiceless member of their obstruent series to the emphatic member³⁸. The presence of emphatic consonants is clearly some irregular or secondary process, but it appears to be an ongoing process, as the Zenaga language shows the spread of emphasis to all coronal obstruents in the suffix-conjugation.

The plural forms are also worth some comment, particularly because of the split between languages such as Tuareg or Zenaga, which boast complete, fully distinctive paradigms of plural suffixes, and those like Qabyle and Ghadames, which show a common **-it* ending for all plural persons. Since the forms of the complete plural paradigm are not (at least superficially) clearly cognate with those of Egyptian or Semitic, it is not clear a priori which set is original. However, as Zenaga in fact attests both its full paradigm, as well as the reduced form, we may suppose that both forms existed at the common Berber stage with some languages eventually displacing the full paradigm with its reduced counterpart³⁹.

The lack of cognation among the plural forms is also worth noting in and of itself. It is not surprising that the 3rd persons are innovative, as both Semitic and Egyptian appear to have developed novel 3rd person forms for the suffix-conjugation. It is more striking that the 1st and 2nd persons lack this cognation. Prasse (1973) has attempted to argue that the 2nd persons of the complete paradigms may in fact reflect the same **-tun/*-tin* and *<.ti>* endings of Semitic and Egyptian. Prasse suggests that Proto-Berber **-am* and **-mat* may reflect a Pre-Proto-Berber **-tam* and **-tamat* respectively. Why the **-t* of this proposed suffix would disappear is not clear. Some scholars have suggested a loss of the **-t* due to haplology triggered by the presence of the **t-* prefix. Such a change, if present, clearly must not be a regular sound change as it has failed to occur in the case of the singular 2nd forms. It is likewise not attested in the case of the *t...-t* feminine state/gender markers. No adequate reason has been offered for the absence of the presumed 1st plural forms in **-n*.

The most common suffix-conjugation in Cushitic is, as has been previously described, the Cushitic "weak verb," the remnant of an old prefix-conjugated auxiliary that has univerbated with an otherwise invariant verb stem. It is, therefore, correctly not regarded as the direct inheritor of the old Afro-Asiatic suffix-conjugation. In addition to this, however, there exists in East-Cushitic a second suffixing verbal conjugation, referred to by Banti (2001) as the Second Cushitic Suffix-Conjugation (SC2) or the East-Cushitic Stative. As the name states, this form is used for verbs in East-Cushitic, which are predicates, adjectival, unaccusative or otherwise intransitive. Examples of the SC2, drawn from the Somali and Afar-Saho verb *ʿusub* "be new," are presented below, adapted from Banti (2001); Khan et al. (2012).

³⁸Afro-Asiatic **ṭ* straightforwardly yields **ḍ* in Berber, which is attested in Qabyle and Zenaga (and in the voiced variant of Tuareg). Afro-Asiatic **ḳ* yields Berber **y/qq*, which is reflected in all 1st singulars presented here.

³⁹There is also the fact that the default plural marker here bears a striking resemblance to the Berber plural clitic **id*. We may envision these forms as a univerbation of a bare verb stem and a plural marker, perhaps originating in the otherwise unmarked 3rd person forms and spreading from there.

| | Somali | Afar-Saho |
|---------|----------|-----------|
| 1st Sg. | ʿusbi | ʿusubiyo |
| 2nd Sg. | ʿusbid | ʿusubito |
| 3rd Sg. | ʿusub | ʿusuba |
| 1st Pl. | ʿusbin | ʿusubino |
| 2nd Pl. | ʿusbidin | ʿusubitin |
| 3rd Pl. | ʿusub | ʿusubon |

Figure 1.45: East Cushitic Stative

There is little consensus within the field as to whether the SC2 represents an inheritance of the original suffix-conjugation, or an innovation internal to the East-Cushitic languages. Banti (1987) originally argued for a common origin of the SC2 and the original stative conjugation, but subsequently (Banti, 2001) shifted his opinion, linking the SC2 with the possessive suffixes of Cushitic, and claiming that it represents an originally nominal/participial form with possessive suffixes, akin to the Egyptian *sḏm.f* clitic "conjugation."

Both proposals are not without their own merits and issues. If we suppose that the SC2 is indeed a retention of the stative conjugation, we may ask why it lacks the characteristic **-k* of the 1st Sg. of the suffix-conjugation. Rather, it would appear that the 1st Sg. form of the SC2 has been borrowed into the paradigm of verbal inflection from the possessive suffixes, where Banti reconstructs **-iyi/u* for the SC2 and **-yi/u* for the possessive suffixes. This parallels the Egyptian *sḏm.f* conjugation, where the 1st Sg. form <.i> is identical with the possessive suffix <.i>. On the other hand, if it is cognate with the possessive suffix pronouns, we may argue why effectively none of the SC2 suffixes except the 1st singulars resemble their possessive suffix counterparts. Compare the SC2 and possessive forms below, adapted from Banti (2001).

| | | SC2 | Possessive Suffix |
|---------|---|-------|-------------------|
| 1st Sg. | | -iyi | -yi/-yu |
| 2nd Sg. | | -itu | -ku/-ki |
| 3rd Sg. | M | -∅ | -su/-si |
| | F | | -si/-sa |
| 1st Pl. | | -inu | -inu/-ni |
| 2nd Pl. | | -itin | -kin/kutṽ |
| 3rd Pl. | | -∅ | -sin/-sutṽ |

Figure 1.46: SC2 vs. Possessive Suffixes

Banti (2001) has argued that the presence of **-t* in the 2nd persons can

be likened to the phenomenon in Egyptian whereby the 2nd person feminine suffixes were palatalized to <.t> and eventually passed to -**ṯ** in Coptic. We argue against such an analysis, since, unlike in Egyptian, there is no evidence that palatalization is an active sound change shared by East-Cushitic, nor has this change occurred in the suffix pronouns themselves. We may also note, as seen in Somali, that the verb of the SC2 is characterized by stem allomorphy, which the verbal forms arising from univerbation, such as the SC1 "weak verb," lack. For our purposes, we will tentatively accept the proposal of the SC1 as the descendent of the original stative conjugation, while acknowledging their possibly novel origin. For more detail, see section 6.2.1.

As for Chadic and Omotic, there is no evidence that the stative suffix-conjugation was ever present in either branch. Neither the suffixes themselves, nor the presence of a distinct stative conjugation is reflected in either branch. Due to the family structure that we have here supposed, we will regard this absence as a loss of the inherited suffix-conjugation. We nevertheless admit the possibility, particularly if the Cushitic Suffix-Conjugation 2 is of non-cognate origin, that the suffix-conjugation itself may be an innovation on the part of the northern Egyptian-Semitic-Berber clade.

Considering these data from the daughter branches, we may reconstruct the following suffix/stative conjugation affixes for Proto-Afro-Asiatic (or for Proto-Northern-Afro-Asiatic).

| | | <i>Sg.</i> | <i>Pl.</i> |
|------------|----------|------------|------------|
| <i>1st</i> | | *-(ā)ku | *-(ā)nṯ |
| <i>2nd</i> | | *-(ā)tṯ | *-(ā)tṯn |
| <i>3rd</i> | M | *-∅ | |
| | F | *-∅/-t | |

Figure 1.47: Proto-Afro-Asiatic Suffix-Conjugation

As in the prefixing conjugation, a clear morphological distinction between the Sg. and Pl. 1st person morphemes is securely reconstructable⁴⁰. As is typical of the family, gender is not distinguished in the 1st person. Unlike the prefix morphemes, the suffix forms reflect a Sg. vs. Pl. distinction in the 2nd persons, which is at least plausibly reconstructable. Semitic and Egyptian clearly reflect a plural in *-tṯn, and if the East Cushitic stative conjugation is truly cognate, its 2nd Pl. form *-itin would appear to be a dead ringer. We should only mention the caveat that the form of the 2nd Pl., which appears to be the 2nd Sg. suffixed with the same *-n affix that indicated plurality in the pronominal forms, could plausibly represent a parallel innovation on the part of these daughters, since it has the appearance of a rather transparently derived

⁴⁰Note also that in the case of both the prefix and suffix morphemes, along with the various personal pronouns, the 1st Pl. is characterized by the segment *n.

formation.

The precise behavior of the suffix-conjugation in the third person is most difficult to recover. The simplest is the case of the Fem. Sg., so we will begin there. Semitic, Egyptian, and Berber all clearly point to a Fem. Sg. that is indicated by the presence of the typical feminine **-t*. This distinctive feminine form is absent from the East-Cushitic stative, but it should be noted that the Afro-Asiatic **-t* feminine affix appears only sporadically in Cushitic outside of Beja. This suggests two possibilities to us: 1) the Egyptian-Semitic-Berber state of affairs is original, and the Cushitic languages have remodeled their original feminines in **-t*, after the loss of that morpheme in that branch, or 2) the Cushitic state of affairs is original, and Egyptian, Semitic, and Berber have each independently innovated a feminine in **-t*, presumably on the similarity between feminine adjectives in **-t* and feminine statives. Tentatively, we favor the former proposal, but both are plausible.

The form 3rd Masc. Sg. suffix is even more difficult to recover. The evidence of Egyptian and Coptic points clearly to a morphologically overt and vowel-initial suffix. This is mirrored in the **-a* suffix reflected in Arabic, Ge'ez, etc. As we discussed, however, there is at least some evidence that the **-a* suffix of these forms is not original in Semitic. It is largely absent in East Semitic, and it appears to be absent from our most archaic onomastic representations of the West Semitic languages. The attestation of Berber is consistent with either, since no overt suffix is present, but a word-final, unstressed vocalic suffix would have been lost in Berber in any event. The East-Cushitic stative conjugation also has no overt 3rd Masc. Sg. form. Given the typically unmarked nature of the masculine singular in Afro-Asiatic (having no overt marking in nominal inflection, default **yǝ-* in prefixed verbal inflection), we tentatively favor the idea that the 3rd Masc. Sg. of the suffix-conjugation had no overt morphological realization.

The 3rd plural forms are difficult to analyze. In effectively every branch for which we have evidence of the suffix-conjugation, we find that 3rd Pl. suffixes are distinct from 3rd Sg. suffixes, but none of the plural suffixes are cognate with one another. Semitic **-ū* and **-ā* appear to be drawn from the paradigm of nominal inflection, corresponding to nominative masculine plural in **-ū* and the feminine plural in **-āt* respectively. The same is likely true of Egyptian $\langle .w(i) \rangle$ and $\langle .t(i) \rangle$, as each, particularly the former, resembles the nominal plurals $\langle .w \rangle$ and $\langle .wt \rangle$. The Berber languages do not show internal agreement within the family pointing to a single set of 3rd plural suffixes. Rather it seems clear that there is a cluster of geographically northern languages in which the **-it* of the 3rd plural is simply a part of the generalized **-it* suffix that characterizes all subject-conjugated *verbes qualitatifs*. Then there appears to be a more southern group, characterized by Zenaga (as well as the suffix forms of general verbal inflection in Tuareg) in which distinctive 3rd Pl. suffixes **-an* and **-nat* can be reconstructed. Which, if either, of these systems ought to be reconstructed to the Proto-Berber stage is unclear. The East-Cushitic stative conjugation likewise exhibits no distinctive forms for the 3rd plural, or indeed, of the 3rd persons at all.

Across the daughter languages, then, we find common evidence for the presence of 3rd Pl. suffixes, but almost all such morphemes bear strong resemblances to morphemes present in nominal inflection, and almost none of the morphemes in question exhibit any straightforward or uncontroversial cognation with one another. We therefore cannot reconstruct a clear affix indicating the 3rd Pl. in Afro-Asiatic, though we acknowledge the possibility that such an affix may have existed at one point, but has since been lost and replaced with other more transparently derived morphemes from nominal or pronominal inflection.

1.3.2.3 Aspect

Excluding the previously discussed possibility of a long vs. short/stative vs. perfect opposition within the suffix-conjugation, it is the eventive prefixing conjugation that can be further sub-divided into aspectual categories. Although the systems do not agree perfectly in detail, a picture nevertheless emerges of an Afro-Asiatic eventive verb which reflects two primary aspects: an unmarked and default perfective form and a marked imperfective. We will discuss the distinctive form and the attestation of each below.

1.3.2.3.1 Perfective Stem

As with many elements of the morphology of Afro-Asiatic, the perfective stem is best known to us from Semitic. This stem is the form of the Akkadian preterite, the Ugaritic perfective, the Hebrew, Aramaic and Syriac imperfects, the Classical Arabic non-past and jussive, the Ethiopic jussive, and the South Arabian subjunctive. In all of these attestations, it reflects the same basic stem shape: **CCVC'*, as demonstrated in the comparison of the most basic paradigms from Semitic, adapted from Lipiński (2001).

| | | <i>Akkadian</i> | <i>Arabic</i> | <i>Hebrew</i> | <i>Ge'ez</i> | <i>Mehri</i> |
|---------|---|-----------------|---------------|---------------|--------------|--------------|
| 1st Sg. | | aprus | 'af'alu | 'eqtōl | 'əqtəl | ləktēb |
| 2nd Sg. | M | taprus | taf'alu | tiqtōl | təqtəl | təktēb |
| | F | taprusī | taf'alīna | tiqtālī | təqtəli | təktēbi |
| 3rd Sg. | M | iprus | yaf'alu | yiqtōl | yəqtəl | yəktēb |
| | F | taprus | taf'alu | tiqtōl | təqtəl | təktēb |
| 1st Pl. | | nīprus | naf'alu | niqtōl | nəqtəl | nəktēb |
| 2nd Pl | M | taprusā | taf'alūna | tiqtālū | təqtəlu | təktēbəm |
| | F | | taf'alna | tiqtōlnā | təqtəla | təktəbən |
| 3rd Pl. | M | iprusū | yaf'alūna | yiqtālū | yəqtəlu | yəktēbəm |
| | F | iprusā | yaf'alna | tiqtōlnā | yəqtəla | təktəbən |

Figure 1.48: Trilateral Semitic Perfective Stem Forms

Considering the root shapes of other Afro-Asiatic families, biliteral verbal

roots are suspiciously absent from the the inflection of prefix-conjugated forms in attested Semitic languages. Many Semitic verbs reflect only two root consonants in their surface representations, and some may be correctly interpreted in the synchronic grammars of Semitic daughter languages as having only two root consonants. However, almost all such forms can be rightly regarded as the outcomes of originally "weak" verbs containing one (or more) sonorant or guttural consonants prone to vocalization or disappearance depending on position within the syllable. Based on this, we may rightly say that Proto-Semitic had no biliteral inflection⁴¹.

Because all non-imperative finite verb forms which can be securely reconstructed to the common Proto-Semitic stage are trilateral, we cannot directly comment on the shapes of other stems in Proto-Semitic, but we can nevertheless remark upon their behavior in specific daughters. In Arabic, four-consonant verb roots form an irregular but relatively coherent class that take the uniform shape *CVCCVC* in both the prefix and the suffix-conjugation: as in *yutarjimu* "he translates" or *yucahqihi* "he laughs aloud." Quadrilaterals in Akkadian are limited exclusively to the derived N-Stem (see section 1.3.2.4.3 for further discussion of the N-Stem), but nevertheless exhibit the same distinctive *CVCCVC* stem shape: *ibbalkit*⁴² "he turned over." Ethiopic and South Arabian both attest four-consonant forms of the Arabic type (Ge'ez *yətārgwəm* "may he translate," Mehri *yakarbəl* "may he run," Rubin (2010); Tropper (2002)), but they share with Akkadian an association of the N-Stems with quadrilaterals. Indeed, in South Semitic, quadrilateral verbs are the only forms which retain the N-Stem in any form. In the Northwest Semitic languages, quadrilaterals take the same form as in Arabic, (Hebrew *yətagēm* "he is/will translate"). Five-consonant, or quinquilateral, verbs are even rarer across Semitic, however, they do occur sporadically, especially in South Semitic, where they attest a stem shape *CCVC-CVC* (Ge'ez *yədləqləq* "may he tremble," which appears to be a reduplication).

As we turn our attention to Berber, we find a similar system in many respects. Here, again, trilateral forms predominate, and like Semitic, they attest a *CCVC* stem shape. In addition to these most common root forms, however, we likewise find in Berber regular or semi-regular classes of biliteral, quadrilateral and even quinquilateral verbal roots. Though comparatively less frequent than their trilateral counterparts, these forms are common enough for Prasse (1973) to reconstruct them to Proto-Berber, along with their distinctive stem shapes. Biliterals appear as *CVC*, quadrilateral roots as *CVCCVC*, and quinquilateral roots as *CCVCCVC*. Note that, as in Semitic, other phonologically

⁴¹There is, in fact, some evidence that Proto-Semitic had inherited archaic biliteral verbal forms, albeit not in the prefix-conjugation. In Arabic, for instance, some verbs which begin with weak consonants such as *w, *y, *ʾ, etc. appear as biliteral in the imperative: *kul* "eat!" vs. *yaʾkulu* "he eats." Rather than an Arabic innovation, we may compare this with the common Semitic imperatives – Akkadian *lidī*, Ugaritic *ld*, Hebrew *lədī*, or Ge'ez *lādi*, all meaning "give birth!," missing the initial weak consonant *w/*y seen in the inflected verb **walad/*yalad*. Since, however, all these verbs have been extended with weak consonants in the prefix- and suffix-conjugation forms, we cannot examine the form of the perfective stem with biliteral verb roots.

⁴²Originally **inbalkit*.

well-formed stem types not precluded by syllable-structure rules (such as *CVCC* *CVCVCC* or *CVCCVCC*) are **not** attested in the basic verbal system of Berber. A complete illustration of the possible perfective stem shapes is provided below, adapted from Prasse (1973) and Heath (2005).

| | | Biliteral | Triliteral | Quadriliteral | Quinquiliteral |
|---------|---|-----------|------------|---------------|----------------|
| 1st Sg. | | əwätäy | əkräsäy | əbärdäyäy | əblänkäsäy |
| 2nd Sg. | | təwätäd | təkräsäd | təbärdäyäd | təblänkäsäd |
| 3rd Sg. | M | iwät | ikräs | (i)bärdäy | iblänkäs |
| | F | təwätät | təkräsät | təbärdäyät | təblänkäsät |
| 1st Pl. | | nəwät | nəkräs | nəbärdäy | nəblänkäs |
| 2nd Pl | M | təwätäm | təkräsäm | təbärdäyäm | təblänkäsäm |
| | F | təwätmät | təkräsmät | təbärdäymät | təblänkäsmät |
| 3rd Pl. | M | əwätän | əkräsän | əbärdäyän | əblänkäsän |
| | F | əwätinä | əkräsnät | əbärdäynät | əblänkäsänät |

Figure 1.49: Tuareg Berber Perfective Stem Forms

In the Cushitic languages, the perfective stem is retained only in the prefix-conjugated "strong verbs," but nevertheless, a similar pattern emerges. Larger 4- and 5-consonant verbal roots are not attested in Cushitic, but biliterals, which are the most common root type in Cushitic, attest the same primarily *CVC* stem shape (with occasional conditioned variation to *CC*), while trilaterals attest primarily *CCVC*, excepting stems containing weak or laryngeal consonants, or stems containing long first vowels, which appear as *CVVCVC*). While the stems with long vowels are likely Cushitic innovations, the biliteral forms agree quite closely with Berber, and the trilaterals with Berber and Semitic. Bi- and triliteral stem formations from both Beja and Afar-Saho are presented below, adapted from Wedekind and Musa (2010), Zaborski (1975), Banti and Banti (1988), and Bliese (1981).

| | | Beja | | Afar-Saho | |
|---------|---|-----------|------------|-----------|------------|
| | | Biliteral | Triliteral | Biliteral | Triliteral |
| 1st Sg. | | arib | ašbib | able | afkune |
| 2nd Sg. | M | tiriba | tišbiba | table | tafkune |
| | F | tiribi | tišbibi | | |
| 3rd Sg. | M | irib | išbib | yable | yafkune |
| | F | tirib | tišbib | timiy | tafkune |
| 1st Pl. | | nirib | nišbib | nable | nafkune |
| 2nd Pl. | | tiribna | tišbibna | tablin | tafkunin |
| 3rd Pl. | | iribna | išbibna | yablin | yafkunin |

Figure 1.50: Beja and Afar-Saho Perfective Stem Forms

Since the perfective stem is morphologically unmarked, and is identifiable only in the inflection of the prefix-conjugation, direct reflexes of this stem are unrecoverable in those branches which have lost the prefix-conjugation, namely Egyptian, Chadic, and Omotic.

On the basis of these data, we may reconstruct the basic perfective stems of Proto-Afro-Asiatic as varying distinctly based on the number of consonants that make up the root. We will return to this variability in section 2.2.1, in which we discuss the generation of such forms from an originally vocalized and syncopated root. A summary of reconstructable stem shapes is provided in section 1.3.2.5.

1.3.2.3.2 Imperfective Stem

The other of the securely reconstructable aspectual stems is the imperfective stem. In contrast to the perfective stem, which is morphologically unmarked, other than potential stem allomorphy, the imperfective stem has a characteristic morphological form, often treated as a templatic phenomenon, which we will here argue is better-characterized as a simple case of infixation.

The imperfective stem, both in its form and its semantics, is best-attested in Semitic, specifically east Semitic, where Akkadian attests to a morphologically distinctive imperfective verbal stem formed, using the terminology of the traditional grammars of Semitic languages, by the gemination of the second root-consonant: CVC_2C_2VC . This geminated imperfective is likewise attested in the Ethiopic languages, although its basic semantics have shifted, now representing a combined present/future "non-past" form. A geminated second root-consonant may be hypothesized to underlie the imperfect form of the Modern South Arabian languages, such as Mehri *yərōkəz*. The long vowel appearing between the first and second root-consonants is a lengthening by prosodic position, but the presence of a vowel in such a position at all suggests that it arose not as a $CCVC$ perfective stem but rather a CVC_2C_2VC stem with sub-

sequent loss of gemination⁴³. The geminated imperfective clearly has been lost in Classical Arabic, but it was likely present at the Proto-Arabic stage. As noted by Rubio (2006), Andalusian Arabic still retained the geminate imperfective as late as the 16th century, when Pedro de Alcalá recorded forms such as <nihammí> (**niḥammī*) and <nixehhéd> (**nišehhed*) in place of the expected classical forms *'aḥmī* and *'ašhadu* respectively⁴⁴. The geminated imperfective is unattested in Hebrew and Aramaic, and the writing of Ugaritic makes it impossible to ascertain its presence there with certainty. Nevertheless, there is some evidence that such forms may have been present in Central or Northwest Semitic. Recovered Amorite onomastics such as <ya-ma-at-ti-Ēl> and <ya-na-ab-bi-Ēl> seem to demand reconstructions as geminated imperfectives **yamatti* 'el "El will protect" and **yanabbi* 'el "El will name" rather than perfectives **yamti* 'el or *yanbi* 'el respectively. Below we present forms from Akkadian and Ge'ez, which clearly reflect the old imperfective geminate stem, as well as the Modern South Arabian forms, as represented by Mehri, which may reflect this formation.

| | | <i>Akkadian</i> | <i>Ge'ez</i> | <i>Mehri</i> |
|---------|---|-----------------|--------------|--------------|
| 1st Sg. | | aparras | 'əqättəl | əkütəb |
| 2nd Sg. | M | taparras | təqättəl | təkütəb |
| | F | taparrasī | təqättəli | təkətəb |
| 3rd Sg. | M | iparras | yəqättəl | yəkütəb |
| | F | taparras | təqättəl | təkütəb |
| 1st Pl. | | niparras | nəqättəl | nəkütəb |
| 2nd Pl | M | taparrasā | təqättəlu | təkətbəm |
| | F | | təqättəla | təkətbən |
| 3rd Pl. | M | iparrasū | yəqättəlu | yəkətbəm |
| | F | iparrasā | yəqättəla | təkətbən |

Figure 1.51: Trilateral Semitic Imperfective Stems

In each of these cases, the traditional templatic description of these imperfectives as having a geminated second root-consonant is consistent with the data. When we begin to examine the quadrilateral and quinquilateral verb forms, however, it becomes clear that this formulation must be modified. In Akkadian, for instance, the imperfective counterpart to *ibbalkit* is not **ibballkit* (which would violate syllable structure), or **ibballökkit* with an epenthetic vowel to correct for syllable structure, but rather, *ibbalakkit*, with the third radical apparently geminating. The same pattern holds true in Ge'ez where, the perfect *yəṭärgwəṃ* is

⁴³**yarákkaz*>**yarákaz*>*yərókəz*

⁴⁴The replacement of the *'a- 1st Sg. prefix with **ni-* is a common characteristic of Maghrebi Arabic and has no bearing on the presence of morphological gemination in these forms.

paired not with **yətärräg^wəm*, but rather with *yətärügg^wəm*. Likewise for the quinquiliterals of Ethiopic. Perfect *yəsarsər* is geminated in the present/future not as **yəhössarsər* with second-radical gemination, but rather as *yəhasrassər*. In the case of these data, we can perhaps salvage the templatic account by suggesting it is not the second root-consonant that geminates, but rather that the formation of the imperfective stem is effectively a right-edge prosodic effect which geminates the second root-consonant from the right. Such a theory would produce both the more conventional *CVC₂C₂VC* triconsonantal forms as well as the less conventional *CVCVC₃C₃VC* quadriliterals.

A similar situation presents itself in Berber. The old Afro-Asiatic imperfective is survived in Berber in the form of the so-called "Intensive Imperfect," which functions as a present progressive, and is marked by gemination. For trilateral roots, as in Semitic, it is characterized by the gemination of the second root-consonant, and the presence of a full vowel between the first root-consonant and the geminate (**yikarras*). The biliterals of Berber, absent from Semitic, are consistent with the right-edge analysis, with gemination in such forms occurring on the initial root-consonant, the second from the right (**yiwwat*). Samples of biliteral and triconsonantal inflection are provided below, again adapted from Prasse (1973) and Heath (2005).

| | | Biliteral | Trilateral |
|---------|---|---------------------|-------------|
| 1st Sg. | | əggāt ⁴⁵ | əkárras |
| 2nd Sg. | | təggätäd | təkárräsäd |
| 3rd Sg. | M | iggät | ikárräs |
| | F | təggätät | təkárräsät |
| 1st Pl. | | nəggät | nəkárräs |
| 2nd Pl | M | təggätäm | təkárräsäm |
| | F | təggätmät | təkárräsmät |
| 3rd Pl. | M | əggätän | əkárräsän |
| | F | əggätñät | əkárräsñiat |

Figure 1.52: Bi- and Trilateral Geminate Imperfectives in Tuareg

Four- and five-consonant verbal roots are present within Berber, but we cannot directly observe the shape of the geminated imperfective in these forms due to a particular quirk of the imperfective stem in general, and of these larger verb stems in Berber specifically. The geminated imperfective stem in Berber does not co-occur with any of the derived stem types (see section 1.3.2.4 for discussion of derived stems). Although they are not transparently derived in any detectable fashion, the quadrilateral and quinquilateral stems of Berber exhibit the morphological behavior of derived stems, both in terms of affixes and stem

⁴⁵This is the same root as perfect *iwät*. Geminate *w in Berber results in an alternation with [gg].

shapes. They therefore do not show any gemination in the imperfect, instead showing a novel imperfect prefix in **t-*. However, there is another important class of verbs in Berber, those we might rightly describe as *CVCV* biliterals, which contain only two root-consonants, but are bisyllabic. In these forms, gemination of the intensive imperfect (the old imperfective stem) appears on the final root consonant (**yibassa*). We will return to these momentarily, as the data from Beja can help clarify their behavior.

among the Cushitic languages, the original distinction between the old Afro-Asiatic perfective and imperfective stems is retained only in Beja, which is not particularly surprising, as Beja is the only Cushitic language outside of Afar-Saho in which the prefix-conjugation survives as anything more than a handful of irregular or suppletive verbs. In contrast to its northern cousins, Beja does not reflect the same characteristic gemination of root consonants in imperfective verb stems. Rather, it shows an imperfective verb formed by the presence of an infix $\langle n \rangle$. However, this $\langle n \rangle$ infix corresponds closely to the gemination reflected in Semitic and Berber, with the infixed segment appearing directly adjacent to the same consonant which would geminate in the northern languages. For triliteral *CVCVC* verbs, this means the $\langle n \rangle$ infix appears adjacent to the second root-consonant (Beja *(i)danbīl* vs. Akkadian *iparras*). For biconsonantal *CVC* verbs, this means the infixed $\langle n \rangle$ appears adjacent to the initial root-consonant (Beja *inrīb* vs. Tuareg *iggât*). Finally, in biliteral, bisyllabic *CVCV* verbs, the $\langle n \rangle$ -infix appears adjacent to the final root consonant (Beja *(i)dangi* vs. Tuareg *ibâss*).

One striking difference between the imperfective stems of Beja and those of Semitic and Berber is that the $\langle n \rangle$ infix which indicates the imperfective appears to be wholly absent in the plural forms, although Reinisch (1893) reports forms from the Hadendowa dialect of Egypt, Eritrea, and Sudan, which maintain $\langle n \rangle$ -infixation throughout the full paradigm. To judge from the external comparanda, it would appear that this is the original configuration, though it is not entirely clear as to why the infix should be lost. It is true that the plural forms have allomorphically variant stems that could be interpreted as spelling out the imperfectivity without the need for the infix. Such an approach is perhaps supported by the fact that in the Hadendowa forms reported by Reinisch, the presence of the $\langle n \rangle$ infix in the plural is accompanied by no other changes to the verbal stem. Sample paradigms are provided below, again from Wedekind and Musa (2010), Zaborski (1975), and Reinisch (1893).

| | | Bilateral | Bisyllabic | Trilateral | Hadendowa |
|---------|---|-----------|------------|------------|-------------------------|
| 1st Sg. | | anrīb | adangi | adanbīl | arank ^w ī |
| 2nd Sg. | M | tinrība | dangi | danbīl | rank ^w īya |
| | F | tinrībi | dangi | danbīl | rank ^w īyi |
| 3rd Sg. | M | inrīb | dangi | danbīl | rank ^w ī |
| | F | tinrīb | | | |
| 1st Pl. | | nirib | nideg | nidabil | nerank ^w i |
| 2nd Pl | | tiribna | tidegna | tidabilna | terank ^w īna |
| 3rd Pl. | | iribna | idegna | idabilna | erank ^w īna |

Figure 1.53: <n>-Infix Imperfectives in Beja

A number of scholars, such as Greenberg (1952), have commented on the similarity between the geminate imperfective of Berber and Semitic on the one hand and the <n>-infix imperfective of Beja on the other. Greenberg suggests that the Beja form arises from an originally geminated form with secondary dissimilation of the geminate into a nasal/consonant cluster ($CC > nC$). We, however, suggest that the relationship is quite the opposite. Namely, the geminates of Semitic and Berber are in fact the reflexes of these originally infix clusters ($nC > CC$). We believe this is the correct interpretation for a number of reasons.

First, dissimilation of geminates into [nasal]+[stop] is not a known phonological process in Beja, and indeed geminate consonants are quite commonplace in Beja without any evidence of dissimilation. On the other hand, both Semitic and Berber offer some evidence of the assimilation of [nasal]+[consonant] clusters into geminate clusters. Complete assimilation of nasal clusters to geminates is a surface-true rule in Akkadian, Phoenician, and Hebrew. It is likewise attested in Andalusi Arabic, Sabeian, sporadically in Ge'ez inscriptions, and in Gurage and Gafat (Lipiński, 2001). In Berber, Dell and Elmedlaoui (2012) and Bendjaballah and Haiden (2005) both demonstrate how the genitival preposition *n in Tashelhiyt and Qabyle Berber undergoes assimilation with the onset of the noun that it governs, with Bendjaballah and Haiden further noting how such assimilations seem to be a fairly regular part of the word internal phonology of Qabyle. The data of all three languages therefore support the hypothesis of geminates arising in [nasal]+[consonant] clusters, rather than the inverse.

Additionally, supposing an original <n>-infix allows us to better explain why the different verbal root types appear to select different root consonants as the target for gemination. If we suppose that the initial process was some sort of templatic or prosodically motivated gemination, it is difficult to state concisely in a single rule which root consonant appears to be the target of such gemination. If, on the other hand, we suppose that the initial state of affairs was rather the infixation of <n>, followed by subsequent assimilation, the situation is far simpler. This infix is inserted from the right before the onset consonant of the word-final syllable, in keeping with the simple observa-

tion that the relevant consonant for the formation of the imperfective (whether geminated or [nasal]+[consonant]) is *always* the onset of the last syllable. In the case of *CVC* biliteral roots, this will generate **nCVC*/**CCVC* forms such as Beja *inrīb* or Tuareg *iggât*. In the case of *CVCVC* trilaterals, it will create *CVnCVC*/*CVCCVC* forms, such as Beja *(i)danbīl* or Akkadian *iparras*. And critically, in the case of the bisyllabic *CVCV* verbs found in Cushitic and Berber, it easily generates the otherwise difficult-to-explain final-consonant geminate/cluster *CVnCV*/*CVCCV*, as in Beja *(i)dangi* or Tuareg *ibâss*. In this way, we can see that an account which locates the origin of the imperfective stem in simple right-edge infixation, rather than as a templatic process, more easily and succinctly accounts for the location of the geminate/cluster as it appears in the attested data.

Unlike the perfective stem, which is morphologically unmarked and therefore effectively undetectable in those branches which have lost the prefix-conjugation, the imperfective stem is characterized by an overt morphological realization, one we might hope to recover in even the more innovative branches such as Egyptian, Chadic, or Omotic. In Egyptian, some scholars have suggested a link to the class of perfect/imperfect verbal pairs such as <qb> vs. <qbb> "be cold," <šm> vs. <šmm> "be hot," or <km> vs. <kmm> "be black," in which the forms with the doubled written consonant have inchoative, habitual, or progressive meanings. Such forms are, however, false cognates with the original imperfective, as gemination is typically not displayed overtly in hieroglyphic writing, and a consideration of the outcomes of such pairs in Coptic reveals the the doubled written consonants are just that: freestanding consonants separated by vowels.

- **ⲕⲉⲗ** (*qib) vs. **ⲕⲗⲟⲗ** (*qṽbab)
- **Ⲓⲉⲙⲙ** (*šim) vs. **Ⲓⲙⲟⲙ** (*šṽmam)
- **ⲕⲉⲙⲙ** (*kim) vs. **ⲕⲙⲟⲙ** (*kṽmam)

Such forms should more rightly be considered as examples of true reduplication, and indeed, Bendjaballah and Reintges (2009) compares these forms with other complete reduplicative verb stems within Egyptian using the term pluractional, obviously suggesting that such forms find their true cognate forms in the reduplicated pluractional verbs of Chadic (see below), rather than the geminated forms of Semitic, Berber, or Cushitic, an analysis we favor as well.

There is, however, a small sub-category of Egyptian verbs which may represent a true inheritance of the original imperfective geminate/cluster stem: namely, the so-called medial geminate verbs. This small class of mostly biliteral verb roots shows the same written alternations as the general perfect/imperfect pairs (<pr.t> vs. <prr.t> "to come forth"), but their descendants in Coptic reveal a different phonological structure. For instance, <pr.t> survives as Coptic **ⲡⲓⲣⲉ**, reflecting a Middle Egyptian **pīrūt*. On the other hand, <prr.t> survives as the so-called absolute form of the verb in Coptic, attested as **ⲡⲓⲣⲓⲣⲉ**, reflecting a Middle Egyptian **pīrrū(y)ūt*. While it is clear that gemination

must be reconstructed for the imperfectives of the medial geminate verbs, the potential connection of the long/geminate imperfective of Afro-Asiatic is less clear. The gemination in Egyptian occurs on the onset of the final syllable, as in the inherited geminate imperfective, but if it is an inheritance from AA, it has clearly been conflated with the entirely separate reduplicative pluractional verb form. For our purposes, we remain agnostic about potential relations between the long/geminate imperfective and the medial geminate verbs.

In Chadic, we find that the most common morphological marking of duration, repetition, or habitual verbal semantics is associated with the reduplicated forms known as pluractionals. These have traditionally been treated as quite distinct from the gemination of the imperfective, and we will do the same. Nevertheless, we may still examine the verbal system of Chadic and note any potential relics of the original imperfective stem. Jungraithmayr (1974), in his discussion of the development of the verbal system of Chadic, reconstructs a basic opposition between imperfective and perfective stems at the Proto-Chadic level. He notes, however, that the morphological realization of this distinction varies greatly across the Chadic languages. Surveying these various forms, he proposes a diachronic development from older methods of aspect markings to comparatively more transparent innovative forms. Jungraithmayr's basic schema is illustrated below.

- **Stage I** (Migama, Mubi, Sokoro)
 - Vowel infixation and internal apophony/lengthening, gemination
- **Stage II** (Dera, Dangla, Birgit)
 - Vowel suffixation, external (word-final) vowel apophony
- **Stage III** (Hausa, Ron, Zime)
 - Tonal alternation
- **Stage IV**
 - No marking. Impf. and Perf. stems identical

As Jungraithmayr points out, his so-called Stage 1 Chadic languages still attest to an imperfective stem formed by the gemination of root consonants⁴⁶. He notes, for instance, that in languages such as Migama or Mubi, we find gemination on the second radical of biliteral verbs such as Migama *bèré/bèrré* "measure" or Mubi *ber/birra* "fly." Note that these forms agree exactly with the disyllabic biliterals of Beja, in which * $\langle n \rangle$ infixation occurs one syllable from the right. Jungraithmayr is somewhat struck that in Migama, which has trilateral verb forms, it is the 3rd! root consonant which geminates, as in

⁴⁶As well as the infixation of * $\langle a \rangle$, which is likewise common throughout Afro-Asiatic. For further discussion of this instance of infixation/apophony, see section 2.3.2.2.1, in which apophony is taken up in greater detail.

ʾápilé/ʾápàllá "wash." While unexpected from the perspective of a templatic theory, this is nevertheless precisely the position predicted from a theory of infixation from the right, given that Chadic verbal roots have been extended with root-final vowels generating an additional syllable and altering the location of infixation. For our purposes, we will regard the gemination seen in these *Stage I* Chadic languages as a fossilized relic of the once fully functional imperfective stem inherited from Proto-Afro-Asiatic.

1.3.2.3.3 Summary of Aspect Stem Formation

Considering the data presented above from the Afro-Asiatic daughters, we can reconstruct the following underived stem types for Proto-Afro-Asiatic. Forms are given in the 3rd M Sg., in keeping with the typical convention for Semitic.

| | Perfective | Imperfective |
|------------|------------|--------------|
| Biliteral | *yǎ-CVC | *yǎ-n-CaC |
| Triliteral | *yǎ-CCVC | *yǎ-CVnCaC |

Figure 1.54: Proto-Afro-Asiatic Aspectual Stems

The case of larger four- and five- consonant verbal roots is uncertain. As we have previously mentioned, it is unclear whether such forms should be reconstructed for Proto-Afro-Asiatic proper at all. If they are to be reconstructed at all, the shape of the imperfective stem is not securely reconstructable, as Semitic exhibits the characteristic right-edge infixation, whereas Berber shows derived-stem behavior for the imperfectives of these roots. Whether the Semitic or Berber state of affairs is more archaic is not immediately apparent. We will discuss the development of quadrilaterals later in sections 3.2, 4.2, and 5.2 when we focus in on the development of our theory of syncope in the verbal systems of each Afro-Asiatic daughter.

1.3.2.4 Verbal Derivation – Derived Stems

The derived verbal stems of Afro-Asiatic are, on the whole, remarkably well-attested, considering the tendency for the inherited prefix and suffix-conjugation systems to be displaced by innovative verbal systems. Both the forms and the approximate functions of the derivational morphemes are securely recoverable, and they often trigger cognate alterations in the apparent shape of the derived verbal stem which they form. Using terminology adapted from Semitic, we will refer to each of these derived stem types as the S-Stem, the N-Stem, and the T-Stem. The form and function of each will be discussed in detail below.

1.3.2.4.1 S-Stem

By far the most common and most securely reconstructable of the derived stem types is the S-Stem. The S-Stem appears in all Afro-Asiatic daughter branches, likely with the exception of Chadic, where it is regularly used to create derived verbs with causative or factitive semantics, or otherwise generally to increase verbal valence.

In Semitic, the S-Stem, or Š-Stem as it is there known, is widely attested, appearing in every major branch of Semitic, as well as in close to all attested languages. The morpheme which forms the Semitic S-Stem is quite securely reconstructable as a *ša-/*šu- prefix, although the *š segment appears only in Akkadian, Ugaritic, and some stem formations in Mehri. Elsewhere in Semitic, it has undergone weakening to /h/, as in Hebrew, Aramaic, or the remaining Mehri stems, or fully lenited to /ʾ/, as in Arabic, Syriac, or the Ethiopic languages. A summary of S-Stem forms in Semitic is presented below, adapted from Lipiński (2001).

| | Perfective | Imperfective | Stative |
|----------|-----------------------|------------------------|---------|
| Akkadian | ušapris | ušapras | šuprus |
| Arabic | yufʿilu ⁴⁷ | – | ʾafʿala |
| Hebrew | yaqtīl ⁴⁷ | – | hiqtīl |
| Geʿez | yaqtəl ⁴⁷ | yaqättəl ⁴⁷ | ʾäqtälä |
| Mehri | yəhafʿəl | yəhəfʿol | həfʿol |

Figure 1.55: S-Stem Verbs in Semitic

As illustrated above, the perfective Š-Stem in Semitic attests the same *CCVC* shape of the verbal root as the perfective of the underived verb stem (henceforth referred to as the G-Stem, again adopting terminology from Semitic). Interestingly, the stative stem, which typically shows only alternations between *CVCVC* and *CVCC* in the G-Stem, now shows exclusively a *CCVC* root shape, the same as the perfective. While Geʿez attests to a distinctive Š-Stem form along with imperfective gemination, both Akkadian and Mehri agree that the characteristic gemination of the imperfective was absent from the Š-Stem. Outside comparison will confirm that this was the original state of affairs, and that, indeed, the gemination of the imperfective (or the nasal-infix which gave rise to that gemination) did not co-occur with any of the derived stem forms.

In Berber, a similar picture emerges. As in Semitic, the S-Stem is marked by a prefix *sǔ-, though which vowel is present appears to vary in different forms. One peculiarity of the Berber S-Stem, and of the derived verbal stems more generally, is that the *s segment of the prefix shows sporadic gemination across

⁴⁷The Arabic, Hebrew, and Geʿez forms reflect original *yuʾafʿilu, *yahaqtīl, and *yaʾaqtīl/yaʾaqtīl respectively.

the Berber languages, and indeed, even within a single language, as illustrated in the Tuareg forms given below (adapted from Prasse (1973) and Heath (2005)). Possible explanations for this gemination will be offered in later discussion, but it would appear to be an innovation internal to Berber, and indeed, possibly after the Proto-Berber stage, since the individual Berber languages do not always agree as to where such innovative gemination occurs.

| | Perfective | Imperfective |
|---------------|------------|--------------|
| Biliteral | isyän | isâyän |
| Triliteral | issəkräs | isâkräs |
| Quadriliteral | isbärdäy | isâbärdây |

Figure 1.56: S-Stem Verbs in Tuareg

The Berber triliteral root, like its Semitic counterpart, retains the characteristic *CCVC* shape which we saw for the underived G-Stem. The biliteral, on the other hand, retains an invariant *CVC* stem shape⁴⁸. As in Semitic, the quadrilaterals have an invariant *CVCCVC* shape.

Another point of agreement between Semitic and Berber is that the gemination of the imperfective G-Stem is incompatible with the S-Stem form. But unlike Semitic, which indicates the difference between the perfective and the imperfective of the S-Stem with vowel apophony, Berber has developed a novel imperfective marker, which consists of the lengthening of the vowel of the **sǔ-* prefix to **sǔ̄-*. This length is, to reckon from the other Afro-Asiatic daughters, clearly not original to the prefix, and we may rightly consider a development internal to Berber. In addition to the lengthening of the prefix vowel, Berber S-Stems, and derived stems more generally, commonly co-occur with an apparent **(t)tǔ̄-* prefix, which also marks imperfective in Berber, as discussed in section 4.2.

The situation in Cushitic is more complex and requires further comment. In Beja, we find the S-Stem alive and well, again marked by a prefix-containing **s*, as in the forms below from Wedekind and Musa (2010), Zaborski (1975) and Appleyard (2007).

⁴⁸The vowel of the root is subject to lengthening by position or stress in Tuareg, but this is a later, Tuareg-internal development.

| | Non-Intensive | | Intensive | |
|------------|----------------------|----------------------|----------------------|----------------------|
| | Perfective | Imperfective | Perfective | Imperfective |
| Biliteral | isōdir | isōdir | isdār | |
| Bisyllabic | isdag | isdagi | isdāg | isdāgi |
| Triliteral | išbašik ^w | išbāšik ^w | išbašik ^w | išbāšik ^w |

Figure 1.57: S-Stem Verbs in Beja

Here we find that Beja is unlike Berber or Semitic, in that the triliteral verbal root in the S-Stem does not match the shape of the G-Stem, appearing as *CVVCVC*, rather than *CCVC*. Biliterals are again invariant. Another important point of contrast is that, unlike the S-Stems of Semitic or Berber, the Beja S-Stem surfaces in some forms with the causative prefix lacking any following vowel. We will see that this is indeed a common feature of Cushitic and will comment further on this phenomenon in our discussion in section 6.2.2.2. The causative prefix has likewise developed a long form **sō-*, which is used with biliteral roots, but this is an innovation specific to Beja within Cushitic, and we will not discuss it further here.

Although Beja is the most archaic of the Cushitic daughters, we have previously remarked that the prefix-conjugated "strong verb" likewise survives robustly in Afar-Saho, and, along with it, the S-Stem. Though lacking the elongated *sō-* prefix of Beja, the forms of Afar-Saho otherwise agree with Beja, with trilaterals showing a *CVVCVC* root shape, and biliterals an invariant *CVC*, as illustrated in the forms below, from Hayward (1984).

| | Biliteral | Triliteral |
|-----------|----------------------|------------|
| Afar-Saho | yeyder ⁴⁹ | yus'usube |

Figure 1.58: Fossilized S-Stems in Afar-Saho

The S-Stem is also preserved, however, even in those Cushitic languages which lose common prefix-conjugation in the form of strong verbs. In the Cushitic "weak verb" (Banti's SC1), we find the S-Stem survives in the form of a suffix in **-s*. In keeping with the accepted origin for the SC1 as a prefix-conjugated auxiliary which has subsequently undergone univerbation with an invariant verb stem, the causative **-s* suffix of Cushitic is regarded as the same prefix-conjugated auxiliary with the *s*-prefix. The apparent suffixation arises

⁴⁹The form of the causative prefix is subject to a number of phonological alternations in Afar-Saho. It appears as *ys-* before vowel-initial roots, as *y-* before roots beginning with a coronal obstruent, and as *s-* before other root forms. These alternations may be shared by East Cushitic languages more generally.

once the auxiliary, always in final position due to the SOVT word order in Cushitic, unverbates with the verb. Examples of such forms are presented below, adapted from Appleyard (1987), Wedekind and Musa (2010), Mahaffy (1940), Hayward (1984), and Mous (1993).

| | | | | |
|------------|-----------|-----------|--------|-------------------|
| | Beja | Afar-Saho | Agaw | Iraq ^w |
| Bilateral | tamsiya | fahise | kĩns | qasīs |
| Trilateral | kaḏawšiya | hawenise | gidĩrz | ‘aktīs |

Figure 1.59: Cushitic Weak-Verb Suffixed S-Stem Forms

Although the suffixed causatives of the Cushitic weak verb represent the inheritance of the old Afro-Asiatic S-Stem in a certain sense, because they represent the outcome of unverbation rather than the simple affixation of derivational morphemes, they cannot directly inform us as to the shape of the original S-Stem in Afro-Asiatic. The fact that such forms, as with all Cushitic weak verbs, exhibit a completely invariant verbal root is an important component of our analysis, which we will discuss further in sections 6.2.3 and 6.2.3.2.

In contrast to typical Omotic data, which is sparse in terms of both attestation and clarity of reconstruction, the S-Stem in particular and the derived verbal stems more generally are well-attested and point rather unambiguously to simple constructions. Like its Cushitic counterpart in the form of the S-Stem weak verbs discussed above, the S-Stem in Omotic survives exclusively as a *-s suffix which appends to an otherwise invariant verbal stem. This supports the notion, discussed in section 1.3.2.2.1 above, that Omotic developed the same periphrastic verbal conjugation which characterizes the Cushitic weak verb, perhaps as an innovation shared by a common Cushitic-Omotic ancestor. Omotic S-Stem forms are provided below, adapted from Bender (2000).

| | | | | | |
|-----------------|-------------|--------------|-------------|-------------|------------|
| Wolaytta | Koré | Yemsa | Dizi | Aari | Mao |
| immis | woḏus | kunsi | çars | wursis | kēšīše |

Figure 1.60: Suffixed S-Stem Verbs Across Omotic

We have previously described how Egyptian lacks any trace of the prefixes of verbal inflection common throughout the remainder of the family. Nevertheless, Egyptian preserves the prefixes of verbal derivation, most clearly the S-Stem. As in the other languages, Egyptian S-Stems function primarily as causative or factitives, as in the case of <‘nh̄> "to live" vs. <s‘nh̄> "to make live, to nurse." Fortunately for the historical linguist, the S-Stem forms survive into

Coptic, albeit as a relic class⁵⁰, and from these, we may recover the shape of the verbal root of S-Stems in older forms of Egyptian.

| | Coptic | Middle Egyptian |
|---------------|---------------|-----------------|
| Biliteral | ⲥⲙⲓⲛⲉ | *sṽmīnṽt |
| Triliteral | ⲥⲁⲛⲁⲛⲉ | *sa ˈnaḥ |
| Quadriliteral | ⲥⲕⲟⲣⲕⲣ | *sṽkarkṽr |

Figure 1.61: S-Stem Verbs in Coptic and Middle Egyptian

The Egyptian S-Stem forms bear a striking resemblance to their Semitic and Berber counterparts. As in Berber, the biliteral roots show no stem variation from the *CVC* root⁵¹. As in Berber and Semitic, the trilaterals show a *CCVC* root shape with the *sṽ- prefix, as in *sa ˈnaḥ. Finally, as in both Berber and Semitic, quadriliteral verbs attest the same invariant *CVCCVC* root shapes as in the G-Stem.

Finally, we may consider the case of the S-Stem in Chadic. There are many causative morphemes identifiable among the Chadic languages, and a few which appear to be reconstructable to older stages of the family. Few of these, however, bear any clear resemblance to the Afro-Asiatic S-Stem. Schuh (2019) notes the commonality of a causative suffix in *-d, which is securely reconstructable at least for the West and Central branches of the family. He likewise notes the presence of an East Chadic causative suffix *-t. It is unclear if these suffixes should be considered cognate. East Chadic *t does not typically correspond with Central or West Chadic *d, so if cognation is to be proposed, we must likewise suppose an irregular sound change or other process beyond simple sound change has altered the morpheme in some as-yet-undescribed fashion.

The best potential match for the Afro-Asiatic S-Stem in Chadic comes, somewhat surprisingly, from Hausa. Since the work of Parsons (1960), the Hausa verbal system has conventionally been divided into distinct verb forms referred to as "grades." These different grades can reflect differences in features such as verbal valence, aspect, or agentivity. among these distinct forms, we may note that the Grade 5 form is typically regarded as, at least in part, a semantic causative. The Grade 5 verb is formed, generally speaking, by the suffixation of -ař, which, as noted by Newman (1983), reflects an original *-as suffix still attested in some more conservative Hausa dialects. Consider the underived vs. Grade 5 pairs below, from Jaggar (2001).

⁵⁰The productive causative formation in Coptic involves the prefixing of Ⲧ-. In contrast to the S-Stem, which represents an inheritance of the old Afro-Asiatic derivational prefixes, this causative in *t- is in fact the univerbation of the Egyptian verb to give, <di>.

⁵¹The lengthening present in *sṽmīnṽt is a surface-level prosodic fact about Middle Egyptian and does not represent the underlying form.

| Underived Verb | Grade 5 |
|------------------------|-------------------------|
| <i>faṛkà</i> "awaken" | <i>faṛkaṛ</i> "wake up" |
| <i>fiṭa</i> "go out" | <i>fiṭaṛ</i> "take out" |
| <i>tāshì</i> "rise" | <i>tāyaṛ</i> "raise" |
| <i>warkè</i> "recover" | <i>warkaṛ</i> "cure" |
| <i>fāḍi</i> "fall" | <i>fāḍaṛ</i> "drop" |

Figure 1.62: Hausa Grade 5 Verb Forms

Given their initial **-as* shape, it is tempting to link the Hausa Grade 5 verbs with the suffixed S-Stem forms seen in the weak verbs of Cushitic and, likely, Omotic. Despite these apparent surface-level similarities, there are reasons not directly link these formation with the weak verb S-Stems of Cushitic and Omotic. For one, cognate forms to Hausa Grade 5 verbs are not recoverable elsewhere in Chadic, making a reconstruction to Proto-Chadic difficult. For another, as demonstrated by Jaggar (2014), the Hausa Grade 5 verbs are not clearly a causative formation in the first place. While some verbs have plausibly causative semantics, many Grade 5 verbs are more accurately assessed as having a semantics associated with motion away from the speaker. For our purposes, we will not regard the Grade 5 verbs of Hausa as representing an inheritance of the older S-Stem.

We would also be remiss in terms of discussing possible remnants of the S-Stem in Chadic more generally, or Hausa specifically, without mentioning the Hausa periphrastic causative. In addition to the morphologically fused Grade 5 form, Hausa also attests another more common and more productive periphrastic causative construction involving the use of the freestanding "verb" *sâ* "put." This construction, which is somewhat confusingly referred to as the "syntactic causative" of Hausa, involves the insertion of *sâ* between the so-called subject pronoun (likely an expression of I/T) and the causee, as in the case of the following example taken from Newman (1983).

- (11) *sarkī yā* *sâ* *sù* *yi rawā*
 chief 3rd.Sg.M.Perf CAUSE 3rd.Pl do dance
 'The chief made them dance'

Like the Grade 5 verb form, the "syntactic causative" verb *sâ* looks like a plausible candidate for cognation with the archaic S-Stem on the surface. However, such a connection is unlikely. Jaggar (2001) suggests that the Hausa verb *sâ* derives originally from *sakâ* "place, put." In such a case, Hausa *sâ* would relate not originally to the old S-Stem, but rather to other Chadic verbs such as Masa *súk* "sit down," or Pa'a *šikì* "dwell, live," as well as to verbs outside of Chadic like Akkadian *šakanu* "set out, arrange." For this reason, we will again not regard the Hausa verb *sâ* and any constructions involving this verb as related to the original Afro-Asiatic S-Stem.

Considering these data, we will reconstruct the following paradigm for the S-Stem of Afro-Asiatic.

| Biliteral | Triliteral | Quadriliteral |
|-----------------------|-------------------------------------|--------------------------|
| *y \check{v} -s-CVC | *y \check{v} -s \check{v} -CCVC | *y \check{v} -s-CVCCVC |

Figure 1.63: S-Stem in Afro-Asiatic

Note carefully the alternation in the forms of the prefix and the verb root. The biliterals reflect are reconstructed with a purely consonantal **s*- prefix and an invariant verb stem, as in Berber and Cushitic (strong) biliterals (though against Egyptian biliterals). Triliterals reflect a **s \check{v}* - prefix and a *CCVC* root shape as in the simple underived G-Stem, as seen in Semitic, Berber, and Egyptian, but against Cushitic strong verbs. The quadrilaterals, if they are to be reconstructed for Afro-Asiatic at all, again reflect a consonantal **s*- prefix, like the biliterals, and, also like the biliterals attest an invariant root shape *CVC-CVC*. We will return to these prefix and root shapes in section 2.2.1.2, where we discuss how this apparently random distribution is in fact perfectly predicted by an analysis using syncope.

1.3.2.4.2 T-Stem

The next most widely attested of the derived stems is the T-Stem. The T-Stem is found securely in Semitic, Berber, Cushitic, and Omotic, possibly attested in Chadic, again in the form of Hausa, and is absent entirely from Egyptian. Unlike the S-Stem, which has a comparatively easily recoverable semantic function, the T-Stem frequently undergoes confusion with the N-Stem as the functions of each frequently mismatch between distinct Afro-Asiatic branches. At a sufficient level of abstraction, the T-Stem tends to function as a reflexive, a passive, a middle, or a general intransitive, though we will discuss the distinctive function of the T-Stem in each daughter branch in greater detail below.

In Semitic, the T-Stem is attested in all major branches, though it is subject to significant re-modification. It is reflected in the East Semitic *iptaras* (reflexive/reciprocal), the Arabic form VII *yafta \acute{c} alu* (reflexive/passive), the Ugaritic <ypt \acute{c} 1> **yapta \acute{c} ilu*, (reflexive), and the Mehri *y \acute{a} nti \acute{f} əz* form, (primarily reciprocal, though reflexive and passive meanings are likewise attested). Examples of the old Semitic T-Stem are presented below, adapted from Lipiński (2001) and Rubin (2010).

| | Perfective | Imperfective | Stative |
|----------|-------------------------|--------------|-------------------------|
| Akkadian | iptaras | iptarras | pitrus |
| Arabic | yafta ^ʿ ilu | – | ʾifta ^ʿ ala |
| Ugaritic | *yapta ^ʿ alu | – | *ʾipta ^ʿ ala |
| Mehri | yəntifəz | yəntəfūz | natfəz |

Figure 1.64: Infixed T-Stem Verbs in Semitic

As illustrated above, the T-Stem in Semitic originally was characterized by an infixed *⟨ta⟩ morpheme which appears following the initial consonant of the root, except in the stative stem, where the languages disagree. In the East Semitic and Mehri suffix-conjugation, the infix of the T-Stem appears before the second root-consonant, while in the Central Semitic languages the infix still immediately follows the first root-consonant, while the verb stem itself is preceded by a *ʾi- prefix of uncertain origin. The agreement of the East and South Semitic forms, as well as the fact that the central Semitic form is transparently derived, suggests that the stative *CVtCVC* form is original for Semitic.

Despite the apparent commonality of the T-Stem form with an infixed *⟨ta⟩, there is a strong tendency within Semitic to replace this form with a novel T-Stem with a *ta- prefix. Such developments characterize the modern Aramaic *ʾetqətel*, the Ethiopic *yəṭqatal* form, a number of *ʾitfataḥ* forms which characterize modern Egyptian and Magherbi Arabic, and a *taḥida* form attested in Hijazi and South-Palestinian Arabic since approximately the 9th century AD.

In Berber, the T-Stem is likewise widely attested, though it forms a passive rather than a reflexive as in Semitic. Further contrasting with Semitic, the T-Stem in Berber is formed not by an infixed *ta morpheme, but rather by the prefixation of a *tǝ- affix. Like the *s of the S-Stem, the *t of the T-Stem is subject to sporadic gemination across Berber, again clearly internal to the development of the Berber languages. The prefix also commonly surfaces as *(t)twǝ-. The two forms are identical in meaning, and the distribution and origin of the two forms are not known. T-Stems from Tuareg are presented below, adapted from Prasse (1973) and Heath (2005).

| | Perfective | Imperfective |
|---------------|--------------|--------------------------|
| Biliteral | ittəwät | itəwät/itätəwät |
| Triliteral | ittəkräh | itīkräh/itätəkräh |
| Quadriliteral | yättwəkəyləl | ittwäkəyləl/ititwəkəyləl |

Figure 1.65: T-Stem Verbs in Tuareg

The T-Stems show similar patterns to the S-Stem. The biliteral verb roots are invariant in basic shape, although the **tǔ-* prefix, unlike the **sǔ-* prefix, always occurs with a vowel in Tuareg. The trilaterals have the same *CCVC* root shape as the G-Stem, and the quadrilaterals are again *CVCCVC*. We will discuss the difference between the presence and absence of the vowels in the prefixes of the derived stems further in section 2.2.1.2 below.

In Cushitic, we see the same split between strong verb forms, which attest a T-Stem prefix, and weak verbs (the SC1), which form the T-Stem with a suffix. In Beja, the T-Stem functions primarily as a passive, as in Berber, although the functions across Cushitic are sufficiently varied that Hayward (1984) refers to the **t-* affix as a "middle root-extension." The Beja forms are similar enough to their S-Stem counterparts, as illustrated below, again from Wedekind and Musa (2010), Zaborski (1975) and Appleyard (2007).

| | Non-Intensive | | Intensive | |
|------------|---------------|--------------|------------|--------------|
| | Perfective | Imperfective | Perfective | Imperfective |
| Biliteral | itōdār | itōdīr | – | |
| Bisyllabic | itdagāy | itdagi | itdāgāy | itdāgi |
| Triliteral | itdabāl | itdabīl | itdābāl | itdābīl |

Figure 1.66: T-Stem Verbs in Beja

Note again that the **t-* prefix typically lacks a subsequent vowel, excepting the novel long prefix *tō-*, parallel to the S-Stem *sō-*, and clearly an internal development within Beja. The relic strong verbs which remain throughout Cushitic are quite similar. We may again illustrate this in Afar-Saho, from Hayward (1984).

| Saho | | Afar | |
|---------------------|------------|-----------|------------|
| Biliteral | Triliteral | Biliteral | Triliteral |
| yat ^ʕ ey | yatribih | yabbul | yaddihil |

Figure 1.67: Fossilized T-Stems in Afar-Saho

The original **t-* prefix is preserved unchanged in Saho, while it has undergone gemination with the initial root consonant in Afar. Hayward regards these geminates as the result of a **t-* prefix directly adjacent to the initial root consonant, making such forms parallel both with Saho and with the Beja strong verb.

Again, the most common attestation of the T-Stem in Cushitic takes the form of the suffixed **-t* in the weak verb. As with the S-Stem, these forms

are supposed to have originated with the univerbation of an originally prefix-conjugated, and prefix-derived T-Stem auxiliary. Suffixed T-Stems are presented below from Appleyard (1987), Wedekind and Musa (2010), Mahaffy (1940), Hayward (1984), and Mous (1993).

| | | | | |
|------------|------|-----------|--------------------|---------------------|
| | Beja | Afar-Saho | Agaw | Iraq ^w |
| Bilateral | – | ḍāmit | čibr | g ^w ērīt |
| Trilateral | – | lagadat | iq ^w ar | diya ʿāt |

Figure 1.68: Cushitic Weak-Verb Suffixed T-Stem Forms

The suffixed T-Stems are noticeably absent from Beja, where the function of the passive for weak verbs has been subsumed by the N-Stem, discussed in further detail below. Otherwise the forms are similar to the weak S-Stem previously detailed. The **-t* suffix is lenited in the Agaw languages to *-r*, but otherwise the form of the suffix appending to an invariant verb stem is identical with the S-Stem. The forms across Cushitic are primarily passive, but occasionally reflexive, middle or generalized intransitive verbs are attested.

The T-Stem is restricted in Omotic exclusively to suffixes, as was the S-Stem, again suggesting a potential connection between the Omotic verb and the Cushitic weak verb. Bender (2000) notes that T-suffixed forms appear in all major Omotic sub-families, with the exception of the Mao group, for which we lack sufficient data. Forms are presented below.

| | | | | | |
|-----------------|-------------|--------------|--------------|-------------|------------|
| Wolaytta | Koré | Yemsa | Sheko | Aari | Mao |
| meçet | ʾušut | wort | duft | dīber | – |

Figure 1.69: Suffixed T-Stem Verbs Across Omotic

The Aari form has undergone a lenition from original **-t* to *-r*, akin to the Agaw Cushitic languages. The presence of an original **-t* is confirmed by the forms of the other Aroid languages, where the Hamar language forms passives with *-d* and the Dime language with *-nd*, both voiced variants of the original **-t*, likely reflecting an intermediate stage between **-t* and *-r*. Bender notes that the meaning of suffixed T-Stem verbs in Omotic is typically inconsistent, with derived passives, reflexives, and reciprocals all attested. Bender even mentions that some Omotic languages are able to form intransitive verbs from adjectival stems using a *-t* suffix, though it is unclear whether we should connect these forms with the T-Stem forms inherited from Afro-Asiatic.

In Chadic, the most basic passive/reflexive/intransitive construction is not the inherited derived-stem type, but rather the apparently innovative Intransi-

tive Copy Pronoun (ICP). This form, coined by Newman (1971), involves the affixation of clitic/suffix object⁵² pronouns to an otherwise intransitive verb, in agreement with the verbs subject. Consider the pairs of sentences from Kanakuru below (from Schuh (2019)).

(12) *Kanakuru*

| | |
|--|---|
| <p>nà jaɲi 1st.SG cure.PERF</p> <p>‘I cured (him)’</p> | <p>nà jaɲ-no 1st.SG cure.PERF-1st.SG.ICP</p> <p>‘I recovered’</p> |
| | |
| <p>mə kew pitila 1st.PL lower.PERF lamp</p> <p>‘We lowered the lamp’</p> | <p>mə kewo-mu 1st.PL lower.1st.PL.ICP</p> <p>‘We went down’</p> |

These ICP constructions are common in Chadic (particularly West Chadic) and would appear to be inherited from Proto-Chadic. There is, however, little evidence that they were inherited from common Afro-Asiatic, and they are clearly not related to the derived-intransitive verbal stems (either the T-Stem or the N-Stem discussed below).

Rather, the best candidate for a survival of the original T-Stem in Chadic again comes to us from Hausa. Hausa attests a number of intransitive or passive verbal formations, including the aforementioned Intransitive Copy Pronouns, and the more common and productive Grade 7 verb, which is formed by a *-u* suffix, as well as a (HL) tonal melody, spreading from right to left. Along with these forms, there is also evidence of a passive/intransitive suffix *-ta~da*. This suffix can append to verbs to form derived-reflexive or intransitive forms. Consider the pairs below.

- | | |
|---|---|
| <ul style="list-style-type: none"> • <i>tsai</i> "remain in place" • <i>kwān</i> "sleep" • <i>cî</i> "eat" | <ul style="list-style-type: none"> • <i>tsaidā</i> "to place oneself" • <i>kwāntā</i> "spend night, be at ease" • <i>cīdā</i> "feed oneself" |
|---|---|

Despite superficial similarities, however, it is unlikely that these suffixed forms (sometimes referred to as Form II verbs) are in fact related at all to the T-Stem. First, as with the Grade 5 Hausa verb forms discussed above, this form has no obvious cognates as a verbal stem anywhere in the Chadic family. Second, it *does* appear to have cognates in a so-called "efferential" preposition

⁵²Note that, while in most Chadic languages the ICP pronouns are identical to the object suffix pronouns, there are some languages that have distinct forms for ICP, DO and IDO pronouns, such as Miya.

dā, which appears both in other Chadic languages, and even in other dialects of Hausa, and likely represents the original form of this morpheme. Finally, while the Form II verbs sometimes have intransitive or reflexive semantics, as in the examples above, they frequently have transitivizing or even causative semantics (*tashi* "rise" vs. *tadā* "raise"), or more idiosyncratic semantic relationships (*sai* "buy" vs. *saidā* "sell"). For these reasons, we will not regard the Hausa Form II verb as related to the Afro-Asiatic T-Stem, and conclude that the T-Stem does not survive in Chadic.

Given these data, we will reconstruct the T-Stem in Proto-Afro-Asiatic as follows

| Biliteral | Triliteral | Quadriliteral |
|-----------|-------------|---------------|
| *yṽ-t-CVC | *yṽ-tṽ-CCVC | *yṽ-t-CVCCVC |

Figure 1.70: T-Stem in Afro-Asiatic

We have here reconstructed the formation of the T-Stem as parallel to that of the S-Stem, but that requires further comment. The **t-CVC* shape of the biliteral stem is reflected clearly in Cushitic, where it is the common form of the strong verb T-Stem in effectively all languages, except the obviously innovative *tō-* form of Beja. It is not, however, reflected in Berber, where in contrast to the *s-CVC* S-Stem, we find a *tō-CVC* T-Stem. We will suppose that this form is an innovation, and whose specific form and origin will be described in greater detail in section 4.2.1.4 below.

For triliteral verbs, the **tṽ-CCVC* shape we reconstruct is directly attested in Berber, and is likewise reflected in those forms of the Semitic T-Stem which are not infixes. As in the case of the S-Stem, the Cushitic T-Stem differs here from the others, reflecting a *t-CVCCVC* form which we will consider innovative. It is difficult to say much with any certainty about the form of the T-Stem quadriliteral, since it is reflected directly only in Berber as *tṽ-CVCCVC*. Note, however, that this contrasts with both the quadriliteral S- and N-Stem forms within Berber, as well as the forms of Semitic. Given this exceptional status, and the variation regarding the **t-~*tw-* forms of the prefix, we will regard the Berber forms as innovative.

1.3.2.4.3 N-Stem

The last of the major derived-stem types which we will consider in Afro-Asiatic is the N-Stem. It is the most difficult derived-stem form to reconstruct, both in the sense that it occurs in the smallest number of Afro-Asiatic daughter branches, and also in that its semantics often appear to overlap or be confused with the otherwise more widely attested T-Stem. The N-Stem occurs unambiguously only in Semitic, Berber, and Cushitic, with a probable reflex in Egyptian and

possible fragments in Omotic. It is unattested in Chadic. Semantically, the N-Stem is similar to the T-Stem in forming derived passives, reflexives, reciprocals or other types of intransitives. We may presume that originally one stem formed true passives, with the other having reciprocal or middle function, and that the two have been subject to consistent confusion and reanalysis along each distinctive line of descent.

As we have come to expect, the N-Stem is best-known to us from Semitic. The N-Stem occurs in every Semitic sub-branch, although in South Semitic it has lost semantic function and rather become a fossilized element present only on quadriliteral verb formations.

| | Perfective | Imperfective | Stative |
|----------|------------|--------------|------------|
| Akkadian | ipparis | ipparras | naprus |
| Arabic | yunfa‘ilu | – | ’infa‘ala |
| Hebrew | yiqqātel | – | niqtal |
| Ge’ez | yanqälqäl | yanqallaqäl | ’änqälqäla |
| Mehri | yənqərbət | yənqərbüt | ənqərbüt |

Figure 1.71: N-Stem Verbs in Semitic

Semantically, the Semitic N-Stem is primarily passive, with passive semantics attested from Akkadian, Arabic, Hebrew, and throughout West Semitic more generally. The semantics-less association between the N-Stem and the quadriliteral verb roots attested in South Semitic is worth mentioning since it may have parallels outside of Semitic. The form of the morpheme is reflected as **nǝ-* in the stative stems of Akkadian and Hebrew, but is reflected following an **’a-/*’i-* prefix in Arabic and throughout South Semitic (also in the Hebrew N-Stem imperative), making it difficult to reconstruct a single form for Proto-Semitic, and suggesting that both forms (**nǝ-* and **’ǝn-*) may have been present.

In Berber, the N-Stem presents itself in a similar fashion. As with the other Berber derived-stems, the form of the derivational-prefix is subject to sporadic gemination, but its basic form can be reconstructed as **mǝ-/*mmǝ-*, in agreement with the **nǝ-* prefix of Akkadian and Hebrew in Semitic.

| | Perfective | Imperfective |
|---------------|------------|--------------|
| Biliteral | immädäd | itämädäd |
| Triliteral | immäkräs | itämäkräs |
| Quadriliteral | imdərwəy | itĩmdərwiy |

Figure 1.72: N-Stem Verbs in Tuareg

Semantically, the N-Stem verb of Berber forms either reciprocal verbal forms or more characteristically agent-less passives (mediopassives according to Heath (2005)). Heath further notes that the N-Stem derivation is the least common of the derived verbal stem types, as many Berber verbs can be used with an agentless intransitive sense without derivation. Many N-Stem forms have a lexically specific semantics, often with the original underived verb having been lost. As with the other derived verbal-stems in Berber (though unlike in Semitic), the N-Stem appears to be incompatible with the characteristic gemination of the imperfective stem, rather, surfacing with the *tǝ-* imperfective prefix. Note further that the alternation between the *mǝ-* and *m-* prefixes matches that of the S-Stem for trilateral and quadrilateral stems, but differs for the bilaterals.

The N-Stem is attested in Cushitic, divided between a prefixed N-Stem characteristic of the Cushitic strong verb, and a suffixed form for weak verbs. As always, the strong verb is best attested in Beja, where it survives as a truly productive class. In Beja, the N-Stem functions as a reflexive or reciprocal verbal form, referred to as a social or collective form by Wedekind and Musa (2010). A full paradigm is presented below from Zaborski (1975) and Appleyard (2007).

| | Non-Intensive | | Intensive | |
|------------|---------------|--------------|------------|--------------|
| | Perfective | Imperfective | Perfective | Imperfective |
| Biliteral | imōdār | imōdīr | imedīr | |
| Bisyllabic | imdagāy | imdagi | imedgāy | imedgi |
| Trilateral | imdabāl | imdabīl | imedbāl | imedbīl |

Figure 1.73: N-Stem Verbs in Beja

The so-called "intensive" forms of the N-Stem have clearly innovated a novel prefix of the form *me-*, which is not shared by any of the other derived-stem types. Nevertheless, in the more conservative and archaic non-intensive forms, we find the characteristic *mō-* prefix of the bilaterals, along with the vowel-less *m-* prefix for all other verbal types. The originality of the vowel-less form in Cushitic is again confirmed by the forms attested in the fossilized strong verbs throughout the rest of the family, as best illustrated, again, by the East Cushitic languages, such as Afar-Saho.

| Afar-Saho | |
|---------------------|------------|
| Bilateral | Trilateral |
| yumḥū ⁵³ | yamḥukum |

Figure 1.74: Fossilized N-Stems in Afar-Saho

As with the other derived-stem types, the N-Stem is best-preserved in Cushitic in the form of the suffixed weak-verb forms, as these are the most common verbal formations among the Cushitic languages. A sample of weak N-Stem forms is presented below.

| | Beja | Afar-Saho | Agaw | Iraq ^w |
|------------|-------------------------|-----------|------------------------|-------------------|
| Bilateral | tamamiya | ḍā'ime | ḵ ^w aləstəŋ | – |
| Trilateral | huk ^w umamiy | digālim | wäkkälsəŋ | – |

Figure 1.75: Cushitic Weak-Verb Suffixed N-Stem Forms

In Beja, the suffixed N-Stem forms serves the semantic function of both the passive and the reciprocal/reflexive, since the suffixed T-Stem forms have not survived in that language. In the Agaw languages, the reciprocal suffix survives, surfacing primarily as *-əŋ*, but it must co-occur with the passive suffix *-əst*. The passive *-əst* of Agaw is itself a derivative of the causative S-Stem suffix and the passive T-Stem suffix, suggesting that the mandatory co-occurrence of the two might be part of the general trend of confusing and overlapping the T- and N-Stems. In the Southern Cushitic languages, the suffixed N-Stem does not survive, here being replaced by a suffixed T-Stem which serves both passive and reciprocal functions. Note that this is the same change, but in the opposite direction, as was observed in Beja.

In the case of the S- and T-Stems, we saw that the inherited derived stems of Omotic share their greatest affinities with Cushitic, specifically with the Cushitic weak verb, since both are suffixed forms which append to an otherwise invariant verbal stem lacking in vowel apophony or stem-shape alternations. We also saw that, in contrast to the typical situation with regard to Omotic, the derived stems show remarkably clear and uncontroversial cognation with sister stems outside the family. It is striking, then, that there is no widely attested derivational form in **-n* or **-m* across the Omotic family. Nevertheless, Bender (2000) notes that there are potential fragments which he states "may reflect *Afrasian [N-Stem]." These forms are presented below.

⁵³This form representing an underlying yumḥuw~yumḥuy.

| Bench | Yemsa | Aari | Dime |
|---------|-------|------|---------|
| titsasn | tūm | esim | ṭsohind |

Figure 1.76: Potential Suffixed N-Stem Verbs in Omotic

Although Bender is rightly conservative regarding the morphological history of Omotic, and is therefore hesitant to connect these forms directly with the Afro-Asiatic N-Stem, there are a number of parallels supporting the association of such forms with the Cushitic weak-verb N-Stems. They are, in each case, suffixed to an invariant verbal stem, as with the other Omotic derived stems and the Cushitic weak forms. The Bench forms obligatorily co-occur with the causative S-Stem suffix, exactly as in Bilen forms from the Agaw group of Cushitic, suggesting this may be an Ethiopic *Sprachbund* feature. Additionally, the Aari forms in *-im* function as a so-called "impersonal" or agentless passive, in contrast to the more common passive in *-er*. This is again parallel to the situation in Cushitic, where the weak N-Stems often behave as reflexives/reciprocals as well as agentless passives, contrasting with the more conventionally passive T-Stem. For our purposes, we remain agnostic regarding the possibility of N-Stems in Omotic, but note that if such forms are indeed cognate, our analysis of the Cushitic N-Stem weak-verb forms and other Omotic derived stems will apply here.

In Egyptian, it is likely that the N-Stem survives in the form of relatively common, though apparently non-productive <n>-prefixed verb forms. As illustrated by Derchain-Urtel (1973), many such verbs are derived reflexives or reciprocals or passive, as illustrated in the pairs below.

- <ḥbi> "reduce, decrease"
- <kʕi> "think about"
- <hp> "take from, wrest"
- <nḥbḥb> "be smaller"
- <nkʕ> "ponder (intrs.)"
- <nhp> "escape, spring from"

Such forms would appear to related with the wider Afro-Asiatic N-Stem, but they survive in Egyptian only as a relic class. The n-prefix cannot occur with all verb types, being attested primarily in the 2ae- and 3ae-infirmas verbs, 3ae geminatae verbs, as well as showing a strong preference for a reduplicated verbal root. In addition, many n-prefixed verbs appear to have an idiosyncratic meaning, or the same meaning as their underived counterparts⁵⁴, suggesting that the semantic coherence of the N-Stem has deteriorated and these verbs were reanalyzed by speakers as lexically specific "deponent" verbs, rather than a class of derived verbs with systematically derived meanings.

⁵⁴As in <gsi> "to run (towards)" vs. <ngsgs> "to overflow," where the reflexive/reciprocal/passive relationship is unclear and the meaning is lexically specific, or <qdd> "sleep" vs. <nqdd> "sleep," where the n-prefixed verb is completely deponent.

As pointed out by Rubin (2004), this situation in Egyptian closely parallels the development of the N-Stem in Ethiopic Semitic. In each case, some passive/reflexive verbs survive, but for a great many others, the semantics of the N-Stem is weakened or completely lost. In each case, the n-prefix no longer freely co-occurs with all possible root types in language, but rather can occur only with a restricted subset of verbal types. And most strikingly, in each case, the deponent N-Stem forms have a strong preference for reduplicated $C_1C_2C_1C_2$ verbs specifically and for quadrilaterals more generally⁵⁵.

The stem shapes of the relic N-Stem in Egyptian are reconstructable on the basis of their surviving Coptic reflexes, and show strong similarities to their Semitic, Berber, and Cushitic counterparts. Forms are presented below, adapted from Allen (2000).

| | Coptic | Middle Egyptian |
|---------------|----------------------------|-----------------|
| Biliteral | ⲛⲕⲁⲧ | *nṽqad |
| Triliteral | ⲛⲉⲒⲓⲉ ⁵⁶ | *nihsil |
| Quadrilateral | ⲛⲕⲁⲧⲕⲉ | *nṽqadqad |

Figure 1.77: Relic N-Stem Verbs in Coptic and Middle Egyptian

Using these data, we may tentatively reconstruct the N-Stem forms of Afro-Asiatic as follows.

| Biliteral | Triliteral | Quadrilateral |
|-----------|-------------|---------------|
| *yṽ-n-CVC | *yṽ-nṽ-CCVC | *yṽ-n-CVCCVC |

Figure 1.78: N-Stem in Afro-Asiatic

The precise articulation of the nasal consonant of the prefix is difficult to reconstruct with certainty. Egyptian and Semitic agree in *n-, but both disagree with Cushitic and Berber which point to *m-. Since the prosodic shape

⁵⁵The association between the N-Stem and quadrilaterals in Semitic is not limited solely to Ethiopic. In Akkadian, the N-Stem also serves as a deponent formative for a number of quadrilateral verbs. As noted by Heidel (1940), approximately half of these deponent quadrilaterals are also 3ae infirmae verbs, a class which commonly occurs with the n-prefix in Ancient Egyptian. It is possible, therefore, that the association between a deponent N-Stem, 3ae infirmae verbs, and quadrilaterals may be inherited from the most recent common ancestor of Egyptian and Semitic.

⁵⁶This verb is, in the strictest sense, not a true N-Stem, since there exists in Egyptian no underived form <hs(i)> from which it was formed. Nevertheless, the so-called 4ae infirmae verbs are commonly regarded as containing a number of fossilized S- and N-Stem forms. Indeed, of the 12 4ae infirmae verbs listed by Plumley (1948), which he considered a "fairly complete list," fully half begin either with *s- or with *n-.

of the prefix is identical regardless, we remain agnostic in this analysis. As for the prefix + root shapes, further comment is called for. Biliterals have a $(n)n\check{v}$ -CVC shape in Berber and Egyptian, but n -CVC in Cushitic. Despite greater frequency of the $n\check{v}$ - form, we will suppose that the Cushitic variant is the original, for reasons discussed in section 2.2.1.2 below. For trilaterals, the branches are again split, with Egyptian, and Berber both reflecting a $n\check{v}$ -CCVC shape (against Cushitic and Semitic n -CVCCVC). We will reconstruct the former. For quadrilateral roots, there is general agreement as Semitic, Berber, and Cushitic all reflect the n -CVCCVC shape, which we reconstruct (against Egyptian $n\check{v}$ -CVCCVC).

1.3.2.4.4 Combined Stems

Because the derived stems are transparently formed by the affixation of simple derivational affixes (regardless of whatever subsequent changes in root shape and vowel apophony might accompany such affixation), it is unsurprising that more complex derivations may in principle be built onto the singly derived stems. Such forms are widely attested, and as one might expect, their semantics consist of transparent relations. In Semitic, for example, where the T-Stem forms reflexive/reciprocal verbs, and the Š-Stem forms causatives, the combined derived ŠT-Stem represents a reflexive formed to the original Š-Stem causative, as in, for example, Akkadian *uštalpit* "destroyed one another/itself" from *ilput* "hit/strike" or Arabic *yastaqtilu* "risk one's life"⁵⁷ from *yaqtal* "kill." The same such combination occurs in the Berber languages where, for example, we find combined stems such as the Tuareg SN-Stem form *ismäkräs* "to tie together" from *ikräs* "tie/be tied." The same pattern is attested in Cushitic, for example in Beja weak verb *balamsisya* (Appleyard, 2007). This same combination of derived stems is even attested in Omotic, as in, for example, Wolaytta *keṭetis* "make something become built" from *keṭ* "build," ensuring that these combinations could, in principle, be reconstructed to the common Afro-Asiatic period.

Despite the relative frequency of such combined stems, we will not treat them as a necessary reconstruction for Proto-Afro-Asiatic. This is because the combined stems are transparently generated from the simple sequential affixation of material which each Afro-Asiatic daughter must itself have inherited. If, for example, both Semitic and Berber inherit the S- and T-Stems, as we know they do, then the presence of combined ST-Stems in both daughters does not necessitate their inheritance from a common Semitic-Berber ancestor, since the material necessary for independent development of the form is already present in each. It is in fact quite likely that combined stems of this sort *were* present in the parent Afro-Asiatic language, but since it is impossible to disambiguate combined stems which represent common inheritance vs. independent innovation, we will not discuss them in great detail.

⁵⁷It is not unusual for combined derived stems to acquire idiosyncratic, lexically specific meanings beyond the simple concatenation of their derived-stem types.

1.3.2.4.5 Other Derived Stems

The derived-stem types presented above, the S-, T-, and N-Stems, are those stem formatives which can be reconstructed for the common Afro-Asiatic parent language, but they are not an exhaustive list of verbal derivations which appear throughout the range of Afro-Asiatic daughter languages. There are numerous verbal derivations which are restricted to single languages or to specific families and which therefore cannot be projected beyond the most recent common ancestor of those languages. The D-Stem in Semitic is among the most widely attested derived-stem forms (rivaled only by the Š-Stem), but it has no obviously cognate forms outside of that family. The pluractional verbal formations of Chadic are unquestionably the most common shared verbal derivations within that family, but, again, it is difficult to connect them obviously with derived forms outside of Chadic, and they are therefore typically regarded as an innovation internal to that family.

These derived forms, which have no obvious external cognation beyond the immediate family in which they are found, cannot have any obvious impact on our analysis as it pertains to the inheritance of syncope and syncopated forms from Afro-Asiatic proper. We will return to the issue of these secondary innovative verbal stem derivations in our discussion of each family, showing in what ways each either accords with or fails to accord with the syncope analysis presented here.

1.3.2.5 Summary of Verb Stems

Based on the data presented above, we can reconstruct paradigms of Afro-Asiatic verbal morphology, both inflectional and derivational, approximately as presented below, using the verbs **sim* "call, name" and **mawut* "die."

| <i>Stative: CVC Root</i> | | | | | |
|--------------------------|---|---------------|---------------|---------------|---------------|
| | | G-Stem | S-Stem | T-Stem | N-Stem |
| 1st Sg. | | *sim-(ā)ku | *sṽ-sim-(ā)ku | *tṽ-sim-(ā)ku | *nṽ-sim-(ā)ku |
| 2nd Sg. | M | *sim-(ā)tṽ | *sṽ-sim-(ā)tṽ | *tṽ-sim-(ā)tṽ | *nṽ-sim-(ā)tṽ |
| | F | *sim-(ā)tṽ | *sṽ-sim-(ā)tṽ | *tṽ-sim-(ā)tṽ | *nṽ-sim-(ā)tṽ |
| 3rd Sg. | M | *sim-∅ | *sṽ-sim-∅ | *tṽ-sim-∅ | *nṽ-sim-∅ |
| | F | *sim-at | *sṽ-sim-at | *tṽ-sim-at | *nṽ-sim-at |
| 1st Pl. | | *sim(ā)nṽ | *sṽ-sim(ā)nṽ | *tṽ-sim(ā)nṽ | *nṽ-sim(ā)nṽ |
| 2nd Pl. | M | *sim(ā)tṽn | *sṽ-sim(ā)tṽn | *tṽ-sim(ā)tṽn | *nṽ-sim(ā)tṽn |
| | F | *sim(ā)tṽn | *sṽ-sim(ā)tṽn | *tṽ-sim(ā)tṽn | *nṽ-sim(ā)tṽn |
| 3rd Pl. | M | *sim-∅ | *sṽ-sim-∅ | *tṽ-sim-∅ | *nṽ-sim-∅ |
| | F | *sim-at | *sṽ-sim-at | *tṽ-sim-at | *nṽ-sim-at |

| <i>Stative: CVCVC Root</i> | | | | | |
|----------------------------|---|---------------|----------------|----------------|----------------|
| | | G-Stem | S-Stem | T-Stem | N-Stem |
| 1st Sg. | | *mawut-(ā)ku | *sṽ-mwut-(ā)ku | *tṽ-mwut-(ā)ku | *nṽ-mwut-(ā)ku |
| 2nd Sg. | M | *mawut-(ā)tṽ | *sṽ-mwut-(ā)tṽ | *tṽ-mwut-(ā)tṽ | *nṽ-mwut-(ā)tṽ |
| | F | *mawut(ā)tṽ | *sṽ-mwut(ā)tṽ | *tṽ-mwut(ā)tṽ | *nṽ-mwut(ā)tṽ |
| 3rd Sg. | M | *mawut-∅ | *sṽ-mwut-∅ | *tṽ-mwut-∅ | *nṽ-mwut-∅ |
| | F | *mawut-at | *sṽ-mwut-at | *tṽ-mwut-at | *nṽ-mwut-at |
| 1st Pl. | | *mawut(ā)nṽ | *sṽ-mwut(ā)nṽ | *tṽ-mwut(ā)nṽ | *nṽ-mwut(ā)nṽ |
| 2nd Pl. | M | *mawut(ā)tṽn | *sṽ-mwut(ā)tṽn | *tṽ-mwut(ā)tṽn | *nṽ-mwut(ā)tṽn |
| | F | *mawut(ā)tṽn | *sṽ-mwut(ā)tṽn | *tṽ-mwut(ā)tṽn | *nṽ-mwut(ā)tṽn |
| 3rd Pl. | M | *mawut-∅ | *sṽ-mwut-∅ | *tṽ-mwut-∅ | *nṽ-mwut-∅ |
| | F | *mawut-at | *sṽ-mwut-at | *tṽ-mwut-at | *nṽ-mwut-at |

| <i>Eventive: CVCVC Root</i> | | | | | | |
|-----------------------------|---|---------------|---------------------|---------------|---------------|---------------|
| | | G-Stem | G-Stem Impf. | S-Stem | T-Stem | N-Stem |
| 1st Sg. | | *'a-sim | *'a-<n>sim | *'a-s-sim | *'a-t-sim | *'a-n-sim |
| 2nd Sg. | | *tṽ-sim | *tṽ-<n>sim | *tṽ-s-sim | *tṽ-t-sim | *tṽ-n-sim |
| 3rd Sg. | M | *yṽ-sim | *yṽ-<n>sim | *yṽ-s-sim | *yṽ-t-sim | *yṽ-n-sim |
| | F | *tṽ-sim | *tṽ-<n>sim | *tṽ-s-sim | *tṽ-t-sim | *tṽ-n-sim |
| 1st Pl. | | *nṽ-sim | *nṽ-<n>sim | *nṽ-s-sim | *nṽ-t-sim | *nṽ-n-sim |
| 2nd Pl. | | *tṽ-sim | *tṽ-<n>sim | *tṽ-s-sim | *tṽ-t-sim | *tṽ-n-sim |
| 3rd Pl. | M | *yṽ-sim | *yṽ-<n>sim | *yṽ-s-sim | *yṽ-t-sim | *yṽ-n-sim |
| | F | *tṽ-sim | *tṽ-<n>sim | *tṽ-s-sim | *tṽ-t-sim | *tṽ-n-sim |

| <i>Eventive: CVCVC Root</i> | | | | | | |
|-----------------------------|---|---------------|---------------------|---------------|---------------|---------------|
| | | G-Stem | G-Stem Impf. | S-Stem | T-Stem | N-Stem |
| 1st Sg. | | *'a-mwut | *'a-ma<n>wut | *'a-sṽ-mwut | *'a-tṽ-mwut | *'a-nṽ-mwut |
| 2nd Sg. | | *tṽ-mwut | *tṽ-ma<n>wut | *tṽ-sṽ-mwut | *tṽ-tṽ-mwut | *tṽ-nṽ-mwut |
| 3rd Sg. | M | *yṽ-mwut | *yṽ-ma<n>wut | *yṽ-sṽ-mwut | *yṽ-tṽ-mwut | *yṽ-nṽ-mwut |
| | F | *tṽ-mwut | *tṽ-ma<n>wut | *tṽ-sṽ-mwut | *tṽ-tṽ-mwut | *tṽ-nṽ-mwut |
| 1st Pl. | | *nṽ-mwut | *nṽ-ma<n>wut | *nṽ-sṽ-mwut | *nṽ-tṽ-mwut | *nṽ-nṽ-mwut |
| 2nd Pl. | | *tṽ-mwut | *tṽ-ma<n>wut | *tṽ-sṽ-mwut | *tṽ-tṽ-mwut | *tṽ-nṽ-mwut |
| 3rd Pl. | M | *yṽ-mwut | *yṽ-ma<n>wut | *yṽ-sṽ-mwut | *yṽ-tṽ-mwut | *yṽ-nṽ-mwut |
| | F | *tṽ-mwut | *tṽ-ma<n>wut | *tṽ-sṽ-mwut | *tṽ-tṽ-mwut | *tṽ-nṽ-mwut |

Chapter 2

Syncopation Analysis

In this chapter, we will reconsider the reconstructed data and forms presented for Proto-Afro-Asiatic above. We will demonstrate that, rather than reconstructing the characteristic root- and stem-shape alternations into the grammar of the proto-language, we can generate effectively all such forms by supposing a non-templatic, vocalized root and stem, and a rule of left-to-right syncopation which alters the shape of such roots/stems. We will begin by discussing syncope as a synchronic and diachronic process, as well establishing the cross-linguistic plausibility of the syncope rule proposed here. We will then discuss the evidence for such a rule among attested Afro-Asiatic languages and the initial analysis, which we will expand to the family as a whole, for generating templatic morphological phenomena using syncopation (this data from Akkadian).

Having established the evidence for such a rule, we will then provide detailed examples and derivations demonstrating how the attested forms can be generated without any need for the postulation of a distinct template using only our rule of persistent syncopation. These novel reconstructed forms with syncope will serve as the basis for the discussion presented in the subsequent chapters of this dissertation, in which we discuss the development of these forms to their particular instantiations along each line of descent within the family.

Finally, we will discuss an important part of the templatic puzzle that is missing from the syncopation analysis presented here: namely, the alternation of vowels which comes to characterize much of the morphological behavior of attested Afro-Asiatic languages. We will provide evidence that such apophonic alternations are far less common in the more archaic elements of Afro-Asiatic morphology, and argue that those alternations which are attested are originally independent of the root/stem-shape alternations and are better characterized as a separate system of morphological vowel apophony, as proposed and analyzed by Kuryłowicz (1972).

2.1 Syncope Rule – Formulation and Cross-Linguistic Analysis

In the traditional parlance of comparative linguistics, arising for the most part in the 19th century, syncope occupies space alongside a number of rules involving the loss of vowels, including apocope and apheresis. In the pre-generative era in which the early scholars of comparative linguistics operated, the loss of such vowels was often spoken of in descriptive, non-theoretic terms as a "weakening," "elision" or, more pejoratively, "slurring." Today, we would rightly talk about all such sound changes as instances of deletion, either conditioned or unconditioned phonologically.

Syncope as a diachronic change is quite common, and is attested in a number of well-known circumstances. Medial, unstressed vowels were syncopated in the transition from Classical into Vulgar Latin and the Romance languages, as in Latin *calidus* yielding Italian and Spanish *caldo*, French *chaud*, Sardinian *caldu*, and Romanian *cald*. Medial schwas in open syllables are subject to syncopation in the transition from Sanskrit to modern Hindi-Urdu, as in Sanskrit *racanā* yielding Hindi-Urdu *racnā*. In addition to operating as a diachronic change, syncope can also operate as a synchronic component of the grammar, as it did in Old English, generating such pairs as dryhten "lord (NOM)" and dryhtnes "lord (GEN)"⁵⁸.

For the purposes of our analysis, however, the most illustrative example of syncope is to be found in Irish Gaelic. The reasons for this are twofold. First, although syncope was a major diachronic change which distinguished Irish from Proto-Celtic, it was likewise a synchronic component of the grammar of Old Irish, and its effects can therefore be observed directly in the attested texts. Second, the Irish syncope is an iterative phonological rule which operates over the length of the entire word, from left to right. In the purely descriptive, pre-generative terminology of his day, Thurneysen described the rule as follows:

War nach dem (§ 87 f.) besprochenen Schwund der Vokale der Endsilben ein Wort mehr als zweisilbig, so fiel bei ungestörter Entwicklung der Vokal der zweiten Silbe aus. Hatte es fünf oder mehr Silben, so scheint außerdem der Vokal der vierten Silbe geschwunden zu sein.

Today, rather than describing syncope in Irish as a descriptive fact about words of three and five syllables, we might restate the rule as: the vowel of every other unstressed medial-syllable following the stressed syllable deletes. Consider the forms below, demonstrating both the Proto-Celtic and Old Irish forms:

- Proto-Celtic
 - *Karatākos
 - *barinākos
 - *dekametos
- *Karatākos
- *barinākos
- *oxtūmetos

⁵⁸The details of Old English syncope are rather more complex than those of Latin to Romance or Indic schwa deletion. For more explicit discussion, see Hickey (2011).

- Old Irish
 - dechmad
 - Carthach
- báirneach
- ochtmhadh

Syncope related alternations are not merely an artifact of the diachrony of Old Irish Gaelic, but are indeed a part of the synchronic grammar of the language. For example, in the inflection of the verb, the presence of the negative proclitic *ní-* can trigger syncope of the verb which is otherwise absent, as in pairs such as *as-berat/ní-epret* or *do-róscái/ní-derascaigi*.

The specific details of the the syncope rule which we will reconstruct for Afro-Asiatic in this dissertation are, of course, distinct from those which characterize Old Irish. But it nevertheless serves as a typological model illustrating that left-to-right iterative syncope rules of this sort are possible and attested, and that originally phonological processes of this sort can easily become intertwined with the morphology of a language, leading to quite pronounced and striking morphophonemic alterations in the roots and stems of words.

2.1.1 Syncopation in Akkadian

2.1.1.1 Traditional Analysis

Our analysis of syncope in Afro-Asiatic begins in Akkadian, where the syncope rule which we reconstruct for Proto-Afro-Asiatic was first recognized and formally characterized. The presence of such a rule in Akkadian has been almost uniformly accepted by Akkadologists and scholars of comparative Semitic, to the point that Albrecht Goetze was comfortable beginning his 1946 article on the topic saying,

It is a universally recognized fact that Akkadian does not tolerate the sequence of two or more short open syllables in the middle of a word. Wherever such sequences were inherited from Primitive Semitic, or encountered in borrowed words, the last of the short vowels is syncope-pated.

Although Goetze, like so many in his field, discusses this syncope rule in characteristically descriptive and non-theoretic terms, we may state it simply in the form of a phonological rule:

- $V \rightarrow \emptyset / V\$C_ \$CV$

The evidence for such a rule in Akkadian, or perhaps in its relatively near prehistory, is quite ample. Precious few examples of such sequences of adjacent, light, word-internal syllables can be found in the corpus of written Akkadian⁵⁹. In addition, root and stem alternations triggered by syncope are abundant

⁵⁹Though it is not entirely true that no exceptions can be found. For greater detail on these exception forms, see Greenstein (1984).

throughout Akkadian. Greenstein (1984) notes six common Akkadian morphological forms which attest to these alternations, including: (1) the stative verb, (2) monosyllabic feminine nouns with *-at*, (3) the imperative inflection of G-Stem verbs, (4) disyllabic masculine noun inflection, (5) derived verbal stems, and (6) the G-Stem of certain *primae-w* verbs. The forms below are adapted from Greenstein's work.

The stative verb shows alternations between the basic stative stem *CVVCV*, and a shorter syncopated root *CVCC*, which appears in the feminine singular, the 3rd persons plural, and the subjunctive.

(13) *Stative Verb*

| | | |
|-----|--------|-----------------|
| (a) | damiq | 'he is good' |
| (b) | damqat | 'she is good' |
| (c) | damqu | 'were he good' |
| (d) | damqū | 'they are good' |

Although some scholars, such as Reiner (1966), have posited the existence of two distinct underlying stative stems, /damq/ and /damiq/ in this case, to account for variable forms such as these, most have found the more economical explanation in positing a single stative stem /damiq/ which is subject to syncope in some environments (/damiqat/→[damqat]), and not others (/damiq/→[damiq]).

In Akkadian, there are two suffixes which can indicate the feminine gender on nouns: a *-t* suffix, which appears with with trilateral *CVVCV* nouns, and a related suffix *-at*, which appears with trilateral segolate nouns *CVCC* and with the archaic monosyllabic root nouns *CVC*. In this final group, we find that the underlying vowel of the suffix surfaces only in certain forms and is absent in others, a fact which caused early Akkadologists no shortage of trouble in identifying which nouns selected which suffixes. Such alternations are illustrated below.

(14) *Feminine Noun*

| <i>Unbound</i> | <i>Construct</i> | |
|---------------------|------------------|--------------------------|
| ʾamtu | ʾamat | 'servant girl' |
| biltu | bilat | 'unit of weight; talent' |
| šattu ⁶⁰ | šanat | 'year' |

The simplest explanation to account for these alternations is not to claim, as was initially supposed, that the unbound and construct forms were varying between the *-t* and the *-at* feminine suffixes. Rather, we may suppose a single underlying *-at* suffixes for both forms, which is subject to syncope in

⁶⁰šattu reflecting underlying *šantu, with complete assimilation of nasals to adjacent consonants.

the unbound forms where case marking is present (/’amatu/→[’amtu]), and not subject to syncope in the construct form where case marking is absent (/’amat/→[’amat]).

In Akkadian, the form of the imperative consists of the basic verbal root *CVCVC* lacking other overt morphology. This form would appear to be original, since it is shared by the other Semitic languages⁶¹, as well as throughout Afro-Asiatic more generally. To this basic imperative stem, novel feminine and plural forms have been innovated, indicated by the addition of suffixes. Akkadian attests to stem alternations between this original and unmodified masculine form and its feminine and plural counterparts.

(15) *G-Stem Imperative*

| <i>2nd Sg. M</i> | <i>2nd Sg. F</i> | <i>2nd Pl.</i> |
|------------------|------------------|----------------|
| ’alik | ’alkī | ’alkā |
| ṣabat | ṣabtī | ṣabtā |
| tišab | tišbī | tišbā |

Since, for a trilateral verb, the second vowel of the verbal root cannot be predicted according to a grammatical template and must be specified in the underlying representation, we must suppose that it is the fully vocalized *CVCVC* masculine form which is original diachronically, and the underlying form synchronically. Therefore, we must derive the others from the rule of syncope (/’aliki/→[’alki], /’alika/→[’alkā]).

Non-segolate masculine nouns undergo a similar alternation in their unbound and construct states. The unbound forms with case markings reflect a *CVCC* root shape, while the construct forms reflect *CVCVC*. Consider the examples below.

(16) *Non-Segolate Masculine Nouns*

| <i>Unbound</i> | <i>Construct</i> | |
|----------------|------------------|----------|
| epru | eper | ‘dust’ |
| malku | malik | ‘prince’ |
| ziqnu | ziqan | ‘beard’ |

We may eliminate the possibility that nouns of this sort are underlyingly segolate by comparison with the other Semitic languages⁶². In some instances, we may also observe the difference between segolate and non-segolate nouns within Akkadian. In the construct form of truly segolate nouns in Akkadian, the word-final cluster of consonants, allowable in Proto-Semitic but not in Akkadian,

⁶¹Hebrew *qəṭil*, Ge’ez *qəṭal/qəṭəl*. Though see Arabic *’iqṭal/’iqṭil/’iqṭul*, which shows a *CCVC* root shape in the imperative.

⁶²Compare respectively Arabic ‘*afar* “dust,” *malik* “king,” and *ḍiqan* “beard.”

is broken up by the duplication of whatever vowel is otherwise present in the root. Such duplication can be seen in construct forms such as *kalab* "dog," *uzun* "ear," and *biriq* "lightning," reflecting underlying /kalb/, /uzn/, and /birq/, respectively. In the case of forms like *malik* and *ziqan*, however, we cannot generate the construct forms by vowel doubling. Rather, we must suppose that such vowels are present in the underlying representations, and are lost in the unbound forms due to the presence of case marking which triggers syncope (/maliku/→[malku], /ziqanu/→[ziqnu]).

The Akkadian participle, like participles throughout Semitic, exhibits the morphological behavior of a noun, meaning it is inflected for case and occurs in a number of distinct "states." As illustrated below in the N-Stem forms, the unbound participial form reflects a *CVCC* root shape, while the construct form reflects the same fully vocalized *CVCVC* shape as the basic perfective stem.

(17) **Verbal Forms**

| <i>Unbound</i> | <i>Construct</i> | <i>Perfective</i> |
|----------------|------------------|-------------------|
| mupparsu | mupparis | ipparis |

Again, the vocalization of the root cannot be generated by duplication, as at least for some verbal forms, the vowels mismatch. We must therefore posit the presence of both vowels in the underlying representation, and the subsequent deletion of the final vowel due to syncope in the unbound, case-inflected forms (/mupparisu/→[mupparsu]).

The Akkadian w-primae verbs are a subclass of the larger Semitic category of so-called "weak verbs." In contrast to the Cushitic weak verb, or the Indo-European weak verbs from which the Cushitic forms get their name, the Semitic weak verbs are not so-named due to their regular or affixing inflection. Rather, the name refers to the presence within the verbal root of "weak" consonants which have a tendency to be lost in the Semitic daughters, creating a verb with an irregular, apparently biconsonantal inflection. Weak consonants across Semitic include *ʾ, *w, *y, *ʿ, *h, *ḥ, and *ġ, depending on the Semitic daughter.

In the case of the w-primae verbs, these forms in Akkadian have developed from an original **yawbil*, still reflected with a different vocalization in the S-Stem in Hebrew *yōḇīl* (**yihwibil*). In Akkadian, the root initial /w/, a weak consonant, undergoes contraction with the vowel of the inflectional prefix. It is not clear why such contraction did not result in a surface-long vowel, but the resulting verbal form produces a short first syllable, followed by a closed second syllable. The w-primae verbs are subject to alternations between a root (*w*)*VVCVC* for verbal forms lacking a vowel initial suffix, and a (*w*)*VCC* root with such suffixes.

(18) **W-Primae Verbs**

| | | |
|----------------|----------------|----------------|
| <i>3rd Sg.</i> | <i>3rd Pl.</i> | <i>Ventive</i> |
| ubil | ublū | ublam |

The simplest explanation to account for these alternations is, again, to posit that the presence of the suffixes creates the necessary environment for the operation of syncope (/ubilū/→[ublū], /ubilam/→[ublam]). W-primae verbs have been included here for thoroughness, though we will not discuss them further. This is because it is unclear whether and in which forms the initial *w might have survived in Akkadian, and if they should be represented in the underlying form. This makes the analysis somewhat muddled, since we do not have a clear picture of the underlying forms to which we would apply the rule of syncope.

In the traditional analysis of the 19th and 20th century, it is these forms which are typically taken to be the best evidence for the operation of the syncope rule in Akkadian, while other alternations of the root or stem are considered to be separate, as part of the morphophonemic "templatic" manipulation of the consonantal root. We will argue that this analysis has far greater explanatory power, and that a great many more such stem and root alternations can be accounted for by an extension of the syncope analysis.

2.1.1.2 Bacovcin and Freeman (2015)

Our own investigation into the greater explanatory power of the rule of syncope begins with Bacovcin and Freeman (2015). In this work, the pair attempt to account for the apparent asymmetry which exists between the expression of the gemination of the imperfective (durative in their terminology) verbal stem. As they note, gemination characterizes the imperfective of the G-Stem, the N-Stem, the T-Stem, but is strikingly absent from the forms of the S-Stem⁶³, as illustrated in the paradigm of forms presented below.

| | Perfective | Imperfective |
|---------|------------|--------------|
| G-Stem | iprus | iparras |
| T-Stem | iptaras | iptarras |
| N-Stem | ipparis | ipparras |
| S-Stem | ušapris | ušapras |
| ST-Stem | uštapis | uštapras |

Figure 2.1: Perfective and Imperfective Verb Stems in Akkadian

⁶³The imperfective of the ST-stem in fact shows a split between a truly passive *uštapras* form and a reflexive *uštaparras* form with gemination. As this split may be paralleled in the form of the Modern South Arabian present/future verb, it may be reconstructable for Proto-Semitic.

Unlike the traditional templatic analysis, which can do little more than stipulate that a given derived verb has a given stem shape, Bacovcin and Freeman are able to derive the distribution of imperfective gemination across stems naturally through the application of the syncope rule, along with distinct phonological cycles triggered by the affixation of the derivational prefixes/infix.

For our purposes, the most important part of Bacovcin and Freeman’s analysis is the postulation of a fully vocalized verbal root. In contrast to a templatic analysis, they propose that the Akkadian verbal root is a fully vocalized, fully syllabified segmental sequence:

Here, we take the Akkadian verbal root to have the shape $C_1aC_2\check{V}C_3$, where the second vowel is a theme vowel specified by tense and verb class⁶⁴ (Wallace 2013, 15 ff.). The /a/ after the first consonant is often deleted by syncope, but is consistently retained when durative gemination creates a heavy syllable after C_1 .

Bacovcin and Freeman developed this analysis in the context of explaining the behavior of the gemination of the derived stems in Akkadian, but its implications for the basic inflection of verbs and the alternations of the verbal root are immediately apparent. In the basic underived G-Stem, if we begin with an underlying $C_1aC_2\check{V}C_3$ root shape, as posited by Bacovcin and Freeman, the affixation of the prefix-conjugation affixes will, in conjunction with the rule of syncope, naturally produce a $CC\check{V}C$ root shape without any templatic or non-concatenative morphological processes. Observe how we can generate the apparent stem shape of the Akkadian perfective (preterite), imperfective (durative), and stative (permansive) verb without needing to stipulate any templatic morphological alternations by beginning with a fully vocalized stem (parus/parras/paris) and running each through the rule of syncope.

(19) *Perfective*

| UF | → | Syncope | → | SF |
|----------|---|-----------------------|---|---------|
| aparus | → | ap a rus | → | aprus |
| taparus | → | tap a rus | → | taprus |
| taparusī | → | tap a rusī | → | taprusī |
| iparus | → | ip a rus | → | iprus |
| niparus | → | nip a rus | → | niprus |
| taparusā | → | tap a rusā | → | taprusā |
| iparusū | → | ip a rusū | → | iprusū |
| iparusā | → | ip a rusā | → | iprusā |

⁶⁴We might here amend their assertion by suggesting that the vowel present in the perfective G-Stem, the so-called theme vowel, is underlying and is not specified by any other morphological categories. For more evidence as to the presence of such thematic vowels, see section 2.3.1.1.3

In all person and number forms, the application of the conjugation prefixes to the vocalized verbal root creates a sequence of adjacent, light, word-internal syllables as the first and second syllables of the verb. This means that the first vowel of the verbal root will be deleted in every form of the perfective verb, exactly in keeping with our observation that the Akkadian perfective (preterite) always attests a *CCVC* root shape. Using syncope, we may generate this fact about the Akkadian verb using elements already present in the grammar, rather than simply stipulating a verbal template which the consonantal root must match.

Supposing that we begin with an imperfective stem *parras*, we can easily account for the unaltered root shape because, unlike in the case of the perfective stem, the addition of the conjugation prefixes produces no sequences of adjacent, light, word-internal syllables.

(20) *Imperfective*

| UF | → | Syncope | → | SF |
|-----------|---|-----------|---|-----------|
| aparras | → | aparras | → | aparras |
| taparras | → | taparras | → | taparras |
| taparrasī | → | taparrasī | → | taparrasī |
| iparras | → | iparras | → | iparras |
| niparras | → | niparras | → | niparras |
| taparrasā | → | taparrasā | → | taparrasā |
| iparrasū | → | iparrasū | → | iparrasū |
| iparrasā | → | iparrasā | → | iparrasā |

Note that while the traditional analysis of root gemination of this sort in Semitic (as illustrated previously with the examples of *katab~kattab* in Arabic) has been to attribute the gemination of the second root-consonant to a template requiring pre-specified gemination, we have previously noted that in diachronic terms, we can likely generate these forms by the infixing of the same $\langle n \rangle$ infix attested in Beja. In this way, the shape of both the perfective and imperfective stem can be generated solely by means of affixes and syncope, without any need for an explicitly non-concatenative morphological process.

The same analysis will generate the apparent shape of the stative stem. Starting with an underlying stem *paris*, the application of the conjugation suffixes will produce the necessary environment for syncope in some forms and not others.

(21) *Stative*

| UF | | Syncopation | | SF |
|------------|---|-------------|---|-----------|
| parisāku | → | pariśāku | → | parsāku |
| parisāta | → | pariśāta | → | parsāta |
| parisāti | → | pariśāti | → | parsāti |
| paris | → | paris | → | paris |
| parisat | → | pariśat | → | parsat |
| parisānu | → | pariśānu | → | parsānu |
| parisātunu | → | pariśātunu | → | parsātunu |
| parisātina | → | pariśātina | → | parsātina |
| parisū | → | pariśū | → | parsū |
| parisā | → | pariśā | → | parsā |

Note that while the stem is normally *CVCC*, it is *CVCVC* in the 3rd M. Sg. Under the templatic analysis, we must simply stipulate that most forms require the *CVCC* template, while another, the 3rd M. Sg., requires the *CVCVC* template. Under the syncope analysis, all of these forms have the same underlying verb stem (*paris*), and the alternation between the two surface stem shapes is predicted perfectly and derived via syncope.

Although Bacovcin and Freeman developed their analysis primarily to explain some of the idiosyncrasies of the more complex derived stems in Akkadian, its ability to generate all of the basic verbal alternations within the language was not lost on them. Discussions with both scholars about the forms attested across Semitic and Afro-Asiatic more generally acted as the foundation of the analysis presented below, and to each both I and this overall analysis owe a great debt.

2.1.2 Syncope in Afar-Saho

Unbeknownst to Goetze, Greenstein, or Bacovcin and Freeman, Akkadian is not alone within the Afro-Asiatic family in attesting to a syncope rule with almost these exact specifications within its synchronic grammar. Indeed, the Lowland East Cushitic language(s) Afar-Saho, which is neither particularly closely related to Akkadian, nor likely to have undergone contact with Akkadian at any point in its history, contains a strikingly similar phonological rule to that of Akkadian. Bliese (1981) states of the syncope rule of Afar-Saho:

...in those words which do have an underlying (C)VCVCVX pattern, the vowel which is second from the left is deleted to break them into (C)VCCVX.

Bliese, of course, makes no mention of the similarity to Akkadian, since he has no external reason to suppose that the two may be related in any capacity, or indeed, he may not have been aware of the presence of such a rule within Akkadian at all. And we should mention that the Afar-Saho syncope rule is not perfectly identical to that of Akkadian. For example, it does not allow identical

consonants to become adjacent via syncope, hence the existence of Afar-Saho forms such as *miḍadi* "fruit" or *sababa* "reason." It is also sensitive to stress, with the presence of a word-level stress on the second light syllable able to block syncope⁶⁵. This is observed in nominative/genitive vs. accusative pairs such as *xamīla* vs. *xamlī*, both "love." It can also be blocked if the second of the newly adjacent consonants would be *y, as in *daraya* "worm" or *katayēni* "they followed," though this blocking appears to be variable, as alternate forms such as *katyēni* are also attested. Finally, Bliese remarks that this rule may have sensitivity to the left edge of the word, and may only apply word initially, but we should note that his examples provide no counter-examples demonstrating that the rule **does not** apply to word-internal sequences.

Notwithstanding these small-scale deviations, it is impossible not to note the striking similarities between this rule in Afar-Saho and the one which we have demonstrated for Akkadian. The most obvious similarity, of course, is that they have effectively the same environments (sequences of adjacent light syllables), the same targets (the second syllable of such a sequence), and of course produce the same output (the deletion of a vowel). But the similarities run far deeper than a simple description of the rule's environment and output. Bliese also remarks that this syncope rule is responsible for alternations which are quite similar to those which are conventionally attributed to templatic morphological processes in the other Afro-Asiatic languages, including in other Cushitic languages. For example, Bliese notes that the syncope rule in Afar-Saho explains the variations present in the stems of Strong Verbs (the Cushitic inheritor of the old prefixing/eventive-conjugation) between what we would term G-Stem forms such as *i-rxide* "I slaughtered" with a *CCVC(V)* form, and old S-Stem causatives such as *i-y-rixide*⁶⁶, with a *CVCVC(V)* stem, which Bliese analyzes as underlyingly /iyirixidi/. But note that this precise alternation, between a G-Stem in *CCVC* and an S-Stem in *CVCVC* is not unique to Afar-Saho, as might be supposed by the assertion that that it is purely the result of the synchronic syncope rule found only in that language. Rather, it is paralleled perfectly by Beja forms such as *i-dbil* "he collected" vs. *i-s-dabīl* "he made collect." Bliese also remarks that the Afar-Saho syncope rule can explain the variation in suffix-conjugated verbs between stems such as *alf-ēni* "they closed" vs. *alif-tēni* "you (pl.) closed." Again, note that this variation is perfectly parallel to the variation in stem shape seen in the Semitic suffix-conjugation between forms such as Akkadian *parsāku* but Arabic *fa'altu*.

Without a clearer picture of the comparative history of the Cushitic languages, it is impossible to say with certainty how far back we should project the syncope rule of Afar-Saho, or whether we can directly link this rule with that of Akkadian. We cannot, in principle, rule out the possibility that this rule is simply a parallel development on the part of two out of the close to 400

⁶⁵The Cushitic languages frequently have a system of contrastive stress, pitch accent or metrical syllable prominence, which does not appear to be shared with Semitic, hence the absence of such an exception in Akkadian.

⁶⁶Recall that in Afar-Saho, the old causative *s morpheme typically surfaces as y. This form reflects an earlier *'i-s-rixide, perfectly parallel to the other Cushitic forms.

Afro-Asiatic languages recognized by Ethnologue. Nevertheless, the fact that two syncope rules, each having similar formulations, trig

Nevertheless, the fact that two syncope rules, which have such strikingly similar formulations, and which explain and generate many of the same otherwise stipulated morphological alternations characteristic of the families exists in two not-particularly-closely related sub-families should be considered, if nothing else, evidence for the plausibility that such a rule might have been present at older stages of the history of Afro-Asiatic, perhaps at the common ancestor of Semitic and Cushitic.

2.2 Syncope in Reconstructed Afro-Asiatic Forms

The fact that syncope can accurately predict and generate the forms of the Akkadian verb, as well as those of Afar-Saho is a striking realization in and of itself, and points to potential non-templatic analyses for large portions of both the Akkadian and Afar-Saho verbal systems. However, the Akkadian verbal system is not unique to that language, and is indeed shared, to a greater or lesser degree, with the remainder of the entire Semitic family. Likewise for Afar-Saho, where the verbal system preserved there is not dissimilar to that recoverable for Beja, Somali, or the various other Cushitic languages. And indeed, the Cushitic and Semitic verbal systems are quite similar to one another, and to that of Berber, as well as potentially to the weak suffixed-forms of Omotic, and to the stative suffix-conjugation of Egyptian. If syncope can account for these forms in Akkadian and Afar-Saho, forms that are clearly cognate with formations throughout the Afro-Asiatic world at large, it immediately raises the question as to whether these cognate forms could, in principle, have been generated by a syncope rule as well, and whether the ancestral verbal formations of earlier stages of Afro-Asiatic, from which these forms are inherited, can have been derived from syncope.

In the following section, we propose precisely this analysis. We suggest that effectively the same rule of iterative, persistent syncopation which characterizes Akkadian and Afar-Saho was active in the synchronic grammar of Proto-Afro-Asiatic. We will demonstrate how the reconstructable forms presented above may be generated in their myriad root and stem shapes using solely affixation and syncope, without need to reconstruct a non-concatenative "templatic" morphological structure to the common Afro-Asiatic stage.

2.2.1 Verbal Morphology

We will begin with verbal morphology, which we have reconstructed for Afro-Asiatic, since the syncope rules of both Akkadian and Afar-Saho have been suggested to have their largest impacts on the formation of verbal stems. We will consider the same categories as presented above: namely, the Prefix and Suffix conjugation, the perfective and imperfective aspect stems, and the G-, S-, T-, and N-Stems.

2.2.1.1 G-Stem

As we summarized in Section 1.3.2.5 above, the inflection of the G-Stem can be reconstructed as follows.

| | Prefix-conjugation | | Suffix-Conjugation | |
|---------------|--------------------|--------------|--------------------|------------|
| | Perfective | Imperfective | Short | Long |
| Biliteral | yṽ-sim | yṽ-<n>sim | sim-ku | sim-āku |
| Triliteral | yṽ-mwut | yṽ-ma<n>wut | mawut-ku | mawt-āku |
| Quadriliteral | yṽ-tumtum | yṽ-tumtum | tumtum-ku | tumtum-āku |

Figure 2.2: Afro-Asiatic G-Stem Inflection

Having summarized the comparative morphology actually attested, as well as discussing and introducing the syncopation rule, we now possess all of the tools needed to generate all such forms through simple affixation and syncope, with no need for "root-and-template" morphological effects. We will begin with the discussion of the biliterals.

One of the striking features of the biliteral verb forms in Afro-Asiatic (most clearly attested in Berber and Cushitic), is the comparative stability of the root. The biliteral root exhibits little of the apparent root or stem alternations of their triliteral counterparts, appearing in almost all attested instances with an invariant root **CVC*. Under a templatic analysis, this fact must effectively be left to simple stipulation: the templates which govern biliteral verbs are simply less mutable or variable than those that govern triliterals. Under the syncopation analysis, this lack of variability emerges naturally as part of the derivation. Neither the affixation of the *CV-* prefixes, the **-Cṽ* suffixes, or even the **-āCṽ* long suffixes to the underlying **CVC* biliteral root will produce in the verbal stem a sequence of adjacent, light, word-internal syllables. Therefore, the biconsonantal verb will never be subject to syncopation, regardless of the inflection it undergoes.

(22) *CVC G-Stem*

| | Perfective | Imperfective | Short Stative | Long Stative |
|-------------------|----------------|-----------------|----------------|-----------------|
| Underlying Root | sim | sim | sim | sim |
| | ↓ | ↓ | ↓ | ↓ |
| <n>-Infix | - | <n> sim | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Affixes | yṽ- sim | yṽ- nsam | sim -ku | sim -āku |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yṽ sim | yṽ nsam | sim ku | sim āku |

The trilateral roots may be derived in the same fashion. Beginning with a fully vocalized and syllabified *CVCVC* root, the addition of the various actor affixes and imperfective *<n>* infix will trigger or block the syncope rule, generating precisely the expected forms in their expected roles.

(23) *CVCVC G-Stem*

| | Perfective | Imperfective | Short Stative | Long Stative |
|-------------------------|------------------|-----------------------|------------------|-------------------|
| Underlying Root | mawut | mawut | mawut | mawut |
| | ↓ | ↓ | ↓ | ↓ |
| <i><n></i> -Infix | – | ma<n>wut | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Affixes | yǎ- mawut | yǎ- manwat | mawut -ku | mawut -āku |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yǎ mawut | – | – | mawut āku |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yǎ mwut | yǎ manwat | mawut ku | mawt āku |

Here, the syncope analysis begins to show its strength. Using only the shapes of the reconstructable morphemes, we are able to generate all four of the possible G-Stem root shapes, despite the fact that no two forms have the same surface root structure. The perfective root form **CCVC*, inarticulable as a stand-alone sequence in a language that disallows complex onsets, and that conspiratorially only occurs with prefixes that make it articulable, is here revealed not merely to co-occur with prefixes, but rather to be the syncopated output triggered by the affixation of the prefix-conjugation morphemes to the fully vocalized **CVCVC* root. This syncope cannot occur in the imperfective or the short-form stative forms. In the imperfective, the presence of the *<n>* infix blocks the application of syncope by creating a closed, and therefore heavy, syllable. Likewise, in the short-form stative, the lack of a prefix prevents syncope of the first root-syllable, while the suffixes' consonant-initial **-CV* shape means that these affixes do not generate any sequences of light, word-internal syllables, and do not trigger syncope. Not so, however, in the long-form stative. Here, the presence of the long **ā* vowel connecting the root to the suffix creates a string of light syllables and therefore feeds syncope.

The quadrilateral verb roots, to the extent that we must reconstruct such forms for Proto-Afro-Asiatic, are like the biconsonantals in that they typically exhibit little in the way of root-internal variation when inflected. Again, this fact follows naturally from the shape of such roots under an analysis of syncope, as demonstrated in the derivation below.

(24) *CVCCVC G-Stem*

| | | | | |
|-------------------|-------------------|-------------------|-------------------|--------------------|
| | Perfective | Imperfective | Short Stative | Long Stative |
| Underlying Root | tumtum | tumtum | tumtum | tumtum |
| | ↓ | ↓ | ↓ | ↓ |
| <n>-Infix | - | tumtum | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Affixes | yǎ- tumtum | yǎ- tumtam | tumtum -ku | tumtum -āku |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yǎ tumtum | yǎ tumtam | tumtum ku | tumtum āku |

It should be noted that, in the case of quadrilaterals, the syncope analysis provides the additional benefit of explaining the absence of quadrilateral verb roots without medial clusters, such as *CVCVCVC*. Even if such forms were present in the underlying representation, they would naturally be subject to syncope (*CVCVCVC* → *CVC*∕*CVC* → *CVCCVC*) and would invariably surface with medial clusters.

As illustrated above, then, the full range of stem- and root-shape allomorphy which we may securely reconstruct for the G-Stem of Proto-Afro-Asiatic can be generated solely from:

- a) Fully Vocalized and Syllabified Roots: **CVC*, **CVCVC*, **CVC(V)CVC*
- b) Simple concatenation of inflectional Affixes
- c) Application of syncope rule

Under such an account, there is no need to posit consonantal roots, templatic tiers, interdigitation of vowels and consonants, or any of the other striking non-concatenative theoretical apparatuses that scholars such as McCarthy (1981) have invoked to explain these verbal alternations. Excepting vowel apophony, which will be discussed in section 2.3.2.2.1 below, the inflection of the G-Stem verb can be reconstructed as purely concatenative, albeit subject to phonological changes that make the structure quite opaque at the surface level.

2.2.1.2 Derived Verbal Stems

The formation of derived verbal stems, as summarized above, can be reconstructed with the following forms⁶⁷.

⁶⁷In this table, and in the discussion that follows below, the reconstructable derivational prefixes **sǎ-*, **tǎ-*, and **nǎ-*, will be represented as **Dǎ-* in the instances in which we wish to discuss the derivational prefixes as a category, without distinguishing between the three derivational categories.

| | Prefix-conjugation | | Suffix-Conjugation | |
|---------------|--------------------|--------------|--------------------|---------------|
| | Perfective | Imperfective | Short | Long |
| Bilateral | yǎ-D-sim | yǎ-D-sam | Dǎ-sim-ku | Dǎ-sm-āku |
| Trilateral | yǎ-Dǎ-mwut | yǎ-Dǎ-mwat | Dǎ-mwut-ku | Dǎ-mwut-āku |
| Quadrilateral | yǎ-D-tumtum | yǎ-D-tumtam | Dǎ-tumtum-ku | Dǎ-tumtum-āku |

Figure 2.3: Afro-Asiatic Derived Verb Inflection

The derived verbal forms can be generated using the same account of syncope, and indeed, it is through syncope that we can account for the peculiar alternation of **Dǎ-* and **D-* prefix forms we saw throughout the daughters languages in different verbal forms. These alternations suggest a further fact about syncope, as we must reconstruct it for Afro-Asiatic. Syncope was not a rule that applied to the output of phonological derivation, functioning as a surface-level constraint. Rather, syncope must have applied at multiple steps throughout the morphological derivation, presumably when a given affix or process triggers a phonological cycle.

Consider the example below, in which we attempt to generate the bilateral, trilateral, and quadrilateral derived verb stems using surface-level syncope applied directly before output to the surface form (remember that the derived stems are not reconstructable as co-occurring with the $\langle n \rangle$ imperfective infix of the G-Stem).

(25) *CVC Derived Stem*

| | Perfective | Imperfective | Short Stative | Long Stative |
|----------------------------|------------------------------|------------------------------|--------------------|--------------------------------|
| Underlying Root | sim | sim | sim | sim |
| | ↓ | ↓ | ↓ | ↓ |
| $\langle n \rangle$ -Infix | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Dǎ-Prefix | Dǎ- sim | Dǎ- sam | Dǎ- sim | Dǎ- sim |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Affixes | yǎ-Dǎ- sim | yǎ-Dǎ- sam | Dǎ- sim -ku | Dǎ- sim -āku |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yǎDǎ ǎ sim | yǎDǎ ǎ sam | - | Dǎ ǎ sim āku |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yǎD sim | yǎD sam | Dǎ sim ku | Dǎ sim āku |

(26) *CVCVC Derived Stem*

| | Perfective mawut | Imperfective mawut | Short Stative mawut | Long Stative mawut |
|-------------------|----------------------------|------------------------------|-------------------------------|------------------------------|
| Underlying Root | ↓ | ↓ | ↓ | ↓ |
| <n>-Infix | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| DV-Prefix | Dǔ-mawut | Dǔ-mawut | Dǔ-mawut | Dǔ-mawut |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Affixes | yǔ-Dǔ-mawut | yǔ-Dǔ-mawut | Dǔ-mawut-ku | Dǔ-mawut-āku |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yǔDǔmawut | yǔDǔmawut | Dǔmawutku | Dǔmawutāku |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yǔDmawut | *yǔDmawut | Dǔmwutku | Dǔmwutāku |

(27) *CVCCVC Derived Stem*

| | Perfective tumtum | Imperfective tumtum | Short Stative tumtum | Long Stative tumtum |
|-------------------|-----------------------------|-------------------------------|--------------------------------|-------------------------------|
| Underlying Root | ↓ | ↓ | ↓ | ↓ |
| <n>-Infix | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| DV-Prefix | Dǔ-tumtum | Dǔ-tumtum | Dǔ-tumtum | Dǔ-tumtum |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Affixes | yǔ-Dǔ-tumtum | yǔ-Dǔ-tumtum | Dǔ-tumtum-ku | Dǔ-tumtum-āku |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yǔDǔtumtum | yǔDǔtumtum | Dǔtumtumku | Dǔtumtumāku |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yǔDtumtum | yǔDtumtum | Dǔtumtumku | Dǔtumtumāku |

Treating the syncope as a surface-level phenomenon correctly produces the forms of the biliteral and quadrilateral roots, but incorrectly generates the trilateral forms, particularly the eventive forms (perfective and imperfective). Specifically, this analysis fails to capture the generalization that for trilateral verbs, the derivational prefix is always vocalized *Dǔ-, while *all* verbal roots always reflect the shape *CCVC* in all forms, and rather predicts the opposite⁶⁸. But we need not seek the explanation of this phenomenon in a morphologically prespecified template. Rather, it, as well as the correct forms for triconsonantal derived and combined verbs, follows naturally from an analysis in which the application of the derivational morphemes triggers a round of syncope, with each instance of a derivational affixation triggering another round of syncope. Observe how the trilateral derived stem can be correctly produced using multiple rounds of syncope, while also correctly producing the biliteral, trilateral, and quadrilateral G-Stem forms.

(28) *G-Stem Forms and Trilateral Derived Stems*

⁶⁸Note, however, that it matches the forms as reconstructable for Proto-Cushitic. We will discuss this state of affairs in section 6.2.2.2 below.

| | Bilateral | Trilateral | Quadrilateral | Trilateral Derived |
|--------------------|----------------|------------------|-------------------|--------------------|
| Underlying Root | sim | mawut | tumtum | mawut |
| | ↓ | ↓ | ↓ | ↓ |
| DV-Prefix | – | – | – | Dv̄-mawut |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | Dv̄mawut |
| | ↓ | ↓ | ↓ | ↓ |
| Add Actor Prefixes | yv̄-sim | yv̄-mawut | yv̄-tumtum | yv̄-Dv̄mwut |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | yv̄mwut | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yv̄sim | yv̄mwut | yv̄tumtum | yv̄Dv̄mwut |

The syncope analysis, therefore, can correctly produce all of those forms that we have previously reconstructed for Proto-Afro-Asiatic from a simple system of verbal affixation and ordered-rule phonological alternation. It has the additional benefit of not only producing the reconstructed forms, but further explaining why these forms have the particular shapes they do, rather than simply stipulating that a given form is prespecified into the template. In following sections, we will discuss how this system of verbal inflection and syncope developed and changed into the attested languages we see across the Afro-Asiatic family.

2.2.2 Nominal Morphology

As previously discussed, the nominal morphology of Proto-Afro-Asiatic is significantly more difficult to reconstruct than its verbal morphology. This is in part due to the simple fact that, cross-linguistically, verbal morphology tends to be far more robust and therefore easier to detect with the comparative method, even at the vast time depths associated with Afro-Asiatic. But it is also largely attributable to the fact the the nominal morphologies of the attested Afro-Asiatic daughter languages show a much weaker degree of clear and unambiguous cognation, suggesting that much of it may represent independent post-Proto-Afro-Asiatic innovations.

For this reason, we can discuss the impacts of our syncope analysis in far less detail than we could for the inflection and derivation of the verb. Nevertheless, we can still discuss the impact of syncope on the potential or hypothetical nominal morphemes discussed above.

2.2.2.1 Gender Inflection

In a sense, the morphology of gender in Afro-Asiatic is one of the more easily reconstructable areas. As previously discussed, the presence of the feminine **-t* marker is one of the most obviously characteristic features of the Afro-Asiatic family. Whether in the form of outright **-t* marking nouns, or as part of the pervasive *n/t/n* system of pronominal and deictic inflection, this morpheme

is present in effectively every sub-branch of Afro-Asiatic⁶⁹. It seems entirely clear, then, that this morpheme is securely reconstructable to the common Afro-Asiatic period as a marker of the feminine gender.

What is not clear is the precise form that morpheme should take. As discussed in section 1.3.1.2, many of the daughter languages appear split as to whether the feminine gender suffix was a consonant **-t* that appended directly to the final consonant of the root/stem, or whether it took the form **-at* (or **-ūt* to remain agnostic about potential vowel quality). This disagreement can exist even between closely related languages. Consider the feminine formations below from across Semitic.

| | | |
|--|---|---|
| <ul style="list-style-type: none"> ● <i>*malik-</i>: – Eblaite: malik-tu – Arabic: malik-at – Hebrew: malk-at – Ge'ez: nəgəs-t⁷⁰ | <ul style="list-style-type: none"> ● <i>*baʿal-</i>: – Akkadian: bēl-tu – Arabic: baʿl-at – Hebrew: baʿal-at – Mehri: bāl-ēt | <ul style="list-style-type: none"> ● <i>*ʾaḥ-</i>: – Akkadian: aḥ-ātu – Arabic: ʾaḥ-t – Hebrew: ʾaḥōt – Ge'ez: ʾaḥ-t |
|--|---|---|

The shape of the feminine morpheme is not securely recoverable even within a single line of descent, as reflexes of both **-t* and **-ūt* are often recoverable from a single daughter language. Again, Semitic provides ample examples, as in the feminine noun forms from each language below.

| | <i>*-t</i> | <i>*-at</i> |
|----------|------------------|------------------|
| Akkadian | rapaš-tu | erṣ-etu |
| Arabic | bin-t | layl-at |
| Hebrew | ba- <u>t</u> | malk- <u>at</u> |
| Ge'ez | ʾəgziʾ- <u>t</u> | bäräk- <u>ät</u> |

Figure 2.4: **-t* and **-at* Reflexes in Semitic

The precise shape of the affix, of course, has a strong bearing on our analysis of syncope, because the two reconstructable forms (**-t* and **-ūt*) will have

⁶⁹The only possible exception being Omotic, though see Bender (2000) who suggests relics of **-t* form across the family.

⁷⁰Note that this does not represent the same Proto-Semitic form **malik*, but rather a different Semitic root reflected in Akkadian *nagāšu* "overthrow" Arabic *najaša* "drive," Hebrew *nāgās* "oppress, extract tribute," and Ugaritic <ngš> "overseer." It is also reflected in Chadic in Gisiga *mangaš* "bridegroom" reflecting **ma-nagaš*, with syncope.

different impacts on the syllabification of the stem after affixation. Most notably, a **-v̄t* feminine affix shape would be expected to trigger syncopation on all *CVCCV* trilateral nouns, as in the derivations below.

(29) **-v̄t Affixation on Feminine Nouns*

| Underlying Root | Bilateral ʾam | Trilateral yamin | Quadrilateral taftaf |
|-----------------------|-------------------------|----------------------------|--------------------------------|
| Feminine <i>*-v̄t</i> | ↓ | ↓ | ↓ |
| | ʾam- <i>v̄t</i> | yamin- <i>v̄t</i> | taftaf- <i>v̄t</i> |
| Syncopate | ↓ | ↓ | ↓ |
| | – | yam̄n̄v̄t | – |
| Output | ↓ | ↓ | ↓ |
| | ʾamv̄t | yam̄n̄v̄t | taftafv̄t |

Under our theory, this would make the prediction that all trilateral *CVCCV* nominal roots, when affixed with the feminine suffix, should surface with a *CVCC* segolate root shape, regardless of whether the corresponding masculines were segolate or not.

In section 1.3.1.2, we suggested that the feminine **-t* suffix was original in form, because it was more widely distributed, and because it occurred with deictics, pronouns, and commonly with more archaic bilateral nouns. To this we may now add the fact that suffixation with the feminine suffix does not commonly trigger stem-shape alterations in Afro-Asiatic. Indeed, only in Egyptian is such variability regularly seen, and it is telling that Egyptian is the only branch in which the original **-t* form has been completely displaced by a vocalized **-v̄t* form that *should* trigger syncopation.

We may therefore suggest that the original form of the feminine suffix was a non-syncopate-inducing **-t*, and that the alternate variant **-v̄t* finds its origin as an allomorph of **-t* which appears in environments in which the affixation of the standard feminine suffix would violate the syllable-structure constraints, that is, following segolate *CVCC* nominal roots, which are already heavy, and nouns ending with *CVC* sequences. It is precisely in these cases that we find the vocalic **-v̄t* variant in Akkadian and also in Berber. And it is perhaps telling that in Egyptian, which exhibits exclusively **-v̄t*, the word-final extrametricality allowing for *CVCC* sequences at word end has been lost, making the **-v̄t* form the only allomorph which can append to effectively any nominal root or stem.

2.2.2.2 Number Inflection

Since the Afro-Asiatic languages show such a wide array of pluralizing morphemes, it is difficult to comment on the ways in which these morphemes may have variously interacted with syncopation. While we will discuss the role of syncopation with respect to concatenative sound-plural formation in the various daughter languages, we can say little about sound-plural syncopation in Afro-Asiatic proper, since we cannot securely reconstruct concatenative pluralizing

morphemes. Instead, we will focus our attention on those broken-plural formations that can be reconstructed for at least a few of the daughter languages, discussing how they interact with our rule of syncopation.

2.2.2.2.1 Changes in Vowel Quality/Quantity

Broken plurals formed by alternations of either vowel quality or quantity, without other changes to root or stem shape, are common throughout the family, being attested in every branch of Afro-Asiatic, except Omotic, as illustrated below.

| | |
|----------|--|
| Semitic | Arabic: kitāb/kutub |
| Egyptian | Coptic: ⲕⲁⲥ/ⲕⲁⲁⲥ |
| Berber | Tuareg: a- <i>yānib</i> /i- <i>yūnab</i> |
| Chadic | Hausa: <i>gàtarī</i> / <i>gāturà</i> |
| Cushitic | Beja: <i>asūl</i> / <i>asil</i> |
| Omotic | – |

Figure 2.5: Broken Plurals Formed by Vowel Apophony

Under the common templatic theories, such forms are generated by the direct manipulation of the consonantal root and the interdigitation of the vowels which form the plurals. But, as discussed in far greater detail in section 2.3 below, our analysis of syncopation suggests that, at least initially, these were distinct morphophonological processes. Since our syncope rule is insensitive to vowel quality, it must originally have been the case that there was an unrelated rule of vowel gradation or apophony, which transformed vowels within the roots of nouns and verbs, quite independent of any changes in the shape of the root/stem. Over time, since these two processes co-occurred with such frequency, they may have become conflated and reanalyzed as part of a single process.

For this reason, we will not discuss pluralization formed by the apophonic transformation of vowels internal to the root or stem, since they will have little bearing on our analysis of the shapes of such roots or stems. For further discussion on the plausibility of apophony as an originally distinct morphological process, with particular emphasis on the verb, where such apophonic transformations are presumed to have arisen, see section 2.3

2.2.2.2.2 Changes in Root Shape

Far more interesting for our purposes are those plurals formed by the alternation of the basic shape of the nominal root or stem. These "root-manipulated" broken plurals are no less common than their apophonic counterparts, again being found in every major branch of the family.

| | |
|----------|--|
| Semitic | Arabic: rub ^c /’arbā ^c |
| Egyptian | Coptic: Ⲡⲱⲛⲧ/Ⲡⲟⲛⲧ ⁷¹ |
| Berber | Tuareg: a-dkər/i-dəkrân |
| Chadic | Hausa: garkë/garākē |
| Cushitic | Beja: loliš/lolša |
| Omotic | – |

Figure 2.6: Broken Plurals Formed by Root/Stem Alterations

The precise patterns and forms attested differ from branch to branch and language to language, but there are a number of general trends which are consistent with and easily explained by an analysis of syncope, but are otherwise unexplainable and purely stipulated under a templatic analysis.

We may first consider the "broken plural" types involving a cluster of the final two root consonants, *-CC-* forms for biliterals, and *-CVCC-* forms for trilaterals. The trilateral form is clearly allowable given the syllable structure of Afro-Asiatic, in that it is identical to a segolate root noun. Such forms should, therefore, be possible as freestanding plurals without the need for any additional affixation. And yet, what we find is that they co-occur with suffixes in almost all situations.

| | |
|--------|----------------|
| Arabic | ġazāl/ġizlān |
| Tigre | kətāb/’akətbət |
| Tuareg | adkər/idəkrân |
| Beja | loliš/lolša |
| Somali | gabaḍ/gabḍo |
| Boni | šilib/šilbi |

Figure 2.7: Suffixed Plurals Exhibiting CVCVC~CVCC Root Shape

Under a templatic theory, this co-occurrence between a *CVCC* root alternation and the presence of a vowel-initial suffix is simply a matter of stipulation, as it need not be the case any more than any other type of affixation ought to call for such a root manipulation. But under our theory, the conspiratorial relationship is unmasked. The presence of the vowel initial suffix is precisely the cause of the syncope that generates the *CVCC* root shape, as in the simple derivation provided below.

⁷¹Although the Coptic words have the same basic syllable structure, excepting the difference in vowel length, the presence of the long vowel in the singular form reveals that this syllable must have originally been open, since original *ā is only possible in open syllables in Middle Egyptian. This points to a singular form *ḥāfat contrasting with a plural form *ḥaftaw, with a closed initial syllable.

(30) *Derivation of CVCC Root Plurals*

| | CVCVC Roots |
|-----------------|-----------------|
| Underlying Root | yamin |
| | ↓ |
| -V(C) Suffix | yamin-ān |
| | ↓ |
| Syncopate | yamīnān |
| | ↓ |
| Output | yamnān |

The same would apply to broken plurals exhibiting a *CCVC* root structure. As goes without saying, such forms cannot surface on their own, and most co-occur with a **CV-* vowel-final prefix, bringing such forms into accord with the Afro-Asiatic syllable-structure constraints. Again, our rule of syncopation easily predicts the common co-occurrence of such forms, since the addition of the prefix will necessarily trigger syncope. This explains not only the common co-occurrence of the **CCVC* root shape with prefixes, but also the otherwise unexplained gap wherein **CVCVC* roots rarely if ever co-occur with **CV-* prefixes. Simple derivations are provided below.

(31) *Derivation of CCVC Root Plurals*

| | CVCVC Roots |
|-----------------|-----------------|
| Underlying Root | yamin |
| | ↓ |
| CV- Prefix | ʾa-yamin |
| | ↓ |
| Syncopate | ʾaymīn |
| | ↓ |
| Output | ʾaymin |

We will have a great deal more to say about the role of syncope in the formation of broken plurals in the sections below, in which we discuss broken plural along each line of descent. There, the specific plural formations are far more easy to reconstruct and identify, and we can therefore comment on the role that syncope plays in the generation of each broken-plural formation.

2.2.2.3 Case Inflection

We can say little about the interaction of case marking and syncope at the Afro-Asiatic level, because, as we have discussed, we cannot reconstruct the form of case-marking morphemes to the Afro-Asiatic level with any degree of certainty. Since the rule of syncopation is precisely sensitive to the specific shape of the morphemes which append to the nominal root/stem, we therefore do not know

what our theory predicts, and whether the attested data is in accord with these predictions.

For this reason, we will not discuss case inflection at the Afro-Asiatic level here. We will, however, discuss the extent to which case marking triggers (or fails to trigger) syncope in the nominal roots and stems of each Afro-Asiatic daughter, where the precise form of the case-marking morphemes can be identified more clearly.

2.2.2.4 Nominal Derivation

By contrast, in the realm of nominal derivation, we can say a great deal more, both about the morphemes themselves, and about the way the presence of derivational affixes can cause syncope in the nominal stem. The most widespread derivational affix throughout Afro-Asiatic is the prefix **mǔ-*, which is used in the formation of agent nouns, instrument nouns, location nouns, abstract verbal nouns, and, in some daughter branches, participles. In particular, we will consider the behavior of biliteral roots *CVC* and trilateral roots *CVCVC* which are affixed with the **mǔ-* prefix. Biliterals are, of course, unrecoverable from Semitic, since the **mǔ-* prefix appends to verbal roots/stems, and all Semitic verbal roots are effectively trilateral in their inflection. They are, nevertheless, recoverable from a number of other branches. Consider the examples below:

| | |
|--------|---------------------|
| Beja | madar |
| Coptic | ⲙⲁⲃⲁⲣ ⁷² |
| Tuareg | ǎmǎǎn |
| Giziga | mùhúf |

Figure 2.8: **mǔ-* Prefixed Biliteral Nouns

It is striking that biliteral *CVC* roots exhibit an effectively invariant root/stem shape. Indeed, the only major variations in the root shape of **mǔ-* prefixed biliteral nouns come in the form of *CVCV* nouns in languages like Tuareg (*emǎkš*⁷³ "eater"), or Beja (*mifrey*⁷⁴ "birth"), or in feminine biliterals in Egyptian, such as Coptic ⲙⲁⲃⲁⲣⲉ **matkǔt*⁷⁵ "dress." In each case, we might make note of the presence of a vowel immediately following the final root consonant. The presence of this vowel is hardly coincidental, as it is in fact the presence of the vowel which triggers syncope and enables the modification of the root. Note further that surface **mǔCC* nouns are not attested with basic *CVC* biliteral verbal roots, only

⁷²Reflecting a Middle Egyptian **nǎbǔs*, reflecting an underlying **/nǎbǔs/*, with secondary lengthening of the stressed vowel in an open syllable.

⁷³From the verbal root *ǎks* "eat," whose underlying form Heath (2005) gives as *i-ǎkšǐ*.

⁷⁴From verbal root *firi* "give birth."

⁷⁵From the *verba III infirmae* <tkǐ> "to dye." Weak trilateral verbs in Egyptian frequently lose their weak consonants in nominal derivation, which has happened in this case. Therefore, **matkǔt* represents the form of a two-consonant biliteral feminine noun.

with underlyingly *CVCV* roots. This despite the fact that, in Berber and Beja at the very least, super-heavy *CVCC* syllables are allowable word-finally, and that therefore such forms *are not* precluded by Afro-Asiatic syllable-structure rules. They are, however, predicted not to arise via our syncope rule, since they cannot be generated. Observe the derivations below, featuring both underlying *CVC* biliterals, along with derivations of the two variable types in Cushitic/Berber and Egyptian

(32) *Derivation of *mǎ- Prefixed Biliterals*

| Underlying Root | CVC Root bin | CVCV firi | CVC-at tǎk(vi) |
|-----------------|------------------------|------------------------------|--------------------------------|
| | ↓ | ↓ | ↓ |
| mǎ- Prefix | mǎ-bin | mi-firi | mǎ-tǎk |
| | ↓ | ↓ | ↓ |
| Syncopate | – | mifiri | – |
| | ↓ | ↓ | ↓ |
| -ǎt Suffix | – | – | mǎtǎk-ǎt |
| | ↓ | ↓ | ↓ |
| Syncope | – | – | mǎtǎkǎt |
| | ↓ | ↓ | ↓ |
| Output | *mǎbin | mifri → mifrey | mǎtǎkǎt → ⲙⲁⲛⲁⲕⲉ |

Trilateral *CVCCV* verbal roots prefixed with the **mǎ-* prefix are recoverable from effectively every major branch, and they again exhibit a very distinctive root shape. In almost all cases, the verbal root appears with a characteristic *CCVC* root shape, as in the examples below.

| | |
|--------|---------------|
| Arabic | masjid |
| Beja | mignaf |
| Coptic | ⲙⲁⲛⲁⲕⲉ |
| Tuareg | añâftâk |
| Giziga | mángás |

Figure 2.9: **mǎ-* Prefixed Trilateral Nouns

Again, in a templatic analysis, this common co-occurrence of prefix and root shape must effectively be stipulated, or an accidental, contingent occurrence. So too must be the common exceptions. The *CCVC* root shape can be blocked by, for example, the gemination of one of the first two root-consonants, as in Arabic *mukattab* "writing," and Tuareg *añâbbedar* "rude person." It can also be blocked by the presence of a long vowel, as in Arabic *mubarak* "blessed" or Coptic **ⲙⲁⲛⲁⲕⲉ**⁷⁶ "ash."

⁷⁶Reflecting a Middle Egyptian **mǎdūḥvr*, from an underlying /mǎdūḥvr/.

Once more, using our theory of syncopation, we can predict both the commonality of the *CCVC* as well as the specificity of the common exceptions to it. Observe the derivations below.

(33) *Derivation of *mǔ- Prefixed Trilaterals*

| Underlying Root | CVCVC Root mawut | C̄VCVC kātib | CVCCVC kattab |
|-----------------|----------------------------|------------------------|-------------------------|
| mǔ- Prefix | ↓ | ↓ | ↓ |
| | mǔ-mawut | mu-kātib | mu-kattab |
| Syncopate | ↓ | ↓ | ↓ |
| | mǔmawut | - | - |
| Output | ↓ | ↓ | ↓ |
| | *mǔmwut | mukātib | mukattab |

Nominal derivative suffixes are also present in a number of Afro-Asiatic daughter languages, although it is difficult to identify a single suffix that is as widely cognate as the near-ubiquitous **mǔ-* prefix. Nevertheless, by considering the forms of derived nouns from the daughters, we can begin to piece together the interaction between suffixed derivation and syncopation. Consider, for example, the case of Semitic nominals affixed with the derivational suffix **-ān*, such as Arabic *rahīmān* "merciful" (*rahīma* "to have mercy"), Hebrew *qadmōn* "eastern" (*qedem* "east, front"), Akkadian *šanšānu* "sunny" (*šamšu/Šamaš* "sun (god)"). Comparing directly to these, we might consider Berber adjectives such as *abərkan* "black" (*ibərrik* "be black"), which appear to reflect the same **-ān* suffix. This suffix is not attested in Egyptian, but we may consider the behavior of those nominal forms suffixed with the common nominal suffixes <.w> and <.i>, such as Coptic **ⲡⲠⲕⲉ** **rakḥvī* "fire wood" (**ⲡⲠⲕⲉ** **rākah* "to burn"). And to this group we may then add forms such as Afar-Saho agent nouns bearing the suffix *-eyna*, such as *beyeyna* "tong" (*beyee* "to take") and *ukteyna* "one who stands" (*ugute* "to stand up").

Although many of these suffixes are non-cognate (Afar-Saho *-eyna*), or at least not obviously cognate (Egyptian <.w> and <.i>), we may nevertheless remark on the characteristic shape of both the affixes themselves, as well as their impact on the shape of the root/stem. A large number of the derivational suffixes in Afro-Asiatic languages, particularly those suffixes which exhibit any cognation across more than a single daughter branch (**-ān* in both Semitic and Berber), are vowel initial⁷⁷. We may additionally note the impact which the affixation of such suffixes has on the root shape of the stem to which they apply. They occur, in an overwhelming number of cases, with *CVC* root shapes for

⁷⁷Indeed there are few suffixes of any sort across Afro-Asiatic which are consonant initial. The subject affixes of the stative/suffix-conjugation are vowel-initial, excepting the possibility of the long **ā* initial variants we have previously discussed. The suffix pronouns are also mostly consonant-initial, but given their functions, it is quite likely that these forms began initially as pronominal clitics, and their status as suffixes likely arose from their common position following nouns as members of a construct chain.

bilaterals (Afar-Saho *beyeyna*, Zenaga *ašiban*), and segolate *CVCC* shapes for trilaterals (Arabic *rahmān*, Coptic **ⲣⲟⲕⲉ** **rakḥōi*, Afar-Saho *ukteyna*). However, the segolate root shape apparently can be blocked by the gemination of one of the medial root-consonants (Afar-Saho *cemmiseyna* "beginning," Hebrew *zikkārōn* "remembrance"), along with the lengthening of any of the root vowels (Akkadian *nādinānu* "merchant," Coptic **Ⲙⲁⲛⲟⲩⲉ**⁷⁸ "coward"). Again, our theory can predict this distribution cleanly. We predict the commonality of the segolate *CVCC* root shape, as well as its blocking from forms with geminated second root-consonants and lengthened root-vowels.

(34) *Derivation of Suffixed Trilaterals*

| | CVCVC Root | C̄VCVC | CVCV̄C | CVCCVC |
|-----------------|-----------------|-----------------|-----------------|---------------------------|
| Underlying Root | yamin | nādin | sanād | zikkar |
| | ↓ | ↓ | ↓ | ↓ |
| Suffix | yamin-ān | nādin-ān | sanād-ṽw | zikkar-ān |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yamīnān | — | — | — |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yamnān | nādinānu | sanādṽw | *zikkarān→zikkārōn |

In sections below, we will discuss the behavior of nominal derivation as it pertains to syncope in each of the daughters, where we can speak about the shapes and patterns associated with nominal derivation in far greater detail and with more security and certainty.

⁷⁸Reflecting middle Egyptian **sanādṽw*, with an underlyingly long second vowel.

2.3 Syncopation and Vowel Apophony

The syncope rule proposed here is, as demonstrated, capable of successfully generating the alternations in root and stem shape attested and reconstructable across much of the Afro-Asiatic family. It cannot, however, generate the changes in vocalism which often co-occur with these stem and root alternations. In many instances, these vowel changes often serve as primary or secondary markers of morphological inflection or derivation, as illustrated in the examples below.

| | | | |
|---------------|-------------------------------|-----|--------------------------------|
| <i>Arabic</i> | <i>faʿala</i> "he did" | vs. | <i>fuʿila</i> "it was done" |
| <i>Tuareg</i> | <i>a-γânib</i> "molar" | vs. | <i>i-γûnab</i> "molars" |
| <i>Coptic</i> | ⲛⲟⲩⲧⲉ "god" | vs. | ⲛⲧⲏⲣ "gods" |
| <i>Beja</i> | <i>miri</i> "he found" | vs. | <i>manri</i> "he finds" |
| <i>Hausa</i> | <i>gāshì</i> "hair" | vs. | <i>gašū</i> "hairs" |
| <i>Ometo</i> | <i>šīkadis</i> "I approached" | vs. | <i>šīkides</i> "he approached" |

Figure 2.10: Morphological Vowel Alternations Across Afro-Asiatic

The importance of these vowel alternations in morphological processes, as well as their frequent co-occurrence with root/stem alternations, has led to their inclusion under traditional theories as a basic component of the morphological template, which is constructed as consisting of a consonantal tier, a vocalic tier, and a prosodic template (into which the previous two tiers are interdigitated).

In contrast to this canonical templatic theory, we argue for the fundamental separation of each as a distinct element of Afro-Asiatic morphology, at least at a sufficient time depth. To do this, we will attempt to demonstrate: **a)** that the alternation of vocalism is not original to the oldest and most archaic part of the Afro-Asiatic vocabulary; **b)** that even among innovative forms, some vowels appear to be underlying; and **c)** that the changes in vocalism which are attested, now divorced from root/stem shape alternations, are better understood in terms of vowel apophony than the complex theories of templatic interdigitation.

2.3.1 The Necessity of Conflating Stem/Root Allomorphy and Vowel Apophony

Regarding the templatic theories commonly proposed to describe the morphology of Afro-Asiatic languages, the first question we must consider is whether it is an a priori theoretical necessity that a language whose morphology is characterized by vocalic alternations within morphemes and alternations to the syllabic structure of root morphemes and full stems be analyzed using a theory of distinctive tiers interdigitated with a prosodic template, or if more conventional theories can be used to describe such languages. The answer would appear to be a resounding no. We need look no further than our grammatical analyses of

archaic Indo-European languages, and their Proto-Indo-European ancestor to conclude that non-templatic morphological theories are quite capable of describing languages with significant alternations in vocalism as well as the prosodic structure of morphemes. Consider the following example of the reconstruction of a pattern of noun inflection from Proto-Indo-European:

| | |
|---------|----------------------|
| Nom Sg. | nók ^w ts |
| Gen Sg. | nék ^w ts |
| Nom Pl. | nók ^w tes |

Figure 2.11: Inflection of *nók^wts in PIE

Superficially, this state of affairs is not altogether dissimilar to a set of related inflected words in an Afro-Asiatic language, such as Arabic *yaf^ʿ alu*, *yuf^ʿ alu*, and *fa^ʿ ala*, the 3rd M. Sg. forms of the imperfect, imperfect passive, and perfect respectively. In each case, there are two forms, which are distinct only because of alternations in vocalism (*nók^wts*~*nék^wts*, *yaf^ʿ alu*~*yuf^ʿ alu*), each of which is opposed to another inflected form which differs in its basic prosodic shape, and features an apparently inserted vowel (*nók^wtes*, *fa^ʿ ala*). If we so wished, we could apply a templatic analysis to the forms of Indo-European, suggesting that the root morpheme of *nók^wts is in fact a discontinuous triconsonantal root morpheme $\sqrt{nk^wt}$, which is matched with distinctive templates (*CóCCs*, *CéCCs*, *CóCCes*) in each of the case and number forms. Since *nók^wts in fact belongs to a relatively large class of acrostatic nouns that exhibit similar (if not exactly identical) behavior in terms of inflection, the postulation of such templates would indeed characterize a non-trivial portion of Indo-European nominal morphology.

Despite these superficial similarities, scholars have quite rightly rejected root-and-template analyses of the morphology of Indo-European languages in favor of more conventional theories, in which Indo-European morphemes contain basic, underlying vowels, which can then be either transformed or deleted in accordance with other rules within the phonological system⁷⁹

The fact that such an analysis works for Indo-European does not necessarily mean that it is appropriate for Afro-Asiatic. For that reason, we will now briefly discuss how a similar analysis might be applied to the case of Afro-Asiatic, and provide evidence that a root-and-template approach is not only not strictly necessary to characterize most of the phenomena attested in the family, it may also be in some respects sub-optimal. Since it is the most well-studied, we will focus our discussion here on the vowel apophony of Semitic.

⁷⁹For an example, see Andrew Byrd's (2015) excellent work regarding Indo-European syllabification and the ability to generate much of IE ablaut from careful generative syllabification rules.

2.3.1.1 Vocalic Stability – Vowels Present in Underlying Forms

Because templatic alternations, whether in terms of changes to the prosodic shape of the root/stem or in terms of the vowel qualities within the root/stem, are typically thought of as the Semitic morphological feature par excellence, it can be easy to lose sight of just how many of the vowels present in Semitic morphemes must be postulated into underlying grammatical representation, and which are not subject to any alternations whatsoever. In the following sections, we will discuss these stable, invariant, underlying vowels before moving on to the more well-known vowel apophonies.

2.3.1.1.1 Grammatical Morphemes

In his discussion of the role and presence of underlying vocalism in Proto-Semitic, Kogan (2005) notes the importance of distinguishing between those vowels which are present in derivational/inflectional morphemes, as well as deictics/determiners, and those which are present in nominal and verbal lexical morphemes. The vowels in these non-lexical "grammatical morphemes" are subject to precious little in the way of vocalic alternation. Indeed, if we consider only these morphemes, we would have no need for a templatic theory at all, as these vowels are far more stable than those which appear in, for instance, English verb inflection.

| Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez |
|---------------|----------|--------|--------|-------|
| *-ka | -ka | -ka | -kā | -ka |
| *-ki | -ki | -ki | -kī | -ki |
| *-šu | -šu | -hu | -hū | -hu |
| *-ša | -ša | -hā | -hā | -ha |

Figure 2.12: Semitic "Grammatical Morphemes" Exhibiting Stable Vocalism

It is striking that the vowels present in these morphemes are not only stable diachronically, as is clear from the tables above, but are also generally stable within the synchronic grammar as well. The suffix pronouns and suffix-conjugation are, for example, almost entirely invariant within each Semitic language, as are the forms of the independent pronouns. The prefix-conjugation is subject to certain well-defined and understood alternations, as discussed in sections 2.3.2.1.1 and 2.3.2.1.2 below, but these are much more simply characterized as instances of phonologically conditioned allomorphy rather than as an example of templatic alternation in vocalism.

2.3.1.1.2 Nominals

In addition to Kogan's "grammatical morphemes," many of the basic, underived nominals present throughout Semitic also exhibit stable, invariant vowels, which

must be projected into the underlying forms. Consider the nouns below, attested in each major Semitic branch, and the striking degree to which they agree in terms of their basic vocalism.

| Proto-Semitic | Akkadian | Arabic | North-West | South |
|---------------|----------|--------|------------------------|---------------|
| ʾarṣ | erṣetu | ʾarḍ | Ugaritic: ʾarṣ | Jibbali: ʾerḍ |
| *ʾudn | uznu | ʾudn | Ugaritic: ʾudn | Geʾez: ʾozn |
| *lišān | lišānu | lisān | Aramaic: liššān-ā | Geʾez: ləsan |
| *šalām | šalāmu | salām | Hebrew: šalōm | Geʾez: sālām |
| *tūm | šūmu | tūm | Hebrew: šūm | Jibbali: tūm |
| *gamal | gammalu | jamal | Hebrew: gamāl | Geʾez: gāmāl |
| *tawr | šūru | tawr | Syrian Aramaic: tawr-ā | Mehri: tawr |
| *šinn | šinnu | sinn | Aramaic: šin-ā | Geʾez: sənn |
| *bayt | bītu | bayt | Hebrew: bayit | Geʾez: bet |
| ḥaql | eqlum | ḥaql | Syrian Aramaic: ḥaql | Geʾez: ḥäql |
| ʾumm | ummu | ʾumm | Ugaritic: ʾumm | Geʾez: ʾəmm |
| ʾab | abu | ʾab | Hebrew: ʾāb | Geʾez: ʾäb |

Figure 2.13: Semitic Nouns Exhibiting Stable Vocal Quality and Quantity

In each of these nouns, as well as many others, it is clear that the vowels present in the nominal form are perfectly cognate across the Semitic family, exhibiting no variation except for those regular sound changes which occur along each line of descent. It should be noted that the stability of these vowels is not merely a diachronic fact, but is also largely a synchronic fact. Let us consider various derived and inflected forms of the noun *ʾab "father" in several Semitic languages:

| | Akkadian | Arabic | Hebrew | Geʾez |
|---------------|----------|----------|----------|----------|
| Nom. | abu | ʾabu | ʾāb | ʾäb |
| Gen | abi | ʾabi | | ʾäbä |
| Acc. | aba | ʾaba | | |
| 1st Sg. Poss. | abī | ʾabī | ʾabī | ʾäbuyä |
| Fatherly | – | ʾabawī | ʾabāhī | ʾäbawī |
| Fatherhood | abbūtu | ʾabwiyat | ʾabbāhūt | ʾäbäwəna |

Figure 2.14: Vocalic Stability throughout Inflection and Derivation in Semitic

In each of these examples, the basic underlying vowel of the root (the typical reflex of Proto-Semitic *a) appears in every word form, regardless of any inflectional or derivational processes present. Note that this stability of vocalism in

underived basic nominals is *not* an a priori necessity, as it is not the case in Indo-European, where, as we have seen, the vowels of underived nominals are subject to significantly more variation than those of Semitic.

Indeed, the only morphological process which triggers any change to the basic vocalism of underived Semitic nominals is the formation of irregular broken plurals, which, as discussed in 3.1.4.2.3, may themselves be originally derived forms, and therefore not truly underived nominals like their singular counterparts. Given this fact, a far simpler analysis of the morphological structure of underived nominals in Semitic than root-and-template structure is that these nouns are fully vocalized, mono- or bisyllabic root morphemes with a stable underlying vocalism and a basically affixing morphology. In addition, they are sometimes subject to an irregular process of plural formation, which distorts or transforms this simple underlying vocalism. In this sense, we may suggest Semitic underived nominals are not dissimilar to English strong verbs. Strong verbs are never construed as having a basically consonantal structure, but nevertheless can form their past tense and sometimes even participial forms by the manipulation of vowels between apparently fixed sequences of consonants, in addition to the more traditional affixes which still append to such roots.

2.3.1.1.3 Verbal Theme Vowels

Although we have demonstrated that basic, underived nominals are less amenable to a root-and-template analysis, it is clear that these theories were designed to handle the more complex verbal morphology of Semitic, where apparently non-concatenative phenomena are more prevalent. We may ask ourselves, then, how a root-and-template theory fares as a basic description of the morphology of the verbal root of Semitic. If by root-and-template we mean a theory in which the basic verbal root is a discontinuous string of non-vocalized and non-syllabified consonants, into which vowels (which are not a part of the root morpheme) are inserted by a process of templatic interdigitation (as in the work of McCarthy and Prince), then we must conclude that it fares poorly.

This is because, while a great many of the vowels present in the forms of a Semitic verb would appear to be fundamentally morphological in nature, it is empirically *not* true that all of the vowels present in Semitic verb inflection can be generated through a process of interdigitation from a morphological template. Rather, the vowel present between the second and third root-consonants in the prefix-conjugated perfective stem is lexically specific and unique to each verb, and *must* be stored as part of its underlying representation. As stated by Jerzy Kuryłowicz (1972)

it would be erroneous to consider the root of the Sem. verb as a merely consonantal skeleton. Within the primary conjugation ... there is only one paradigm whose vocalism (of R2) is basic or unpredictable ... The vowel of R2 of the "imperf." being u, the verbal root is k(u)tub and not simply k-t-b...[T]o look for a morphological function of the root vowel (the vowel of R2) in the primary verb

must be considered a misunderstanding. To look for a constant association between the vocalism of R2 and the fundamental meaning of non-motivated (primary) verbs is a methodological derailment tantamount to the old theory of Lautsymbolik

Kogan (2005) states that this observation and Kuryłowicz's analysis have not been met with widespread acceptance, but further notes "to [my] knowledge, no coherent objection against it has been advanced so far." Diakonov (1988) argues that because both the perfective and imperfective verbal stem can be reconstructed to Proto-Semitic (and likely beyond), we cannot rightly conclude which is the original verb form from which the other is derived. Kogan rightly rejects this line of argumentation on theoretical grounds. It is easy to postulate, as we have done, that the a-a vocalism and the gemination of the stem are morphological markers of the imperfective stem. It is significantly more difficult to create a coherent theory of morphology in which the absence of gemination and the non-obligatory presence of other non-*a (*u and *i) theme vowels is a marker of the imperfective stem. Fox (2003) argues that because the theme vowel is not present in other forms of the prefix-conjugation besides the perfective stem, we cannot consider it as the vowel present in the root. Again, this argument misunderstands the theoretical rationale behind projecting material to the underlying form in a generative theory. We do not project a segment to the underlying form because it is phonetically invariant or because it surfaces in a majority of circumstances. Indeed many underlying segments are not invariant, and some underlying segments effectively never surface. Rather, we project a segment to the underlying form because we cannot predict its presence or generate it via some other rule of the grammar. Since we can neither predict nor generate the specific theme vowel of the perfective stem of a Semitic verb, we must conclude that this vowel is part of the underlying representation of that verbal root.

Having established that these theme vowels must be present in the underlying representations of the individual Semitic languages⁸⁰, we can examine reconstructable Semitic roots to determine if, even at the stage of Proto-Semitic, we may observe vowels which are purely part of the lexical representation of the verbal root. A great deal of work has been done over the decades, including notable contributions from Fronzaroli (1963), Aro (1964), and Bělova (1993) in comparing the thematic vocalism of Semitic verbals. A sample of such comparisons is provided below, excluding the Canaanite languages, where thematic vowels have largely been lost.

⁸⁰Not all modern Semitic languages retain the characteristic theme vowels. They are clearly present in Akkadian and Arabic, as well as in Ge'ez, though the merger of the *i and *u vowels of Semitic makes it impossible to distinguish those classes. They would appear to have been lost in the Canaanite languages, though they may survive in Ugaritic, however our evidence there is necessarily weak.

| | Akkadian | Arabic | Ge'ez |
|-------------------|----------|----------------------|--------------------|
| *šma ^ˁ | išme | yasma ^ˁ u | yəsmä ^ˁ |
| *rkab | irkab | yarkabu | yərkäb |
| *ʾšir | īšir | yaʾsiru | yəʾsər |
| *šriq | išriq | yasriqu | yəsrəq |
| *rgum | irgum | yargumu | yərgəm |
| *qtul | iqtul | yaqtulu | yəqtəl |

Figure 2.15: Lexically Specific Verbal Theme Vowels in Semitic

In the work of these scholars, as well as that of Kogan, it becomes clear that, despite some variation, the correspondences between the theme vowels in Semitic perfective-stem forms are too numerous and too regular to be analyzed as anything other than an underlying segment and a part of the verbal root-morpheme. These scholars therefore reconstruct Semitic verbal roots, not as a discontinuous string of consonants ($*\sqrt{qtl}$), but rather, as illustrated in the chart above, as monosyllabic **CCVC* sequences with distinctive underlying vowels (**rkab*, **šriq*, *qtul*). Although this is a profound insight, it is striking that the shape of the root morpheme: a) never surfaces on its own in any Semitic languages, since it violates surface phonotactic rules; and b) would still seem to require root-and-template manipulation to generate the fully vocalized forms such as **yaqattal* or **yaqtatal*.

With our analysis of syncope, we can push this reconstruction one step further. Taking the perfective stem with the theme vowel as reflective of the root morpheme, we may reconstruct the verbal root of either Proto-Semitic (or Pre-Proto-Semitic to be more conservative) as a fully vocalized **CaCVC̣* (**rakab*, **šariq*, *qatul*), with the knowledge that the affixation of the subject prefixes will trigger in all trilateral roots (the only roots that survive into Semitic) the syncope of the initial **a* vowel between the first and second root-consonants, as illustrated in the simple derivations provided below.

(35) *Derivation of Perfective Stem Forms from Vocalized CaCVC̣ Roots*

| | | | |
|--------------------|------------------|------------------|------------------|
| | *rakab | *šariq | *qatul |
| Underlying Root | *rakab | *šariq | *qatul |
| | ↓ | ↓ | ↓ |
| Prefix-Conjugation | *ya-rakab | *ya-šariq | *ya-qatul |
| | ↓ | ↓ | ↓ |
| Syncopate | *yar akab | *ya šariq | *ya qatul |
| | ↓ | ↓ | ↓ |
| Output | *yarkab | *yašriq | *yaqtul |

2.3.1.1.4 Summary of Vocalic Stability

In this section, we have analyzed a number of different types of morphemes in Semitic which appear to have a stable, underlying vocalism with no traces of vowels supplied by templatic interdigitation. We have further demonstrated that, in addition to the vowels in inflectional/derivational morphemes, pronouns, deictics, and determiners, the root morphemes of both underived nouns and verbs must likewise contain vowels in their underlying representations, contra-templatic theories in which Semitic root morphemes contain no intrinsic vocalism. We have further demonstrated how we can extend the work of Fronzaroli, Aro, and B elova in conjunction with our own theory of syncopation to reconstruct Semitic verbal roots with the form **CaC C*.

2.3.2 Template vs. Vowel Apophony

Although we have demonstrated that we must project vowels into the underlying form of effectively all basic and underived morphemes in Proto-Semitic, it is undeniable that changes in vocalism occur frequently in the inflection and derivation of many words. If, as we propose, syncope can account for the changes in the prosodic shape without need for templatic morphology, we must develop an alternative theory, or set of theories, to account for the variations in vocalism which we find. The development of a full theory of apophonic alternation within Semitic is a dissertation in its own right, one we will not undertake in this work. Nevertheless, we can sketch a basic picture of what such a theory might look like, and how we can produce the forms necessary to account for the behavior of those most archaic Semitic languages.

2.3.2.1 Vowel Alternations in "Grammatical Morphemes"

Although Kogan's grammatical morphemes exhibit far fewer changes in vocalism than their nominal or verbal counterparts, they are not completely fixed. Indeed there is at least some variation, both diachronic and synchronic, in the quality of the vowels present in such morphemes in almost all Semitic branches and families. We will discuss such variability below, demonstrating that normal theories of allomorphy and apophony are better able to account for such variability without the need for recourse to templates.

2.3.2.1.1 **yu-* vs. **yi/*ya* Alternation

It is well-known that in the more morphologically archaic Semitic languages, we find that the subject prefixes of the prefix-conjugation are in fact divided between two distinct sets: one containing **u* vocalism, which occurs with the derived forms of the S- and D-Stems; and another with either **a* or **i* vocalism, which occurs with all other stem types (including the intransitive but derived T- and N-Stems), a pattern illustrated in the Akkadian, Arabic, and Hebrew forms below.

| | Akkadian | Arabic | Hebrew |
|--------|----------|-----------|----------------------|
| G-Stem | iprus | yaktubu | yiktōb |
| N-Stem | ipparis | yankatibu | yikkātēb |
| T-Stem | iptaras | yaktatibu | — |
| Š-Stem | ušapris | yuktibu | yaktīb ⁸¹ |
| D-Stem | uparris | yukattibu | yəḱattēb |

Figure 2.16: *yi-/*ya- vs. *yu- Prefixes in Semitic

While interesting from a comparativist perspective for the potential relationship between the *-u vowel of the causative and factitive prefix forms, and the *-u nominative ending of Semitic (or *wa- prefix of Berber), this alternation deserves no special attention as it pertains to the merits of or necessity for a templatic theory. It is clearly a simple case of allomorphy no different in theoretic terms from the fact that in the Latin second declension, the nominative case takes the form -us, while for third-declension nouns, it takes the form -s. In each case, there are simply two (sets of) allomorphs (clearly historically related), which are called upon in distinctive morphological contexts.

The prefix-conjugation affix sets are therefore no support for a templatic theory, as they are both able to be described and better characterized by a simple theory of affix-allomorphy based on verbal stem type.

2.3.2.1.2 Barth's Law

More intriguing for our discussion of apophony in Semitic than the two sets of prefix-conjugation affixes is another variation in the vocalism of the subject prefixes known as Barth's Law, or sometimes, Barth-Ginsberg's Law, reflecting the contributions of Harold Louis Ginsberg in applying Barth's Law to Ugaritic. In his original formulation, Barth noted that, in contrast to Arabic or Ge'ez (which have uniform 'a-/ta-/ya-/na- and 'ə-/tə-/yə-/nə- sets of prefixes respectively), or Akkadian (which has a heterogeneous a-/ta-/i-/ni- set), Hebrew and Aramaic show evidence for a systematic alternation between the vowels present in the prefix-conjugation; namely, when the vowel of the perfective stem is *i or *u, the vowel of the prefix-conjugation will be *a, but when the vowel of the perfective stem is *a, the vowel of the prefix-conjugation will be *i. In native Ugaritic writing, we can confirm the presence of Barth's Law alternations only in the first-person singular, where the vowels are indicated following the aleph-initial suffix. Ginsberg cites forms such as <'amt> (*'amūt), 'ašr *'ašîr, but <'il'ak> (*'il'ak), which point to Barth's Law's operation. We can further recover Barth's Law variants in syllabic cuneiform transcription of Ugaritic names such as <^IIa-ab-ni-DINGIR> *yabnī 'ilu "El will establish," versus <^IIg-mara-^dIŠKUR> *yigmar haddu "Hadad will destroy." Barth's Law may also be

⁸¹Reflecting a contraction from an original *yuhaktib

observed in the inflection of the Canaanite language reflected in the Amarna letters. Although the letters themselves are ostensibly written in Akkadian, they reflect a host of Canaanite linguistic features, including verb forms such as <ia-az-ku-ur> **yazkur*, <aḥ-ri-šu> **'ahrītu*, vs. <yi-iḥ-na-nu-ni> **yihnanu-ni*.

| | Hebrew | Ugaritic | Amarna Canaanite |
|---------|--------------|-------------------------------------|-------------------------------------|
| yaqtulu | yāsōb *yasub | < ^I Ia-ku-un> *yakwun | <ia-az-ku-ur> *yazkur(u) |
| yaqtīlu | yāgēn *yagin | <Ia-ab-ni> *yabniy(u) | < ^I Ia-ab-ni> *yabniy(u) |
| yīqtalu | yēgal *yigal | < ^I Ig-ma-ra> *yigmar(u) | <ir-ka-ab> *yirkab(u) |

Figure 2.17: Barth's Law in Hebrew, Ugaritic and Amarna Canaanite

As demonstrated by Bloch (1967), Barth's Law forms can also be recovered from several of the pre-Classical dialects of Arabic. Bloch points to the grammatical tradition established by the great Arabic grammarian Sibawayhi in his work *Al-Kitāb*, where he makes mention of Eastern Arabic dialects spoken in the Najd and Iraq, in which the vowel of the prefix-conjugation of the imperfect (the reflex of the old perfective stem) is *i. After collecting all such examples from *Al-Kitāb*, Bloch demonstrates that they all contain an *a theme vowel (*yigtal*), as predicted by Barth's Law, and a *qatila* perfect stem. One peculiarity of these dialects is that, while they show *i vocalism as predicted for Barth's law for most forms (*'i-*, *ti-*, *ni-*), they have *ya-* for expected *yi-* in all forms. We can only conclude that this is a secondary dissimilation from original **yi-*.

Barth himself believed that the alternations in prefix form were inherited from Proto-Semitic, but since evidence for **yi-*~**ya-* alternation is restricted to the Central Semitic languages⁸², and is absent from Akkadian, Ge'ez, and the Modern South Arabian languages, we should rightly regard Barth's Law as a post-Proto-Semitic innovation.

At first glance, Barth's Law presents a more likely candidate for a vowel alternation which we might rightly characterize as "templatic." After all, the alternation of Barth's Law allows only a subset of vocalisms (*yigtal*, *yaqtul*, *yaqtīl*) while other combinations of vowels (*yaqtal*, *yigtīl*, etc.) are conspicuously absent. It may be tempting, then, to think of Barth's Law simply as an epiphenomenon emerging from the existence solely of templatic patterns:

- Ca-CCuC
- Ca-CCiC
- Ci-CCaC

⁸²Assuming the classification of Arabic as Central Semitic. The position of Arabic is somewhat contentious, with some scholars including Arabic as a member of South Semitic. Increasingly, however, scholarly consensus places Arabic broadly within Central Semitic.

This solution, however, is untenable. As we have previously discussed, the root vowel appearing in the **CCVC* stem of the G-Stem perfective is categorically **not** generated or supplied by a templatic morphological process, but rather is part of the underlying representation of the verbal root. With the knowledge that this vowel cannot be provided by templatic alterations, the simpler description of Barth's Law is clearly a simple phonologically conditioned rule of allomorphy:

- $Ca \rightarrow Ci / _ \$C[-\text{high}, -\text{consonantal}]$

Descriptively, then, Barth's Law is the change of the prefix form **Ca-* to **Ci-* for those verbal roots which contain the low vowel *a, a simple instance of dissimilation. This kind of alternation is handled far more simply, and with far fewer problems posed vis-a-vis the presence of underlying root vowels, using a single allomorphic rule, than by making recourse to a full template.

2.3.2.1.3 Anceps Vowels

The *Ca-*/*Ci-* vs. *Cu-* variation within the prefix-conjugation and the alternations attributable to Barth's Law are both synchronic variations present within the grammar of individual Semitic languages. Another instability in vocalism, this time of a diachronic nature, is presented by the so-called "anceps vowels." As its name suggests, anceps vowels are vowels appearing at the ends of Semitic words (most commonly in grammatical morphemes, pronouns, deictics and other such forms), whose reflexes across the daughter languages vary sporadically between a reflex demanding an original short vowel, and those demanding an original long vowel. For a simple illustration, let us consider the reflexes of two clearly parallel Semitic verb forms, namely the Arabic suffix-conjugation (past tense) *fa'altu* and the Ge'ez suffix-conjugation (perfect) *qätälku*. Each consists of a basic verbal root of the form **CaCvC* (**pa'al*, **qatal*) along with the first-singular suffix-conjugation affix. The form of this affix, however, is impossible to reconstruct from the two attested forms, because they suggest mutually contradictory reconstructions. Arabic *-tu* suggests a Proto-Semitic **-ku*⁸³. The Ge'ez form, however, cannot reflect Proto-Semitic **-ku*. This is because the reflex of Proto-Semitic *u in Ethiopic is in fact /ə/ ([i]), meaning we would expect *-kə*. Ge'ez *-ku* can **only** reflect Proto-Semitic **-kū*, with an unambiguously long vowel. We are therefore split between a reconstruction **-ku*/**-kū*.

The reconstructive problems posed by anceps vowels are even more acute when we consider the case of the second-person independent pronouns, both masculine and feminine. Illustrative forms are given below, from Hebrew, Arabic, and Ge'ez.

⁸³Note that the Central Semitic languages have undergone a change, in which the suffix-conjugation forms involving a *k have been leveled to contain a *t.

| | Arabic | Hebrew | Ge'ez |
|------------|--------|--------|-------|
| 2nd Sg. M. | ʾanta | ʾattā | ʾäntä |
| 2nd Sg. F. | ʾanti | ʾat | ʾänti |

Figure 2.18: 2nd Sg. Independent Pronouns in Arabic, Hebrew, and Ge'ez

In the case of the masculine forms, we find that the Arabic and Ge'ez forms are now in agreement. Both point rather transparently to a reconstruction as Proto-Semitic *ʾanta. The Hebrew form, on the other hand, *cannot* be the reflex of *ʾanta, since, as noted by Al-Jallad (2014), Hebrew has lost word-final short vowels inherited from Proto-Semitic. At the same time, Hebrew ʾattā cannot reflect a simple long variant *ʾantā, because the regular unconditioned outcome of Proto-Semitic *ā in Hebrew is ō, and we would therefore expect Proto-Semitic *ʾantā to surface in Hebrew as ʾattō.

In the feminine forms, by contrast, we find that it is Arabic and Hebrew that agree completely, and it is Ge'ez that is incompatible. Both Classical Arabic ʾanti and Hebrew ʾat can be the regular reflex of a Proto-Semitic ʾanti, since the vowels remain effectively unchanged in Arabic, and Hebrew shows the expected loss of a short vowel in word-final position. The Ge'ez form, however, cannot reflect *ʾanti, since, as mentioned previously, both *u and *i in Proto-Semitic merge in Ethiopic as /ə/. Ge'ez ʾänti, therefore, can *only* reflect Proto-Semitic *ʾantī, which cannot be the antecedent of the Arabic and Hebrew forms.

While a satisfying solution to the apparent issue of the anceps vowels is not entirely apparent (though see work by Hasselbach (2004) and Al-Jallad (2014) for some recent developments along these lines), it is quite clear that the variability which the anceps problem presents is not templatic in nature. For one, it is not a synchronic variation which exists within the grammar of any given Semitic language or group of Semitic languages, but rather a diachronic discontinuity in the development of vowels in final position in the Semitic languages. For another, the vowels do not vary freely between the three different inherited Semitic vowels, as is the case with more typical vowel apophony, but rather, seem to conspire to retain their approximately original phonetic property. For these reasons, we need not consider the anceps phenomenon with regard to the vowel alternations typically construed as evidence for templatic morphological structures.

2.3.2.2 Vowel Alternations in "Lexical Roots"

In our analysis of vowel apophony with lexical root morphemes, we will restrict ourselves primarily to the finite verb and the prefixing conjugation. This is because, as Kuryłowicz suggests, the prefix-conjugation verb appears to be the source of vocalic apophony within Semitic. In principle, the analysis put forth here could be expanded to other portions of the verbal system, like the

suffix-conjugation, as well as to verb-derived nominals (possibly including broken plurals), though such forms will not be analyzed in detail here.

2.3.2.2.1 Verbal Apophony

It is in the vowels of lexical roots where we see the greatest number of vocalic alternations, and these occur overwhelmingly in the inflection and derivation of verbs. For Kuryłowicz, the verb therefore is of paramount importance for the understanding of "vowel gradation" (as he terms it):

The primary verb is to be considered as the original source of apophony simply because the latter is firmly established in its inflection. The variability of the root-vocalism in conjugation implies the choice (selection) of a definite degree in the corresponding derivative. On the other hand, nominal inflection shows no trace of apophony... Therefore, the study of apophony must start with the analysis of the mechanism and functioning in the conjugation of the primary verb.

In this regard, we will follow Kuryłowicz, both in asserting the diachronic primacy of the verb when it comes to vowel apophony, and also in beginning our investigation there, particularly in the forms of the prefix-conjugated underived G-Stem. We will address the derived stems in subsequent sections.

Although vowel alternations are typically thought of as the hallmark feature of Semitic verbal inflection, they are, in fact, remarkably rare in the inflection of the underived prefix-conjugation G-Stem. Indeed, as Kogan (2005) remarks, the only purely vocalic inflection⁸⁴ known from the perfective prefix-conjugation inflection is the apophony "u, i : a", which characterizes the so-called "internal passive" formations attested in the Central Semitic languages, including Arabic, Ugaritic, and the Canaanite languages (such as Arabic *yaqtulu* "he kills" vs. *yuqtalu* "he will be killed"). Even here it must be noted that such internal passives are: a) difficult to reconstruct beyond Central Semitic into the Proto-Semitic parent language; and b) not *purely* vocalic, since they co-occur with distinctive passive forms of the subject prefixes. Our theory, then, must be primarily concerned with describing and capturing apophonic changes in the formation of derived tense and voice forms. In the following discussion, we will consider the Akkadian and Arabic verbal systems, describing each in terms of the vocalic alternations present in the inflection of the prefix-conjugation G-Stem.

In Akkadian, there exist four classes of verbs based on the behavior of the thematic vowel in the inflection of the G-Stem. Three of these classes, the so-called a/a, i/i, and u/u classes are characterized by a stable vocalism of the theme vowel throughout the G-Stem, while the fourth, the a/u class, is characterized by an alternation between a /u/ theme vowel in the perfective stem, but an /a/ theme vowel in the presumably derived imperfective and perfect forms. Each of these classes is illustrated below.

⁸⁴By which we mean a form of verbal inflection characterized solely by a variation in vocalism, with no corresponding variation in syllable or prosodic structure of the root, or differences in affixation.

| | a/a | i/i | u/u | a/u |
|--------------|-----------------------|---------|---------|---------|
| Perfective | iṣbat | ipqid | irpud | iprus |
| Imperfective | iṣabbat | ipaqqid | irappud | iparras |
| Perfect | iṣṣabat ⁸⁵ | iptaqid | irtapud | iptaras |

Figure 2.19: Verbal Vowel-Classes in Akkadian: G-Stem

Since it is the vowel of the perfective stem which is the underlying thematic vowel, to generate the finite forms of the Akkadian G-Stem we need only account for a single vocalic alternation, namely the change of u→a in the imperfective and perfect stems of the a/u class.

The situation in Arabic is generally similar. In the classical language, there are three categories of prefix-conjugated verb forms: the imperfect, the jussive, and the subjunctive. Each of these forms is approximately stem cognate to the Akkadian perfective stem, since the old Semitic imperfective and perfect are absent from Classical Arabic, and as such, each is characterized by a single vowel through each of its prefix-conjugated forms, as illustrated below.

| | /a/ | /i/ | /u/ |
|-------------|---------|---------|---------|
| Imperfect | yafʿalu | yaʿkisu | yaqtulu |
| Subjunctive | yafʿala | yaʿkisa | yaqtula |
| Jussive | yafʿal | yaʿkis | yaqtul |

Figure 2.20: Verbal Vowel-Classes in Classical Arabic: G-Stem

Between Akkadian and Arabic, then, in order to account for the full range of stem-internal vocalic alternations present in the prefix-conjugated G-Stem, we need only account for the alternation u→a in the Akkadian imperfective and perfect, and possibly the alternation a,i,u→a in the geminate imperfectives of Andalusī Arabic, should they prove cognate with their Akkadian counterparts. Because of the simplicity of the Semitic vowel system, we need not postulate individual rules which transform *i and *u into *a, but rather, can simply postulate a single morphophonological rule whereby, in the imperfective and perfect forms, the thematic vowel is overlaid with an infix morpheme containing only the feature [-HIGH]. Since there are only three segmental vowels present in the inventory, a [-HIGH] feature will necessarily transform any vowel present into *a. Conceptually, we may think of this as akin to plural formation by i-umlaut in Germanic. Individual verbal stems may be lexically specified to undergo this change in certain morphological conditions, and the resultant change is one in which features are overlaid onto already present vowels, as in the gaining of

⁸⁵Reflecting an underlying /iṣtabat/.

[+FRONT] for i-umlaut plurals. Consider the simple derivations below, in which both Akkadian and Arabic forms can be generated.

(36) *G-Stem Prefix-Conjugation Perfective*

| | | | | | | | |
|-----------------|---------|---------|---------|---------|----------|----------|----------|
| | a/a | i/i | u/u | a/u | a | i | u |
| Underlying Root | ṣabat | paqid | rapud | parus | faʿal | ʿakis | qatul |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Prefix | i-ṣabat | i-paqid | i-rapud | i-parus | ya-faʿal | ya-ʿakis | ya-qatul |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Syncopate | iṣbat | ipaqid | irapud | iparus | yafʿal | yaʿakis | yaqatul |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Output | iṣbat | ipqid | irpud | iprus | yafʿal | yaʿkis | yaqtul |

We may again derive the imperfectives using syncope and a simple rule of [-HIGH] vowel apophony. We suppose that this rule occurs concomitant with the introduction of the geminate imperfective morpheme. In Akkadian, this occurs only in the lexically specified a/u class, while in Arabic, if we follow Corriente (5/17/2018) in assuming that the semantically non-factitive *CaCCaC* stems are in fact old imperfectives, apophony would occur with verbs of all types. In the derivations below, we provide attested Akkadian forms, as well as hypothetical Andalusī Arabic forms (and possibly Proto-Arabic, if such forms are inherited) for illustrative purposes.

(37) *G-Stem Prefix-Conjugation Imperfective*

| | | | | | | | |
|-----------------|----------|----------|----------|----------|-----------|-----------|-----------|
| | a/a | i/i | u/u | a/u | a | i | u |
| Underlying Root | ṣabat | paqid | rapud | parus | faʿal | ʿakis | qatul |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Geminate Impf. | ṣabbat | paqqid | rappud | parrus | faʿʿal | ʿakkis | qattul |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| -H Apophony | – | – | – | parras | faʿʿal | ʿakkas | qattal |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Prefix | i-ṣabbat | i-paqqid | i-rappud | i-parras | ya-faʿʿal | ya-ʿakkas | ya-qattal |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Output | iṣabbat | ipaqqid | irappud | iparras | *yafaʿʿal | *yaʿakkas | *yaqattal |

The same basic sequence of rules will allow us to obtain the perfect forms, though the original Semitic perfect marked with the *-t- infix is not attested anywhere in Arabic, so we will provide only Akkadian forms. As we will discuss in greater detail in our overview of the morphology of Semitic, the perfective infix, for whatever reason, *does not* trigger a phonological cycle and therefore *does not* trigger syncope. Because the perfect does not occur in Arabic, we have presented only forms from Akkadian.

(38) *G-Stem Prefix-Conjugation Perfect*

| | | | | |
|-----------------|--------------------------|------------------------|------------------------|------------------------|
| | a/a | i/i | u/u | a/u |
| Underlying Root | ṣabat | paqid | rapud | parus |
| | ↓ | ↓ | ↓ | ↓ |
| -ta- Perf | ṣa<ta>bat | pa<ta>qid | ra<ta>pud | pa<ta>rus |
| | ↓ | ↓ | ↓ | ↓ |
| -H Apophony | - | - | - | pataras |
| | ↓ | ↓ | ↓ | ↓ |
| Prefix | i-ṣatabat | i-pataqid | i-ratapud | i-pataras |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | i-ṣatabat | ipataqid | iratapud | ipataras |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *iṣabat → iṣṣabat | iptaqid | irtapud | iptaras |

2.3.2.2.2 Apophony in Verbal Derivations

The vowel apophonies which characterize the derived verbal stems are slightly more complex, since there are more apophonic transformations necessary to generate the attested forms, but they are not meaningfully different in kind from those found in the G-Stem. We can make use of the same basic apophonic transformations, inserting morphemes with floating features as the basic derivational affixes, and successfully generate almost all of the derived stem types common to Semitic. We may begin with a simple observation about the theme-vowel vocalism in derived verbal classes.

We have established that the theme vowel present in the perfective of the G-Stem is effectively arbitrary, and can be transformed via apophony into the appropriate vocalism for the imperfective stems (or perfect in the case of Akkadian). We likewise observed that in order to transform the theme vowel of the perfective into that of the imperfective and perfect, we required, in a sense, only a single apophonic transformation, namely the alteration of the theme vowel into /a/, or, perhaps more accurately, into a [-HIGH] vowel.

As it turns out, when we consider the formation of the derived verbal stems of Semitic, or at least those forms which are cognate between Akkadian and Classical Arabic, we find that we require in essence only a single additional apophonic transformation, namely the transformation of the underlying theme vowel into /i/, or perhaps more accurately a [+FRONT] vowel, along with subsequent application of the [-HIGH] apophony of the imperfective and perfect where appropriate (in Akkadian only). Let us begin with a discussion of the derived D- and Š-Stems. We will discuss these two forms together not merely because they are semantically related (being causative/factitive and generally transitivity), but also because they exhibit uniform behavior as it pertains to their vocalism.

The Š-Stem of Arabic (derived verb class IV in traditional Arabic grammatical terminology) survives solely in the stem-cognates of the perfective, in the form of the Arabic imperfect *yuf' ilu*, subjunctive *yuf' ila*, and jussive *yuf' il*. It is clear that all such forms contain the same basic stem *yuCCiC*, reflecting an orig-

inal $*yušaCCiC \rightarrow *yuhaCCiC \rightarrow *yu'aCCiC \rightarrow *yuCCiC$ ⁸⁶. All Š-Stem forms in Arabic will exhibit the form $yuCCiC$, and we therefore require only a single example of [+FRONT] apophony to produce all such forms.

The same observation holds for the Arabic D-Stem (derived verb class II in traditional Arabic grammatical terminology). These stems appear as imperfect $yufa' 'ilu$, subjunctive $yufa' 'ila$, and jussive $yufa' 'il$. The shared component is clearly the original stem $yufa' 'il$, exhibiting the characteristic gemination of the D-Stem, along with a uniform /i/ vocalism in the theme vowel position. We therefore require nothing more than a simply [+FRONT] apophony in order to properly generate such forms.

The situation in Akkadian is, indeed, a bit more complex, but only because it exhibits an additional step which obfuscates the simplicity of the apophonic transformation. For example, the Akkadian D-Stem exhibits perfectly parallel *uparris* vocalism in the perfective stem. It shows the same vocalism in the perfect *uptarris* (although, as we have discussed, the perfect has no Arabic cognate). The imperfective, on the other hand, has an *uparras* vocalism, with the same [-HIGH] apophony which characterized the imperfective in the G-Stem of apophonic a/u verbs. This same pattern repeats in the Š-Stem, with the perfective and the perfect exhibiting a transformation to /i/ vocalism (*ušapris/uštapris*), and the imperfective stem exhibiting /a/ vocalism, as in the G-Stem (*ušapras*). The full range of Arabic and Akkadian forms are presented below:

| | Akkadian | | Arabic | |
|------------|----------|----------|-----------|---------|
| | D-Stem | Š-Stem | D-Stem | Š-Stem |
| Perfective | uparris | ušapris | yufa' 'il | yuf' il |
| Perfect | uptarris | uštapris | – | – |
| Imperfect | uparras | ušapras | – | – |

Figure 2.21: D- and Š-Stem Vocalization in Akkadian and Arabic

We can generate these forms comparatively simply. We may suppose that both the D-Stem and the Š-Stem are characterized by [+FRONT] apophony, triggered by the addition of the derivational morphemes that otherwise form these stems. Simple derivations are provided below.

(39) *D- and Š-Stem Perfective Vocalism*

⁸⁶The presence of the original *š, surviving in Arabic as /ʔ/ can be confirmed by the form of the perfect (the original stative stem), which survives as ʔaf'ala, in which the /ʔ/ is present on the surface.

| | Arabic | | Akkadian | |
|--------------------|---------------|----------------------|----------------|-----------------------|
| | D-Stem | Š-Stem | D-Stem | Š-Stem |
| Underlying Root | fa' al | fa' al | parus | parus |
| | ↓ | ↓ | ↓ | ↓ |
| Derivational Affix | fa' al | 'a-fa' al | parrus | ša-parus |
| | ↓ | ↓ | ↓ | ↓ |
| +FRONT Apophony | fa' il | 'afa' il | parris | šaparis |
| | ↓ | ↓ | ↓ | ↓ |
| Syncope | — | 'afa' il | — | ša-p a ris |
| | ↓ | ↓ | ↓ | ↓ |
| Prefix | yu-fa' il | yu-'af' il | u-parris | u-šapris |
| | ↓ | ↓ | ↓ | ↓ |
| Syncope | — | — | — | — |
| | ↓ | ↓ | ↓ | ↓ |
| Output | yufa' il | *yu'af' il → yuf' il | uparris | ušapris |

The imperfectives require only the addition of a single further step; namely, the subsequent addition of the morpheme of the imperfective, and the corresponding application of the [-HIGH] apophony which accompanies it. The perfects, however, require additional comment. We have seen that the Akkadian G-Stem perfect is characterized by [-HIGH] apophony in those verbs which belong to the apophonic a/u class. In the derived D- and Š-Stems, however, the perfective appears to behave as a purely non-apophonic class, failing to trigger any [-HIGH] apophony. Although this makes the system more complex, it is not, in principle, different than the situation as it stands for the G-Stem. In the G-Stem, some verbs, in effect arbitrarily, exhibit perfective or imperfective apophony, and others do not. In the D- and Š-Stems, the imperfective behaves as a uniformly apophonic class, whereas the perfect behaves as a uniformly non-apophonic class. While the classes themselves have shifted, this is not different in kind from the system which we have established for the G-Stem. Again, corresponding Andalusi Arabic forms of imperfective D- and Š-Stems cannot be identified, so we will present only those recoverable from Akkadian.

(40) *D- and Š-Stem Imperfective/Perfect Vocalism*

| | Imperfective | | Perfect | |
|--------------------|------------------|-----------------------------|------------------------------|--------------------------------|
| | D-Stem | Š-Stem | D-Stem | Š-Stem |
| Underlying Root | parus | parus | parus | parus |
| | ↓ | ↓ | ↓ | ↓ |
| Derivational Affix | parrus | ša- parus | parrus | ša- parus |
| | ↓ | ↓ | ↓ | ↓ |
| +FRONT Apophony | parris | ša parris | parris | ša parris |
| | ↓ | ↓ | ↓ | ↓ |
| Syncope | - | ša p r is | - | ša- p r is |
| | ↓ | ↓ | ↓ | ↓ |
| Impf/Perfect Affix | - | - | patarris | ša-ta- pris |
| | ↓ | ↓ | ↓ | ↓ |
| -HIGH Apophony | parras | ša pr as | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Syncope | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Prefix | u- parras | u-ša pr as | u- patarris | u-ša ta pris |
| | ↓ | ↓ | ↓ | ↓ |
| Syncope | - | - | u p a rris | uša t a pris |
| | ↓ | ↓ | ↓ | ↓ |
| Output | uparras | uša pr as | uptarris | ušta pris |

The N-Stem is similar, although the details differ slightly as to which verbal formations function as apophonic and which do not. Just as with the D- and Š-Stems, we find that the basic perfective N-Stem shows a largely invariant vocalism with /i/, as in Akkadian *ipparis* and Arabic *yanfa‘ilu*, suggesting that this derivational affix, like the other two, triggers a [+FRONT] apophony. As illustrated in the derivation below.

(41) *N-Stem Perfective Vocalism*

| | | |
|--------------------|--------------------------------|---------------------------------|
| Underlying Root | Arabic fa‘al | Akkadian parus |
| | ↓ | ↓ |
| Derivational Affix | na- fa‘al | na- parus |
| | ↓ | ↓ |
| +FRONT Apophony | na fa‘il | na paris |
| | ↓ | ↓ |
| Prefix | ya-na fa‘il | i-na paris |
| | ↓ | ↓ |
| Syncope | ya n - fa‘il | i n - paris |
| | ↓ | ↓ |
| Output | ya fa‘il | i paris →i pparis |

In Akkadian, we find that while the perfective stem shows the expected /i/ vocalism, the imperfective and perfect show /a/. This means that the N-

Stem of Akkadian behaves identically to the a/u apophonic class of the G-Stem, with the perfective showing its own distinct vocalism (in this case supplied by the [+FRONT] apophony of the derived classes), and the imperfective and perfect showing the same [-HIGH] apophony which they exhibit for underived verbs. We can therefore derive them comparatively simply; by assuming the same apophonic rules as are present in the a/u class, with the addition of the [+FRONT] apophony of derived stems.

(42) *N-Stem Imperfective/Perfect Vocalism*

| | | |
|--------------------|------------------------------------|-------------------------------------|
| | Imperfective | Perfect |
| Underlying Root | parus | parus |
| | ↓ | ↓ |
| Derivational Affix | na- parus | na- parus |
| | ↓ | ↓ |
| +FRONT Apophony | na paris | na paris |
| | ↓ | ↓ |
| Impf/Perfect Affix | na parris | na taparis |
| | ↓ | ↓ |
| -HIGH Apophony | na parras | na taparas |
| | ↓ | ↓ |
| Prefix | i-na parras | i-na taparas |
| | ↓ | ↓ |
| Syncope | ina parras | ina taparas |
| | ↓ | ↓ |
| Output | in parras →ip parras | in taparas →it tapras |

Of all the derived stems in Semitic, the T-Stem is the most complex as it pertains to vocalism, because there is disagreement between Akkadian and Arabic. In Arabic, the T-Stem form is perfectly parallel to the other derived stems, exhibiting /i/ vocalism in place of the thematic vowel of the perfective stem, as in *yafta 'ilu*. On the other hand, Akkadian shows an unanticipated *iptaras*, in contrast to the expected **iptaris* with /i/ vocalism akin to the other derived forms. The Akkadian imperfective and perfect show the expected vocalism with [-HIGH] apophony, surfacing as *iptarras* and *iptatras*. The simple derivation of the perfective stem is provided below.

(43) *T-Stem Perfective Vocalism*

| | | |
|--------------------|------------------------|-------------------------|
| | Arabic | Akkadian |
| Underlying Root | fa' al | parus |
| | ↓ | ↓ |
| Derivational Affix | fata' al | patarus |
| | ↓ | ↓ |
| +FRONT Apophony | fata' il | pataris |
| | ↓ | ↓ |
| Prefix | ya- fata' il | i- pataris |
| | ↓ | ↓ |
| Syncope | yaf ta ' il | ip ta ' aris |
| | ↓ | ↓ |
| Output | yaf ^t a' il | *iptaris ⁸⁷ |

Clearly, our syncope theory correctly predicts the stem shape $y\check{v}CtaCVC$. But while it generates the correct vocalism for Arabic, it fails to account for the unexpected vocalism in Akkadian. A potential explanation for this unpredicted outcome is, fortunately, easily found. In both Arabic and Akkadian, it appears that the derived stems are characterized by an apophonic transformation of the theme vowel to /i/. It is likely no coincidence that the single form which varies is the form of the T-Stem in Akkadian specifically. This is because Akkadian is the only Semitic language which exhibits a perfect verbal stem characterized by a <ta> infix. This means that the Akkadian T-Stem perfective (which we predict as *iptaris*) and G-Stem perfect (*iptaras*) are extremely similar in form, differing only in vocalism. It is not implausible that the two <ta> infixes have been conflated in Akkadian and that the original [+FRONT] apophony of the T-Stem -ta- has been conflated with and replaced by the [-HIGH] apophony of the perfect <ta> affix. Since Arabic either never had or has lost the perfect verbal form, there is no similar form from which to level, and therefore the original [+FRONT] apophony and original /i/ vocalism survives.

The imperfective and perfect T-Stems, by contrast, are easy to generate, as both show the same [-HIGH] apophony associated with the imperfective and perfect in the underived G-Stem in the apophonic a/u class, as in the derivations below.

(44) *T-Stem Imperfective/Perfect Vocalism*

⁸⁷Unattested. The attested form is *iptaras*.

| | | |
|--------------------|------------------------------|--|
| | Imperfective | Perfect |
| Underlying Root | parus | parus |
| | ↓ | ↓ |
| Derivational Affix | patarus | patarus |
| | ↓ | ↓ |
| +FRONT Apophony | pataris | pataris |
| | ↓ | ↓ |
| Impf/Perfect Affix | patarris | patataris |
| | ↓ | ↓ |
| -HIGH Apophony | patarras | patataras |
| | ↓ | ↓ |
| Prefix | i-patarras | i-patataras |
| | ↓ | ↓ |
| Syncope | i-patarras | i-patataras |
| | ↓ | ↓ |
| Output | iptarras | iptatras |

2.3.3 Further Discussion of Apophony

In the preceding sections we have demonstrated how the apophonic transformations of the G-Stem can be produced in both Akkadian and Arabic without recourse to non-concatenative or templatic morphological processes. Indeed the system of apophonic transformation, both the number of distinct apophonies, and the situations in which they apply (one for derived stem types, another for non-basic aspect formations), is relatively simple. This system would become larger and more complex if we were to extend it to include the behavior of the suffixing conjugation. It would need to be expanded even further if we were to include the behavior of nominals derived from verbs, along with broken plurals⁸⁸. That said, although the system proposed here would have to be expanded significantly to accommodate the full range of apophonic transformations common to the archaic Semitic languages, a task which would likely encompass a full dissertation unto itself, it is not clear why the principles of apophony and syncope established here should be unable to account for a more complex set of transformations.

2.4 Syncope and Prosody

We have so far discussed the purported syncope rule in Afro-Asiatic in relatively descriptive terms, or in terms of a simple phonological rule. We would be remiss, however, if we did not briefly discuss the way in which the rule presented here interacts with the reconstructable syllable-structure rules and the metrical structure of words to seemingly favor certain syllable types, or perhaps certain

⁸⁸Although if we used the same methodology applied here, we would have to seek out broken-plural patterns common to both Arabic and Akkadian, or perhaps more generally, Akkadian and some other West Semitic languages.

foot types. As described above, this syncope rule deletes the second of two adjacent, light, word-internal syllables. But it would be equally true to state the rule in terms of constraints or preferences: close as many metrically footed syllables as possible. Such an analysis does have some advantages in terms of explanatory power. For example, it would allow us to succinctly explain why the syncope rule does not apply to open syllables at word end. If we assumed an extrametricality of word-final syllables at the Afro-Asiatic stage, it would immediately exclude all such syllables from possible syncope, without need for any further stipulation in the rule. This could easily be accomplished under an optimality-theoretic schema. Consider the simple analysis presented below, using Semitic as an example:

- **CLOSED**: Each metrically footed syllable should be closed
- ***COMP**: Onsets are not complex
- ***Weight**: Syllables have no more than two moras
- **MAX-M**: Each mora in the input is preserved in the output
- **DEP**: Each segment in the output has a corresponding segment in the input
- **MAX**: Each segment in the input is preserved in the output

| /ya/ + /qatul/ | *COMP | *WEIGHT | MAX-M | DEP | CLOSED | MAX |
|----------------------|-------|---------|-------|-----|--------|-----|
| yaqatul | | | | | **! | |
| yaqatl | | * | | | *! | * |
| ^{ES} yaqtul | | | | | | * |
| ya'qa'tul | | | **! | ** | | |
| yqatl | *! | * | * | | | ** |

| /mu/ + /bārak/ | *COMP | *WEIGHT | MAX-M | DEP | CLOSED | MAX |
|-----------------------|-------|---------|-------|-----|--------|-----|
| mubrak | | | *! | | | * |
| ^{ES} mubārak | | * | | | ** | |
| mubā'arak | | *! | | * | * | |
| mbārk | *! | * | * | | | ** |
| mubārk | | *! | | * | * | * |

| /malik/ + /u/ | *COMP | *WEIGHT | MAX-M | DEP | CLOSED | MAX |
|---------------------|-------|---------|-------|-----|--------|-----|
| maliku | | | | | **! | |
| malk | | | | | | **! |
| ^{ES} malku | | | | | | * |
| mal'iku | | | | *! | * | |
| mlik | *! | | * | | | ** |

Chapter 3

Afro-Asiatic to Semitic

As with every comparative survey of the Afro-Asiatic language family, we have the most to say about the the development of our analysis of syncope into Semitic. Beyond the obvious facts that Semitic has received so much more attention from researchers, and has been, in general, the subject of far superior scholarship compared to other Afro-Asiatic branches, our analysis of syncope itself has partial origins in Semitic (Akkadian), and we therefore have the most potential material to discuss with respect to syncope.

3.1 Nominal Morphology

The nominal morphology of Semitic is the best-studied and the most securely reconstructable of any Afro-Asiatic family. Stem shapes, affixes, and morphemes are all, for the most part, securely reconstructable. We will discuss this morphology in the context of our analysis of syncope, demonstrating how it may account for a number of well-known morphological forms attested throughout Semitic, as well as discussing apparent issues or conflicts with our syncope rule, and how they may be resolved.

3.1.1 Gender Inflection

As previously discussed, Semitic nominals inflect for two basic genders, an unmarked masculine, and a feminine marked by the addition of an affix **-t* or **-ṯt*⁸⁹. Throughout Semitic, it is likewise the case that the addition of the feminine suffix typically does not trigger syncope of the accompanying nominal root, even in Akkadian, where syncope is known to occur. We will argue that this is a natural result of the fact that, when syncope ceased to be active in the grammar of common Semitic, the feminine affix had the form **-t* for all non-segolate nouns.

⁸⁹The feminine may also be left morphologically unmarked, as in nouns such as **'umm/*'imm* "mother" or **'atān* "she-ass."

In Akkadian, it is clear that the basic underlying form of feminine suffix is **-t*. This is the form that appears with most basic non-segolate nouns and adjectives (*maliktu*, *iltu*, *damiqtum*), as well as with non-segolate numerals (M: *ištē-n* vs. F: *ištē-t*, M: *šin-ā* vs. F: *šit-t-ā*). Indeed, outside of the likely innovative 3rd Fem. Sg. stative form⁹⁰, the **-at* ending is attested only with segolate *CVCC* nouns, or with nouns exhibiting super-heavy *CVC* final syllables (*šarr-at*, *kalbat*, M: *šalāš* vs. F: *šalāšat*). In Akkadian then, it is the **-t* variant which appears in the elsewhere distribution as the more basic underlying form of the suffix, with the vocalized **-at* variant appearing *only* in those circumstances where the affixation of the **-t* suffix would create an ill-formed syllable.

In the South Semitic languages, it seems likely that the form of the feminine suffix was also simply **-t*. In Ge'ez, almost all feminine nominals take the suffix **-t* (*nəgəšt* "queen," *ʾəḥt* "sister," *kəbərt* "great" (F)), with the only primary exceptions being those nouns which would have ill-formed final syllables if suffixed with **-t*, as in Akkadian: (*ʿamät*⁹¹ "year," *məlkät*, "possession"). The form of the feminine suffix is also **-t* when it appears on deictics and pronominals, as in the case of the demonstrative *zəntu*, whose feminine is *zatti*⁹². In the Modern South Arabian languages, Rubin (2014) notes that feminine nouns in Jibbali may be marked either by **-t* or by *-ṽt*. Again the distribution is that those nouns with a phonologically well-formed feminine in *-t* do so (*ḥīt*⁹³ "sister-in-law," *dīt*⁹⁴ "aunt," and *kōt*⁹⁵ "bitch"), while those which cannot (*baʿlet* "lady," *qerḥet* "female donkey," *keltot* "story") exhibit the vocalized variant in **-ṽt*.

In the Central Semitic languages, there is a much stronger tendency for the **-at* variant to be generalized as the default form of the feminine suffix. It is clearly attested in Amorite (*ʿuzzatum* "strength"), and Ugaritic (*ḥamʾatu* "butter," *rabbatu* "great F.," *marīʾatu* "fat"), and has become the default suffix in Arabic (*malikat* "queen," *kabīrat* "great F."), Hebrew (*malkāh* "queen," *sadnāh* "workshop"), Aramaic (*malkətā* "queen," *tābāh*), and, likely, Phoenician (*ʿurpot* "portico," *helikot* "hospitality"). Nevertheless, there is still evidence for the originality of the **-t* suffix variant even within the Central Semitic family. It is still attested with many nouns in Ugaritic (*maliʾtu* "full") and, despite losing status as the default marker in the Canaanite languages and Arabic, remains as the suffix present on many of the presumably more archaic biliteral nouns (Arb./Heb./Arm./Phn.: *bint/bat/bartāh/bit* "daughter"⁹⁶, *tintān/šətaḡim/tartēn/štēm* "two"⁹⁷).

⁹⁰Recall that the third persons, both singular and plural, of the suffix-conjugation showed little cognation across the branches which still attest to the form.

⁹¹Reflecting an original **ʿamat*, with a heavy root syllable.

⁹²Greenberg (1960) analyzes such forms as *zə-n-tu* and *za-t-ti* respectively, with the feminine marked by **-t* and the masculine marked by the old Afro-Asiatic masculine/plural deictic affix **-n*, here fossilized and unproductive in Semitic.

⁹³Reflecting an underlying */ḥimt/*, compare with masculine *ḥim* "brother-in-law."

⁹⁴Reflecting underlying */didt/*, compare with masculine *did* "uncle."

⁹⁵Reflecting underlying */kəbt/*, compare masculine *kəb* "dog."

⁹⁶These forms likely reflect two originally distinct Semitic roots. But since each is an archaic biliteral *CVC* noun inherited from Afro-Asiatic, we may suitably use them interchangeably for the purposes of archaic gender inflection.

⁹⁷The Proto-Semitic cardinal for "two" is typically reconstructed as **tīn* or **tīnay* with

We will suppose, then, that the basic form of the Semitic feminine suffix was **-t* with an allomorph **-ūt*, which appeared following word-final super-heavy syllables such as in segolates or closed final syllables with a long vowel. Critically, we will argue that at that stage in the development of Semitic, in which syncopation was still synchronically active, the form of the suffix was **-t* (a state of affairs still either attested directly or reflected quite faithfully in Akkadian). It follows that the affixation of the feminine suffix does not trigger syncopation, since the **-t* suffix cannot itself create an open syllable, and the **-ūt* suffix can only occur following super-heavy syllables which are not subject to syncopation anyway. Consider the forms below, in which Akkadian masculine and feminine nouns, along with their Proto-Semitic reconstructed counterparts, are derived without triggering syncope in the feminine forms.

(45) *Proto-Semitic and Akkadian Feminine Derivation*

| | | | |
|-----------------|---------------------------|---------------------------|---------------------------------------|
| | malik/*malik | kalb/*kalb | asīr/*'asīr |
| Underlying Root | malik/*malik | kalb/*kalb | asīr/*'asīr |
| | ↓ | ↓ | ↓ |
| Feminine Suffix | malik-t/*malik-t | kalb-at/*kalb-at | asīr-at/*'asīr-at |
| | ↓ | ↓ | ↓ |
| Syncopate | – | – | – |
| | ↓ | ↓ | ↓ |
| Case Suffix | malikt-u/*malikt-u | kalbat-u/*kalbat-u | asīrat-u/*'asīrat-u |
| | ↓ | ↓ | ↓ |
| Syncopate | – | – | – |
| | ↓ | ↓ | ↓ |
| Output | maliktu/*maliktu | kalbatu/*kalbatu | asīratu⁹⁸/*'asīratu |

We would argue then that by the time that the vocalized **-ūt* began to spread and become the generalized feminine suffix in the Central Semitic languages, syncopation was no longer a synchronically active component of the grammar of Central Semitic, and therefore the novel shape of the suffix could no longer trigger syncopation of the accompanying noun, rather it simply appended to the nominal stem, regardless of its phonetic shape, as in Classical Arabic.

the dual morpheme. Nevertheless, Aramaic *tōrēn* and South Arabian, such as Mehri, *tōrō* appear to reflect a form **tīr/*tar*. This state of affairs in Semitic is paralleled in Afro-Asiatic at large, where Berber and Egyptian attest a numeral in **-n* (Proto Berber **sin*, Egyptian/Coptic <sn.wi>/**ⲥⲏⲁⲩ**), while Cushitic and Chadic reflect the form in **-r* (Iraq^v *tsar*, Mubi *sīir*). This fact led Takács (2015) to reconstruct a heteroclitic root numeral for Afro-Asiatic **či-n/r~*ča-n/r*. Takács also notes that Semitic is unique among Afro-Asiatic daughter branches in attesting both forms of what can only be assumed to be a very archaic Afro-Asiatic heteroclitis.

⁹⁸The feminine of Akkadian *asīru* "captive" as a noun is attested in a non-lengthened form as *asirtu*. The lengthened feminine above is attested as an Old Babylonian onomastic element and is presumed to be the more archaic and original form, given the archaism of proper names as well as the attestation of lengthened feminines in other Semitic languages, such as Arabic (*'asīrat*) or Hebrew (*'asīrah*).

3.1.2 Case Inflection

The presence of case inflection in Proto-Semitic is, for the most part, beyond question. Case marking is attested in Akkadian, (likely) Eblaite and Amorite, Ugaritic, Classical Arabic, and in a partial and fragmentary form in Ge'ez. Despite somewhat persistent arguments by Jonathan Owens (1998a; 1998b) to the contrary, Rebecca Hasselbach (2013) has demonstrated quite convincingly that the distinctive idiosyncracies shared between the Semitic case systems⁹⁹ demand the reconstruction of a shared system of case marking to the common Proto-Semitic ancestor. We may reconstruct the common system of Proto-Semitic case marking as follows.

| | Sg. | Dl. | Pl. |
|-----|-----|-----|-----|
| Nom | -u | -ā | -ū |
| Acc | -a | -ay | -ī |
| Gen | -i | | |

Figure 3.1: Common Proto-Semitic Triptote Declension

In addition to the triptote system with distinct nominative, genitive, and accusative forms at least for singular nouns, there is also evidence, at least from Arabic and Ugaritic, for a fully diptotic declension in which the genitive and accusative cases have the same suffix for all nouns (both singular and dual/plural).

| | Sg. | Dl. | Pl. |
|-----|-----|-----|-----|
| Nom | -u | -ā | -ū |
| Acc | -a | -ay | -ī |
| Gen | | | |

Figure 3.2: Ugaritic and Arabic Diptote Declension

Because the evidence for the diptotic declension comes primarily from Arabic and Ugaritic, it is unclear whether diptotic nouns should be reconstructed all the way back to Proto-Semitic, or whether they should be considered as an innovation of Central Semitic (the most recent common ancestor of Arabic and Ugaritic). Purely mechanically, the diptotic declension need be pushed no further back than Central Semitic, but the lack of an obvious source for the innovation and the parallel with the diptotic pattern of the plural and dual nouns makes a Proto-Semitic form plausible.

⁹⁹Such idiosyncracies include the triptote singular vs. diptote dual and plural declension, as well as the somewhat peculiar use of accusatives for subjects of predication and complements of certain particles.

Although the full triptote declension at the very least *must* be inherited from Proto-Semitic, there is also ample evidence for the existence of a zero case-marked form along with the case inflected forms, which Hasselbach (2013) refers to as the so-called "absolute" state. Evidence for this absolute form comes from a number of distinct Semitic languages, where it appears in several distinct uses. In Akkadian, the absolute state can be used as a vocative (*bēlet* "lady!", *šar* "king!"), an explicitly singulative noun (*šanat* "a single year," *uṭṭet* "a single grain"), certain place and time expressions (*ana dār* "forever," *ana imen* "to the right"), for measures, quantity and prices (*sebe uṭṭet* "seven grains," *ḥamšat kur* "five kor," *ana šīm gamer* "for the full price"), cardinal numbers more generally (*šalāš šinnišātum* "three women"), theophoric elements, including native Semitic ones (*Il, Malik, Šamaš*), month names¹⁰⁰, (<ba-ḥi-ir> **baḥir*, <za-lul> **zalul*), and common place names (<a-šūr^{K1}> *Aššur**, <maš-gán^{K1}> **maškan*). In addition, a number of Akkadian loan words (of Semitic origin) into Sumerian show zero evidence of a case suffix (<šúm> **šūm* "garlic," <ḥa-zi-in> **ḥaššin* "axe"). Finally, a zero-marked form is common with predicative adjectives, with Hasselbach remarking that the zero-marked predicate adjective is more common in Old Akkadian):

- Ē-a-ra-bi (**Ea rabi*')
- eš₄-dar-ma-al-ga-at (*' *ištar malkat*)
- Ē-a-dan (**Ea dan*)

Although the data is far more fragmentary, many of the same uses can be identified for the absolute form in Eblaite. It has been attested with theophoric elements (ma-lik), predicate complements (<^dda-gan-li-im> "Dagan is Lim"), numerals (mi-at "100"), and in month names. The same is true in Amorite, where zero-marking characterizes theophoric elements (*Ba^cal, 'il*), the vocative (šū-ub-na-il **šubna 'il* "return, O El"), and complements of predication (ki-bi-ir-é-a **kibir ea* "Ea is great," ia-tar-^dIM **yatar haddu* "Haddu is surpassing").

In Epigraphic South Arabian, zero case-marked forms can be identified by the absence of the otherwise present determinate (<-n>) and indeterminate (<-m>) state endings¹⁰¹. Beeston (1984), in his *Sabaic Grammar*, notes instances of zero-marked forms which resemble the uses in Akkadian, including cardinal numbers (<ḥd> "one," <'rb^ḥ> "four"), season names (<dt' w-ḥrf> "spring and autumn"), cardinal directions (<dy s₂'mt> "up to the north"), and certain fixed expressions (<w-l-'ḥr> "and in the future," <w-l-'sfl> "and lower"). Additionally, verbal participles used as predicate complements can appear unmarked:

¹⁰⁰Indeed, Hasselbach (2013) notes that eight out of the 12 attested Old Akkadian month names are commonly attested without case marking.

¹⁰¹These endings are also absent from the construct state in the Epigraphic South Arabian languages, so in order to identify absolute forms, we must identify nouns which both lack determinate/indeterminate suffixes and which clearly stand outside of obvious construct formations.

- (46) b-hn gwz bḥtn w-hw' 'br-∅
 because cross.PERF.3ms BḤTN and-he transgress.PTC.ms
 'Because he crossed BḤTN while he transgressed (the law)'

Evidence from Ugaritic is difficult to recover, since vowels are not indicated in native orthography. Nevertheless, Tropper (2000) notes a few instances of nouns without case marking. Syllabic renderings of Ugaritic nouns such as ni-it (**ni't* "tool") can hardly be regarded as bearing case endings, but such forms are few and far between, since syllabic texts of Ugaritic are less common than their alphabetic counterparts. Tropper also notes a few instances in which the structure of the words in question (critically having *' as their final consonant) reveals a potentially endingless form (as in the vocative <ks'i nqmd> which Tropper vocalizes as **kussi' Naqmaddu* "O throne of Naqmaddu!" since the word-final *aleph* lacks the expected alphabetic symbols indicating nominative or accusative case endings <'u>/<'a>). Although the use of the absolute form as a vocative matches with the usage attested in Akkadian, Eblaite, and Amorite, the data is simply too sparse to conclude with any certainty that the absolute form survived in any capacity in Ugaritic.

Jonathan Owens (1998a) believes that the phenomenon whereby classical Arabic nouns lose their case inflection *in pausa* is related to endingless forms in Akkadian, and indeed Owens considers all of this as evidence that case marking is an innovation within Semitic. This conclusion seems untenable, and the loss of case marking *in pausa* in Arabic seems much more likely to be a prosodically motivated innovation within the development of Arabic, and not a reflex of the common-Semitic absolute state.

Considering these data, we may reconstruct a Proto-Semitic case system as follows¹⁰².

| | Masculine | | | Feminine | | |
|------|-----------|-----|-----|----------|------|------|
| | Sg. | Dl. | Pl. | Sg. | Dl. | Pl. |
| Nom. | -u | -ā | -ū | -tu | -tā | -ātu |
| Acc. | -a | -ay | -ī | -ta | -tay | -āti |
| Gen. | -i | | | -ti | | |
| Abs. | -∅ | | | -∅ | | |

Figure 3.3: Full Proto-Semitic Declension

There are a number of elements of this reconstruction which are significant for this analysis in terms of syncope in Semitic nominals, and we will discuss each in detail. The first is the basic status of the nominal root and the case endings. This reconstruction necessarily implies that the basic nominal root

¹⁰²The diptotic declension has been excluded since we cannot demonstrate conclusively that it belongs to the common Proto-Semitic period.

in Semitic is an unbound morpheme (unlike, for instance, the Indo-European nominal root), which can stand on its own without any additional morphemes. Likewise, the case endings themselves are not an obligatory part of the formation of a well-formed noun, as evidenced by the absolute state forms.

Another important point is the relative functions of the case forms and the absolute. In the familiar case systems we know from Indo-European languages such as German, Russian, or Latin (since all nouns are obligatorily case-inflected) the various cases effectively cover the full range of possible syntactic or semantic roles a noun can fill (verbal subject, direct object, object of a preposition, etc.), with the nominative decidedly acting as a default case for a noun in any position for which another more specific case form is not mandatory. A different picture emerges from our reconstruction of Semitic. Hasselbach (2013), for instance, notes:

All the attestations for the zero-marked forms we find in Akkadian are either numbers, measures, or the VOC – that means, constructions that commonly stand outside of syntactic contexts – and fixed expressions/idioms which commonly reflect older forms of the language.

Although we may quibble somewhat with Hasselbach's choice of words or theoretical analysis (it is doubtful that any syntactician would agree with her assertion that numbers, measures or vocatives are not situated within a syntactic structure), her point remains well-taken that the data from the archaic Semitic languages point to a function for the absolute state as the form of the noun which is not explicitly the subject or direct object of an overt finite verb. The overtly case-marked forms would therefore be restricted in use to only true arguments of the verb: with the nominative marking explicit verbal subjects, the accusative marking explicit verbal direct objects. The genitive is a special case, as it does not mark a verbal argument. There is evidence from Amorite, however, that the genitive could indeed be unmarked, as in the Amorite forms <ḥa-ab-du-ḥa-na-at> **ʿabdu ʿanāt* "servant of ʿanat," <su-mu-el> **šumu ʿil* "son of El," and <su-mi-ia-ma-am> **šumi yamam* "son of Yamam." Moreover, from a broader Afro-Asiatic perspective, the Semitic Genitive (characterized by its ending -i) is typically thought of as being related to the gentilic nisba construction elsewhere attested in Egyptian, and it is not unreasonable to conclude that the the genitive may have been a comparative late-comer to the Semitic case system derived from the earlier nisba form. This would account for both the non-argument usage of the Semitic genitive, as well as its eventual usage for a number of the functions which originally seemed to belong to the absolute state, such as objects of prepositions, or counted/quantified nouns.

Finally, it is important to note that the absolute-state forms are atypical as they pertain to the system of number marking which otherwise characterizes Semitic nominal inflection. The case endings (in the case of the masculines) and the feminine ending itself (in the case of feminines) clearly have distinct singular and plural forms, as well as a dual which is shared with Egyptian and must

therefore be reconstructed for Proto-Semitic. The absolute-state forms have no distinct dual or plural forms. This does not simply mean that the absolute is attested solely in the singular (though the use in Akkadian to indicate a distinctly singulative noun does perhaps suggest singular semantics), because even nouns which are obviously semantically plural, such as those modified by numerals (*sebe uttet* "seven grains," *ḥamšat kur* "five kor"), **have no morphologically distinct dual or plural forms**¹⁰³. This split, between the number-marking case-inflected forms, and the number-neutralized absolute form, will be important for our ensuing analysis of number marking vis-a-vis syncopation.

The reconstruction as presented above, featuring both case-suffixed and zero-inflected absolute nominal forms has implications for our theory of syncopation. For non-segolate masculine nouns, the presence of the case-marking suffixes, which are vowel initial, would be expected to trigger syncopation, while the zero-marked absolute forms should remain unaffected, as demonstrated in the derivations below.

(47) *Proto-Semitic Case-Marked and Absolute Forms*

| | <i>Non-Segolate</i> | | <i>Segolate</i> | |
|-----------------|---------------------|----------|-----------------|----------|
| | Case-Marked | Absolute | Case-Marked | Absolute |
| Underlying Root | *malik | *malik | *kalb | *kalb |
| | ↓ | ↓ | ↓ | ↓ |
| Case Suffix | *malik-u | *malik-∅ | *kalb-u | *kalb-∅ |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | malīku | — | — | — |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *malku | *malik | *kalbu | *kalb |

The outcome of this interaction between full and absolute marking and syncopation is a split between segolate nouns, which remained segolate (*CVCC*) in all forms, and non-segolate nouns, which alternated between a superficially segolate shape when case-marked (*CVCC-u*), and which reverted to their underlying non-segolate shape in the absolute form (*CVVC-∅*). This fact is critical for answering the crucial question as it pertains to the interaction of case-marking and syncopation in Semitic: why aren't all case-inflected forms throughout Semitic syncopated?

It should be noted first that syncopation associated with case-inflected forms *is* attested in Semitic. It certainly characterizes Akkadian, as mentioned above. It is superficially present in Eblaite and Amorite as well, but since both languages are known primarily from words written in Akkadian texts, it is difficult

¹⁰³Potential feminine plurals of the absolute state have been noted in Akkadian bearing the ending *-ā. Since, however, this is the precise form of the feminine plural of the stative, it is unclear whether these are true absolute-state forms, and if they are, whether this represents an innovative plural modeled on the morphological similarity between the bare, unmarked form: *šar* is both the form of the absolute state, as well as the 3rd M. S. of the stative "he is a king."

to conclude whether this is a truly separate instance of syncopation, or simply Akkadian orthographic conventions bleeding over into the writing of foreign words and names. Syncopation is not typically reconstructed for the vocalization of Ugaritic, and it is clear that syncopation cannot be construed as an active part of the synchronic grammar, as exceptions are attested. Nevertheless, it should be noted that apparently syncopated pairs are attested in the corpus of syllabic Ugaritic, such as those presented below.

- <LÚḥa-ma-ru-ú> **ḡamaruhu*
 "his tiro"
- <LÚḥa-am-ru-šu-nu> **ḡamrušunu*
 "their tiro"
- <LÚḥa-ma-ru-ma> **ḡamarūma*
 "tiros"
- <LÚ.MEŠḥa-am-ru-ma^{MEŠ}>
 **ḡamrūma* "their tiro"

Syncopation is certainly *not attested* in Classical Arabic, or in Ge'ez with the accusative-construct case form. Relevant data is unrecoverable from Epigraphic South Arabian and Phoenician, for the most part because of purely consonantal writing.

Given such sporadic attestation of syncopation attributable to the presence of case markers, what evidence can we provide that case-related syncope indeed was common to Proto-Semitic, and how do we account for its absence from such a wide range of Semitic daughters? To answer this question, we will begin with one of the more striking facts about reconstructable nominals in the Semitic family, and demonstrate how this state of affairs may indeed be a byproduct of once-widespread syncopation related to case inflection.

3.1.2.1 Nominal Biforms

There has been significant and fruitful work in the reconstruction of the Proto-Semitic lexicon to the point that we have a fairly large inventory of words which effectively all scholars would agree belong to the common Proto-Semitic period. Examining these words, one notes that the nouns reconstructable for Proto-Semitic, regardless of the security of their reconstruction, are characterized by a very distinctive form of variation across the daughter languages: namely the variation between a segolate *CVCC* form, and a non-segolate *CVCVC* form. Even remarkably well-attested nouns, clearly reconstructable from every major branch of Semitic, can still show massive variability in terms of the basic root structure which each attests. Consider the forms below.

- **kabid* "liver, mind"
 - Akk: *kabid*
 - Arabic: *kabd*, *kabid*
 - Hebrew: *kābēd* (**kabid*)
 - Ge'ez: *kābd*
 - Tigre: *kābəd*
- **napiš* "breath, life"
 - Akk: *napiš*
 - Arabic: *nafs*
 - Hebrew: *נַפְשׁ* (**nafš*)
 - Ge'ez: *nāfs*
 - Zway: *nāfis*
- **bariq* "lightning"
 - Akkadian: *bariq*
 - Arabic: *barq*
 - Hebrew: *bārāq* (**baraq*)
 - Tigre: *bārq*
 - Mehri: *bōrek*
- **gilad* "skin, hide"
 - Akkadian: *gilad*
 - Arabic: *jild*, *jalad*, *jilid*
 - Hebrew: *gēlād* (**gild*)
 - Ge'ez: *güld*

Although these segolate and non-segolate pairs, typically referred to in the literature as bifurms, are well-known and may appear unremarkable to the scholar well-versed in comparative Semitic studies, alternations of this sort are not the norm in comparative reconstruction. Indo-European nominals, for instance, can show significant variance in terms of the presence or absence of derivational affixes¹⁰⁴ or in ablaut grade/vocalism¹⁰⁵, but variations in the basic shape of the root (such as that reflected in **dyéws* vs. **deywós*) are comparatively rare and are regarded as an irregular and poorly understood process.

Under a purely templatic theory of morphology, nominal bifurms present little problem, as we can easily stipulate arbitrary templates which account for the variation (Akkadian has a *CaCiC* template for *napiš*, but Arabic as a *CaCC* template for *nafs*). Since we have demonstrated, however, that the vowels of Semitic nominals, particularly of underived nominals, are in fact remarkably stable and are far more consistent with a vocalized and syllabified underlying representation than with any sort of root-and-template system, we may wonder if appeals to different templates are more theoretical sleight-of-hand than a true explanation for the variation.

Our theory of syncopation, combined with the notion of a Semitic case-marking system consisting of both case-inflected and zero-marked absolute nominals, gives us the tools to provide such an explanation. At the common Semitic stage, there would have been systematic variation between forms bearing case suffixes, which would be subject to syncopation and appear on the surface as superficially segolate, and the zero-marked absolute forms, which would surface either as segolate or non-segolate depending on the underlying form. Critically,

¹⁰⁴Compare, for instance, **gónh₁os* (Sanskrit *jāna*, Greek γόνος) against **génh₁tis* (Greek γενεος, Latin *gēns*).

¹⁰⁵Compare the vocal variation in **g^{wh}éros* (Sanskrit *hára*, Greek θέρος) against **g^{wh}ormós* (Latin *formus*, Sanskrit *gharmá*), and contrast each with the weak ablaut form attested in **g^{wh}rmós* (Sanskrit *ghṛnā*, Latin *furnus*, OCS гърънь).

this state of affairs would mean that every trilateral nominal root present in the language¹⁰⁶, regardless of its underlying form, would have at least some surface realizations with an apparently segolate root structure. This is the state in which we find Akkadian (assuming that the syncope rule is still active in that grammar), as well as possibly Eblaite and Amorite, depending on our ultimate analyses of the status of syncope in these languages.

In later Semitic languages, as the syncope rule is lost, and doubly so as the case system atrophies, the once-principled variation in nominal root shapes would become increasingly opaque, as the daughter languages would inherit, for a vast number of nominal roots, two distinct root shapes whose distributions and functions would no longer be easily recoverable from the synchronic state of affairs. Confronted with the fallout of this system, we could easily envision generalizing one of the two forms at the expense of the other. Since this process would presumably occur noun by noun (or at the very least to multiple groups of phonologically similar nouns), it is not at all difficult to envision different nouns having different root shapes generalized along different lines of descent, as, for instance, Arabic generalizing a form *malik*, while Hebrew generalizes the originally syncopated form **malk* (giving rise to *melek*). According to this analysis, the differing nominal biforms in Semitic are somewhat akin to the strong verb classes of Germanic. They are an archaic morphological holdover of an originally coherent system of inflection. In each case, the groups become fossilized and divorced from their original morphological or phonological conditioning, allowing the classes to become confused, and for words which originally belonged in one class to move into others. The result is chaotic, with different daughter branches suggesting different reconstructions for clearly cognate words, and great difficulty in identifying the original distribution of words across classes.

3.1.2.2 INST/NOM Case – Fossilized Adverbals

If, as we have suggested, the loss of the syncope rule, in conjunction with the loss of the case-marking system, led to mass confusion of syncopated and unsyncopated nouns, resulting in the various segolate~non-segolate nominal biforms attested across Semitic, we may ask whether there is any *direct* evidence for case-related syncope in those languages which no longer reflect it as a part of their typical system of nominal case inflection. We believe that evidence for such syncopation is preserved, even in languages which have lost case marking in the form of the so-called Instrumental/Locative case, and the frozen adverbial forms which survive as its descendents.

Recalling the nominal case-inflection paradigm provided above, there was no distinctive instrumental case form reconstructed in the basic triptote nominal-declension provided above. The reasons for this are twofold. First, the instrumental form exists in the function of a productive suffix only in the most archaic Semitic languages, such as Akkadian and Eblaite (and possibly Ugaritic), as in forms such as *libbum* "within, in the heart of," or *idum bēli* "by the hand of

¹⁰⁶That is to say, both *CVCVC* and *CVCC* nominal root morphemes.

my lord." Outside of these languages, it survives only in the form of individual words, isolated from the paradigms of nominal inflection such as Hebrew *pit'ôm* "suddenly" or Arabic *taḥtu* "below." The second reason is that it is not clear whether this formation represents a distinct instrumental case form, on par with the nominative, accusative, and genitive as separate stand-alone cases, or whether this is simply an extended use of the nominative case beyond its basic function of marking verbal subjects¹⁰⁷.

Hasselbach (2013) argues in favor of the prior interpretation, pointing to Akkadian, where, despite the superficial similarity between the two affixes (both superficially appear with the form *-um*), there are differences in morphological and phonological behavior which separate the two. Hasselbach notes, for instance, that where truly nominative case-marked nouns lose their overt marking when they appear as the possessed member of a construct (*bēl bītim* "lord of the house"), instrumental case marked nouns do not lose their overt instrumental suffix, as we have seen in forms such as *idum bēlī* "by the hand of my lord," and the ending even survives before the possessive suffixes, as in *beluššu* "without his lord" (clearly representing an underlying **belum-šu*).

While these arguments may suggest that at the stage of Proto-Semitic these cases may have been distinct, it is difficult to ignore the similarities in both form and function between the Semitic nominative and instrumental cases and the Berber "construct state"¹⁰⁸. Many scholars have linked the Semitic nominative marker **-u* with the Berber construct-state prefix **wa-*, not merely because of the phonological similarity, but also because the Berber construct state is commonly used, like the Semitic NOM/INST form, with instrumental or locative semantics, and can be used with prepositions.

If we assume that the INST/LOC case and the NOM case of Semitic share a common origin, even if only at the Pre-Proto-Semitic stage, then it seems clear that these forms provide evidence for syncopation. Although the instrumental case as a fully functional inflectional category is present nowhere outside of East Semitic, individual instrumental case-inflected nouns do survive in many Semitic languages, typically as frozen adverbials or directionals, and these forms consistently reflect a shape consistent with syncope. Consider forms such as Hebrew *šilšôm* "three days prior, in the past" (*šālaš* "divide into thirds"), *pit'ôm* "suddenly" (*peṭa'* "suddenness, quickness"¹⁰⁹), Arabic *ba'du* "after, behind" (*ba'ad* "distance, separation") *taḥtu* "below" (*taḥt* "underside, lower part"), or Ethiopic *wātru* "always, continuously" (*wātr* "period of uninterrupted time") *baḥtu* "only" (*baḥata* "be alone, be only one"). In each case, the fossilized adjectives reflect a shape *CVCC* before the suffix. Notably, the only major ex-

¹⁰⁷See the precisely parallel use of the nominative case "*l'état d'annexion*" in Berber, which can function as an instrumental case.

¹⁰⁸Recall from Section 1.3.1.4 that despite usage of the same terminology, the Berber state system is radically different from the system of "states" known from Semitic, and is better thought of as a case system, with the "construct state" acting as a marked nominative case, and the "free state" acting as an accusative/default case for all nominal forms not specifically calling for the marked nominative.

¹⁰⁹The relationship between *peṭa'* and *pit'ôm* is unarguable, but note the irregular correspondence of **c'* and **c'* between the two forms.

ceptions to this pattern are those forms containing a long vowel somewhere in the root, such as Ge'ez *qadīmu* "first, earlier, previously" (*qadīm* "beginning"). We consider such forms to be the fossilized relics of the originally syncopated case-marking forms still attested in East Semitic, and which we postulate for the common Proto-Semitic period.

3.1.3 Derived Nominals

Evidence for syncopation is found most strongly in Semitic in the derivation of nominal forms (with the possible exception of broken-plural formation). In this discussion we will focus primarily on nominal derivation that involves the addition of a concatenative derivational affix. Changes in vowel quantity and quality are known processes to derive new nominals in Semitic, but our focus will be primarily on the changes in root shape triggered by either derivational prefixes or suffixes, since it is these forms that create the necessary environment for our syncope rule to apply.

3.1.3.1 'a-

One of the more common derivational prefixes in Semitic is the affix *^ʾa-. The *^ʾa- prefix is used in the formation of at least two, possibly three, wholly distinct nominal formations, and may indeed represent the coincidental syncretism of originally distinct morphemes which overlapped in phonological form. The most common usage of the *^ʾa- prefix is in the formation of the comparative/superlative so-called "elative" forms of adjectives and nouns referring to states, as in Arabic ^ʾ*akram* "most noble" (*karīm* "noble") and ^ʾ*akbar* "greatest" (*kabīr* "great"), or Mehri *aḵlāl* "smaller" (*ḵel* "small") and *aṭwāl* "longer" (*tawīl* "long"). It is also common in the formation of adjectives, such as Arabic ^ʾ*aḥmar* "red" (*ḥammara* "to redden"), Hebrew ^ʾ*ezrah* "native" (*zārah* "to arise from, come from"). In East Semitic, it is common in the formation of abstract nouns or verbal nouns, such as *ikribu* "blessing" (*karābu* "to bless"), *iṭeru* "ransom" (*paṭāru* "to free, to release"). This usage is not commonly regarded as occurring outside of East Semitic, but it may serve as the origin of the numerous patterns of broken-plural formation throughout West Semitic, including the ^ʾ*af^ʿul*, ^ʾ*af^ʿūl*, ^ʾ*af^ʿāl*, ^ʾ*af^ʿil(at)* and ^ʾ*af^ʿilā* plurals, all attested throughout Arabic, Ethiopic and the Modern South Arabian languages. It may also be sporadically attested in the formation of animal names such as Arabic ^ʾ*arnab* "hare," Akkadian *ayyalu* "stag," or Hebrew ^ʾ*aryeh* "lion," though it is unclear whether these represent truly derived forms, or simply *^ʾ-initial root nouns of varying forms.

The behavior of the *^ʾa- prefix corresponds precisely with that predicted by our theory of syncopation, as the short open syllable *^ʾa- prefixed to a *CVVCV* would be expected to syncopate the first vowel or the root, exactly as we find in such forms. Likewise predicted are the exceptions to the expected ^ʾ*aCCVC* shape, namely ^ʾ*aCVCVC*, as in the case of Arabic masculine plural elative forms ^ʾ*akābir*.

(48) *Derivation of *’a- Prefixed Nominals*

| | | |
|-----------------|------------------|------------------|
| | CCVC | CVCVC |
| Underlying Root | kabar | kābar |
| | ↓ | ↓ |
| ’a- Prefix | ’a- kabar | ’a- kābar |
| | ↓ | ↓ |
| Syncopate | ’ akbar | ’ akābar |
| | ↓ | ↓ |
| Output | ’ akbar | ’ akābar |

We would also predict that syncopation would be blocked in the case of ’a-CVCCVC nouns, though these are possibly unattested in the reconstructable lexicon. Our theory does explain the absence of *’a-CVCCVC forms reconstructable for Proto-Semitic, as these forms are ungenerable using syncopate. Note that nothing else about such forms (their semantics, their syllable structure, their morphological composition) suggests that they should not exist, so their absence from Proto-Semitic is an otherwise unexplained gap which must be stipulated by postulating that *’a- morpheme simply doesn’t take patterns of that shape, without any particular reason why. Our theory of syncopate accounts for this data more succinctly.

3.1.3.2 *mṣ-

The most ubiquitous derivational prefix in Afro-Asiatic, outside of perhaps the causative prefix in *sṣ-, is the agent/instrument/locative form in *mṣ-. The most basic use of the prefix is in the formation of agent nouns. This can take the form of instrument/object nouns, such as Akkadian *narkab*¹¹⁰ "chariot" (*rakābu* "ride"), Arabic *miftah* "key" (*fataḥa* "open"), its Hebrew cognate *maptēah* "key" (*pātaḥ* "open"), or Ge’ez *mālbās* "a dress" (*lābsā* "to dress"), or animate agent nouns such as *marḥītu* "wife" (*reḥū* "to become pregnant, have sex with"¹¹¹), Arabic *muslim* "one who is peaceful" (*salima* "be safe, be at peace"), Hebrew *mal’āk* "messenger, angel" (*lā’āk* "to send, perform, move forward"), or its Ge’ez cognate *māl’āk* "messenger, angel" (*lā’ākū* "send as envoy"). It is also commonly used in the formation of active participles, though these are semantically similar to agent nominals. The second primary use is in the formation of location nouns, as in Akkadian *mūšabu* "dwelling place" (*wašābu* "to live, to dwell"), Arabic *maktab* "school, desk" (*kataba* "write"), Hebrew *mizrāḥ* "East" (*zāraḥ* "to rise"), or Ge’ez *māqdās* "sanctuary" (*qāddāsā* "sanctify"¹¹²). In

¹¹⁰Reflecting an underlying **markab* with dissimilation of the prefix-consonant triggered by the presence of a labial consonant in the root, a well-known allophonic alternation of this prefix in Akkadian.

¹¹¹The Akkadian forms reflecting underlying **marḥi’tu* and *reḥē’u* respectively.

¹¹²This verb is clearly a D-Stem form reflecting a G-Stem which is unattested as such in Ge’ez but whose prior existence is confirmed by Arabic *qadusa* "be holy" and Hebrew *qādaš* "be holy." The expected Ge’ez form would be either *qādasā* or *qādsā*.

addition to these, there is another less-common, albeit still well-attested, usage of the **mǔ*- prefix, which is the formation of abstract nouns. Such forms are reflected in Akkadian *maqlūm* "burning" (*qalū* "to roast, burn"¹¹³), Arabic *maqrabat/maqrubat* "closeness" (*qaruba* "to be near"), Hebrew *mišpāṭ* "judgment" (*šāpāṭ* "to judge, to govern"), and Ge'ez *məgbār* "action" (*gābrā* "do, work").

Regardless of whether these distinct uses constitute a syncretism of a number of originally distinct morphemes, or a single morpheme with multiple disparate uses, the important fact for our analysis is that all forms consist of a light syllable **mǔ*- with a short vowel. Our theory of syncopation predicts that the affixation of this prefix to a *CVCVC* root ought to result in a *mǔ-CCVC* shape, precisely the form which we find in *mǔ*-prefixed forms throughout Semitic. The only major exceptions to this are forms with an initial long vowel within the root, or forms with a geminated middle consonant, such as Arabic *mudarris* "teacher" (*darrasa* "to teach," G-Stem *darasa* "to study, learn") or *musākanat* "cohabitation" (*sākana* "to live together with" G-Stem *sakana* "to live"). These forms, *mǔ-CCVC*, *mǔ-CVCCVC*, and *mǔ-CVCVC* are precisely those predicted via our analysis of syncope, as in the derivations below.

(49) *Derivation of *mǔ- Prefixed Nouns*

| | CCVC | CVCCVC | CVCVC |
|-----------------|----------------------------|-------------------|----------------------------------|
| Underlying Root | salim | darris | sākan |
| | ↓ | ↓ | ↓ |
| mǔ- Prefix | mu- salim | mu- darris | mu- sākan |
| | ↓ | ↓ | ↓ |
| Syncopate | mus alim | mudarris | mus sākan |
| | ↓ | ↓ | ↓ |
| Output | muslim | mudarris | mus sākan (at) |

It is also worth mentioning that the *mǔ-CVCVC* pattern, ungenerable by our theory of syncopation, but otherwise permitted and perhaps predicted to exist by the normal rules of Semitic syllable structure, is effectively unattested, particularly among the oldest layers of the Semitic lexicon reconstructable to the common Proto-Semitic period. In this way, our theory of syncopation not only predicts the attested forms of **mǔ*- prefixed nouns, but also explains a conspicuous gap in the attested morphological forms which is otherwise unaccounted for.

3.1.3.3 *tǔ-

Another common derivational prefix in Semitic is the form **tǔ*-, which is used commonly in the formation of action nouns from verbal stems. These nouns often have a reciprocal or interactive semantics (related to the verbal derivative T-Stem), and also commonly form the names of professions or social roles. Simple

¹¹³Reflecting underlying **maqlǔwum* and **qalāwu* respectively.

action nouns are robustly attested, being reflected in Akkadian *tamḥārum* "battle" (*maḥārum* "to confront, oppose"), Eblaite <ta-er-iš-tù-um> **taḥrittum* "ploughing" (*ḥarātu* "to sow, to plant"), Arabic *tafriq* "partition" (*faraqa* "to split, divide"), Hebrew *talmūd* "learning" (*lāmad* "to learn, study") Ge'ez *täfšam* "completion" (*fäššämä* "to complete"¹¹⁴). Professional or social uses are somewhat less common, but are still reflected in Akkadian *tamkārum* "tradesman" (*makārum* "buy, sell, do business"), Hebrew *talmūd* "disciple" (*lāmad* "learn, study"), as well as the Akkadian and Arabic *targumānu/tarjumān* "translator."

As with the prior prefixed forms, the **tṽ-* forms are characterized by the preponderance of *CCVC* root shapes, as reflected in the various nominals presented above. Again, the *CCVC* root shape can be blocked by the presence of a long vowel in the first syllable of the root, *tṽ-CVCVC*, as in the case of Eblaite <ta-da-bi-lu> **tadābilu*¹¹⁵ "interpreter" (or in principle by geminate roots, though such forms are not reconstructable). Consider the derivations below.

(50) *Derivation of *tṽ- Prefixed Nouns*

| | | |
|-----------------|-----------------------|-------------------|
| | CCVC | CVCVC |
| Underlying Root | maḥār | dābil |
| | ↓ | ↓ |
| tṽ- Prefix | ta- maḥār | ta- dābil |
| | ↓ | ↓ |
| Syncope | ta ḥ maḥār | ta d dābil |
| | ↓ | ↓ |
| Output | ta ḥ maḥār(um) | ta d dābil |

The absence of *tṽ-CVCVC* derived forms is striking, with a notable exception of the Amharic noun *täräkāz*, meaning "heel." This word is clearly unrelated to the common Semitic **^caqib/*^ciqb* "heel," and, indeed, is not attested in Ge'ez, suggesting that it might be a more recent coinage, possibly derived from the verb *rägäzä* "stamp." This is semantically plausible, given the meaning of Arabic cognate *rakaza* "to fix into the ground," but the phonetic correspondence of /g/ in *rägäzä* with /k/ in *täräkāz* is irregular, perhaps suggesting that this word may be derived from the Arabic term, which would account for its irregular root shape.

3.1.3.4 Other Prefixes

Those listed above constitute the major derivational prefixes associated with nominals in Semitic, although others, either more poorly attested or of a more

¹¹⁴*fäššämä* is clearly the D-Stem of a G-Stem form **fäšämä* "be finished, be completed." The existence of such a form can be confirmed by the presence of cognate forms such as Arabic *fašama* and Hebrew *pāšam*, both meaning "be completed."

¹¹⁵Reflecting an unattested verb **dabālu*. This verbal root typically means "bring together or assemble," but has commonly come to mean something like "speak" or "repeat," as in Gafat and Gurage *däbbälä*.

dubious nature may occur. Lipiński (2001) notes, for instance, that a potential variant of the *'a- prefix, *'a-, may be attested in the names of common animals containing the phonemes *r; Arabic 'uṣṣūr "sparrow" (compare Hebrew ṣippōr), or the common Semitic *'aqrab reflected in Arabic, Hebrew, and Ethiopic. Lipiński also proposes the possibility of the deific name *'attar(t), given the association between this deity and the antelope, but we consider such a connection speculative. A derivational prefix in *ya- may also be attested, again primarily in the form of animal names such as Hebrew yaḥmūr "deer" (ḥāmar "be red") or Arabic yaḥrūḥ "mandrake"¹¹⁶. This proposed *ya- prefix may also be used in the formation of proper names such as Arabic Yaṭrib "Medina" or Yarmūk "Yarmouk River," as well as potentially the name of the national deity of Samaria and Judah, Yahweh, though the etymology of this god's name is hotly disputed. Given the similarity of this form to the 3rd M. Sg. of the prefix-conjugation, and the frequency with which finite verbs are used in Semitic onomastics, it seems likely that these may represent the simple use of inflected verbs in a nominal capacity.

In these cases, as well as the few other prefixes which may be present, the important element for our analysis is that these derivational prefixes trigger a concomitant *CCVC* shape of the verbal or nominal root, precisely that form predicted via syncope.

3.1.3.5 *-ān

The derived form in *-ān is one of the most common suffix-derived forms in Semitic. It is used in the formation of denominal adjectives, as well in personal names of adjectival origin. It is likewise sporadically attested in the formation of some verbal nouns, diminutives, and broken-plural forms in Arabic and Old South Arabian. Derived adjectives in *-ān are the most common form, being attested in Akkadian šinnānu "toothed" (šinnu "tooth"), Arabic raḥmān "merciful" (raḥima "have mercy"), Hebrew qadmōn "eastern" (qedem "front, east"), Ugaritic *Nūrānu "Personal Name: luminous" (<nr> "fire"). Verbal nouns or abstract nouns are attested in Akkadian šulmānu "greeting" (šalāmu "be whole, be at peace"), Ugaritic <zbln> "sickness" (<zbl> "sickly"), Hebrew qārbān "offering" (qārab "approach, bring near"), and Ge'ez šəltan "dominion" (šälätä "have power").

What grabs our attention about derived nominals in *-ān is the distribution of root shapes with this suffix. Almost all derived nominals of this type are attested with a *CVCC* root shape, as was illustrated with a great many of the examples provided above. Again, this is precisely the shape predicted via syncope, where the addition of the vowel-initial suffix to the consonant-final *CVCVC* root makes the second root syllable open, targeting it for syncope. Our theory of syncope predicts that suffix-triggered syncope can be blocked by the presence of long vowels in the first or second root syllable, as well as by the gemination of the second root-consonant, and indeed, these forms are

¹¹⁶The potential derivation of this form is unclear. A verb *bariḥa* exists in Arabic, but it is unclear how its meaning "to depart" would be applicable to the mandrake.

attested, as in Akkadian *nādinānu* "seller" (*nadānu* "to give, to pay"), Arabic *salāmān* "peaceful" (*salama* "be at peace") Hebrew *zikkārōn* "remembrance" (*zākar* "to remember"). Derivations for all types are provided below.

(51) *Derivation of *-ān Suffixed Nouns*

| | | | | |
|-----------------|-----------------|---------------------|-----------------|-----------------------------------|
| | CCVC | CVCVC | CVCVC | CVCCVC |
| Underlying Root | salam | nādin | salām | zikkār |
| | ↓ | ↓ | ↓ | ↓ |
| -ān Suffix | salam-ān | nādin-ān | salām-ān | zikkār-ān |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | salāmān | — | — | — |
| | ↓ | ↓ | ↓ | ↓ |
| Output | salmān | nādinān (um) | salāmān | zikkārān → zikkārōn |

Derived nominals in **-ān* attesting a shape *CVCCVC-ān* are comparatively quite rare, and are effectively unattested in nouns which can be reconstructed to common Proto-Semitic. This gap is, again, predicted by our theory, because such forms should be ungenerable. This gap is, under the conventional templatic theory, an unexplained fact and must simply be stipulated. We believe this makes our theory better able to account for the distribution of attested (and unattested) forms.

3.1.3.6 **-iy/iyya*

The nisba suffix is interesting in Semitic as it pertains to our proposed syncope analysis, precisely because it fails to regularly participate in morphological syncope. Denominal nisba adjectives are well-attested in West Semitic, being particularly well-known and robustly attested in Arabic. In contrast to other suffix-derived nominals, which, as we have demonstrated, are typically associated with a *CVCC* root shape, nisba adjectives typically have no concomitant shape in root shape, as illustrated in forms such as Arabic *malikiyy* "royal" (*malik* "king"), Hebrew *yārēhī* "lunar" (*yārēah* "moon"), or Ge'ez *g^wādälawī* "deficient, incomplete" (*g^wādälä* "be missing, lacking")¹¹⁷. In Akkadian, where syncope is typically thought of as a surface-true synchronic fact, the nisba forms are, as expected, typically syncopated, as in forms such as *maḥrū* "first, forward" (*maḥrum* "front part") *urkū* "Urukean," though exceptions in the form of place names are attested, such as *šubarū* "Šubar-ian" or *urukū* "Urukean." Since a great many of these place names are borrowed, or of potentially non-Semitic origin, it is unclear whether these exceptions should be attributed to the

¹¹⁷In all such cases, the nisba suffix can be appended to nouns with an underlyingly segolate *CVCC* root shape. In Hebrew, this can create the apparent alternation between non-affixed segolate nouns with a surface *CVCCVC* appearance (‘*ēber* "Eber," *šēbet* "tribe," *kesep* "silver, money") and suffixed forms in which the root surfaces as *CVCC* (‘*ibvī* "Hebrew," *šibtī* "tribal," *kaspī* "silvery, metallic"). Since both the underived and the suffixed forms in Hebrew reflect an originally segolate *CVCC* root, this alternation should **not** be attributed to inherited Afro-Asiatic syncope, but should instead be considered a Hebrew internal phonological development.

peculiar behavior of the nisba form, or to simple loan word phonology, where loans are often exempt from native phonological processes.

These data raise the obvious question of our theory: Why should the nisba suffix be exempt from the syncopation rule we have proposed? According to the terms of our theory, in order for the nisba to fail to trigger syncope, it should originally not have been: vowel-initial, yielding a closed final syllable and blocking syncope; part of the same morphological word as the nominal stem, since syncope is a word internal process; or the morpheme itself must have had some as-yet-unidentified property that blocked the syncope process. Is there evidence to support any of these theories as it pertains to the nisba suffix? Indeed there is. To demonstrate such evidence, we must begin with a bit of background on the comparative distribution and origin of the nisba form.

The nisba is typically thought of as a quintessentially Afro-Asiatic form, due to its presence in Arabic, Hebrew (and Semitic more generally), and Ancient Egyptian, some of the best-known and most widely studied Afro-Asiatic languages. This appearance in the most well-known Afro-Asiatic daughters obscures the fact that the nisba form is in fact attested nowhere outside of Semitic or Egyptian¹¹⁸. Focusing our attention on the behavior of the nisba form in Egyptian and Semitic, and contrasting the two, we are struck by a pronounced difference. In Semitic, the nisba suffix has all the hallmarks of a true derivational suffix. It affixes directly to the nominal stem (Arabic *malikiy* "royal"), can both follow (Hebrew *qadmōnī* "oriental") and precede other derivational affixes (Ugaritic *šapšiyānu* "sunny"), and it can be followed but never preceded by true inflectional affixes such as case markers (Arabic *malikiyyun*) or gender markers (Arabic *malikiyyat*). The data of Egyptian paints a different picture. While simple examples such as **𓂏𓂏𓂏** **nōtrit* <ntr.i.t> appear similar to their Semitic counterparts, certain more carefully chosen examples reveal a stark difference in behavior.

For example, the Ancient Egyptian word **𓂏𓂏𓂏** **ianam* <imn>¹¹⁹ "right hand" is clearly cognate with the Semitic form **yamān/yamīn*, also meaning either "right hand" or "right-handed." As in Semitic, it has become associated with a cardinal direction, though unlike Semitic, where **yamān/yamīn* comes to mean "south" (the right-hand side when facing the rising sun), in Egyptian the clearly related feminine noun <imn.t> has the meaning "West" (the right-hand

¹¹⁸The status of the nisba form in Berber is controversial. It is clearly no longer a productive affix in the same manner that it is in Semitic or Egyptian, and is not typical of derived adjectives or gentilics, short of names for nations or ethnic groups clearly borrowed from Arabic. Nevertheless, scholars such as Vycichl (1952) and Gordon (1957) believe that the original nisba suffix is preserved in pairs such as Qabyle *ibeqs* "boxwood" vs. *abeqsi* "wooden bowl" or Tashelhiyt *afus* "hand" vs. *afāsi* "right-hand side." That such forms represent fossilized nisba formations is plausible, in which case we should rightly say that the Nisba formation is attested nowhere outside of the Northern Afro-Asiatic languages.

¹¹⁹The Coptic form, as well as the reconstruction which comes from it is subject to a number of phonological alterations. First, the final two root-consonants have undergone metathesis. Second, the initial root-consonant, almost certainly a reflex of Proto-Afro-Asiatic **y*, was irregularly replaced with the reflex of **w*. The common but irregular interchange of **y* and **w* in Afro-Asiatic is a well-known phenomenon, though a suitable explanation as to how or why such changes should occur is not forthcoming.

side when facing the source of the Nile to the South of Egypt in the Rift Valley Lakes region). From this, a nisba form **ꜥꜣꜣꜣꜥ** **iamōntōi* <imn.t.ī>, meaning "Western" or later lexically specified to "Western Wind" can be formed. This form presents a massive problem for the interpretation of the nisba affix in Egyptian as a simple derivational affix. Namely, the nisba "suffix" appears to be able to append to the fully formed and inflected word <imn.t>, critically, being affixed after the inflection morpheme, the feminine <.t>. If we take seriously the theoretical claim that, in the process of word derivation, a derivational affix cannot be added after the affixation of an inflectional morpheme, then we must conclude that, in opposition to its apparent use in Semitic, the Egyptian nisba "suffix" is not a true derivational suffix at all, but rather appears to exhibit the behavior of something more along the lines of a word-level clitic.

This analysis suggests that the nisba "suffix" in fact began as a freestanding clitic or post-position which, at the stage of Pre-Proto-Semitic, may not have participated in word-level phonological processes such as syncope. It seems unlikely that the nisba suffix retained its freestanding clitic properties into Proto-Semitic itself, but it seems plausible that it may have, following its eventual univerbation, exhibited irregular properties with respect to syncope, irregularities which may account for the inconsistent relationship between nisba formation and syncope, even with respect to Akkadian.

3.1.4 Number Inflection

3.1.4.1 Sound Plural

The inflection of the Semitic "sound plural" presents one of the greatest challenges for our theory of root and stem alternation via syncope. Recall from section 1.3.1.3 that the sound plural of Semitic is formed by the lengthening of the case vowel which follows the nominal stem (or in the case of feminines, by the presence of a lengthened *-āt suffix¹²⁰). The form reconstructable for these affixes is important because, in conjunction with our theory of syncope, it makes the prediction that nominal roots and stems in Semitic should be expected to exhibit alternations triggered by syncope as a function of sound-plural formation. As we shall see, such alternations are largely unattested.

We may begin in Akkadian, where, perhaps unexpectedly, syncope is attested. As we have seen, masculine singular nouns in Akkadian are themselves likely to be subject to syncope due to the overt and robust case system, the vowels of which often trigger syncope. The same syncope is attested in masculine plurals, since they exhibit effectively the same prosodic structure as their singular counterparts.

¹²⁰It is incorrect to *simply* consider the feminine plurals as lengthened versions of feminines in *-at. For one, feminines in *-t also take plurals in *-āt (Arabic *bint* vs. *bānāt* "daughter(s)," Hebrew *gəḇeret* (**gabirt*) vs. *gəḇārōt/gəḇīrōt* (**gibarāt/gabirāt*) "lady(s)"). For another, even feminine nouns which lack an overt *-t/*-at affix in the singular can still form their plurals in *-āt (Akkadian *ummu* vs. *ummātu* "mother(s)," Ge'ez *may* vs. *mayat* "water(s)").

| | | |
|----------------------|----------------|---------------|
| M. Sing. Abs. | M. Sing | M. Pl. |
| malik | malku | malkū |

Figure 3.4: Syncope in Masculine Plurals in Akkadian

An important point to make is that the unmarked absolute form can also be used as a plural (as we demonstrated in forms such as *sebe uṭṭet* "seven grains," *ḥamšat kur* "five kur"). We will return to such forms later as a potential source of invariant plural nouns in Semitic. Feminine plurals in Akkadian exhibit the same alternations, with feminine singulars in *-t* showing no syncope, but their corresponding plural showing syncope:

| | |
|--------------|--------------|
| F. Sg | F. Pl |
| damiqtu | damqātu |

Figure 3.5: Syncope in Feminine Plurals in Akkadian

These forms accord with our theory of syncope, but outside of East Semitic, such alternations in the formation of the sound plurals are, for the most part, unattested. They are not known from the sound-plural forms of Classical Arabic (*malik(u)* vs. *malikū*, *malikat(u)* vs. *malikāt(u)*) or from the Modern Arabic vernaculars, where the old oblique plural endings now function as a masculine plural, along with the original feminine plural (*maktub* vs. *maktubīn*, *malika(h)* vs. *malikāt*¹²¹).

This latter state of affairs is shared in Hebrew, in which the common masculine plural suffix in *-im* is itself often taken to be a reflection of the old oblique plural morpheme. In both Hebrew and Aramaic, we find surface alternations which superficially resemble the types of syncope we have here proposed, such as Aramaic *mēlek* vs. *malkīm* or Hebrew *yēləd* vs. *yəldīm*. It is incorrect to include these as examples of syncope, since in each case, both the singular and the plural reflect the same underlying nominal stem (**malk* vs. **malkīm*, **yald* vs. **yaldīm*). Rather, the alternations are due to internal facts about Aramaic and Hebrew syllable structure and the vocalic sound changes each has undergone. Once all such sound changes are undone, evidence for syncope pertaining to sound pluralization is not recoverable from Hebrew and Aramaic.

Ge'ez, and the Ethiopic languages more generally, no longer have a distinct

¹²¹The lack of syncope is perhaps unexpected in the case of the masculine sound plurals in modern Arabic forms, as the masculine sound plural tends to occur only with a restricted set of nouns, including participles, derived nisba adjectives and certain classes of nouns referring to human males.

masculine plural form¹²², instead forming almost all sound plurals by the presence of the originally feminine plural suffix *-at* (reflecting Proto-Semitic **-āt*). Again, the addition of the sound-plural suffix, regardless of the gender of the noun, fails to trigger syncope (*nābiy* vs. *nābiyat*, *nəgəšt* vs. *nəgəštat*). In the Modern South Arabian languages, sound plurals are even more uncommon, with almost all nouns taking broken plurals of one pattern or another. Nevertheless, by considering the few nouns which do form regular sound plurals, we may identify the affixes as well as their behavior on the noun stems to which they are appended. In Mehri and Jibbali, masculine sound plurals are apparently formed from affixes *-un* and *-in* (Mehri *kətōb* vs. *kətābīn*, Jibbali *ktōb* vs. *kətbīn*), which rather transparently reflect the nominative and oblique sound plural morphemes **-ūn* and **-īn*

3.1.4.2 Broken Plurals

In contrast to the difficulties and problems presented by the formation of sound plurals throughout Semitic, the broken plurals by contrast are exceptionally amenable to an analysis via syncope. In fact, not only are the broken-plural forms able to be generated via syncope, we believe our analysis provides a more satisfying explanation for the patterns of broken plurals attested (or systematically unattested) across the family. We will look at an overview of such forms, and demonstrate how the complex range of broken plurals can be broken down and understood in terms of a number of processes of morphological affixation in conjunction with subsequent syncope¹²³.

3.1.4.2.1 Overview of Broken Plurals

At a first glance, the broken-plural patterns of Semitic present a truly dizzying array of possible forms. Classical Arabic, for instance, is characterized by Lipiński (2001) as having up to 30 morphologically distinct broken-plural formations, a sampling of which is presented below.

¹²²A distinct masculine plural form exists in the inflection of adjectives, and is occasionally used in true noun inflection.

¹²³Changes in vocalism are also present, but recall that we have suggested in section 2.3 that such apophonic transformations are an originally distinct morphological process. We will therefore not concern ourselves with them in the following discussion.

| | | | |
|----------------------|------------------------|----------------------|-----------------------|
| fa ^ˈ al | fa ^ˈ alat | | |
| fi ^ˈ al | fi ^ˈ alat | | |
| fu ^ˈ al | fu ^ˈ alat | fu ^ˈ ˈal | |
| fu ^ˈ ul | | | ˈaf ^ˈ ul |
| fa ^ˈ il | | | ˈaf ^ˈ ilat |
| fi ^ˈ āl | fi ^ˈ ālat | | ˈaf ^ˈ āl |
| fu ^ˈ āl | fu ^ˈ ālat | fu ^ˈ ˈāl | |
| fu ^ˈ ūl | | | |
| | fi ^ˈ lat | | fi ^ˈ lān |
| | | | fu ^ˈ lān |
| fa ^ˈ ālil | fa ^ˈ ālilat | fawā ^ˈ il | fa ^ˈ ālā |
| fa ^ˈ ālil | | fawā ^ˈ il | fa ^ˈ āˈil |
| fu ^ˈ ālāˈ | | | ˈaf ^ˈ ilāˈ |

Figure 3.6: Broken Plural Patterns of Classical Arabic from Lipiński (2001)

An important point is that although broken plurals are typically thought of as characteristically and ubiquitously Semitic (likely due to the widespread prevalence of Arabic), they are not equally distributed throughout the family. Rather, broken plurals are sporadically and inconsistently attested in the Northern and Westernmost Semitic languages (such as Akkadian, Ugaritic, or Hebrew) and robustly attested among the languages spoken further south in the Arabian peninsula and East Africa (such as Arabic, Ethiopic, or the Modern South Arabian languages). In the following sections, we provide an overview of the broken-plural types attested throughout Semitic and then begin our analysis using syncope.

Broken-plural forms are largely unattested in East Semitic, where the sound plural forms the vast majority of nominal plurals. One attested broken plural pattern is the formation of plurals via gemination of the second root-consonant, roughly corresponding to the Arabic *fu^ˈˈal* pattern, though the vocalism may vary. Such forms are reflected in Akkadian in the form of plurals such as *abu* vs. *abbû* "fathers" (reflecting **ˈabba-û*), *bakru* vs. *bakkarû* "camels" or *zikru* vs. *zikkarû* "men." While each form is itself marked with the sound-plural suffix, the manipulation of the nominal stem in the form of the gemination of the second root-consonant is unmistakable. This pattern is likewise probably attested in Eblaite forms such as <du-ba-lu> (**dubbarû*?) "pastures," but the nature of Eblaite writing makes such identification difficult. The characteristically Afro-Asiatic "internal a-plural" identified by Greenberg (1955) may be reflected in Akkadian *aḥlāmu* "Arameans," but such a form is likely the borrowing of Proto-Aramaic *ˈaḡlām* "boys, young men." This internal a-plural may also be reflected in Eblaite forms such as <áš-kà-lum> (**ˈatkālum*) "grapes" or <a-sa-lu> (**ˈaˈšālu*) "rushing," in each case prefixed with **ˈa-*, as in the Arabic pattern *ˈaf^ˈāl*. Non-prefixed forms may be reflected in Eblaite <si-kà-ri>

(*sikāri*) "stories," akin to the Arabic *faʿāl* pattern. Finally, a lengthened final *ī is likely reflected in Eblaite forms such as <sa-i-lum/sa-ī-lu-um> (ša ʿirum) "grains of barley," parallel to Arabic *faʿīl*.

Broken plurals are unattested in Ugaritic, although again the nature of the written language may conceal plurals formed by gemination, changes in vocalism, or changes in the prosodic shape of the noun stem. Such broken plurals clearly must have been present in the common Northwest Semitic ancestor, because both Hebrew and Aramaic reveal archaic broken-plural forms. In Hebrew, particularly well-preserved in the Masoretic vocalization tradition, are irregular plurals formed by second-radical gemination such as ʿāqēḇ vs. ʿiqqəḇ-ē/-ōt "heels" or ʿēnāḇ vs. ʿinnəḇ-ē "grapes." The internal a-plural formation survives in the plural forms of the segolate nouns, as in Hebrew *məlek* vs. *məlākīm* (**malk* vs. **malakīm*) or Samaritan Aramaic *rəgēl* vs. *rēgālen* (*riḡl* vs. *riḡalīm*), which are clearly old internal a-plurals to which the sound plural morphemes have been later added in an over-regularization error.

As we have mentioned previously, broken plurals are remarkably common in Arabic, both in the number of nouns whose plural formations are broken, and also in terms of the number of distinctive formations present. Classical Arabic grammarians recognized approximately 30 distinct pluralization patterns, the total of which have been provided in the table above. When we turn our attention to the Ethiopic languages, we find that Geʿez exhibits ten distinct patterns of broken-plural formation for trilateral nouns, including *qətāl* (Arabic *fuʿal* and *fiʿal*), *qəṭul* (Arabic *fuʿūl*), *qätäl* (Arabic *faʿal*), *qätält* (Arabic *faʿalat*), *qättält* (no direct Arabic cognate, see *fuʿal*), *qəttal* (Arabic *fuʿal*), ʿäqtäl (Arabic ʿafʿul), ʿäqtält (Arabic ʿaqtilat), ʿäqtal (Arabic ʿafʿäl), and äq-tul (long variant of Arabic ʿafʿul), as well as a few additional patterns for quadrilateral nouns. The nature of Epigraphic South Arabian writing makes the identification of internal plurals formed solely via vowel apophony, consonant gemination, or change of prosodic shape of the stem effectively impossible, but their existence can be inferred by written broken plurals such as <fʿl>, <fʿlt>, <fʿwl>, <fʿwlt>, <fʿyl>, <fʿylt>, <fʿlw>, <fʿln>, <ʿfʿlt>, <ʿfʿlw>, all of which indicate plural nouns, and none of which exhibit the sound-plural suffixes of Epigraphic South Arabian. The broken-plural patterns of the Modern South Arabian languages are less well-studied and categorized, but Lipiński remarks that these show "more similarity to those of Ethiopic than to those of Arabic."

3.1.4.2.2 Elements of Broken-Plural Formation

Although the range of possible broken-plural patterns across Semitic is considerable, a closer examination of these forms reveals that these patterns are themselves composed of a number of distinct and repeating elements which can be combined to form more complex broken-plural formations. As we shall see, the relationship between the presence of these formatives and the types of broken plural patterns is not arbitrary. Rather, only a subset of the logically possible combinations of affixes of stem shapes occurs, and, as we will demonstrate, we can predict not only those forms which occur, but also those forms which sys-

tematically fail to appear, by examining the way that these affixes interact with syncopation to produce (or never produce) certain prosodic patterns.

For our purposes, we will not consider the issue of vowel apophony. As discussed in section 2.3, we argue that vowel apophony and prosodic stem-shape alternations are originally separate morphological processes, and since the rule of syncope treats all short vowels as essentially identical, it will have no impact on the analysis presented here.

’a-

Broken plurals formed with the prefix *’a- are common across Semitic. They are reflected in the ’af’ul, ’af’ilat, ’af’āl, and ’af’ilā’ patters of Arabic, the <āš-kā-lum> *atkālum pattern of Eblaite, the ahlāmu pattern of Akkadian (if this form is native), the ’äqtəl, ’äqtəlt, ’äqtal, and ’äqtul patterns of Ethiopic, and the <’f’lt> and <’f’lw> patterns of Epigraphic South Arabian. As the dat reveals, for all those patterns for which we have reconstructable phonological or prosodic information (all those besides ESA), the *’a- prefix does not co-occur with nominal root shapes of all the logically possible forms. Rather, they occur effectively only with (triliteral) roots of the form CCVC. Critically, there is a curious absence of broken plurals of the ’a-CVCVC, although nothing about the heretofore established rules of Semitic syllable structure or prosody would appear to prohibit such forms.

A templatic theory can stipulate this conspiratorial gap into existence. CCVC is the pattern that happens to co-occur with the *’a- prefix, and the others are not. But it has no explanation for why this should be the stipulation as opposed to any other logically possible stipulative rule. Our theory of syncopation does better. According to our theory, the co-occurrence of *’a- with the CCVC nominal shape is the logical fallout of the fact that the presence of the prefix will naturally trigger the syncopation of an underlying CVCVC nominal stem. The conspiratorial absence of *’aCVCVC is no conspiracy at all. Rather, such forms are ungenerable from a prefix of the form *’a- and a root of the form CVCVC. Any combination of these two morphemes will result in syncopation to ’aCCVC. Syncopation can *only* be blocked by the lengthening of the first syllable of the nominal stem (CVCCVC, CVCVC). The confluence of these facts explains the gaps in attested broken-plural patterns. Observe the derivations below.

(52) *Derivation of *’a- Prefixed Plurals*

| | | | | |
|-----------------|-----------------------|-----------------------|------------------------|-----------------------|
| | CVCVC | CVC \bar{V} C | CVCCVC | C \bar{V} CCVC |
| Underlying Root | fa ^ˈ ul | fa ^ˈ āl | fa ^ˈ ˈal | fā ^ˈ al |
| | ↓ | ↓ | ↓ | ↓ |
| ˈa- Prefix | ˈa-fa ^ˈ ul | ˈa-fa ^ˈ āl | ˈa-fa ^ˈ ˈal | ˈa-fā ^ˈ al |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | ˈaf a ˈul | ˈaf a ˈāl | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | ˈa-f ^ˈ ul | ˈaf ^ˈ āl | ˈafa ^ˈ ˈal | ˈafā ^ˈ al |

CVC₂C₂VC

Broken plurals formed via gemination are among the most common patterns found throughout Semitic. They are reflected in the fu^ˈˈal and fu^ˈˈāl patterns of Arabic, the *bakkaru* pattern of Akkadian, the **dubbarū* pattern of Eblaite (assuming this form is reconstructed properly), the *ˈiqqəbē* form of Masoretic Hebrew, and the *qättält* pattern of Ge'ez. Such forms are unrecoverable from Epigraphic South Arabian, as gemination is not typically indicated in the script.

One of the striking features of geminated broken plurals (or of verbal forms exhibiting second-radical gemination, such as the D-Stem or Imperfective aspectual stems) is that they are effectively invariant, save for possible lengthening of the final vowel of the stem. We suggest that this fact can be accounted for via our syncope analysis. The addition of a prefix or suffix to a geminated CVCCVC root form cannot ever result in syncope, since there are no light syllables present outside of the prefix. In the sample derivations below, we demonstrate how the presence of either prefixes or suffixes is unable to alter the shape of the plural form.

(53) Derivation of CVC₂C₂VC Plurals

| | | | | |
|-----------------|------------------------|------------------------|------------------------|----------------------------|
| | CVCCVC | CVCCVC | CVCC \bar{V} C | C \bar{V} CC \bar{V} C |
| Underlying Root | fu ^ˈ ˈal | fu ^ˈ ˈal | fu ^ˈ ˈāl | fu ^ˈ ˈāl |
| | ↓ | ↓ | ↓ | ↓ |
| CV- Prefix | CV-fu ^ˈ ˈal | fu ^ˈ ˈal | CV-fu ^ˈ ˈāl | fu ^ˈ ˈāl |
| | ↓ | ↓ | ↓ | ↓ |
| -VC Suffix | CVfu ^ˈ ˈal | fu ^ˈ ˈal-VC | CVfu ^ˈ ˈāl | fu ^ˈ ˈāl-VC |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | CVfu ^ˈ ˈal | fu ^ˈ ˈalVC | fu ^ˈ ˈal | fu ^ˈ ˈalVC |

It is important to mention that, at least in the case of the geminated broken plurals, such invariance need not be accounted for only via syncope. So long as the second consonant is geminated, the loss of any other vowel in the nominal stem would result in an illicit consonant cluster (**ˈa-C₁C₂C₂VC* and **C₁VC₂C₂C-ān* both contain ill-formed syllables in Proto-Semitic). For this

reason, while geminate broken plurals are in accord with our theory of syncopation, they are not exclusively explained by such a theory.

CVCVC̄

Broken pluralization via the lengthening of the vowel of the final syllable is ubiquitous in Semitic. Is it represented by the *fa'āl*, *fi'āl*, *fu'āl*, *fu'ūl*, *fi'ālat*, *fu'ālat*, *fu'āl*, 'af'āl, and *fa'ālā* patterns of Arabic, the *aḥlāmu* pattern of Akkadian, the <āš-kā-lum> (*'atkālum) and also the <sī-kā-ri> *sikāri* patterns of Eblaite, and the *qətul*, *qəttal*, 'äq^tal, and 'äq^tul patterns of Ge'ez. Lengthened-vowel broken plurals are unrecoverable from Epigraphic South Arabian.

At first glance, it may be tempting to link the lengthened-vowel plurals with the internal a-plurals described by Greenberg (1955). For instance, we could attempt to derive a plural form such as *fi'āl* via the following chain *fi'al* → *fi'a* <a> *l* → *fi'āl* by assuming some rule of vowel coalescence. Such an attempt is likely misguided. First, the lengthened broken plurals in Semitic are not limited exclusively to forms with a lengthened final -ā-, as evidenced by the numerous forms above attesting long -ū- or -ī-. Even if we suppose that the coalescence of vowel sequences -aa-, -ia-, -ua- resulted in contractions -ā-, -ī-, and -ū- respectively, this form of internal a-plural formation is otherwise unattested. Greenberg notes that internal a-plural formation takes many forms, including what he terms *intercalation* (Ge'ez 'əzn vs. 'əzän), *replacement* (Hebrew *bēn* vs. *bānim*, Arabic *bint* vs. *banāt*), *dissimilation* (*badrat* vs. *bidar*), *general* (Ge'ez *nəguś* vs. *nägāšt*), and *reduplicative* (Akkadian *šamū* vs. *šamamū*). Internal a-plurals across Afro-Asiatic never exhibit the vowel-hiatus into coalescence behavior proposed here. For this reason, as discussed further in section 3.1.4.2.3 below, it seems more plausible to connect broken plurals of this form to the derived nominals and adjectives with a lengthened final vowel.

As with the other broken-plural forms, patterns with a lengthened final vowel do not co-occur with all logically possible nominal stem shapes. They may co-occur with gemination of the second root-consonant. They may appear with a *CCVC* stem shape (though always with a prefix *CV-*), and can *never* appear with a prefix without also exhibiting a *CCVC* shape; that is to say 'a-*CVCVC* patterns, which are well-formed in terms of syllable structure, are in fact wholly unattested. Again, we can account for this conspicuous gap in a more satisfactory fashion than the stipulation of patterns in a templatic theory. Our account via syncopation both generates those forms attested throughout the family, and also predicts that precisely the unattested 'a-*CVCVC* form should be absent since it is ungenerable.

(54) *Derivation of Lengthened-Final-Vowel Plurals*

| | | | | |
|-----------------|-----------------|---------------------|-------------------|------------------|
| | CVC \bar{V} C | CVC \bar{V} C | CVC \bar{V} C | CVCC \bar{V} C |
| Underlying Root | fi \bar{a} l | fa \bar{a} l | fa \bar{a} l | fu \bar{a} l |
| | ↓ | ↓ | ↓ | ↓ |
| CV- Prefix | fi \bar{a} l | ʾa-fa \bar{a} l | fa \bar{a} l | fu \bar{a} l |
| | ↓ | ↓ | ↓ | ↓ |
| -VC Suffix | fi \bar{a} l | ʾa-fa \bar{a} l | fa \bar{a} l-āʾ | fu \bar{a} l |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | ʾa-f a l | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | fi \bar{a} l | ʾa-f \bar{a} l | fa \bar{a} l-āʾ | fu \bar{a} l |

-(a)t

The use of the suffix **(a)t* as a marker of plurality likely has its roots in the tendency to conflate collective feminine nouns ending in **-t/*-at* with plural forms. Whatever its origin may be, it is relatively common throughout Semitic, being reflected in the *fa \bar{a} lat*, *fi \bar{a} lat*, *fu \bar{a} lat*, *fi \bar{a} lat*, *fu \bar{a} lat*, *fi \bar{a} lat*, and *ʾaf \bar{a} lat* patterns of Arabic, the *qātält*, *qättält*, and *ʾäqtält* patterns of Ge'ez, and the <f \bar{a} lt>, <f \bar{a} wlt>, <f \bar{a} ylt>, and <f \bar{a} lt> patterns of Epigraphic South Arabian.

In contrast, for instance, to the **ʾa-*prefixed plurals or the second-consonant-geminated plurals, the plurals formed by the presence of **-t/*-at* appear to have a freer range of possible nominal stem shapes with which they can co-occur. Such forms can appear with no stem change (*fa \bar{a} lat*, *qātält*), with syncope of the first syllable (*ʾaf \bar{a} lat*, *ʾäqtält*), with gemination of the medial root-consonant (*qättält*), and even with stem-final vowel length (*fi \bar{a} lat*). Indeed, the only stem formation which the broken plural in *-t* appears to disfavor is the segolate *CVCC* shape, with only the relatively uncommon Arabic *fi \bar{a} lat* pattern reflecting such a form. With a templatic theory, there is no a priori reason why this should be the case because, again, both the attested and unattested (or uncommon) forms are well-formed according to the rules of syllabification and syllable structure. For our theory of syncope, the problem is reversed, and therefore simpler. It is not a question of why so few nominal stems of the form *CVCC* appear with the *-t* suffix, rather, it is a question of why even the single form appears at all. This is because under our theory of syncope, the affixation of the feminine suffix **-t* should block the syncope of the final syllable of the nominal stem, as is attested in every broken plural of this type except the Arabic *fi \bar{a} lat* form. We are left with a simpler solution than to appeal to templatic stipulation. We know, independently, that true segolate nouns likely took the allomorph **-at* as their feminine suffix since the affixation of the single consonant **-t* would have produced an ill-formed cluster. The *fi \bar{a} lat* pattern therefore likely began its existence as a group of collective feminine segolate nouns. In the process of vowel apophony and stem allomorphy undergoing grammaticalization (as has likely occurred in, for instance, Arabic) this group was included as a potential source of lexical analogy and new members were added to the class. The remaining

classes we may derive is in the examples provided below.

(55) *Derivation of *-t Suffixed Nouns*

| | | | | |
|--------------------|----------|------------|-----------|----------|
| | CVCVC | CVCVC | CVCVC | CVCCVC |
| Underlying Root | fa' al | fa' al | fa' al | qattal |
| | ↓ | ↓ | ↓ | ↓ |
| CV- Prefix | – | 'a-fa' al | 'a-fa' al | – |
| | ↓ | ↓ | ↓ | ↓ |
| CVCVC̄ Lengthening | – | – | 'afa' āl | – |
| | ↓ | ↓ | ↓ | ↓ |
| -t Suffix | fa' al-t | 'afa' al-t | 'afa' ālt | qattal-t |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | 'afa' alt | 'afa' ālt | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | fa' alt | 'af' alt | 'af' ālat | qattal |

-ān

Although somewhat less common throughout the Semitic daughter languages, the broken-plural formation featuring the suffix **-ān* is solidly reconstructable to Proto-Semitic due to its cognate attestation in the Berber languages, in which it appears as the formative of the broken plural class 3 (Tuareg: *adkær* vs. *idokrân*). It is attested within Semitic primarily in the form of the Arabic plural patterns *fi' lān* and *fu' lān*, as well as the <f'ln> pattern of Epigraphic South Arabian. The Semitic broken plurals in **-ān* only co-occur with syncopated *CVCC* nominal stem shapes, precisely parallel to those attested with Class 3 broken plurals in Berber. This is, again, predictable. The presence of the suffix triggers syncope of the second root-vowel. This syncope to *CVCCān* means that the first syllable, which is now closed and heavy, cannot itself be subject to syncope. A simple derivation is provided below.

(56) *Derivation of *-ān Suffixed Nouns*

| | |
|-----------------|-----------|
| | CVCVC |
| Underlying Root | fi' al |
| | ↓ |
| -ān Suffix | fi' al-ān |
| | ↓ |
| Syncopate | fi' alān |
| | ↓ |
| Output | fi' lān |

Internal <a>

Although the oldest of the broken-plural formations reconstructable for the Afro-Asiatic family as a whole, the internal a-plural is somewhat less common than the other types documented in the summary above. It is reflected most clearly in the irregular plural forms of the segolate nouns of Hebrew and Aramaic. Such nouns exhibit a *CVCC* nominal stem in their singular forms, but the plurals reflect an infix <a> vowel between the second and third root-consonants (Hebrew *mēlek* vs. *mālākīm*, *kēleb* vs. *kālābīm*, *ʿereṣ* vs. *ʿarāṣōt*). The internal a-plural is also likely reflected at least in part in broken plurals such as the Arabic *faʿal*, *fiʿal*, *fuʿal*, *faʿalat*, *fiʿalat*, *fuʿalat*, and *fuʿal* patterns, as well as the *qətāl*, *qātāl*, *qātālt*, and *qāttālt* patterns of Geʿez. It is also reflected in sporadic, apparently irregular, plurals such as Arabic *bint* vs. *banāt*, Akkadian *alaktu* vs. *alkakātu*, or Akkadian *mû* vs. *mamû*.

For the purposes of syncope, it is only those types of internal a-plurals which alter the syllable structure of the nominal stem which are of interest. This means Greenberg's intercalating and reduplicative types, since the others simply replace one vowel quality with <a>, without disrupting the prosodic form of the word. Within Semitic, the intercalating internal a-plural is limited to the segolate plurals of Hebrew and Aramaic. Since this process of plural formation involves the insertion of the a-plural infix between the second and third root-consonant of the segolate nouns, it clearly changes the syllabification and syllable structure of the nominal stem. At the same time however, it is only able to create *CVCVC* stem shapes (a light syllable followed by a word-final heavy one). This means that it should be predicted not to interact meaningfully with syncope since neither the *CVCC* singular forms nor the *CVCVC* plurals contain a sequence of syllables which can be syncopated under our rule¹²⁴.

For this reason, it is only reduplicative plurals which we predict may interact with our rule of syncope, and indeed we do find sparse evidence for this. Reduplicative plurals are attested in Semitic primarily from Akkadian, in irregular and sporadically attested plurals such as **šamamû*¹²⁵ "heavens," or *alkakātu*

¹²⁴An objection could be raised that a reconstructable sequence such as Proto-Hebrew **malakīm*, underlying *mālākīm*, contains precisely such a sequence. It must be noted, however, that the sound-plural suffix *-īm* is clearly an innovation here, since other fossilized intercalated plurals from across Semitic clearly lack them (Arabic *hīr* vs. *hīrarat*, Geʿez *ʿəzn* vs. *ʿezän*). For this reason, we should rightly suppose that the forms that Proto-Hebrew or Proto-Canaanite inherited were in fact **malk* vs. **malak*, and that the addition of the sound-plural suffix was a later development internal to these languages and post-dating the decline of synchronic syncope.

¹²⁵This word is typically reconstructed as **šamāmû* in order to account for the absence of syncope. It is, however, according to the University of Chicago's Assyrian Dictionary, rarely (never?) spelled with full plene writing which would confirm the presence of a long vowel. We propose the alternative theory that the form is indeed **šamamû*, with the sound-plural suffix being a later morphological leveling intended to make the form more apparently plural, as the old internal a-plurals were mostly dying out in Proto-Semitic. This further means that, despite the conventional reconstruction of the singular as Proto-Semitic **šamāy*, the reduplicated plural **šamam* is reflecting an original biconsonantal **šam*, potentially also attested in the proposed Egyptian cognates from the Coffin Texts <šim> "fog," which has itself been extended to triconsonantal form, but via the addition of an internal consonant. For the semantic relationship heavens vs. fog, see the related Akkadian word *šamû/šamûtu* "rain."

"roads." It is only the triconsonantal forms in which we expect to see syncope-related alternations, and indeed, these are the forms we find, as demonstrated in the derivations below (note that we assume the sound-plural morphemes are a later addition in a process of morphological leveling, post-dating synchronic syncope).

(57) *Derivation of Reduplicative Internal a-Plurals*

| | | |
|-----------------|------------------|------------------------|
| | CVC | CVCVC |
| Underlying Root | šam | ʾalak |
| | ↓ | ↓ |
| Redup. <a> | šam-am | ʾalak-ak |
| | ↓ | ↓ |
| Syncopate | — | ʾalakak |
| | ↓ | ↓ |
| Output | *šamam → šamam-ū | *ʾalakak → ʾalakak-ātu |

3.1.4.2.3 On the Origin of Broken Plurals

A number of the broken-plural formatives identified above are identical to those discussed in Section 3.1.3 as derivational formatives common to Semitic. Such overlapping forms include the prefix *ʾa- and the suffix *-ān. We have also noted that the gemination of medial root-consonants and the lengthening of final vowels is a common feature in the derivation of verbal participles and adjectives throughout Semitic. Indeed, the only relatively common broken-plural formative which does not share its form with a derived nominal in Semitic are the internal a-plurals, which are known to be exceedingly archaic even by the time of Proto-Semitic.

For these reasons, it is not implausible to suppose that many of the broken-plural formations characteristic of Semitic began originally as derived nominals of one sort or another. Indeed, they are morphologically often indistinguishable from one another. But this theory immediately raises the question as to why derived nominals of this sort, which were presumably morphologically singular, would become reanalyzed as plurals, or, further, why singular nouns, which presumably had sound-plural forms in Proto-Semitic, should require or allow these derived nominals to become their plurals. While it is beyond the scope of this dissertation proper to assess the precise mechanism of the origin of such forms, suffice it to say that the overlap in formatives present, and stem shapes attested is not coincidental, being rather the natural outcome of the affixation of these formatives and subsequent syncope of the nominal stems.

3.2 Verbal Morphology

The verbal morphology of Semitic is largely inherited from its Afro-Asiatic ancestor. It retains the archaic prefixing conjugation, the suffixing stative conjugation, and the major derived stem types. To the extent that such endings

are recoverable, the actor affixes of Semitic, both prefixing and suffixing, are cognate with the other endings reconstructable from Egyptian, Berber, and Cushitic. Indeed the only major innovation on the part of the Semitic verbal system is the almost total absence of biliteral *CVC* verbal roots or patterns of biliteral verb inflection, presumed to be the more archaic form on the basis of the other Afro-Asiatic daughters. In this section, we will discuss the inheritance of the Afro-Asiatic verb into Semitic, as well as the inheritance of those patterns generated by syncope. We will likewise discuss those verbal formations unique to Semitic and commonly regarded as Semitic internal innovations. We will demonstrate how these innovative forms can also be accounted for using an analysis of syncope.

3.2.1 Inherited Verbal Stems

3.2.1.1 Suffix-Conjugation

3.2.1.1.1 G-Stem

The suffix-conjugation within Semitic shows a distinction between two primary classes of suffix endings, which correspond to two different attested shapes of the verbal stem. The East Semitic suffix-conjugation, as represented by Akkadian (and perhaps Eblaite, depending on one's Semitic internal classification), reflects endings of the form **-āCV* for the second and first persons, both singular and plural¹²⁶. Concomitant with these suffix forms, the Akkadian (and perhaps Eblaite) suffix-conjugation reflects an alternation within the triconsonantal verb stem (the only verbal stem type which survives in Semitic) between a segolate *CVCC* shape and non-segolate *CVCVC* shape. In the other Semitic branches, we find that the cognate subject-suffixes lack the long vowel *-ā-* which appears between the verbal stem and the consonant of the ending itself. Sample forms are provided below.

| | | Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez | Mehri |
|---------|---|----------------------|-------------|------------|----------|------------|----------|
| 1st Sg. | | *qatalku/qatlāku | parsāku | fa'altu | pā'altī | qätälku | kətəbk |
| 2nd Sg. | M | qatalta/qatlāta | parsāta | fa'alta | pā'altā | qätälkä | kətəbk |
| | F | *qatalti/qatlāti | parsāti | fa'alti | pā'alt | qätälki | kətəš |
| 3rd Sg. | M | *qatal(a)/qatil | paris | fa'ala | pā'al | qätälä | kətüb |
| | F | *qatal(at)/qatl(at) | parsat | fa'alat | pā'alah | qätälät | kətübüt |
| 1st Pl. | | *qatalnu~a/qatlānu~a | parsānu | fa'alnā | pā'alnū | qätälñä | kətübən |
| 2nd Pl. | M | *qataltun/qatlātun | parsātun(u) | fa'altum | pə'altəm | qätälkəmmu | kətəbkəm |
| | F | *qataltin/qatlātin | parsātin(a) | fa'altunna | pə'alten | qätälkən | kətəbkən |
| 3rd Pl. | M | *qatalū/qatlū | parsū | fa'alū | pā'alū | qätälu | kətawb |
| | F | *qatalā/qatlā | parsā | fa'alna | | qätälä | kətüb |

Figure 3.7: Suffix-Conjugation Forms in Semitic

¹²⁶The status of duals is somewhat unclear, though these may lack the characteristic long vowel.

Notwithstanding the potential alternation between the a-i vocalism of the stative forms of East Semitic and a-a vocalism of the perfect formations outside of East Semitic, these forms, as well as the alternations associated with them, may be generated comparatively easily using an analysis of syncopation. Example derivations for first and second person forms are provided below.

(58) *Derivation of Long and Short Suffix-Conjugation in Semitic (1st~2nd Persons)*

| Underlying Root | Long Form Stative | Short Form Perfect |
|-----------------|-------------------|--------------------|
| | qatil | qatal |
| | ↓ | ↓ |
| -(ā)CV Suffix | qatil-āku | qatal-ku |
| | ↓ | ↓ |
| Syncopate | qatīlāku | qatalku |
| | ↓ | ↓ |
| Output | qatlāku | qatalku |

The forms of the third persons require some additional comments, and we will discuss each in turn before we provide a complete derivation of forms. The third-person masculine singular form appears most often either with zero overt marking or with an **-a* suffix. The form with the **-a* suffix appears to characterize Classical Arabic, Ge'ez, and likely Mehri and Ugaritic, though it is noticeably absent from syllabic renderings of Ugaritic proper names. It must also underlie the forms of Classical Hebrew and Aramaic, although it is nowhere attested as such. The zero-suffixed form appears in Akkadian, Eblaite, and the early Canaanite of the Amarna letters. In ascertaining which form is original, we may consider the fact that, as discussed in section 1.3.2.2.2, archaic names formed using suffix-conjugated verbs in both Arabic and Ge'ez lack the *-a* suffix which comes to characterize such forms in the later classical languages. For this reason, we will suppose that the unmarked form is the original form of the third masculine singular, and the **-a* suffixed form is an innovation¹²⁷.

On the form of the third feminine singular, the Semitic languages are in almost complete agreement. In each daughter, the form of the third feminine singular suffix is basically identical with whatever form the nominal feminine affix has taken in that language, most typically pointing to a reconstruction **-at*. Note however, that we have presented evidence previously that within Semitic specifically, and Afro-Asiatic more generally, the form of the feminine nominal suffix should likely be reconstructed as **-t*. If we accept this proposal, as well as the idea that the third feminine singular of the suffix-conjugation shared its form with that of the singular feminine nominal, we must conclude that this form originally would have been marked by a **-t* suffix only, and that

¹²⁷For further discussion on the source of the variant with the **-a* suffix and the origin of the suffix itself, see the discussion in Satzinger (1998), in which he equates the **-a* suffix of the Semitic suffix-conjugation with the **-a* suffix of the Semitic accusative case and the **ā-* prefix of the Berber free state (effectively an all-purpose non-nominative "absolute" case).

the presence of the *a vowel in the ending was an innovation of Proto-Semitic, possibly owing to the presence of syncopated, superficially segolate verbal root forms which have appeared to take the *-at feminine allomorph.

Regarding the forms of the third person plural, the Semitic daughters are not in complete agreement, but it seems entirely clear that the the third plural suffixes share their form with the masculine (*-ū) and feminine (*-ā(t)) nominal plural morphemes. Indeed, for all 3rd person suffix-conjugation forms, the endings of the verb appear to resemble the nominal endings of the corresponding number and gender, as presented in the table below.

| | | |
|----|-----|-----|
| | Sg. | Pl. |
| M. | -∅ | -ū |
| F. | -t | -ā |

Figure 3.8: Nominal and 3rd Person Suffix-Conjugation Endings

If we accept these reconstructions as the original form of the third person suffix-conjugation endings for Proto-Semitic or pre-Proto-Semitic, then our theory of syncopation predicts that we ought to see zero syncopation and the fully vocalized *CVVCV* forms in the singulars, but syncopation into the *CVCC* root shape for the plurals, as presented in the derivations below.

(59) *Derivation of 3rd Person Sg. vs. Pl. Suffix-Conjugation in Semitic*

| | | |
|-----------------|----------------------------|----------------|
| | F. Sg. | F. Pl. |
| Underlying Root | qatil | qatil |
| | ↓ | ↓ |
| Suffix | qatil-t | qatal-ā |
| | ↓ | ↓ |
| Syncopate | – | qatīla |
| | ↓ | ↓ |
| Output | **qatilt → *qatilat | qatlā |

What we find throughout Semitic is, in our opinion, rather a case of leveling in each direction. In East Semitic, where syncopation is either still active, or was active in the recent history of the branch, the syncopated form is leveled and expanded to any form where it might apply, even those forms such as the feminine singular, which might not originally have triggered syncope. In the other branches outside of East Semitic, where syncopation is lost comparatively early on, those forms without syncopation are generalized, both those that originally ought to have syncopated, such as the plurals, as well as for innovative forms that come to meet the requirement, such as the feminine singular and the innovative masculine singular in *-a.

Despite this process of generalizing either the extended long-form suffix-conjugation in $*\bar{a}CV$ with concomitant syncopation, or the short form in $*CV$ with no syncopation, we may ask if there is any evidence for a split paradigm, featuring syncopation in the vowel-initial third person forms, but lacking syncopation for the consonant-initial first and second person suffixes. We may find such evidence in the paradigms of the Ethiopic descendent of the suffix-conjugation, the Perfect. We have here presented the third person forms of the Ge'ez Perfect as *qätälä/qätälät/qätäla/qätälu*, but this is something of an oversimplification. There are in fact two distinct types of Perfect verbal formations in Ge'ez; the *qätälä* type and the *läbsä* type. The *qätälä*, which we have presented and discussed to this point, typically consists of transitive verbs, and is characterized by a ä-ä ($*a\text{-}a$) vocalism, as well as an invariant $C\bar{u}C\bar{u}C$ root structure in all persons and numbers. The *läbsä* type, on the other hand, consists largely of intransitive verbs. It is characterized by ä-ä vocalism in the first- and second- person forms, but by a ä-∅ vocalism in all third-person forms. Compare the two paradigms below.

| | | <i>qätälä</i> | | <i>läbsä</i> | |
|-----|----|---------------|-----------|--------------|-----------|
| | | Sg. | Pl. | Sg. | Pl. |
| 1st | | qätälku | qätälnä | läbäsku | läbäs" a |
| 2nd | M. | qätälka | qätälkämu | läbäska | läbäskämu |
| | F. | qätälki | qätälkäḥ | läbäsiki | läbäskäḥ |
| 3rd | M. | qätälä | qätälu | läbsä | läbsu |
| | F. | qätälät | qätäla | läbsät | läbsa |

Figure 3.9: *qätälä* and *läbsä* Type Perfects in Ge'ez

Given the split between the transitive *qätälä* type and the intransitive/stative *läbsä* type, and the fact that the *läbsä* type, like the Akkadian stative, is the type which exhibits syncopation in those forms featuring vowel-initial endings, we may suppose that these are the archaic remnants of the syncopation which originally characterized the full stative paradigm.

3.2.1.1.2 Derived Stems

In the suffix-conjugation, we will consider all of the derived-stem forms together since they pattern together and do not exhibit any peculiar behavior as it pertains to our analysis of syncopation. The Š- and N- stems are formed by the addition of derivational prefixes of the form $*C\bar{v}\text{-}$ to the vocalized verbal stem $CaCVC$. The presence of this affix triggers syncopation¹²⁸ of the initial vowel in

¹²⁸As we will demonstrate below, Semitic has begun to follow in the footsteps of Cushitic in terms of losing the persistent application of syncope, and the surface opaque forms which result from it. This is demonstrated in our derivation, in which the T- and N- stems do not undergo syncopation at each step throughout the course of the derivation. Such differences

the root, between the first and second root-consonants. The T-Stem is unique because its derivational affix has become an infix, which appears infixed one minimal syllable (*CV* in Semitic) from the left word-edge. This infix then undergoes the typical syncope predicted by our analysis. Sample forms and derivations are provided below. For a more in-depth treatment of the derived stems, consult sections 3.2.1.3, 3.2.1.4, and 3.2.1.5 below.

| | Proto-Semitic | Akkadian | Arabic | Ugaritic | Ge'ez | Mehri |
|--------|----------------------|-----------|------------|-------------|----------|-------------------|
| Š-Stem | *šuqtulaku/*šuqtulku | šuprusāku | ʾafʿalti | *šapʿaltī | ʾäqtälku | hərkəbk |
| N-Stem | *naqtulaku/naqtulku | naprusāku | ʾinfaʿaltu | *napʿaltī | – | – |
| T-Stem | *qittulaku/*qittulku | pitrusāku | ʾiftaʿaltu | *ʾiptaʿaltī | – | natfəzək/əftəkərk |

Figure 3.10: Derived-Stem Forms in Semitic

Particular attention must be paid to the tendency for the languages outside of East Semitic to develop forms which are prefixed with the so-called "prothetic aleph." The origin of this *ʾi-/ʾa- prefix cannot be known with complete certainty. Based on the morphological similarity between the two forms, some attempts have been made to connect this mysterious prefix with the prefix of the derived Š-Stem. Possible support for such a conclusion may be found in transitive ʾān- initial forms in Ethiopic, which are transitive despite the presence of the N-Stem prefix. On the other hand, this co-occurrence between the prothetic aleph and transitive meaning is largely unattested outside of Ethiopic, and furthermore, forms exhibiting the prothetic aleph occur even in languages such as Ugaritic, in which the form of the form of the Š-Stem has not undergone debuccalization and was still realized with a coronal obstruent. For this reason, it seems unlikely that the prothetic aleph and the Š-Stem were originally related.

Regardless of its possible origin, the form of the verbal stems affixed with the prothetic aleph is predicted perfectly by syncope, and our analysis explains an inconsistency present in the typical account of such forms. Under the conventional analysis, the prothetic aleph is, quite literally, prosthetic. It is typically thought of as a purely phonological insertion caused by the unpronounceable cluster at the beginning of the derived stem (*-nf-*, *-ft-*). Such an account is plausible synchronically, but it cannot represent the diachronic origin of such forms. The first step of this proposed series of changes is the loss of the initial vowel, generating the cluster which will subsequently require the presence of the prothetic aleph to resolve it and allow it to be articulated. The loss of these initial vowels would appear to be an unconditioned, non-regular change whose environment is completely arbitrary. Second, consideration of the T-Stem reveals that it is not merely the absence of that initial vowel which distinguishes

are undetectable at the surface level, however, as the absence of an inflectional prefix to the left of the derivational prefix results in identical surface forms which mask the difference in the derivations.

the prosthetic aleph forms from the normal derived stems. To reckon from Akkadian, the form of the suffix-conjugation T-Stem was **CVtCVC* (*pitrus*). This is confirmed by the presence of the clearly cognate stem shape *natfəz* in Mehri. Mehri also possesses, however, a T-Stem form with the prosthetic aleph. Comparison of the two, *natfəz*~*eftəkər*, reveals that what distinguishes one form from the other is, in fact, the relative position of the T-Stem infix, which is adjacent to the initial root consonant in forms with prosthetic aleph, but adjacent to the second root-consonant in the basic form (as it is in Akkadian). These positions are precisely those are predicted and generated using our theory of syncope. We can therefore account for this otherwise unprincipled and stipulated variation between the apparent position of the derivational affix without the need to add any further complexity to the grammar, since this variation is an epiphenomenal outcome of syncope and a change in the number of syllables present in the word. Consider the full derivations below for derived suffix-conjugation.

(60) *Derivation of Semitic Derived-Stem Suffix-Conjugation*

| | Š-Stem | N-Stem | T-Stem | Prosthetic T-Stem |
|--------------------------|---------------------------|------------------|---------------------------|-------------------------------|
| Underlying Root | qitul | qitul | qitul | qitul |
| | ↓ | ↓ | ↓ | ↓ |
| Derivational Affix | š <u>u</u> - qitul | na- qitul | qi <ta> tul | qi <ta> tul |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate ¹²⁹ | š <u>u</u> qitul | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Prosthetic Aleph | – | – | – | ^ʾ iqitatul |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | na qitul | qita tul | ^ʾ iqita tul |
| | ↓ | ↓ | ↓ | ↓ |
| Output | š <u>u</u> qtul | na qtul | qittul | ^ʾ iqatul |

3.2.1.2 Prefix-Conjugation

3.2.1.2.1 G-Stem

The prefix-conjugation inherits from Afro-Asiatic the split between the unmarked perfective and the geminate imperfective. To these, Semitic has added a novel perfect form, indicated by an infixed <ta> morpheme. We will discuss each and demonstrate how the attested forms may be generated via syncope.

The perfective is the most widely attested and invariant Semitic verbal formation, being attested in every major Semitic branch and language. In each case, the perfective verbal formation, regardless of the particular semantics which it has developed, is characterized by a *CCVC* root shape.

¹²⁹As we will discuss in later sections, the derived stems of Semitic are split between the Š-Stem, which retains the archaic structure (in which the application of the affix triggers a round of syncope), and a more transparent system in which the affixes do not trigger syncope, and rather the whole word is subjected to a final round of syncope before output.

| | | Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez | Mehri |
|---------|---|---------------|----------|----------|-----------|---------|----------|
| 1st Sg. | | *'aqtal | aprus | 'af'alu | 'ep'al | 'əqtəl | əktēb |
| 2nd Sg. | M | *taqtal | taprus | taf'al | tip'al | təqtəl | təktēb |
| | F | *taqtaḥ | taprusi | taf'alna | tip'alī | təqtəli | təktēbi |
| 3rd Sg. | M | *yaqtal | iprus | yaf'alu | yip'al | yəqtəl | yəktēb |
| | F | *taqtal | taprus | taf'alu | tip'al | təqtəl | təktēb |
| 1st Pl. | | *niqtal | niprus | naf'alu | nip'al | nəqtəl | nəktēb |
| 2nd Pl. | M | *tiqtalū | tiprusā | taf'alū | tip'alū | təqtəlu | təktēbəm |
| | F | *tiqtalā | | taf'alna | tip'alnāh | təqtəla | təktēbəm |
| 3rd Pl. | M | *yiqtalū | iprusū | yaf'alū | yip'alū | yəqtəlu | yəktēbəm |
| | F | *yiqtalā | iprusā | yaf'alna | yip'alnāh | yəqtəla | yəktēbən |

Figure 3.11: Perfective Forms in Semitic

The imperfective is somewhat less widespread, being attested unambiguously in only East Semitic and Ethiopic, with traces or potential forms in South Arabian, Pre-Classical and Andalusī Arabic, Epigraphic South Arabian, and Eblaite, if one does not include that language in East Semitic. A sample of attested forms are presented below.

| | | Proto-Semitic | Akkadian | Andalusī Arabic | Ge'ez | Mehri |
|---------|---|---------------|-----------|-----------------|-----------|-----------|
| 1st Sg. | | *'aqattal | aparras | niqabbal | 'əqättəl | əkütəb |
| 2nd Sg. | M | *taqattal | taparras | tiqabbal | təqättəl | təkütəb |
| | F | *taqattalī | taparrasi | | təqättəli | təkütəb |
| 3rd Sg. | M | *yaqattal | iparras | yiqabbal | yəqättəl | yəkütəb |
| | F | *taqattal | taparras | tiqabbal | təqättəl | təkütəb |
| 1st Pl. | | *niqattal | niparras | niqabbalu | nəqättəl | nəkütəb |
| 2nd Pl. | M | *tiqattalū | tiparrasā | tiqabbalu | təqättəlu | təkətəbəm |
| | F | *tiqattalā | | | təqättəla | təkətəbən |
| 3rd Pl. | M | *yiqattalū | iparrasū | yiqabbalu | yəqättəlu | yəkətəbəm |
| | F | *yiqattalā | iparrasā | | yəqättəla | yəkətəbən |

Figure 3.12: Geminated Imperfective Forms in Semitic

We have previously discussed the potential infixing origin of the imperfective stem, but by the time of Proto-Semitic, any traces of an original *<n> infix are gone, with only gemination left as its exponent. Nevertheless, we may still derive the imperfective of Proto-Semitic using ordered rules and affixation by suggesting that it took the form of an infixing mora, which, like its <n> ancestor, infixing itself one complete syllable from the right edge of the word. This will result in its position as extra weight (in the form of gemination) at the end of the first root syllable.

The perfect form, marked with an infixing *<ta>, is even more restricted

in attestation. It is known primarily from Akkadian, Eblaite, Amorite, and possibly Ugaritic. Sample forms are presented below.

| | | Proto-Semitic | Akkadian | Eblaite |
|---------|---|---------------|-----------|--------------------------|
| 1st Sg. | | *'aqtatal | aptaras | *'aštama [◌] c |
| 2nd Sg. | M | *taqtatal | taptaras | *taštama [◌] c |
| | F | *taqtatalī | taparasī | *taštama [◌] cī |
| 3rd Sg. | M | *yaqtatal | iptaras | yištama [◌] c |
| | F | *taqtatal | taptaras | *tištama [◌] c |
| 1st Pl. | | *niqtatal | niptaras | *ništama [◌] c |
| 2nd Pl. | M | *tiqtatalū | tiptarasā | *tištama [◌] cā |
| | F | *tiqtatalā | | |
| 3rd Pl. | M | *yiqatlū | iptarsū | *yištama [◌] cū |
| | F | *yiqatlā | iptarsā | |

Figure 3.13: *<t> Infix Perfect Forms in Semitic

Note that the *<ta> infix perfect is attested outside of East Semitic solely in Amorite, and there only fragmentarily, as in forms such as <ia-ab-ta-ḥa-ar-na> **yabtaḥarna* "he has chosen us." As such, the reconstruction of this form to Proto-Semitic is not without controversy. It has been included here to demonstrate that, regardless of its origin, it presents no problems for our theory of syncopation and can easily be generated using our system. In contrast to the imperfective infix, which from our investigation of other Afro-Asiatic languages we have supposed is infix from the right, the Semitic *<ta> must be infix from a minimally formed syllable (CV in Semitic) from the left word-edge¹³⁰.

(61) *Derivation of Semitic G-Stem Prefix-Conjugation*

¹³⁰Although the landing position of leftward and rightward infixation is identical for trilateral CVCVC verb roots, they differ for quadrilateral and quinquilateral roots, as evident from Akkadian forms such as *inbalakkat*, with gemination one syllable from the right, but *intabalkat*, with <ta> infixation from the left.

| | Perfective | Imperfective | Perfect |
|-----------------|------------------|-----------------------|------------------------|
| Underlying Root | qatal | qatal | qatal |
| | ↓ | ↓ | ↓ |
| Impf. Infix | – | qa<u>tal | qatal |
| | ↓ | ↓ | ↓ |
| Perf. Infix | – | – | qa<ta>tal |
| | ↓ | ↓ | ↓ |
| Prefix | ya- qatal | ya- qattal | ya qatatal |
| | ↓ | ↓ | ↓ |
| Syncopate | ya qatal | – | ya qatatal |
| | ↓ | ↓ | ↓ |
| Output | ya qatal | ya qattal | ya qatatal |

As is apparent from the derivations above, our theory requires that tense/aspect morphemes used in the formation of the verbal stem not trigger a round of syncopation. This makes sense from an Afro-Asiatic perspective, since the two inherited markers, the $-\emptyset$ marker of the perfective and the $*\langle n \rangle$ infix of the imperfective, would result in no change, irrespective of the application of syncope after their affixation, and therefore the simplest hypothesis for the learner would have been that this type of morpheme did not trigger syncopation. Once we assume this, however, we can now generate all attested forms in all tenses/aspects of the G-Stem using a fully vocalized root, a set of ordered rules, and our rule of syncopation, without any need to postulate a consonantal root or a root-and-template morphological system.

3.2.1.3 Š-Stem

The Š-Stem is unique within Semitic in that it is the only inherited derived verbal stem which likewise inherits the morphological property that the derivational verbal prefixes trigger a round of syncope immediately after their affixation, a property which we have assumed is common to Afro-Asiatic, due to its commonality to Berber and Egyptian. In this sense, we may consider Semitic as preserving a stage of development intermediate between that of Berber and Egyptian, where the derivational affixes all trigger syncopation in the midst of verbal derivation before the final finite verb is formed, and that of Beja or Cushitic more generally, in which the syncopation as applied to verbs appears to apply once to the surface form of the verb after its full derivation and inflection. It appears that Cushitic has undergone a rule-reordering of its inherited morphological structure, making it more surface-transparent, and it would appear that Semitic is in the process of doing the same, with only the Š-Stem still retaining the original, more archaic state.

As previously discussed, the Š-Stem, as the inheritor of the Afro-Asiatic S-Stem, is used in the formation of causatives and other transitives, although the factitive function has primarily been assumed by the innovative D-Dtam in Semitic. The Š-Stem is widely attested throughout Semitic, being attested unambiguously in Akkadian, Eblaite, Ugaritic, Arabic, Hebrew, Aramaic, Phoeni-

cian, Ethiopic entirely, Epigraphic South Arabian, and Modern South Arabian. Despite its wide range of attestation, the Š-Stem in Semitic is subject to an irregular sound correspondence. While Akkadian, Eblaite, and Ugaritic reflect their respective sound-change outcomes of Proto-Semitic *š, all remaining languages reflect an irregular change of *š→*h→*’ with the Canaanite and Modern South Arabian reflecting a form in *’ǝ-, with both often being subject to loss and resulting in an initial long vowel in causative stems. Although the change *š→*h→*’ is not regular (conditioned or otherwise) anywhere in Semitic, it should be noted that a perfectly parallel change has occurred to the third person pronominal forms reflecting Proto-Semitic *š as well, so the cognation of the Š-Stem forms is not in question. Sample Š-Stem forms are provided below.

| | Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez | Mehri |
|--------------|---------------|----------|---------|--------|----------|----------|
| Perfective | *yušaqtil | ušapris | yuktibu | yaktīb | yaqtəl | yəharkəb |
| Imperfective | *yušaqtal | ušapras | – | – | yaqättəl | yəhərkūb |
| Perfect | *yuštaqtil | uštāpris | – | – | – | – |

Figure 3.14: Š-Stem Forms in Semitic

The *š of the prefix survives in the forms presented above only in Akkadian, with the others undergoing debuccalization of the initial consonant. The presence of the *š is reflected in the Mehri /h/, still present on the surface, but the consonant has been lost in the other daughters. The Arabic form reflects **yu’aktibu*, the Hebrew **yihaktīb*, and the Ge'ez *ya’aqṭəl*. Like its Afro-Asiatic predecessor, the Semitic Š-Stem still retains the incompatibility between the derivational prefix and the gemination which characterizes the imperfective stem. Gemination does characterize the Ge'ez Š-Stem imperfective, but the innovative nature of this form is confirmed by the agreement of the Akkadian and Mehri¹³¹ Š-Stems, which both lack gemination.

(62) *Derivation of Semitic S-Stem Prefix-Conjugation*

¹³¹The agreement between the East Semitic Akkadian and the South Semitic Mehri confirms that Proto-South Semitic, the ancestor of Ge'ez, must have inherited non-geminated imperfective Š-Stem forms.

| Underlying Root | Perfective qatil | Imperfective qatal | Perfect qatil |
|-----------------|------------------------------|------------------------------|------------------------------|
| ša- Prefix | ša- qatil | ša- qatal | ša- qatil |
| Syncopate | ša q atil | ša q atal | ša q atil |
| Impf. Infix | – | – | – |
| Perf. Infix | – | – | ša<ta> q tal |
| Prefix | yu-ša q atil | yu-ša q atal | yu-šata q atil |
| Syncopate | – | – | yušata q atil |
| Output | *yuš a q at il | *yuš a q at al | *yuš a q at il |

As is clear, we have assumed that the Š-Stem triggers a round of syncopation immediately following its affixation, and likewise, that the Š-Stem is not compatible with the geminated morpheme of the imperfective. With these assumptions, however, we can generate all of our reconstructed forms using only affixation without the need for root-and-template structures.

3.2.1.4 N-Stem

The N-Stem is the first of the derived verbal forms to lose its persistent application throughout the derivation and which therefore is subject to only a single round of the syncope rule, applied to the fully derived and inflected form before its phonological output. As mentioned, this transition from persistent to one-time syncopation is complete in Cushitic, but is still "in progress," so to speak, in Semitic, with only the N-Stem and T-Stem having undergone the change.

The N-Stem was likely common to Semitic, but it can be difficult to identify in those ancient languages with imperfect written traditions (such as Ugaritic or Epigraphic South Arabian) due to the tendency of the *n consonant to assimilate and geminate with whatever consonant with which it is immediately adjacent. Nevertheless, we can identify distinct N-Stem forms in Akkadian, Arabic, the Canaanite languages (excepting Aramaic) and Ugaritic, though only in the suffix-conjugation. The N-Stem is missing entirely from South Semitic (both Ethiopic and Modern South Arabian)¹³². Sample N-Stem forms are provided below.

¹³²As previously mentioned, relic N-Stem forms used in the formation of quadrilateral verbs may be present in Ethiopic, but these are clearly not productive and it seems unlikely the N-Stem survived as a functional class of derived verbs in South Semitic.

| | Proto-Semitic | Akkadian | Arabic | Hebrew |
|--------------|---------------|----------|-----------|----------|
| Perfective | *yanqatil | ipparis | yanfa‘ilu | yiqqāṭel |
| Imperfective | *yanqattal | ipparras | – | |
| Perfect | *yantaqtal | ittapras | – | |

Figure 3.15: N-Stem Forms in Semitic

The derivation of the N-Stem is, in some senses, simpler than that of the Š-Stem, since the derivation no longer involves multiple iterations of syncope, but rather a final process of syncopation which occurs following the addition of the person/actor affixes. This rearrangement of the rule-ordering has led to a surface form which is less opaque to a learner than the Š-Stem of the presumably original form of the Afro-Asiatic N-Stem still attested in Berber. The innovative status of the Semitic N-Stem is further confirmed by its co-occurrence with the gemination characteristic of the imperfective aspect. The co-occurrence restriction between the derived stems and the imperfective gemination is otherwise unexplained and somewhat opaque in its origin, and therefore presumably old. By contrast, the imperfective of the Semitic N-Stem appears to be formed simply by the overt appearance of both morphemes. The surface transparency of the Semitic N-Stem suggests its innovative status vis-a-vis the more opaque Berber and Cushitic N-Stems in this regard. Derivations of these forms are presented below.

(63) *Derivation of Semitic N-Stem Prefix-Conjugation*

| Underlying Root | Perfective qatil | Imperfective qatal | Perfect qatal |
|-----------------|----------------------------|------------------------------|-------------------------|
| na- Prefix | na- qatil | na- qatal | na- qatil |
| Impf. Infix | – | na qa <μ> tal | – |
| Perf. Infix | – | – | na<ta> qatal |
| Prefix | yu-na qatil | ya-na qattal | ya-nata qatal |
| Syncopate | yan qatil | yan qattal | yan taqatal |
| Output | *yan qatil | *yan qattal | *yanta qatal |

3.2.1.5 T-Stem

Although the Semitic T-Stem is inherited from Afro-Asiatic, it has been subject to significant innovative remodeling. In addition to losing the persistent

application of the syncope rule, like the N-Stem (and the opacity of the output that comes along with it), the T-Stem has also modified the form of its derivational affix. Unlike that of Berber or Cushitic, the Semitic T-Stem affix has become infixated into the middle of the verb stem. This innovative position immediately after the initial consonant of the verbal root is reflected in the T-Stems of Akkadian (*imtaḥṣā*), Eblaite (<ti-il-tap-tu> **tiltaptū*), Amorite (<ia-an-ta-qīm> **yantaqim*), Moabite (<'lthm>), Phoenician (<tthpk>), Aramaic (<ygtzr>), Arabic (*'irtafa'a*), Epigraphic South Arabian (<ḏtrrn>), and Modern South Arabian (Mehri *əktəlōf*).

There is, in addition to this, a form with a T-prefix in present in a number of Modern Arabic varieties (*tfa'al*), Aramaic from the 8th century BCE onward (<ytsm'>), as well as in the Ethiopic (*taqatla*). Typically, outgroup analysis would suggest that the presence of the T-prefix in Semitic and in other Afro-Asiatic branches should mean that it is the ancestral form. However, in two of the three attestations (Arabic and Aramaic), it is clearly an innovation, as we can detect and trace its development within the historical record. In addition, while we have no record of Ge'ez ever having an infixated T-Stem, the presence of such infixated forms in both Epigraphic South Arabian and Modern South Arabian suggests that Proto-South-Semitic should be reconstructed with an infix. In this case, a T-Stem with a derivational infix would be the reconstructed form of all major Semitic branches, and it seems clear that such a form should be reconstructed for Proto-Semitic. Sample T-Stem forms are presented below.

| | Proto-Semitic | Akkadian | Arabic | Mehri |
|--------------|---------------|----------|----------|----------|
| Perfective | *yaqtatal | iptaras | yaqtatil | yiqqāṭel |
| Imperfective | *yaqtattal | iptarras | – | |
| Perfect | *yaqtattal | iptatras | – | |

Figure 3.16: T-Stem Forms in Semitic

Why the T-Stem should have undergone this infixation, while the Š- and N-Stems remain in their initial prefixed position, is not entirely clear. One potential explanation may be sought by examining the phonemic inventory which Semitic inherited from Afro-Asiatic. Of the 33 consonant phonemes reconstructed by Orel and Stolbova (1994) and Takács (1999) for Proto-Afro-Asiatic, a full 13 of them are coronal obstruents of one sort or another. It seems plausible, then, to suppose that the infixation may have arisen as an originally allophonic metathesis triggered by the adjacency of a coronal obstruent. Since such segments would have been quite frequent at the beginning of verbal stems, as they would in all words, it would not be implausible for native speakers to simply extend the rule to all verbal forms. The empirical evidence does support the notion of some interaction between the T-Stem affix and an initial coronal, but the direction of the interaction is inconsistent. In Akkadian, for instance, in verbs

beginning with /d/, /t/, /s/, /š/, /z/ (and presumably /t/, though the form is identical in either case), T-Stem forms without prefixes (such as the imperative or stative) appear with the *t-affix in initial, prefixed position (tizkar, tišbutū). On the other hand, in Aramaic, where a prefixed T-Stem appears with most verb forms, the infixed form surfaces in roots beginning with /š/ and /s/. At present, the question of why the Semitic T-Stem should be infixed in contrast to the other derived stems of Semitic and Afro-Asiatic lacks a conclusive answer.

Despite the innovative position of the affix, the attested forms of the T-Stem in Semitic are no less derivable from a vocalized root using syncope. Like the N-Stem, in order to derive the T-Stem, we must suppose that this verbal form has lost the persistent application of syncope throughout the derivation of the verb, with a single round of syncope applying only at the end of the derivation. Again, this has a direct parallel in the verbal formations of Beja and Cushitic, which we will examine in greater detail in Section 6.2.2.2. For our purposes, we will suppose that the T-Stem infix infixes itself into the vocalized verb stem one minimal syllable (which recall is CV in Semitic) from the left edge of the word. Full derivations of each form are presented below.

(64) *Derivation of Semitic T-Stem Prefix-Conjugation*

| Underlying Root | Perfective qatal | Imperfective qatal | Perfect qatal |
|-----------------|----------------------------|------------------------------|--------------------------|
| <ta> Infix | qa<ta>tal | qa<ta>tal | qatatal |
| Impf. Infix | – | qata<μ>tal | – |
| Perf. Infix | – | – | qa<ta>tatal |
| Prefix | ya-qatatal | yaqatattal | ya-qatatatal |
| Syncope | yaqatatal | yaqatattal | yaqatatatal |
| Output | *yaqtatal | *yaqtattal | *yaqtattal |

3.2.2 Innovative Verbal Stems

In addition to those stem forms cognate outside of Semitic and therefore inherited either from Proto-Afro-Asiatic or some more-immediate common ancestral language, Semitic has also developed a number of forms which would appear to be innovations unique to the family, or at least cannot be conclusively linked to verbal formations outside of Semitic. Since these forms are reconstructable for Proto-Semitic, this implies that at some point between the breakup of the most recent common ancestor of Semitic and whichever branch to which it is most closely related, Pre-Proto-Semitic gained these novel forms. Although they cannot be dated to common Afro-Asiatic, it seems clear that these forms developed

at the time when syncope was still an active part of the synchronic grammar of the language, because, as we will demonstrate, the forms of these innovative verbal stems can be predicted and generated using our rule of syncope.

3.2.2.1 D-Stem

The most common and best attested of the innovative derived verbal stems is the D-Stem. The D-Stem (German *Doppelungsstamm*) is so-named because it is characterized morphologically by gemination of the second root-consonant. This is the same morphological indicator of the imperfective verb form, meaning that in all those verbs with the same vocalism, the D-Stem and the imperfective of a verb may be identical. Because of this morphological similarity, attempts have been made to connect the D-Stem with the imperfective, though the semantic variety of the D-Stem makes such connections speculative. By semantic function, the D-Stem sometimes appears far more similar to the Š-Stem because the D-Stem is used in Semitic in the formation of factitives, some causatives and other general transitive verb forms. On the other hand, D-Stem forms may also be multiplicative, expressing repetition, spatial dispersion, or multiplicity of subject or object, all of which may plausibly derive from an originally imperfective verbal formation. The D-Stem is widely attested, being known from Akkadian, Eblaite, Ugaritic, Arabic, Hebrew, Mehri, and Ge'ez. It is attested in every major Semitic branch and is unquestionably reconstructable for Proto-Semitic.

| | Proto-Semitic | Akkadian | Arabic | Hebrew | Ge'ez | Mehri |
|--------------|---------------|----------|-----------------------|----------|----------|----------|
| Perfective | *yuqattil | uparris | yufa ^ʿ ilu | yəqattēl | yəqättəl | yarökəb |
| Imperfective | *yuqattal | uparras | – | – | yəqettəl | yarakbən |
| Perfect | *yuqtattil | uptarris | – | – | – | – |

Figure 3.17: D-Stem Forms in Semitic

Mechanically, the formation of the D-Stem is precisely parallel to that of the imperfective form; namely, the infix of a mora one full syllable from the right. Unlike the imperfective, in which the outside presence of the Beja <n> infix imperfective allows us to reconstruct an original <n> infix for Afro-Asiatic, it is unclear what exactly gave rise to the gemination of the D-Stem. Despite this etymological uncertainty, it is not at all difficult to generate using our account of syncope, and requires only simple affixation. Derivation is provided below.

(65) *Derivation of Semitic D-Stem Prefix-Conjugation*

| | | | |
|-----------------|-----------------------|-----------------------|-------------------------|
| | Perfective | Imperfective | Perfect |
| Underlying Root | qatil | qatal | qatil |
| | ↓ | ↓ | ↓ |
| D-Stem Infix | qa<u>til | qa<u>tal | qa<u>til |
| | ↓ | ↓ | ↓ |
| Perf. Infix | – | – | qa<ta>ttal |
| | ↓ | ↓ | ↓ |
| Prefix | ya-qattil | ya-qattal | ya-qatattal |
| | ↓ | ↓ | ↓ |
| Syncopate | – | – | yaqattal |
| | ↓ | ↓ | ↓ |
| Output | *yaqattil | *yaqattal | *yaqattal |

It is, unfortunately, impossible to recover precisely whether the D-Stem exhibits the gemination of the imperfective. Recall that in both Berber and Cushitic, the geminated/infixated imperfective does not co-occur with the derived stem types. Therefore, if we could conclusively demonstrate that the D-Stem either showed, or failed to show, gemination, it would be relevant evidence for determining how far back the D-Stem can be reconstructed, since it is clear that derived stems with gemination are markedly younger innovations internal to Semitic. Unfortunately, D-Stem forms with or without gemination would likely be predicted to yield the same surface form. The imperfective D-Stem without imperfective gemination would, of course, be marked by gemination of the second root-consonant caused by the infixation of the D-Stem mora infix. At the same time, the imperfective D-Stem *with* imperfective gemination would have the same realization regardless, as the infixation of both the D-Stem infix mora and the imperfective infix mora would result in a super-heavy word-internal syllable. One of these moras could be realized as gemination on the root consonant, but the other simply could not be realized anywhere at that position within a word, since a super-heavy syllable is allowable only word-finally in Semitic, thanks to the extrasyllabic final consonants permissible there. The remaining mora, with no consonant or vowel within its syllable to which it could attach, would presumably be deleted before the surface form is derived.

3.2.2.2 ŠT-Stem

Another very common innovative derived stem in Semitic is the so-called ŠT-Stem. As its name suggests, the ŠT-Stem is a combined derived stem, being the T-Stem form of an Š-Stem verb, the passive/reciprocal of a causative. Typically, derived forms composed by transparently identifiable affixes, such as the Š-Stem and T-Stem affixes, are not reconstructed using the comparative method (as indeed, we have not reconstructed other combined derived stems) precisely because the transparent derivation makes it possible, and indeed, likely, that such forms could have been generated numerous times independently. In the case of the ŠT-Stem, however, we are able to identify the form as common to Proto-Semitic, because the T-Stem affix, applied later in the derivation since

the form is a passive of a causative, is consistently placed inside the Š-Stem prefix, even in those languages, such as Aramaic or Ge'ez, in which the T-Stem in isolation has developed a prefixed-only form. This implies that the ŠT-Stem developed before the the innovation of these intra-Semitic prefixed T-Stems. The ŠT-Stem is, likewise, very widespread throughout Semitic, being attested in Akkadian, Eblaite, Ugaritic, Hebrew, Aramaic, Arabic, Mehri and Ge'ez, and therefore reconstructable for every major-order Semitic branch and for the proto-language.

| | Proto-Semitic | Akkadian | Arabic | Ugritic | Ge'ez | Mehri |
|--------------|---------------|--------------|------------|------------|-------------|----------|
| Perfective | *yaštaqtil | uštāpris | yastaf'ilu | yaštāp'ilu | yastäqtäl | yəšaf'äl |
| Imperfective | *yaštaqtal | uštāp(ar)ras | – | – | yastäqättäl | yešəf'äl |
| Perfect | *yaštataqtil | uštātapris | – | – | – | – |

Figure 3.18: ŠT-Stem Forms in Semitic

The ŠT-Stem is particularly useful to illustrate how our analysis of affixation and syncopation differs from the templatic analysis. Under a templatic theory, in which we consider both the Š-Stem and the T-Stem to be preformed templates (*yu/ašaCCVC*, *yaCtaCVC* respectively), it is not clear why the combination of these two patterns should necessarily take the form *yaštaCCVC* as opposed to, for instance, ***yašaCtaCVC* or any other prosodically licit form that blends the two patterns. Under our analysis, however, as the affixes are attached one by one, either triggering or failing to trigger syncopation, the form *yaštaCCVC* emerges as the only possibility, as it is the only form which is generable. Observe the derivations below, which predict and produce only the attested and reconstructable forms.

(66) *Derivation of Semitic ŠT-Stem Prefix-Conjugation*

| Underlying Root | Perfective qatil | Imperfective qatal | Perfect qatil |
|-----------------|----------------------------|------------------------------|-------------------------|
| | ↓ | ↓ | ↓ |
| ša- Prefix | ša- qatil | ša- qatal | ša- qatil |
| | ↓ | ↓ | ↓ |
| Syncopate | ša- qatil | ša- qatal | ša- qatil |
| | ↓ | ↓ | ↓ |
| <ta> Infix | ša<ta> qtil | ša<ta> qtal | ša<ta> qtil |
| | ↓ | ↓ | ↓ |
| Impf. Infix | – | – | – |
| | ↓ | ↓ | ↓ |
| Perf. Infix | – | – | ša<ta> taqtil |
| | ↓ | ↓ | ↓ |
| Prefix | ya-ša taqtil | ya-ša taqatal | ya-ša taqtil |
| | ↓ | ↓ | ↓ |
| Syncopate | ya-ša taqtil | ya-ša taqatal | ya-ša taqatal |
| | ↓ | ↓ | ↓ |
| Output | *ya štaqtil | *ya štaqatal | *ya štataqtil |

3.2.2.3 L-Stem

The final of the innovative derived stems of Semitic we encounter is the L-Stem. Unlike the D-Stem and the ŠT-Stem, the L-Stem is far more restricted in its attestation. It is known primarily from Arabic, the the Ethiopic languages, the Modern South Arabian languages, and possibly Ugaritic. This restricted distribution makes reconstruction to the Proto-Semitic period impossible, and the L-Stem is rightly regarded as an innovation internal to the Semitic family. The shared presence of the L-Stem has been regarded by some scholars as evidence for the inclusion of Arabic within an extended South Semitic family. Today, Arabic is not typically included as a genetic member of South Semitic, so the simpler explanation would appear to be the L-Stem was perhaps an innovation of Proto-South Semitic and was spread to Arabic as part of an Arabian peninsular Sprachbund area. How Ugaritic fits into such an account is unclear.

In each case, the L-Stem is formed by the lengthening of the first vowel of the verbal root, present between the first and second root-consonants (Arabic *yufā'ilu*, Ge'ez *yəqatəl*, Mehri *yafō'əl*, potentially Ugaritic **yupā'ilu*). This is striking, because recall from Section 2.3.1.1.3 that this vowel is not a necessary component of the underlying representations of Semitic roots (which can be rightly represented with an original form **CaCōC*, in which the theme vowel is lexically specific, but the initial vowel is pre-specified as /a/ and inserted by rule). Since we will be inserting the initial vowel by rule even in the non-L-Stem forms, we may generate the L-Stem by suggesting there is simply a lengthened-variant **<ā>* infix, which is called for in the case of the L-Stem, as opposed to the simple **<a>* vowel inserted in other forms. Since the typical vowel is short, it can be syncopated in appropriate situations, but the long vowel of the

L-Stem is invariant, since it cannot be syncopated regardless of environment¹³³. The fact that the L-Stem matches our account via syncope is likely an accident, however, since it developed well after the breakup of Proto-Semitic proper, and likely never co-existed in a single synchronic grammar with our syncope rule.

¹³³This presupposes that in all other forms within Semitic what we have presented as the "underlying root" is, in fact, one step removed from the underlying root, after an epenthetic vowel has been supplied to allow for the proper syllabification of the root. This is technically correct. Since, however, in Proto-Semitic, for which we do not reconstruct the L-Stem, *all* verbal forms will have an epenthetic vowel supplied in every possible derivation, we have excluded this step from our sample derivations for simplicity and to avoid redundancy. This step is included here since, for the first time, it is possible for it to be meaningfully contrasted with a distinctive alternative process.

Chapter 4

Afro-Asiatic to Berber

Though less well-known than its Semitic sister, the comparative study and reconstruction of Berber morphology and phonology enables us to piece together a fairly accurate picture of the specific shapes of various morphemes at the Proto-Berber stage. Although the modern Berber languages are well-known for their paucity of surface-vowel segments and rather liberal syllable-structure allowances, the picture that emerges from Proto-Berber is rather similar to Semitic (and to the other Afro-Asiatic languages). All syllables contain vowels, almost all syllables have onsets (though the loss of the sub-oral consonants has created gaps in the surface transparency of the rule), and syllables may have no more than one coda consonant, except at word-end where a super-heavy syllable of $CVCC\#$ or $C\bar{V}C\#$ is allowed. The secondary stressing of primary stressed vowels in certain positions, to go along with the loss of various unstressed vowels, has obfuscated this originally quite simple and quite characteristically Afro-Asiatic system, but it is nonetheless generally recoverable. The nominal and verbal morphology of Proto-Berber can also be reconstructed with reasonable certainty, as seen in the works of Karl Prasse. In the following sections, we will consider these reconstructable morphological forms, and demonstrate how they may be generated from our theory of syncope.

4.1 Nominal Morphology

Berber shows the most marked morphological differences from its northern Afro-Asiatic neighbors in its nominal morphology. While the Berber verb looks rather strikingly like that of Semitic (as well as the prefix-conjugation of Cushitic), the nominal formations of Berber, such as the state prefixes or the sound-plural suffix, not only exhibit tantalizing resemblances to forms known from other languages, but also reflect puzzling, often difficult-to-explain differences. Nevertheless, the basic nominal categories (number, case, gender) are all effectively the same as those of Semitic, and there are certainly unmistakably cognate formations, such as the feminines in $*-t$ or the large classes of internal, non-

concatenative, "broken plurals." In the discussions below, we will demonstrate how the various nominal forms of Berber can be explained as the product of affixation and syncope, beginning with the so-called "state prefixes."

4.1.1 Case Inflection – State Prefixes

Case inflection is somewhat sporadically attested throughout the Afro-Asiatic world, with the peculiarity of its alignment (marked nominative) and the specificity of the use of individual case forms seeming far more securely reconstructable than the specific forms of any individual case marking morphemes. The issue of case in Berber is not entirely without controversy. We will therefore address these issues and controversies before we delve into the particulars of the morphological forms.

As stated, and as will become apparent below, Berber nominals are unambiguously marked for both number and gender. The categories of each (masculine and feminine/singular and plural) are unremarkable within Afro-Asiatic as a family, and more generally in terms of world languages. But Berber nouns are also (typically) inflected for another category, which in traditional Berber studies are referred to as *l'état libre* (free state) and *l'état d'annexion* (construct state), using terms originally borrowed from the grammar of the Semitic languages, most notably Arabic. Despite the directly borrowed terminology, the "states" of Berber are really quite dissimilar to the true state forms of Semitic. In Semitic, for example, the construct state is obviously distinct from the case-marking system indicated by final vocalic suffixes. Rather, the construct state is the form the noun takes when it is behaving as a clitic, and appending to some other word upon which it depends phonologically. This non-tonic clitic behavior of the construct is most apparent in Ancient Egyptian, where the sensitivity of Coptic to the presence of stress in Middle Egyptian reveals construct forms to have been entirely unstressed, exactly like a clitic.

The "states" of Berber, on the other hand, behave very differently. Rather than representing a fact about the prosody of the word, the Berber states appear to be sensitive to the syntactic environment in which a word appears. This syntactic sensitivity has led many scholars, including Sasse (1984), Satzinger (2000), and Gensler (2000), to conclude that the Berber "states" are in fact nominal cases. Although the appeal of this analysis is apparent, the range of functions associated with each of the "states" does not align neatly and cleanly with our expectations of what nominal cases ought to do. Consider the functions of the free state and construct state given below:

- Free State
 - Citation Form
 - Direct Object of Verb
 - Subject of Copular Sentence
 - Nominal Predicate
 - Objects of Prepositions
 - Left Dislocated Subjects
- Construct State
 - Subject of Finite Verb
 - Possessors
 - Objects of "Non-True" Prepositions
 - Numerated Nouns
 - Right Dislocated Direct Objects

The simplest analysis, one adopted by Hasselbach (2013), is that the Berber "states" are indeed cases, effectively nominative and accusative cases, but with a number of unusual uses and syncretic functions.

Having established that we are likely dealing with case, albeit a case-marking system different from the typical nominative and accusative system of Indo-European, we can now consider the morphological form which these cases take in Berber. Case is marked by the so-called "*prefixes d'état*," which prefix to (almost) all Berber nouns. These state prefixes themselves show additional secondary agreement in number and gender, but this is distinctly agreement, as the primary morphological indicators of number and gender appear elsewhere in the word, either as apparent suffixes, or via vowel apophony. Although the precise form of the state prefixes across the Berber languages varies somewhat, we are nevertheless able to identify the form of the prefixes as they would appear in Proto-Berber, as in the table below, adapted from Prasse (1974).

| | Free | | Construct | |
|---|------|------|-----------|------|
| | Sg. | Pl. | Sg. | Pl. |
| M | *ā- | *ī- | *wa- | *wi- |
| F | *tā- | *tī- | *ta- | *ti- |

Figure 4.1: State Prefixes in Proto-Berber

For our purposes, one of the most striking features of the Berber state prefixes is that they appear to trigger syncope of triconsonantal nominal stems. Consider forms such as Qabyle *auray* "yellow" (compare Semitic **waraq* "green/yellow, vegetation"), or Ayr *andər* "tear, wound, opening" (compare Ge'ez *našara*, Bilin *naçar*, both "to tear"), in which a root that clearly originally possessed a full vowel between the first and second root-consonants appears to lose this vowel when a Berber state prefix precedes it. This apparent syncope can be further demonstrated by considering the behavior of those few Berber nouns which lack state prefixes. In contrast to those nominal stems listed above, which surface with a *CCVC* stem shape unless the initial vowel is long or one

of the root consonants is geminated, nouns without a state prefix can, and often do, surface with an unsyncopated *CVCVC* form, as in *kārad* "three," *bədir* "breast," or *ləbək* "weakness/frailty." We might add that syncope appears to be blocked in the case of the alternate free-state prefixes **e-* and **te-*; *edäbir* "dove" and *tekäbärt* "small hut."

Having established that the syncope of triconsonantal nouns (or other nominal forms in which syncope is possible) is associated with the presence of nominal state prefixes, while the absence of such prefixes is associated with an unsyncopated *CVCVC* triconsonantal noun stem, we may ask whether such forms are predicted and accounted for by our account of syncope. To which the answer is: partially. The rule of syncope which we have here proposed certainly predicts that forms such as the Berber state prefixes ought trigger syncope in at least some instances, but it, in a sense, undergenerates syncopated forms from the perspective of the actually attested Berber languages. In actual fact, the presence of *any* state prefix, free or construct, appears to be associated with the apparent syncope of the nominal stem. Note that this uniform syncope is not what is predicted straightforwardly from our rule. Because the prefixes, at their Proto-Berber or Pre-Proto-Berber stage, were characterized by systematic distinctions in the length of vowels present in the morphemes (all free-state prefixes reconstructed with long vowels, all construct-state prefixes reconstructed with short vowels), our rule predicts that we should see variation between fully vocalized nominal stems in the free state, and syncopated stems in the construct state (***āragaz* vs. ***wargaz*), rather than the uniformly syncopated forms (**ārgaz* vs. **wargaz*), which are attested throughout the family.

A solution to this apparent discrepancy is not readily forthcoming, though we might propose a few plausible explanations. The simplest solution is to propose that the uniform syncope with state prefixes which we see in the modern Berber languages and therefore reconstruct for Proto-Berber, is itself an innovation, a leveling of an earlier alternating system in which free-state forms were unsyncopated while construct-state forms were syncopated. While simple, there are a number of issues with the solution. First, there is no evidence of any noun in any Berber language which shows stem variability between its free and construct form, which means that if such variation did occur, it has been completely leveled, having left no discernible traces of any sort. Another issue is the direction of leveling. For this account to be true, obviously, the construct-state form must have been leveled at the expense of an originally unsyncopated free-state form in every instance. This may not seem problematic, given the fact that the construct state corresponds in at least some of its uses to our conventional notion of a nominative case, and that we are accustomed to the idea of leveling of a nominative-case form. But recall that in Berber (as well as Afro-Asiatic more generally) it is the free state (roughly approximating the accusative case) that occurs more commonly in speech, appears in a wider range of possible environments, and in fact appears to be the morphologically-default form of a noun uttered in isolation. A reasonable case could be made that if there were variable free- and construct-state forms originally associated with distinct nominal-stem variants, it should be the *free-state* form which we should expect

to spread at the expense of the more marked and restricted construct-state form.

Another potential solution comes from the distinct phonological form of the free-state prefixes. In contrast to the construct-state forms, which are characterized by short vowels regardless of number or gender, all free-state forms exhibit the reflex of a Proto-Berber long vowel. This makes the free-state prefixes somewhat typologically odd within the world of reconstructable Afro-Asiatic morphemes, in that almost all reconstructable inflectional affixes or pronouns are reconstructed with short vowels¹³⁴. This admits the possibility that the free-state prefixes may themselves be originally morphologically complex, and that at the time when syncope was still a synchronic part of Proto-Berber or Pre-Proto-Berber phonology, the free-state prefix may have consisted of a light syllable. This idea is speculative, however, and without independent evidence or motivation for the existence of such a shortened form, this alternative seems unlikely.

At its most basic, then, we should conclude by stating that case inflection in Berber appears to have some impact on the syncopation of nominal stems, and that at least some of this impact is predicted by our theory. The construct-state forms are appropriate to trigger syncope, syncopated syllable (the first of the nominal stem) is precisely the one predicted by the prefixing of morphemes, as we have demonstrated in countless other examples throughout this dissertation. The process is not, however, completely regular, and if we are to assert that it is syncope that triggers stem alterations in state-prefixed nominals in Berber, a more developed or articulated theory of their origin and diachronic development is clearly required.

4.1.2 Gender Inflection

The gender inflection of Berber is the most familiar and most characteristically Afro-Asiatic feature of Berber nominal inflection or derivation. All Berber nominals belong to one of two grammatical genders, conventionally referred to as masculine and feminine, though as in Semitic or in the modern Romance languages, these categories often function more as classes of noun inflection, and only occasionally and overlap with the biological categories of male and female, typically in the case of animate nouns referring to humans and other animals (and even then, the overlap is not perfect).

As one may have expected given the forms in Semitic or Egyptian, masculine nouns in Berber are typically unmarked (Tuareg *amɣəs* "molar")¹³⁵, while

¹³⁴To the extent that such reconstructions are possible, the reconstructed forms of morphemes such as the suffix pronouns, the independent pronouns (with the possible exception of the Semitic, Egyptian, Berber isogloss *' *anāk*), the prefix-conjugation, the suffix-conjugation, or most of the basic lexical roots all appear to contain short, non-lengthened vowels.

¹³⁵As we have discussed, the Berber state prefixes have distinct and morphologically overt masculine and feminine forms. The nouns themselves have no explicit marking for masculine gender. This is illustrated by the comparison of simple masculine and feminine nouns, in which the feminine shows both a distinctly feminine state prefix and an overt feminine suffix, while the masculine noun shows the masculine state prefix, and no other overt morphological inflection.

feminine nouns are typically marked with the anticipated **-t* suffix ubiquitous throughout the family (Tuareg *tankəbt* "hair-braid"). As in Semitic, feminine nouns can sometimes lack the characteristic **-t* suffix (Tuareg *ma* "mother"). There a number of phonological interactions which exist between the final **-t* feminine suffix and stem-final consonants of the nominal root. These interactions can often conceal the presence of the feminine suffix¹³⁶, but since such alternations are purely allophonic changes, they need have no bearing the analysis presented here. In addition to this expected feminine suffix in **-t*, Prasse (1974) notes two additional feminine suffixes, those appearing in Tuareg as *-a* and *-e*, which he reconstructs with the Proto-Berber forms **-āh* and **-ay*.

The presence of these additional affixes is crucial for the application of our analysis of syncope, as it allows us to examine the behavior of noun stems when they inflect for gender. The most basic nouns, whose feminines are formed by the affixation of the simple **-t* suffix, show effectively no variability in nominal stem shape on the basis of gender inflection. Consider the following pairs of masculine and feminine nouns from Tuareg,

- | | |
|---------------------------------|--|
| • <i>ekäbär</i> "hut" | • <i>tekäbärt</i> "small hut" |
| • <i>amdəɣ</i> "giraffe" | • <i>tamdəɣ-t</i> ¹³⁷ "she-giraffe" |
| • <i>ayrəm</i> "house, village" | • <i>tayrəmt</i> "small house, village" |

This invariance is predicted by our account of syncope. Whatever syncope may be triggered by the state prefixes (as we discussed in section 4.1.1), this syncope is still present in the feminine form. Meanwhile the feminine suffix **-t* cannot create the sequence of adjacent syllables necessary to trigger any syncope that would not otherwise be present in the masculine nouns. Observe the derivations below:

(67) *Derivation of Berber *-t Suffixed Feminine Nouns*

¹³⁶See, for example, the Tuareg noun *tämäsäq* "Tuareg free-woman, Tuareg language," a feminine counterpart to *ämäsäɣ* "Tuareg freeman," underlyingly /*tämäsäy-t*/.

¹³⁷Note that this noun surfaces as *tamdəq*, since underlying sequences of /*ɣt*/ surface in Tuareg as [q] at word end.

| | | | | |
|-----------------|----------------|--------------------------------|----------------|------------------|
| | M | F | M | F |
| Underlying Root | mṽdəy | mṽdəy | kābār | kābār |
| | ↓ | ↓ | ↓ | ↓ |
| Fem. Suffix | - | mṽdəy-t | - | kābār-t |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| State Prefix | a-mṽdəy | ta-mṽdəyt | e-kābār | te-kābārt |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | amṽdəy | tamṽdəyt | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | amdəy | tamdəyt → tamdəq | ekābār | tekābārt |

We may additionally consider those sporadic nouns in Berber which appear with a variant of the feminine suffix in *-ät* (**-at*) rather than the unvocalized *-t*. As noted by Heath (2005), a large majority of such forms are in fact borrowings from Arabic¹³⁸ and are therefore irrelevant to the question of syncopation at the Proto-Berber stage. There are, nevertheless, several nouns of apparently non-Arabic origin, and we might ask whether these forms exhibit any stem alternations. To begin answering this question, we must first observe the striking similarity between the forms of Tuareg (and the picture of Proto-Berber which emerges from it), and the behavior of the archaic Semitic languages. Recall, in our discussion of the feminine suffix in Akkadian, that what governed the apparent distribution between the feminine suffix in **-t* and the feminine suffix in **-at* appeared to be the shape of the nominal stem. Nominal stems ending with syllables already containing two moras (*CVCC#*, *CVC#*) took the vocalised **-at* variant, while all other stems (all those stems for which the addition of **-t* would not create an ill-formed syllable) took **-t*. There is some evidence that a similar situation held in Proto-Berber. Of the forms Heath cites as examples of non-Arabic words exhibiting the suffix *-ät*, there is a strong tendency for these nouns to have super-heavy final syllables: *tanäyw-ät* (**tānayw-at*) "python," *toraw-ät* (**torāw-at*) "honey," *wänšät* (**wanš-at*) "rabies," *šälbät* (**šalb-at*) "intestinal disease." Indeed, the only form which Heath cites which does not exhibit a super-heavy stem-final syllable is *tübəssilläw-ät*, which owing to its unusual shape (quadriliteral with two! medial geminates) as well as its meaning (referring to the fruit of the *Salvadora* plant indigenous to the less-arid sahel and tropical regions of sub-Saharan Africa and India), is more likely to be a borrowing or cultural Wanderwort¹³⁹. If this generalization is indeed true, then it is unsurprising that feminine forms in **-t*/**-at* do not exhibit syncope. The **-t* forms cannot trigger syncope, and the **-at* forms only append to those nominal stems which, due to their super-heavy final syllables, cannot undergo syncope.

¹³⁸Heath cites forms such as *älyibadät* (Arabic *al-'ibadat*) or *älähärät* (Arabic *al-'āhirat*).

¹³⁹Note that the branches of the *Salvadora Persica* plant have commonly been used in oral hygiene throughout North Africa and the Near East, and it should therefore not be surprising that this word would exhibit the potential traits of a cultural loan.

The effective invariance of masculine vs. feminine noun pairs formed by the suffixing of the feminine **-t* suffix is contrasted with the behavior of those forms suffixed with the less-common **-āh* and **-ay* affixes. These forms tend to exhibit a syncopated *CVCC* stem shape, or indeed a fully syncopated *-CC-* stem in the case of biconsonantal nouns, as illustrated in forms such as *tanākra* (**tānakrāh*) "standing up," *tewäḡne* (*tewayḡay*) "package," or *tiske* (**tiskay*) "horn." Prasse notes:

"Il est extrêmement rare de trouver des paires de noms formés sur un même thème, dont l'un est masculin, l'autre un f. à dés -a ou -e (tandis que l'inverse est vrai pour les f. en -t)"

Despite the relative scarcity of such pairs, we may still consider the few which do occur, in order to determine the alternations which are present.

(68) *Derivation of Berber *-āh and *-ay Suffixed Feminine Nouns*

| | | | | |
|-----------------|--------------|----------------|---|-----------------|
| | M | F | M | F |
| Underlying Root | sək | sək | – | nākār |
| | ↓ | ↓ | ↓ | ↓ |
| Fem. Suffix | – | sək-e | – | nākār-a |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | nākāra |
| | ↓ | ↓ | ↓ | ↓ |
| State Prefix | i-sək | ti-səke | – | ta-nākra |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | tisəke | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | isək | tiske | – | tanakra |

In these forms, in which the vowel-initial suffixes **-āh* and **-ay* can append to noun stems of all forms, syncope is both predicted, and indeed attested, in contrast to the more typical **-t*/**-at* feminines. This is the only place in which our theory predicts that we ought to see syncope within Berber gender inflection, and it is the only place in which syncope is attested.

4.1.3 Number Inflection

Berber number inflection is not wholly dissimilar to that of Semitic in terms of its basic structure. There is a simple affixing "sound plural" suffix (to use the Semitic term), which is used to form regular concatenative plurals, along with a large array of internal "broken plurals." An important fact to keep in mind is that formatives present in the broken-plural patterns of Berber show much stronger cognation with formation outside of the family throughout the Afro-Asiatic world, while the sound-plural affix is likely a later, Berber-internal innovation derived from the plural **-n* suffix found throughout the deictic and

pronominal systems of Afro-Asiatic. The difference in relative diachrony between the sound-plural suffix and the presumably earlier, more archaic broken-plural affixes will be critical for our account of the differing nominal stem shapes associated with each form. We'll begin with the sound-plural suffixes.

4.1.3.1 Sound Plural – Class I

Prasse identifies the sound-plural formations of the Berber languages as consisting of two distinct suffixes, surviving as *-än* (M) and *-in* (F) in Tuareg, *-en* (M) and *-in* (F) in Tarifit, *-en* (M) and *-in* (F) in Tashlhiyt, *-ən* (M) and *-in* (F) in Awjila. These affixes are soundly reconstructable for Proto-Berber in the form **-an* and **-in̄*. Prasse in particular is struck by the fact that masculine plural suffix is reconstructable with a short vowel, while the feminine contains a long vowel. In speculating about the origin of the feminine suffix, Prasse cites personal communication with Werner Vycichl who speculates that the feminine suffix arises from a sequence **(v)t̄in̄* via the lenition of the *-t-* and the coalescence of the vowel. Prasse correctly notes that the lenition of intervocalic or prevocalic **t* is otherwise unattested in Proto-Berber¹⁴⁰, and therefore is unsatisfactory as a source for the sound feminine-plural suffix. Prasse supposes in a footnote that the long feminine suffix in **-in̄* may be a secondary back-formation (he does not state whether this secondary development is pre- or post-Proto-Berber) from an original "*époque à pluriel commun*" in which the ending **-an* functioned as a common plural suffix for both masculine and feminine nouns.

This supposition from Prasse may indeed prove to be remarkably prescient. We would today seek the origin of the Berber sound plural **-an* in the common system of gender/number marking, which Greenberg (1960) referred to as the **n/t/n** pattern. This pattern is strongly attested in the Chadic languages, where its most opaque and presumably archaic feature, the neutralization of gender in the plural, is beyond question. If it is true that the Berber sound-plural suffix **-an* shares a common origin with the plural of the **n/t/n** pattern, we would expect it to lack morphologically distinct masculine and feminine forms in its initial state, just as we see in Chadic **n/t/n** plurals. The feminine form in **-in̄*, then, would be, just as Prasse supposed, a later innovative back-formation modeled on the originally common masculine/feminine form **-an*, with the long vowel **ī* which appears repeatedly in feminine pronominal forms in Berber.

As with their Semitic counterparts, the sound plurals of Berber are characterized by stable vocalism in the singular and plural, as well as by a fixed stem-shape which does not vary. Consider the following singular vs. plural pairs from Tuareg.

¹⁴⁰Lenition of stops is attested in the Northern Berber languages, but this is obviously a late development, clearly internal to this particular group of languages.

- *arǧəm* "inscription" • *irǧəmān* "inscriptions"
- *adləy* "trouble" • *idlīḡän* "troubles"
- *tankəbt* "hair braid" • *tinkəbīn* "small house, village"
- *tākəmmust* "little package" • *tikəmmusīn* "little packages"

Notwithstanding the Tuareg phenomenon of lengthening vowels by position, which can trigger the apparent alternation between short schwa vowels and long vowels with distinctive qualities, the nominal stems are entirely invariant. Prasse, for instance, reconstructs Proto-Berber **ā-dliḡ/*ī-dliyan* as the vocalism underlying Tuareg *a-dləy/i-dlīḡän*.

Given the forms reconstructable for the suffixes of the Berber sound plural, we may ask ourselves: Why should the sound-plural suffixes not trigger syncope? After all, if we are supposing an original *CVCVC* nominal root for trilateral nouns (or a *CVC* root for bilaterals), the presence of a vowel-initial suffix would be expected, at least at the synchronic level, to trigger syncope. As far as explaining the absence of syncope in the sound-plural forms, one fact is important above all others: namely, that the innovative spread of the plural **-n* suffix from the paradigm of pronoun/deictic inflection to a full nominal marker of plurality is clearly a late innovation internal to the development of Proto-Berber. If, as most scholars have supposed, and as we have suggested in section 1.3.1.4 above, the state prefixes are cognate, at least in morphological form, with the case suffixes of Semitic, then it is overwhelmingly likely that the state prefixes, and the syncope associated with them, became part of Berber word formation before the sound-plural suffix arose and became the regular morphological plural formation. Concretely, this means that at the stage at which the **-an* sound-plural suffix came to be applied to basic nouns: a) syncope may no longer have been a synchronic part of the grammar of (Pre-)Proto-Berber; and b) the plural suffixes almost always apply to nominal stems which have **already** been syncopated by the state prefixes (**ā-rǧim/*irǧim→*irǧum-an*). Because the syncope triggered by the state prefixes results (at least in the case of trilateral nouns) in a nominal stem shape of *CCVC*, it would be impossible for the sound-plural suffix to trigger syncope, even if syncope were still synchronically active. The innovative status of the sound-plural ending may also be suggested by the fact that it typically does not co-occur with the increasingly archaic bi- and monoconsonantal nouns which survive in the Berber daughters.

4.1.3.2 Broken Plurals

In contrast to the sound plurals, which appear to be comparatively late innovations internal to Berber, the broken plurals (at least some of the formations) would appear to be significantly older. Some have clear cognates outside of the family, particularly with Semitic, and many affect the older, more archaic classes of nouns, suggesting an earlier origin. For this reason, broken plurals are

much more likely to exhibit syncope-related stem alternations. We will move through the commonly reconstructed broken-plural classes as enumerated by Prasse (1974), demonstrating how each relates, or fails to relate, to our theory of syncope.

4.1.3.2.1 Class II

Plural Class II is the first of the broken-plural classes identified by Prasse (1974). Class II plurals are, for our purposes, of little interest. These are purely internal plurals, formed solely by the apophonic transformation of the vocalism of the nominal stem, and by the lengthening of the final vowel (perhaps reminiscent of the $CVC\bar{V}C$ broken plurals of Semitic). It is in accord with our theory that a broken plural formed solely through internal changes in vocalism should show no apparent syncope, as there is no meaningful change in prosodic structure between the singular and plural forms which could trigger syncope. From the perspective of syncope, then, we have little more to say.

Nevertheless, we will give a brief overview on the Class II plurals, both for the purposes of completeness, and also because the Class II plurals of Berber illustrate the so-called internal a-plurals identified by Greenberg (1955). Class II plurals are characterized by a distinctive $C\bar{a}CaC$ vocalism in Tuareg, reconstructible in Proto-Berber as $*CuC\bar{a}C$, and more rarely as $*CiC\bar{a}C$ (both becoming Tuareg $C\bar{a}Cac$ through regular sound change). This plural clearly reflects Greenberg's category of a dissimilatory internal a-plural. The final vowel, as expected, is replaced by the internal <a>, while the initial vowel of the singular stem, whatever its original quality may have been, is replaced by one of the dissimilatory high vowels (*u or *i), but never by *a. Due to the presence of the state prefixes, the initial vowel of the nominal root is likely to syncopate, in both the singular and the plural. However, if the initial vowel of the nominal stem is long (either underlyingly long or lengthened by position), the vowel of the corresponding plural will also be long, revealing the quality of the initial root vowel. Examples of Class II broken plurals, with state-prefix syncope and without, are provided below. A stem containing an initial long vowel in the singular has been included to reveal the dissimilatory vocalism of the plural.

- $a-m\bar{y}\bar{a}s$ ($*\bar{a}-m\bar{y}\bar{i}s$) "molar" vs. $i-m\bar{y}\bar{a}s$ ($*\bar{i}-m\bar{y}\bar{a}s$) "molars"
- $a-\bar{y}\bar{a}n\bar{i}b$ ($*\bar{a}-\bar{y}\bar{a}n\bar{i}b$) "feather" vs. $i-\bar{y}\bar{a}n\bar{a}b$ ($*\bar{i}-\bar{y}\bar{a}n\bar{a}b$) "feathers"

We can also reveal the vocalism by examining those nouns which have state-prefix forms which, as discussed in section 4.1.1 above, do not cause syncope of the noun stems, or in quadrilateral nouns, which cannot syncopate due to their prosodic shape, as in the forms below.

- $\check{a}-h\bar{a}r\bar{i}k$ ($a-har\bar{i}k$) "ill-omen" vs. $i-h\bar{a}r\bar{a}k$ ($*\bar{i}-hi/ur\bar{a}k$) "ill-omens"
- $\check{a}-s\bar{a}g\bar{b}\bar{a}r$ ($*a-sagbur$) "bag-tie" vs. $i-s\bar{a}g\bar{b}\bar{a}r$ ($*\bar{i}-sug\bar{b}\bar{a}r$) "bag-ties"

Since this broken-plural formation exhibits no affixation of new morphemes changing the syllable count and structure, and as predicted from such a formation, no syncopation, we will have nothing further to say on plural class II.

4.1.3.2.2 Class III

The Class III is typically thought of in the study of Berber languages as a variant of Class I, due to the superficial similarities: both are formed by means of the addition of a suffix-consisting of a vowel plus the consonant *-n*, as in *adkər* (**ādkir*) vs. *idəkrān* (**īdukrān*) or *tekäbärt* (**tekabart*) vs. *tikəbrīn* (**tikubrīn*). There are, however, marked differences revealing that we should think of Plural Class III rather as a broken-plural class, and indeed, a comparatively old one. For Berber Class III plurals find their cognates in those broken-plural patterns of Semitic featuring the suffix **-ān* and commonly triggering a *CVCC* stem shape¹⁴¹. The Berber forms match their Semitic counterparts perfectly. They are suffixed not with the normal Berber sound plural *-än* (**-an*), but rather with a lengthened *-an* (**-ān*)¹⁴². They trigger obligatory *-ə-* (**i* or **u*) vocalism of the nominal stem, precisely matching that of the *fi‘lān* and *fu‘lān* forms of Arabic, and they likewise always trigger a shift into a *CəCC* nominal stem shape for trilateral nouns, just like the *CVCC* stems of Semitic.

This nominal stem shape is precisely that form we would predict via our theory of syncope, given certain assumptions about the diachrony. In a class III broken plural in Berber, there are two potential sources of syncopation: the state prefix, and the **-ān* suffix. Our theory makes different predictions about which syllable of a trilateral Berber noun should undergo syncope based on which affixes regularly came to be applied to a given nominal stem first. Given that the state prefixes are known to be innovations internal to Berber (albeit ones using elements likely shared with Semitic), while the **-ān* broken plurals appear to have exact stem and suffix cognates in the Semitic languages, it seems likely that these broken plurals in **-ān* arose well before the time that state prefixes were appended to these nominal stems. In that case, we would expect the nouns to be syncopated into a *Ci/uCC-ān* shape, and it is this form, already having been subject to syncope, which Proto-Berber would inherit. When state prefixes finally arose in (Pre-)Proto-Berber, these nouns would be ineligible to undergo syncopation from the state prefixes, since they contain no sequences of light syllables which the state-prefix can cause to syncopate.

(69) *Derivation of Berber *-ān Suffixed Broken Plurals*

¹⁴¹These include the Arabic *fi‘lān* and *fu‘lān* patterns, as well as <f‘ln> form of Epigraphic South Arabian.

¹⁴²Feminine forms have a distinct suffix **-īn*. Just as with the same phenomenon in the case of the sound plural, we should regard this morphologically distinct feminine form as an innovation.

| | M Sg. | M Pl. | F Sg. | F Pl. |
|-----------------|-----------------|------------------|-------------------|------------------|
| Underlying Root | *dikir | *dukṽr | *kabar | *kubṽr |
| | ↓ | ↓ | ↓ | ↓ |
| -ān Pl. | - | *dukṽr-ān | - | *kubṽr-īn |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | *dukṽrān | - | *kubṽrīn |
| | ↓ | ↓ | ↓ | ↓ |
| Fem. Suffix | - | - | *kabar-t | - |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| State Prefix | *ā-dikir | ī-dukṽrān | te-kabar-t | tī-kubrīn |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | ādīkir | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *ādīkir | *īdukṽrān | *tekarbart | *tīkubrīn |

There is an additional well-known alternation attested within Class III plurals, which is the alternation between a singular form with a geminated second root-consonant and a plural lacking gemination but with syncope, as in *āloggəs* (**aliwwis*) vs. *ilūsān* (*īluwsān*) or *teffart* (**tāhiffart*) vs. *tifrīn* (**tīhifīn*). In order to account for such stems, we must suppose that the singular forms are themselves derived from an originally non-geminated *CVVCV* nominal stem. This stem is subject to gemination in the singular but must either be present synchronically, or have been present diachronically at the point that the broken plurals were formed, in order to be subject to syncope, because if the gemination of the nominal stem were underlyingly geminated, it should block syncope.

In section 3.1.4.2 above, we remarked that the broken-plural forms in **-ān* in Semitic were likely related to the derived adjectives and other nominals formed with the same **-ān* suffix. In the Berber languages, the suffix *-an* (**-ān*) no longer functions as a truly productive derivational affix, but it may appear in a fossilized form in Berber adjectives such as *abərkan* "black" (contrast with the verb *ibərrik* "it is black"), *aquran* "dry," *azayan* "heavy." Indeed, Chaker (1995) notes that the so-called patterns *aCCan*, *aCC:Can*, and *aCVCān* are found solely in adjective formation and tentatively suggests the segmentation of *-an* (*-ān*) as an adjective-forming suffix, noting that adjectives formed with *-an* almost always are formed from a corresponding stative verb which lacks the suffix.

4.1.3.2.3 Class IV

Synchronically, we might rightly describe plural Class IV as a mixed plural, in the sense that it is formed by changes in nominal stem vocalism (specifically internal a-vocalism) along with the affixation of the sound-plural suffixes *-ān/-īn* (**-an/*-īn*). Diachronically, we can consider plural Class IV as an original

subset of plural Class II, since both are characterized by the internal change of a vowel to *-a-* (**-ā-*). To some subset of this original class were added the sound-plural affixes (Class IV plurals are therefore doubly marked for plurality), creating a split within the class and the generation of a new plural type.

Because this plural class is originally a subset of Class II, which does not undergo changes in prosodic shape that would be expected to trigger syncopation, along with the sound-plural affix, which we have previously suggested arose too late in the development of Proto-Berber to trigger syncope in nouns featuring state prefixes, we would not predict plural Class IV to exhibit any syncopation as part of its formation, and indeed, it does not. Examples of Class IV plurals are provided below.

- *admər* (**ādmir*) "chest" vs. *idmār-än* (**īdmār-an*) "chests"
- *akli* (*aklīh*) "slave" vs. *iklân* (*iklāhan*) "slaves"
- *ti-stän-t* (**ta-istin-t* < ***ta-’istin-t*) "awl" vs. *ti-stân-în* (**tī-istān-īn* < ***tī-’istān-īn*) "awls"

4.1.3.2.4 Class V/VI

We will consider Classes V and VI together, because they likely share a common origin, and because they exhibit similar behavior as it pertains to syncope. Class V is formed by the addition of a suffix *-aw* (**-āw*), together with the sound-plural suffixes *-än/-in* (**-an/*-īn*). Class VI is quite similar, being formed by the affixation of a suffix *-iw* (**-īw*) in conjunction with the sound-plural suffixes. Both classes exhibit no internal changes in vocalism, as Prasse notes that the suffixes *-aw* and *-iw* are appended "*au thème inaltéré du sg.*" While the sound-plural affixes are clearly innovations internal to Berber, the **-āw/*-īw* suffixes appear to be far older. Prasse suggests that these suffixes may be related to the common Egyptian sound-plural affix <w>, which, as discussed in section 5.1.3 below, likely takes the form **-ǃw/-wǃt* for masculine and feminine nouns respectively. Although the Berber Class V and VI plural suffixes do not exhibit perfect cognation with their Egyptian counterparts, due to the presence of a long vowel in each of them, it is tempting to link the forms. Prasse also briefly considers the possibility of linking the Berber suffixes with the Semitic nominative masculine sound-plural affix **-ū*, though here the phonological connection is more tenuous, to say nothing of the non-nominative plural forms of Semitic. We consider the connection with Egyptian to be more likely.

Possible evidence for the inherited and archaic status of the Class V/VI plural may be found in examining the nouns which belong to these plural classes, which include select verbal nouns and a handful of underived nominals. In the case of both the verbal nouns and the simple underived forms, there is a strong tendency for these nouns to be biconsonantal in structure, and to exhibit an invariant, word-initial "full vowel" along with no morphologically overt state

prefix, as in *uɔɔf* "holding" or *idəm* "face," and also includes very old and archaic nominal forms such as *isəm*¹⁴³ "name" and *ulh* "heart."

Before we can begin to properly analyze the behavior of these nouns with respect to syncope, we must first say something about their distinctive morphological form. In comparing those Class V and Class VI nouns which have Berber-external Afro-Asiatic cognates, it becomes clear that the initial vowel is, at least superficially, not a part of the original root. Compare, for example, Berber *iləs* "tongue" with Semitic **lišān*, Coptic **ⲗⲁⲥ** Hausa *hārshè* and Kafa *milaso*. While many of these nouns are extended with prefixes and suffixes of one form or another, it seems clear that the reconstructable root is either **lis* or **las*, with **lis* being presumably more original, and **las* arising from confusion with the verb **lahas* "to lick"¹⁴⁴. To the extent that such forms appear in Berber, then, we must consider them innovations in the period before Proto-Berber, and seek their origin therein. We will examine each form in turn, beginning with the *uCəC* nouns.

When they are derived from verbs, *uCəC/uCCawān* nouns exhibit gemination of the apparent first root-consonant in their verbal forms; compare *ukəs* "removal" with *ikkäs* "he took it away." They are likewise characterized by an unexpected -u- vowel following the the S-Stem prefix in causatives, but no gemination, as in *issukəs* "to make remove." These facts together lend themselves to an analysis wherein this initial *u-* vowel is a reflection of a Proto-Berber sequence **wu-* (**wukus*, **yiwkas* and **issiwkus* respectively). This analysis can sporadically be confirmed, either by internal evidence, where for instance the Tamazight verbal noun of the *iddu* "he went" surfaces as *tawada*, revealing its initial *w-*, or by external evidence, where the Tuareg verb *iqqäd* "burn" and causative *issuyəd* "make burn" is a clear cognate of Arabic *waqada* "burn" and Hebrew *yāqad* "burn," and the noun *urəy* is cognate with Semitic **waraq*, and Egyptian <ṯq>. We may apply a similar analysis to nouns of the form *iCəC*, *eCəC*, and *eCäC*, with the first reflecting Proto-Berber **HiCiC*, the second reflecting **wiCiC* and the third reflecting **HaCaC*, in which *H represents one of the inherited Afro-Asiatic sub-oral consonants.

In the case of the verbal nouns, we may uncontroversially suppose that these **wu-*, **wi-*, **Hi-* and **Ha-* simply represent the initial consonant of the verbal root. Indeed, as we have demonstrated, sometimes this reading is forced by either internal or external data. In the case of the underived nouns such as *isəm* or *iləs*, however, this analysis requires further comment. The cognates of these forms in the other Afro-Asiatic languages are, as we have mentioned, uniformly biconsonantal with no recoverable traces of an initial **w-* or **H-*. How, then, can we account for the apparent Proto-Berber forms **Hisim* and **Hilis*?

One possibility is to invoke Belova's Law. Belova's Law is a relatively recent observation in the field of comparative Egyptian phonology which attempts to explain the large number of instances in which an Egyptian triconsonantal

¹⁴³Though Maarten Kossmann in personal correspondence suggested this form may represent a borrowing from Arabic.

¹⁴⁴For similar development, observe the development of Classical Latin *lingua* "tongue" from PIE *dnǵʰwéh₂s* under the influence of *lingere* "lick" from PIE **linǵʰti* ~ **lingʰenti*.

root beginning with <w>, <i>, or <ʕ> corresponds to *CVC* roots in another language. Belova (1987) noticed a correspondence between the vowel internal to the biconsonantal roots in the other Afro-Asiatic languages and the form of the innovative initial consonants in Egyptian: **CuC*=<wCC>, **CiC*=<iCC>, **CaC*=<iCC>/<ʕCC>. Despite its comparative recency, Belova's law was well received and is accepted by a number of scholars within in the field, including Igor Diakonoff and Gabor Takács. Although Belova's Law was originally formulated as a sound law of Egyptian, Marijn Van Putten has tentatively suggested that it may have operated in Berber as well, though data are more sporadic and less consistent in Berber than in Egyptian. If this supposition is true, it would neatly provide the explanation for the otherwise unexpected initial vowels in these words.

Having discussed the peculiar morphological and phonological development of these nouns, we can now examine the interaction between the Class V and VI plurals and syncopation. Nouns of this sort exhibit characteristic alternation between singulars of the form *VCʕC* and plurals of the form *VCCawān*. Given the morphological structure of words belonging to these classes, we can now rightly say that they reflect alternations between singulars **wʕCʕC*/*yʕCʕC*/**HʕCʕC* and plurals **wʕCCāwan*/*yʕCCāwan*/**HʕCCāwan* or an original **wʕCCāw*/*yʕCCāw*/**HʕCCāw* before the sound-plural suffixes, clearly of secondary origin, were appended. This pattern is transparently derivable as a result of syncope, as demonstrated in the sample derivations below.

(70) *Derivation of Berber *-āw/*īw Suffixed Broken Plurals*

| | | |
|-----------------|-----------------------------|-------------------------------|
| | -āwan | -īwan |
| Underlying Root | * Hilis | * madʕl |
| | ↓ | ↓ |
| -v̄w Pl. | Hilis-āw | * madʕl-īw |
| | ↓ | ↓ |
| Syncopate | Hil̄isaw | * madʕl̄in |
| | ↓ | ↓ |
| State Prefix | ā- Hilsaw | ā- madl̄iw |
| | ↓ | ↓ |
| Syncopate | - | - |
| | ↓ | ↓ |
| Sound Plural | ā Hils āw-an | ā madl̄i w-an |
| | ↓ | ↓ |
| Syncopate | - | - |
| | ↓ | ↓ |
| Output | *ā Hils āwan→ilsawān | ā madl̄i wan→amâdliwān |

4.1.3.2.5 Class VII

Class VII is a relatively uncommon plural formation in Tuareg, and its precise form is difficult to recover from the various Tuareg forms. Compare the singu-

lar vs. plural pairs such as *tāfirt/tifir* "word(s)" or *tārik/tirik* "saddle(s)," in which the relationship between the singular and plural forms appears to be one of vowel apophony. The precise form of the plural is more clearly preserved in the Northern Berber languages, where plurals such as Tamazight *tiruka* "saddle(s)" or *timira* "chin(s)," and Qabyle *tiyita* reveal that plural Class VII is characterized by an original **-ā/*-ah* ending.

For our purposes, we must stress several important facts about plural Class VII nouns, as noted by Prasse (1973) himself. He remarks:

Tous les ex. sont trilitères, parfois avec gémiation de la 2^e qui se perd au pluriel....Les deux dernières radicales forment toujours groupe (d'origine protoberbère)

This form as reconstructed by Prasse is precisely that predicted for triconsonantal nominal roots. Just as in Semitic, the addition of a vowel-initial suffix to a fully vocalized *CVCVC* nominal root triggers the syncope of the vowel between the second and third root-consonant, generating the grouping of the last two consonants noted by Prasse. This form can be easily generated as seen in the derivation below, using Prasse's reconstructions.

(71) *Derivation of Berber *-ā Suffixed Broken Plurals*

| | |
|-----------------|------------------------|
| Underlying Root | *rihik |
| | ↓ |
| -ā Pl. | rihik-ā |
| | ↓ |
| Syncopate | rihkā |
| | ↓ |
| State Prefix | tī-rihkā |
| | ↓ |
| Syncopate | - |
| | ↓ |
| Output | *tīrihkā →tirik |

4.1.3.2.6 Class VIII

Plural Class VIII consist of only two nouns, *ma* "mother" and *mäss* "master,"and is characterized by the plural suffix *-aw* (**-āw*). It therefore likely represents the original form of Class V, before the subsequent addition of the sound-plural suffix, surviving here only on a relic class of two archaic nouns. From the perspective of our rule of syncope, Class VIII is of little import, since neither of the nouns in question, *ma/maw* (**mah/*mahāw*) and *mäss/mässaw* (**mass/*massāw*), would be predicted to exhibit any syncope as a result of plural suffixation.

4.1.3.2.7 Class IX

Plural Class IX consists of "a handful of nouns," whose plurals are formed by the addition of the suffix *-t* to the nominal stem according to Prasse. He cites such examples as *ma/mätt* "mother(s)," *ăw/ăyt* "son(s)," and *ăśâḡu/ăśaḡăt* (**ăśâḡuh/*ăśâḡah-t*) "young man/men," as well as the suppletive plural *šêt* "daughters." As Prasse remarks, these forms are likely not original plurals, but rather, at least in part, old collective singular nouns formed with the collective suffix **-t*, which have been reanalyzed as plurals. Regardless of their origin, the simple form of the plural as a single consonant affix **-t* predicts that Class IX plurals ought to exhibit no variation in singular vs. plural stem shape. And indeed, this is precisely what we see in Prasse reconstructions: **mah/*maht*, **aw/*ayt*, **ăśâḡuh/*ăśâḡah-t*. The only variability is the complete suppletion of the stem between singular *wəlt* and plural *šêtt* "daughter(s)," which is clearly not of a templatic nature. We will therefore not dwell on the Class IX plurals other than to note that, again, it is not merely the case that the lack of stem shape alternations is in accord with our theory of syncope, but rather, is predicted by it. In contrast to a purely templatic theory in which such a plural affix could, in principle be associated with stem shape alternations.

4.1.3.2.8 Class X

Prasse's plural Class X consists of a variant plural form for a single noun: *măssa/măssawăt* "mistress(s)." This plural appears rather transparently to consist of the Class VII plural affix *-aw* (**-ăw*) along with an apparently long variant of the feminine suffix *-ăt* (**-ăt*), elsewhere attested in the feminine form of the numeral "two" *sănat*. Little else need be said about this form, since its apparently segolate shape *măss-a* means that it would not be expected to syncope (or indeed, is possibly already syncopeated from an otherwise unattested original **masŷs*) in the plural.

4.1.3.2.9 Class XI

We would be remiss in the discussion of nominal pluralization if we did not mention the so-called default plural particle *ədd*. For a handful of nouns, including a number of derived or compound nouns, as well as *ăgg* (from **aw* "son," presented above), the proposed element, presumably a proclitic, can be added to form a plural. Since this form does not directly attach to the nominal stem (it can be separated by articles or some prepositions as in *ədd i n tetḡâwen* "one eyed people") and is a maximally closed syllable that cannot generate a string of adjacent light syllables, this plural formation is of little interest to us in our discussion of syncope.

4.1.4 Derived Nominals

As in Semitic, a large number of Berber nominals are derived from roots of originally verbal or adjectival meaning. Many such forms are derived simply through

the combination of distinctive vowel apophony and the presence of state prefixes, as well as other number/gender affixes. Since these forms do not directly interact with our syncope rule, we will not further discuss such forms here, other than to mention that gemination of root consonants is relatively common in transition from verbal roots to derived nouns, and that the gemination of these consonants can and does block syncope when it appears in the appropriate environment.

4.1.4.1 *mǃ- Prefix

Berber derived nominals in *mǃ- may effectively be divided into two distinct classes: nouns derived from originally N-Stem-derived verbs, which typically exhibit an *mǃ- initial prefix in Berber, and nouns prefixed with the old Afro-Asiatic *mǃ- agentive/instrumental/locative prefix. We will examine members of each class, and will consider the nominal stem forms associated with each.

Beginning with the former, the most basic examples are simple verbal nouns originally from derived N-Stem verbs (we might here consider the behavior of S- and T- Stem nouns, as being effectively identical). Such nouns are typically formed by the simple addition of a state prefix and appropriate number/gender morphology. Therefore, from *CVCVC* verbs, such as *ifrən* "choose," we have nouns like *anəfrən* "being chosen." From *CVC* verbs, such as *irəd* "be clean," we have forms such as *asîrəd*¹⁴⁵ "washing," and from *CVCV* verbs such as *ibɗu* "be separated," we have nominal forms such as *anəbɗ* "being separated," with the short vowel of the verbal stem having been lost in word-final position.

The majority of these forms are those predicted by our theory of syncope, and, indeed, they are effectively identical, in terms of the root shape to their verbal counterparts. The only primary deviation is in the shape of the *CVC* verbal nouns, in which we would predict the vowel of the prefix to be syncopated, but it typically surfaces, often along with secondary lengthening of the vowel in question. The simple derivations of such forms are presented below. Note the similarity to the derivation of derived verbs.

(72) *Derivation of Berber N-Stem-Prefixed Derived Nominals*

¹⁴⁵This is an S-Stem rather than N-Stem form. They behave identically morphologically.

| | | | |
|-----------------|-----------------------------|------------------------|--------------------------|
| | CVCVC | CVC | CVCV |
| Underlying Root | *f̣vrin | rid | biḍu |
| | ↓ | ↓ | ↓ |
| ṃṿ- Prefix | ṃṿ-f̣vrin | ṃṿ-rid | ṃṿ-biḍu |
| | ↓ | ↓ | ↓ |
| Syncopate | ṃṿf̣vrin | - | ṃṿbiḍu |
| | ↓ | ↓ | ↓ |
| State Prefix | ā-ṃṿfrin | ā-ṃṿrid | ā-ṃṿbiḍu |
| | ↓ | ↓ | ↓ |
| Syncopate | - | āṃṿrid | - |
| | ↓ | ↓ | ↓ |
| Output | *āṃṿfrin → anəfrən | *āṃrid → amrəd | *āṃibiḍu → anəbḍ |

The other of the **ṃṿ-* prefixed forms is, of course, the agentive/instrumental/locative derivation, with its obvious and well-known cognates throughout the remainder of the family. In Berber, however, its functions are somewhat reduced. As Heath notes, when the **ṃṿ-* prefix is appended to a transitive verbal root, the resulting nominal is almost exclusively agentive, with few instrumental or locative forms. When prefixed to an intransitive verbal root, the resulting nominal is not so much agentive as attributive and this function is likely parallel to the formation of participles in Semitic with the **ṃṿ-* prefix.

The primacy of the agentive form is likely quite old, as agent-nouns formed with the **ṃṿ-* prefix can likely be discerned even in the Libyco-Punic inscriptions, in forms such as <nbn> or <nbṭn>, typically translated as "stonecutters" and "carpenters" respectively, which Lipiński (2001) reconstructs as the **ṃṿ-* prefixed agentives of the verbal roots *bbəy* "cut" and *bḍu* "split" respectively. Such forms are likewise common in the modern Berber languages, where they form the names of numerous traditional occupations or social roles, such as *āṃalway* "guide," *ānābdin* "cripple," or *āṃaraw* "parent." While they are somewhat less common, Heath (2005) does additionally note that a handful of **ṃṿ-* prefixed instrument nouns do survive into Tamasheq, indicating that such forms were inherited into Proto-Berber, even if only as archaisms. Tamasheq **ṃṿ-* prefixed instrument nouns such as *ānāzmay* "needle" (*izmay* "sew") or *tenāymitt* "dye" (*iỵm* "decorate") are close parallels to comparable forms in Semitic, Egyptian, and Cushitic.

As in those languages, the forms which **ṃṿ-* prefixed agent/instrumental nominals take in Berber are largely in accord with the predictions of our theory. *CVCVC* verbal roots form *ṃṿ-CCVC* agentives, just as in Semitic and Egyptian. *CVC* verbal roots form *ṃṿ-CVC* agentives, which is, in isolation, the form we would predict, but special mention must be made of the interaction of such forms with state prefixes (see further below). Finally, *CVCV* biconsonantal verbal roots show the same expected syncopation, forming *ṃṿ-CC(V)* agentives, often with the loss of the final vowel. Simple derivations are provided below.

(73) *Derivation of Berber *ṃṿ- Prefixed Agentive/Instrumentals*

| | | | |
|-----------------------|--------------------------------------|------------------------------------|------------------------------------|
| Underlying Root | *laway | ḍan | razṽ |
| | ↓ | ↓ | ↓ |
| mṽ- Prefix | ma- laway | ma- ḍan | ma- razṽ |
| | ↓ | ↓ | ↓ |
| Syncopate | ma l away | - | ma r azṽ |
| | ↓ | ↓ | ↓ |
| Secondary Lengthening | mā l wāy | mā ḍ ān | - |
| | ↓ | ↓ | ↓ |
| State Prefix | ā-mā l wāy | ā-mā ḍ ān | ā-ma r azṽ |
| | ↓ | ↓ | ↓ |
| Syncopate | - | - | - |
| | ↓ | ↓ | ↓ |
| Output | *amā l wāy → āmā l wāy | *āmā ḍ ān → āmā ḍ ān | *āmā r azṽ → emā r z |

4.1.4.2 *sṽ- Prefix

As previously discussed, the archaic Afro-Asiatic **mṽ-* prefix is commonly used in the formation of locatives, agentives, and instrumentals throughout the family. While the agentive use is, as discussed in the preceding section, alive and well in Berber, the instrumental function has largely fallen into disuse. Notwithstanding the presence of some archaic instrumentals such as *ānāzmay* "needle," instrument nouns in Berber are formed primarily through a novel construction involving a **sṽ-* prefix. This derivational prefix clearly shares a common origin with the causative **sṽ-* common to almost all Afro-Asiatic branches, and indeed Heath even notes that some **sṽ-* prefixed instrumentals are homophonous with their derived-causative counterparts, excepting the subsequent additions of the state prefixes and number/gender morphology.

As we would expect, given this frequent homophony, the forms of the **sṽ-* prefixed instrumental exhibit precisely the same sorts of stem shapes which characterize the S-Stem verb itself. Instrument nouns derived from trilateral *CVCVC* verbs, such as *asəfrəḍ* "broom" (*ifrəḍ* "to sweep"), or *asəsləy* "curdled milk" (*isləy* "to curdle, to sour"), exhibit the characteristic *CCVC* root shape we would expect from the cognate forms in Semitic. *CVC* biliterals are, generally speaking, invariant. They commonly surface in Tuareg with secondary lengthening of the vowel of the derivational prefix, as in *āsākəl* "leg/paw" (*ikəl* "to tread") or *tūsāwəq* "obstruction, barrier" (*iwəy* "to keep back"). It should be noted, however, that in those instances in which the prefix has not undergone secondary lengthening, the vowel of the prefixes is absent entirely: *asfəl* "roofing material" (*ifəl* "to be roofed"), *tashərt* "door" (*ihər* "shut, block off"). The *CVCV* verbal roots tend to surface as *CC(V)*, as in *asūlso* "garment" (*ūls* "get dressed") or *tasəswit* "drinking place, well" (*isəw* "drink").

These forms are, for the most part, precisely those which our syncope theory predicts. Excepting the secondary lengthening characteristic of the Tuareg languages, the remaining root and stem shapes are easily generable via our syncope rule.

(74) *Derivation of Berber *sṽ- Prefixed Instrumentals*

| | | | |
|-----------------------|--|----------------------------------|---|
| Underlying Root | *f̄vrid | *kil | siwi |
| | ↓ | ↓ | ↓ |
| s̄v- Prefix | s̄v-f̄vrid | s̄v-kil | s̄v-siwi |
| | ↓ | ↓ | ↓ |
| Syncopate | s̄vf̄vrid | – | s̄vsiwi |
| | ↓ | ↓ | ↓ |
| Secondary Lengthening | – | – | – |
| | ↓ | ↓ | ↓ |
| State Prefix | ā-s̄vf̄vrid | ā-s̄vkil | tā-s̄vswi-t |
| | ↓ | ↓ | ↓ |
| Syncopate | – | – ās̄vkil | – |
| | ↓ | ↓ | ↓ |
| Output | *as̄vf̄vrid → as̄əfrəd | *āskil → askəl | *tāsvswit → tasəswit |

4.1.4.3 Derivational Suffixes

In contrast to Semitic, where derivational suffixes are relatively common in number and whose functions are often easily identifiable, or Egyptian, where forms which appear to be suffixes (*-aw, *-ai) are abundant in number (even if their individual functions are often opaque) derivational suffixes are relatively uncommon in the Berber languages. We will therefore briefly consider those forms which may represent the archaic inheritance of derivational suffixes, and examine the effect that they have on the shapes of roots to which they are attached, if such information is recoverable.

As previously mentioned, Chaker (1995), in discussing the formation of adjectives, notes that the Berber languages have within them a group of patterns which he lists as *CVCCan*, *CVC:Can*, and *CV̄Can*, citing forms such as *abərkan* "black," *aməzzyan* "small," or *azuran* "large," and notes:

...certaines de ces formes sont même exclusivement adjectivales (-a, -an), ce qui permet de poser en berbère nord un suffix d'adjectif -an

Given its similarity in both form and function to the Proto-Semitic derivational suffix *-ān, we can conclude that this form is not unique to northern Berber, as Chaker supposes, but rather was likely inherited from a Proto-Berber *-ān, and instead survives primarily in the northern languages. To reckon from the patterns which Chaker links with this proposed suffix, the stem shapes associated with this Berber affix are likewise cognate with their Semitic counterparts. Forms such as *abərkan* "black" or *azəḍgan* "clean" are transparently identical to derived Semitic nouns like Hebrew *šimšōn* "sunny" or Arabic *raḥmān* "merciful," being distinguished as characteristically Berber solely by the presence of the state prefix *a-*. The form with a geminate as the initial member of the cluster, as in *aməqqran* "large" or *aməzzyan* "small," clearly cannot be reconstructed to Proto-Berber, since such forms would have been in violation of constraint against super heavy syllables except at word end. We should therefore suppose that the Proto-Berber forms underlying these modern variants were non-geminated *āmv̄yrān and *āmv̄zyān respectively. That is, that the original

root shape was *CVCC*. Indeed, even the long vowel *CVCān* forms often appear to go back to an original *CVCC*. Compare, for instance, *azuran* "great/large" with other forms of the same root such as *aməzwaru* "best/first" or the related Mozabite *aziwar* "great." Both reveal that *azuran* should be taken to reflect an original **āzūrān*, with a root-final consonant cluster, *CVCC*.

Chaker does not include any examples with biconsonantal *CVC* or *CVCV* roots, so we cannot address the form that they might take, but of the triconsonantal forms which he includes, effectively all can be reconstructed with *CVCC* root shape which we have postulated for Semitic, and which we would predict according to syncope.

The final potential derivational suffix which we will consider in Berber is the so-called nisba suffix, which forms denominal adjectives. As we have discussed previously in section 3.1.3.6, the nisba suffix is ubiquitous throughout Semitic, and remains robust and productive even in the modern Semitic languages. As we will likewise see in section 5.1.4.2, the nisba suffix was comparably productive in Ancient Egyptian, although it ceased to be so by the time of Coptic, leaving us with only fossilized remnants of the form. The nisba suffix is typically thought of as absent from Berber, excepting the borrowing of gentilic forms from Arabic, as Vycichl (1952) notes.

Im Berberischen waren derartige Bildung bisher völlig unbekannt. Die bekannten Nisbe-Bildung waren arabisch wie arifi¹⁴⁶, amzabi¹⁴⁷...

Although it seems incontrovertible that the nisba suffix is not a productive part of the grammar of any modern Berber language (and is not likely reconstructable as productive at the Proto-Berber stage), Vycichl believes that he has identified the remains of original nisba formations still present in the Berber languages. He notes forms such as Tashelhiyt *turzit* **ta-wurzi-t* "sandal" (*awurz* "heel") or *afäsi* "right side (*afus* "(right) hand")," and Qabyle *abəqsi* "wooden box" (*ibəqs* "boxwood"), which appear to be plausible candidates for nisba-derived formations of Berber origin. He also musters some support for the idea that the Latin names given to the Canary Islands by the Numidian king Juba II (*Canaria*, *Capraria*, *Ninguaria*, *Pluvaria*) may themselves have been calques of the native Berber names, such as *Tebicena*, which he claims may be a nisba from *wiššen* jackal, or *Erbane*, from Tarifit *arban* "billy-goat."

The Canary Island onomastics are intriguing, but they are too second-hand and speculative for us to recover a great deal about the phonotactic shape of proposed nisba forms in Berber. The forms he cites directly from the modern Berber languages are more promising. Although they are relatively few in number, it is at least worth mentioning that both *turzit* and *abəqsi* exhibit the same *CVCC* root shape which our theory might predict for the nisba forms (notwithstanding its likely divergent origin, as discussed in section 3.1.3.6), and that the biliteral nouns are effectively invariant as *CVC*, like *afäsi*, precisely as we

¹⁴⁶Rifian

¹⁴⁷Tashelhiyt

will see is the case in Egyptian in section 5.1.4.2 below. For these reasons, we will say simply that the sporadic data on fossilized nisba formations in Berber are consistent with our analysis, although hardly uniquely so, and there is little probative value gained from these forms.

4.2 Verbal Morphology

The verbal morphology of Berber is remarkably similar to that of its Semitic sister. The forms of the inflectional affixes, the verbal stems, and the derived verbal stems, all have more or less directly cognate formation identifiable from Semitic. They are also, as we will demonstrate, often easily generable from our theory of syncopation, in ways that are more explanatory and satisfying than the stipulative alternative explanations of templatic theories.

As briefly discussed in section 1.3.2.2.2 above, the Berber verb is characterized by the (almost) complete loss of the basic distinction seemingly present in the archaic Afro-Asiatic languages between stative and eventive verbs, as reflected in the prefix- and suffix-conjugations. Note that this does not simply mean that Berber has lost the categories of stative and eventive verbs. Rather, it means that Berber has collapsed the morphological distinction between prefix- and suffix-conjugated verb forms¹⁴⁸, with the Modern Berber languages attesting to a mixed conjugation for most verbs in which actor affixes from both the prefixing and suffixing conjugation are present, sometimes within the same verbal form.

| | | Tuareg | | Proto-Berber | |
|-----|---|----------|-----------|--------------|-------------|
| | | Sg. | Pl. | Sg. | Pl. |
| 1st | | ∅-...-äy | n-...-∅ | *a-...-ay | *na- |
| 2nd | M | t-...-äd | t-...-äm | *ta-...-aḍ | *ta-...-am |
| | F | | t-...-mät | | *ta-...-mat |
| 3rd | M | i-...-∅ | ∅-...-än | *ya-...-∅ | *∅-...-an |
| | F | t-...-∅ | ∅-...-nät | *ta-...-∅ | *∅-...-nat |

Figure 4.2: Actor Affixes in Tuareg and Proto-Berber

With the exception of the prefixes of the third plural forms, the prefix-conjugation affixes survive into Berber with relatively little change, and therefore require little comment. The suffix-conjugation forms, however, are worth mentioning. The 1st Sg. and 2nd Sg. forms are not perfect sound-correspondence

¹⁴⁸Recall additionally from section 1.3.2.2.2 that a possible survivor of the original Afro-Asiatic stative suffix-conjugation may be found in the Berber so-called *Verbes Qualitatifs*, which are semantically stative or adjectival verb forms inflected solely with the remaining suffix forms and without any prefixing actor affixes.

cognates of their Semitic and Egyptian counterparts, where Semitic $*(\bar{a})ku$, $*(\bar{a})ta/i$ and Egyptian $\langle kw(i) \rangle$, $\langle t(i) \rangle$ suggest that the Proto-Berber forms ought to have been $*-ak$ and $*-at$. Instead we find Proto-Berber $*-ay$ and $*-ad$, reflecting the emphatic counterparts (Afro-Asiatic $*\bar{k}$ and $*\bar{t}$) of the expected suffix-conjugation forms. While the change that "emphasized" these suffixes is irregular in the sense that it certainly did not apply to all inherited instances of $*k$ and $*t$, it seems clear that it applied in the case of the singular suffix-conjugation forms. The plural suffix-conjugation forms are not obviously cognate with their Semitic or Egyptian counterparts, and despite occasional attempts to link them with the affixes in these better known languages, we would suggest that these suffixes are innovative.

We should also briefly comment on the precise shape of the suffix-conjugation forms (at least of those forms which are clearly cognate with those of Egyptian and Semitic). To reckon from what we have suggested about the suffix-conjugation forms present in both Semitic and Ancient Egyptian, where we find at least some evidence for a distinction between so-called long and short suffix-conjugation forms, varying by the presence of a long vowel preceding the $*-CV$ suffixes, Proto-Berber would appear to have inherited the short-form suffixes. While a vowel is present in the Proto-Berber form, it is characteristically short, while we might expect the long vowel to survive either as vowel length or as consonant gemination word-finally¹⁴⁹.

4.2.1 Inherited Verbal Stems

The inherited verbal stems of Berber show an overwhelming similarity to those of Semitic, with the simple underived G-Stem, the causative S-Stem, the passive T-Stem, and the reciprocal N-Stem all exhibiting striking similarity in both form and meaning. Berber has apparently inherited the Afro-Asiatic state of affairs as it pertains to verbal aspect, with both the old imperfective stem and the old perfective reflected in Proto-Berber verb forms. Additional forms have been developed, however, as Berber has innovated a distinction between so-called "simple" and "intensive" verbal forms. The original perfective functions as the simple perfect form, which is preterite, with its intensive counterpart functioning as a true perfect. The old imperfective functions as the intensive imperfect form, a present progressive/durative/habitual, while the simple imperfect is the basic present/future form.

We must also remark that the original imperfective stem retains the Afro-Asiatic peculiarity in which the derived verbal stems lack the characteristic gemination which indicated the imperfective in the G-Stem. The original, morphologically indistinct imperfective form is preserved in Berber in the S-Stem, where both the perfective and imperfective are morphologically unmarked. In the remaining derived stems (the T- and N-Stems), a novel imperfective form has

¹⁴⁹Consider Kossman's Proto-Berber 1st Sg. Independent pronoun $*nak\bar{k}$, clearly cognate with Akkadian $an\bar{a}ku$, Hebrew $\text{'}an\bar{o}k\bar{i}$ both reflectic Proto-Semitic $*\text{'}an\bar{a}ku/i$, and Coptic ⲁⲛⲟⲕ reflecting Middle Egyptian $*\text{'}anak$, underlyingly $*\text{'}an\bar{a}k/$.

been created, indicated by a **tǝ*- prefix. This innovative form will be discussed in greater detail below.

4.2.1.1 G-Stem

In considering the basic underived G-Stem of Berber, we will focus our attention primarily on the simple perfect form and the intensive imperfect forms, since these are direct reflexes of the original Afro-Asiatic perfective and imperfective stems respectively, and therefore directly cognate with the perfective and imperfective of Semitic, as well as the preterite present/habitual of Beja¹⁵⁰. The other forms, the intensive perfect and the simple imperfect, to reckon from their morphological form, appear to be secondary innovations based on the perfective stem with minor alterations in vocalism and occasional lengthening of the final verbal root vowel.

In considering these forms, the most basic observation is that each takes precisely those forms predicted by our account of affixation with syncope, and indeed, our account explains some aberrations which must be stipulated under a purely templatic theory. Triconsonantal verbs exhibit the expected characteristic *CCVC* stem shape, precisely parallel to those of Semitic. In the case of Berber, however, we may also examine the case of biliteral verbs, both those of the more conventionally Afro-Asiatic *CVC* stem shape, as well as the *CVCV* verbs that appear sporadically¹⁵¹ in Berber. The *CVC* verbs exhibit no syncope in their basic inflection, though Heath (2005) notes that within the Tuareg dialect there exists an alternation between *CVC* stems (such as *wət* "hit"), which he states is the obligatory form before consonants or word finally, and a syncope form *CC* (*-wt-*), which he notes is optional, but can only appear before a vowel-initial suffix or clitic, precisely those environments in which syncope would be possible according to our theory. *CVCV* verb stems show syncope to *CCV* in all forms of the G-Stem, as the addition of the actor prefixes creates the necessary environment for syncope to take place. All of these forms are precisely those which we would predict using our analysis of syncope.

(75) *Derivation of Berber G-Stem Perfectives*

¹⁵⁰Also possible with the proposed geminated imperfectives of Ancient Egyptian, though the existence of such forms is not without controversy.

¹⁵¹Some such forms appear to arise from *CVCVC* verbs with a weak third root-consonant, but some appear to be extensions of *CVC* verbs with an additional vowel of uncertain etymological origin.

| | | | | |
|---------------------|---------------|-------------|------------|----------------|
| | CVCVC | CVCC | CVC | CVC-VC |
| Underlying Root | *k̥vris | *basa | *wat | *wat |
| | ↓ | ↓ | ↓ | ↓ |
| Subject Affix | yi-k̥vris | yi-basa | yi-wat | yi-wat |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yik̥vris | yibasa | - | - |
| ↓ | ↓ | ↓ | ↓ | ↓ |
| -V(C) Suffix/Clitic | - | - | - | yiwat-an |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | yiwat̥an |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yikris→ikrəs | *yibsa→ibsâ | yiwat→iwät | yiwat̥an→äwtän |

In the case of the imperfective G-Stem, our theory provides even more satisfying explanations. Berber trilateral verbs exhibit the characteristic gemination of the second root-consonant (Tuareg *i-kârräs*), perfectly parallel to their Semitic counterparts. But again, the biconsonantal verbs (of both sorts) reveal that this simple description, which applies to effectively all verbs in Semitic, is in fact inaccurate. In the case of biliteral *CVC* verbs, it is not the second root-consonant which geminates, but rather the first, as in Tuareg *i-ggât*¹⁵², the imperfective counterpart to *iwät*. Based on these two examples, we could perhaps try to rescue our templatic approach by stating that it is not the second root-consonant from the left which geminates, but rather, perhaps, the second root-consonant from the *right*. Even this alternative stipulation, however, appears to be empirically false, as is revealed by the case of the *CVCV* verbs. Here, it is not the first root-consonant that geminates, as predicted by our "from the right" templatic hypothesis, but rather the second root-consonant, as in Tuareg *ifillu* "be splitting." The consideration of all these forms simultaneously leads to the idea that the gemination of the imperfective is not sensitive to imposed templatic structures, but rather, is completely sensitive to the syllabic structure, as *it is always the onset consonant of the final syllable which geminates in every case, regardless of which numbered root consonant it happens to be*. This fact is difficult to capture in a theory in which all such verbal roots consist effectively of discontinuous, non-vocalized strings of consonants. In fact, it appears to create a circular argument. The selection of which template applies to a given verb root appears to require the presence of vowels and syllabification to determine which consonant will be geminated, but these vowels are allegedly supplied by the template itself. This creates a situation in which the template must have already applied in order for the grammar know which template ought to be applied. Such problems are avoided (at least diachronically) in our account, in which the verbal roots contain underlying vowels, and gemination behaves as an infix which appends one syllable in from the right. In this instance, the information necessary to calculate the correct target for gemination is already present within the verbal root itself, and the behavior of

¹⁵²Note that Tuareg [gg] is a reflex of Proto-Berber *[g^wg^w], which is known to be the phonetic realization of a geminated sequence */ww/.

gemination as fundamentally affixing means it can correctly exhibit the syllabic sensitivity and right-edge effects that appear to characterize its behavior. Observe in the derivations below that, with affixation to vocalized and syllabified verbal roots, we can generate the apparent "movement" of the gemination from one root consonant to another comparatively trivially.

(76) *Derivation of Berber G-Stem Perfectives*

| | | | | |
|---------------------|-------------------|----------------|--------------|------------------|
| | CVCVC | CVCC | CVC | CVC-VC |
| Underlying Root | *karas | *basa | *wat | *wat |
| | ↓ | ↓ | ↓ | ↓ |
| Impf Geminate | karras | bassa | wwat | wwat |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| ↓ | | | | |
| Subject Affix | yi-karras | yi-bassa | yi-wwat | yi-wwat |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| ↓ | | | | |
| -V(C) Suffix/Clitic | - | - | - | yiwwat-an |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| ↓ | | | | |
| Output | *yikarras→ikârräs | *yibassa→ibâss | yiwwat→iggât | yiwwatan→iggâtän |

More so even than in Semitic, the advantages of our affixation and syncope theory are apparent in Berber verbal inflection. For the perfectives, we correctly predict the variability between syncopated forms like Tuareg/Proto-Berber *ikräs*/**yikras* and non syncopated forms such as *iw"at*/**yiwat*, despite the fact that forms such as the hypothetical **iwt*/***yiwat* are permissible according to the rules of Proto-Berber syllable structure. For the imperfectives, we likewise correctly predict which root consonant should undergo gemination in each case. Critically, for each instance, these are *true predictions*, not post-hoc stipulations, since we do not start with a specific final morphological form in mind and create a template that will generate them, but rather start with a number of apparently unrelated phonological rules and morphological affixes which, in concert with one other, create precisely and only those forms which are attested.

4.2.1.2 S-Stem

Befitting the most common of the derived stems in Afro-Asiatic, the S-Stem is attested in Berber with its expected causative semantics. It should be noted that the Berber S-Stem, in addition to simple causatives, can form factitive verbs, unlike in Semitic, which has developed the innovative D-Stem to form factitive verbs. As we move into the derived stems, we will also have to confront a peculiar development internal to the Berber languages, namely, the gemination or "lengthening" of the consonants of the derivational prefixes. This gemination is quite common and widely attested throughout the Berber region, but appears to

be somewhat inconsistent as to which derivational prefixes and which forms of the verb reflect gemination. We can illustrate this behavior most clearly in the form of the S-Stem. In the Northern Berber language Tashelhiyt, the S-Stem prefix (like the other derivational prefixes) is uniformly geminated for all singly derived verbal forms, as in *isslsa* "dress." It is not geminated, however, for doubly derived verbs such as *ismhada* "position next to one another." By contrast, in the Eastern Berber language Awjila, the S-Stem prefix is never geminated (though the T- and N-stem often are), as in forms such as *šəndəl* "cover" or *šəgzəl* "shorten." Finally, in the Southern Berber language Tuareg (Tahaggart specifically), the S-Stem form reflects gemination, but only in specific verbal forms, as illustrated in the table below adapted from Prasse (1973)

| | Simple | Intensive |
|------------|----------|-----------|
| Imperative | səkrəs | |
| Perfect | issəkräs | yässikräs |
| Imperfect | isəkrəs | isâkräs |

Figure 4.3: Tuareg S-Stem Forms

This comparative inconsistency of gemination or lengthening of the derivational prefixes makes their precise reconstruction for Proto-Berber somewhat difficult. Given how widespread the phenomenon of gemination is throughout the Berber family, it seems unlikely that there were not at least some geminate forms present in the parent language, though which ones, and how extensive they were, remains unclear. Nevertheless, the outgroup comparisons provided by Semitic, Ancient Egyptian/Coptic, and the Cushitic strong verb confirm that the gemination present in Berber is certainly a family-internal innovation, and that the forms inherited into either Proto-Berber or Pre-Proto-Berber most certainly had the form **CV-*. We will consider these forms for our purposes, since it is these forms, without additional gemination or secondary lengthening, that syncope likely acted on.

When examining the behavior of the S-Stem, notwithstanding the issues of gemination, the most obvious point with triconsonantal verbs is how remarkably similar they are to their Semitic and Egyptian counterparts. Verbs such as Tuareg *issəkräs* or Awjila *išəgzəl* are strikingly similar in morphological to Akkadian *ušapris*, featuring a vocalized **Cv-* prefix appending to a *CCVC* verbal stem. The Tuareg imperative *səkrəs* likewise bears a strong resemblance to the Akkadian imperative *šupris*, and even to the S-Stem forms of Ancient Egyptian/Coptic, which lack actor prefixes, such as <s'nh>/**ꜥꜥꜥnh** (**sa'nvh*). These forms are easily generable under the assumption that the derivational prefix appends first, triggers syncope, and is followed by the actor prefix. The biconsonantals have no precise parallel in Semitic, since no verb reconstructable for Proto-Semitic retains a biconsonantal shape during inflection, but they are

comparable to those of Cushitic. Compare, for instance, Tuareg *isyän* "make kneel" with Beja *isdār* "kill." In each case, the verbal root is fully vocalized, and the prefix appears without a vowel as *s*-¹⁵³. These contrast with the biconsonantal verbs which are also bisyllabic, such as *issəknâ*, in which the underlying *CVCV* verbal root is syncopated, and the prefix morpheme retains its vocalism. All such forms follow naturally from simple affixation and the application of syncope throughout the derivation.

(77) *Derivation of Berber S-Stem Perfectives*

| | | | | |
|---------------------|-------------------------------------|-----------------------------------|-------------------------------|-----------------------------------|
| | CVCVC | CVCC | CVC | CVC-VC |
| Underlying Root | * karas | * basa | * wat | * yan |
| | ↓ | ↓ | ↓ | ↓ |
| s̄v- Prefix | si- karas | si- kana | si- yan | si- yan |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | si k aras | si k ana | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Subject Affix | yi-si kras | yi-si kna | yi-si yan | yi-si yan |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | yi s yan | yi s yan |
| | ↓ | ↓ | ↓ | ↓ |
| -V(C) Suffix/Clitic | - | - | - | yi sy an-an |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yis ikras →issə kräs | *yis ikna →issə knâ | yis yan →isy än | yis yanan →isy änän |

In the case of the imperfective S-stem, we find in Berber a situation strikingly similar to that of Semitic. Recall in Semitic (and, as we shall see, in Cushitic as well) that in contrast to the G-Stem, in which imperfective verbs are characterized by gemination of the second radical, the Š-Stem imperfective is characterized only by a change in vocalism and attests the same *CCVC* verbal root shape as its perfective counterpart. The same is true in Berber, where trilateral verbs form their imperfective S-Stems almost identically to the S-Stem perfective, with the notable difference that the imperfective forms are characterized, at least in Tuareg, by the secondary lengthening of the vowels (Impf *isâkräs* vs. Perf *issəkräs*). This secondary lengthening also characterizes the two types of biconsonantal verb roots, as illustrated by imperfective forms such as *isâyän* and *isâknâ*.

Special attention must be paid in these instances to the secondary lengthening of vowels. Since these vowels are originally (and perhaps still underlyingly) short, they can participate in syncope, but cannot themselves be syncopated. We can achieve this effect through simple rule ordering of the **s*̄V̄- prefix and its associated syncope before the lengthening of the vowel. Since the secondary vowel lengthening itself one of the morphological markers of the imperfective, it is not implausible that this lengthening (and whatever morpheme originally

¹⁵³Recall that in some forms of this verb, Beja attests a prefix *sō*-. This form is clearly innovative to Beja, being unattested even elsewhere in Cushitic, and is therefore not relevant to external comparisons with Berber.

triggers it) would occur later in the derivation than the valence-altering S-Stem prefix, as illustrated in the sample derivations below.

(78) *Derivation of Berber S-Stem Imperfectives*

| | | | | |
|---------------------|-------------------------------------|-----------------------------------|----------------------------------|--------------------------------------|
| | CVCVC | CVCC | CVC | CVC-VC |
| Underlying Root | * karas | * kana | * yan | * yan |
| | ↓ | ↓ | ↓ | ↓ |
| sǎ- Prefix | sa- karas | sa- kana | sa- yan | sa- yan |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | sak aras | sak ana | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Impf. Lengthening | s ak ras | s ak na | s ay an | s ay an |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Subject Affix | yi-s ak ras | yi-s ak na | yi-s ay an | yi-s ay an |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| -V(C) Suffix/Clitic | - | - | - | yis ay an-an |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | - | - | - | - |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yis ak ras→is ak räs | *yis ak na→is ak nâ | yis ay an→is ay än | yis ay anan→is ay änän |

4.2.1.3 N-Stem

The Berber N-Stem is clearly cognate in morphological form with its Semitic counterpart, but it exhibits a different semantic meaning. While the N-Stem in Semitic is almost exclusively passive, the Berber N-Stem is a reciprocal/reflexive, as illustrated in the forms such as Tashelhiyt *izri* "to pass by" vs. *immzri* "to meet one another," Middle Atlas *irdel* "to lend something" vs. *imerdal* "to lend to one another," Qabyle *izer* "to see" vs. *imzer* "to see one another," or Tuareg *irmäm* "stick to something" vs. *innärmäm* "to stick to one another."

Morphologically, the N-Stem in Berber shows many of the same properties as the S-Stem. It is frequently subject to sporadic and seemingly inconsistent gemination across various verbal forms, just like the S-Stem. And, as in the case of the S-Stem, it seems clear from the cognates of Semitic and Cushitic (and possibly Egyptian, if the proposed fossilized N-Stems suggested there represent true cognates) that this gemination is an innovative fact internal to the Berber family, which therefore need not have any impact on our analysis of the verbal morphology inherited into Proto-Berber. We will therefore reconstruct the Proto-Berber or Pre-Proto-Berber N-Stem prefix as **mǎ-*. The Berber N-Stem is likewise subject to a consistent, phonologically conditioned allomorphy whereby the initial **m-* of the prefix alternates with **n-* in verbal roots containing additional labial consonants.

From the perspective of syncope, the most important fact about the N-Stem is the corresponding verbal root shapes which co-occur with with the prefix, and, here, the form is distinctly parallel to the S-Stem. Triliteral verb roots are attested with the characteristic *CCVC* root/stem shape, as in Tuareg *immärtüy*. *CVCV* biconsonantal roots are likewise unproblematic, reflecting

the same *CCV* root shape as in the S-Stem, as seen in Tuareg *innəbɔ̄dɑ*. The *CVC* biconsonantals are problematic, however. Recall that in the S-Stem, the derivational prefix appears without a vowel in the case of *CVC* verbal roots (*isyän*). Our theory predicts that the N-Stem ought to be perfectly parallel to the S-Stem, but in fact, the attested forms which we encounter reflect the presence of a vowel following the derivational prefix, as in Tuareg *immədääd*. Why the two forms should behave differently is not superficially clear. One possibility is that the perfectives have been remodeled on the basis of the imperfective, where, as we will demonstrate below, the presence of the vowel following the derivational prefix follows naturally from the typical derivation. This is likely the most plausible source for the observed deviation from the expected shape, but it is not itself without problems. For one, the perfective appears itself to be derived from the imperfective, so it is somewhat less plausible that the derived imperfective forms should influence the simpler perfectives. For another, Berber N-Stem (and T-Stem) imperfectives are formed with a novel affix not attested elsewhere in Afro-Asiatic. That said, the imperfectives with lengthening and the novel *t-* affix appear to have become the default, so it is not implausible that it might be used as the basis for remodeling of other types. The derivation of the perfective verb stems is presented below, demonstrating the improper derivation of *CVC* verbal roots.

(79) *Derivation of Berber N-Stem Perfectives*

| | CVCVC | CVCC | CVC |
|---------------------|----------------------|----------------------|-------------------|
| Underlying Root | *ratay | *baɖɑ | *dad |
| | ↓ | ↓ | ↓ |
| mǃ- Prefix | mi-ratay | mi-baɖɑ | mi-dad |
| | ↓ | ↓ | ↓ |
| Syncopate | miratay | mibaɖɑ | - |
| | ↓ | ↓ | ↓ |
| Subject Affix | yi-mirtay | yi-mibɖɑ | yi-midad |
| | ↓ | ↓ | ↓ |
| Syncopate | - | - | yimɨdad |
| | ↓ | ↓ | ↓ |
| -V(C) Suffix/Clitic | - | - | - |
| | ↓ | ↓ | ↓ |
| Syncopate | - | - | - |
| | ↓ | ↓ | ↓ |
| Output | *yimirtay → immərtäy | *yimibɖɑ → innəbɔ̄dɑ | **yimɨdad → imdäd |

In the case of the imperfective stems, the situation is simpler. Just as in the S-Stem (as well as in the case of the derived stems throughout Afro-Asiatic more generally), the N-Stem lacks the gemination which characterizes the imperfectives of the G-Stem. In the S-Stem, we saw that the lack of gemination in the imperfective is compensated for by the development of a morphological lengthening of the vowel of the derivational prefix. In the N-Stem (and the T-Stem), the characteristic lengthening of vowels is indeed still present, but it now finds itself realized on an additional prefix of the form *tä-* in Tuareg, presumably **tä-*

in Proto-Berber. The origin of this marker of the imperfective is unclear, since it has no obvious external parallels throughout Afro-Asiatic. Attempts have been made to link this prefix with the **<ta>* infix, which marks the perfect stem in East Semitic, but the semantic connection here is nebulous, since perfects and imperfectives have rather different meanings and could rarely, if ever, be used in similar types of sentences. For this reason, we consider the *tā-/tā-* prefix to be an innovation internal to the development of Berber. Regardless of its potential origin, we can account for the verbs formed with this prefix quite easily in our theory of syncope, as demonstrated in the derivations below.

(80) *Derivation of Berber N-Stem Imperfectives*

| | CVCVC | CVCC | CVC |
|---------------------|---|---------------------------------------|--------------------------------------|
| Underlying Root | *ratay | *baḍa | *dad |
| m̃v- Prefix | ma- ratay | ma- baḍa | ma- dad |
| Syncopate | ma r atay | ma b aḍa | — |
| Impf. Prefix | tā- martay | tā- mabḍa | tā- madad |
| Syncopate | — | — | — |
| Subject Affix | yi- tāmartay | yi- tāmabḍa | yi- tāmadad |
| Syncopate | — | — | — |
| -V(C) Suffix/Clitic | — | — | — |
| Syncopate | — | — | — |
| Output | *yitā martay →itāmā r tāy | *yitāmab ḍa →itānā b ḍā | yitām adad →itāmā d ād |

4.2.1.4 T-Stem

The T-Stem is the last of the derived stem types in Berber. It has the basic function of forming passive verbs from transitive underived verbs, although, as noted by Heath (2005), "the passive derivation is not very common." The reason is that a great many Berber verbs are either naturally intransitive with approximately passive semantics, or are labile and can be used either transitively or intransitively. For this reason the causative derivation (S-Stem), which can form transitives from this large class of intransitive or partially transitive verbs, is by far the more common of the derived verb types.

Morphologically, the T-Stem is, for the most part, similar to the other derived verbal forms which we have seen in Berber, reflecting the sporadic gemination of what was originally a singlet **t̃v-* prefix, the lack of gemination characterizing the imperfective verbal stem, as well as the unexpected presence of a vowel with the derivational **t̃v-* prefix in the perfective of biconsonantal *CVC* verbal roots (parallel to the N-Stem). Although the imperfective gemination of the G-Stem is unattested, the form which appears as the imperfective of the T-Stem varies between the simple lengthened-vowel prefix of the S-Stem,

as in *it̄kräh* and the innovative **t̄v̄*- prefix of the N-Stem, as in *it̄at̄kräh*. In our analysis, we will discuss both forms and demonstrate how each is trivial to derive using our analysis. An additional complication arises in the form of an alternate, so called "tw-" T-Stem formation which surfaces with a prefix **tw̄*-. The origin of this variant is unknown, and its shape is quite odd, since it begins with an initial consonant-cluster, a form inarticulable in archaic Afro-Asiatic languages, and which is otherwise unattested in all verbal or nominal affixes. Despite its comparatively strange shape, the affix presents little difficulty for our theory, as we can simply assume its presence at the Proto-Berber stage and derive the attested forms (excepting the *CVC* biconsonantal perfective) using simple affixation and syncope. We will begin with the perfectives.

The perfective T-Stems are largely similar to those of the N-Stem. Triconsonantal verbal roots still exhibit the same basic *CCVC* stem shape, while *CVCV* biconsonantals reflect a *CCV* surface stem-shape. The simple *CVC* biconsonantal roots exhibit the same unexpected irregularity as in the N-Stems, in which the derivational prefix unexpectedly retains its vowel, contrary to the predictions of our theory. As mentioned, this may find its origin in the shape of the imperfective stem, where the presence of a vocalized derivational prefix is predicted by the theory. Sample derivations are provided below.

(81) *Derivation of Berber T-Stem Perfectives*

| | CVCVC | CVCC | CVC |
|-----------------|--------------------------------------|--------------------------------------|---------------------------|
| Underlying Root | * karaz | * nana | * wat |
| t̄v̄- Prefix | ti- karaz | twa- nana | ti- wat |
| Syncopate | ti k araz | twa n ana | — |
| Subject Affix | yi-ti k raz | yi-twa n na | yi-ti- wat |
| Syncopate | — | — | yi-ti- wat |
| Output | *yit k raz → itt k räh | *yitwa n na → itw n nâ | **yit w at → itwät |

The imperfective T-Stems show little difference from their N-Stem counterparts, with the notable exception that they attest to forms with both an imperfective **t̄v̄*- prefix (like the N-Stem) and imperfectives formed by lengthening (*it̄at̄ärmâs* vs. *it̄ermâs*). The derivations of each are identical in form to those of the N-Stem and S-Stem respectively. In the derivations below, we will present solely the prefixed **t̄v̄*- forms.

(82) *Derivation of Berber T-Stem Imperfectives*

| | | | |
|-----------------|---|---------------------------------------|--------------------------------------|
| | CVCVC | CVCC | CVC |
| Underlying Root | *karaz | *nana | *wat |
| | ↓ | ↓ | ↓ |
| tǃ- Prefix | ta- karaz | ta- nana | ta- wat |
| | ↓ | ↓ | ↓ |
| Syncopate | ta k araz | ta n ana | ta- - |
| | ↓ | ↓ | ↓ |
| Impf. Prefix | tā-ta k raz | tā-ta n na | tā-ta w at |
| | ↓ | ↓ | ↓ |
| Syncopate | - | - | - |
| | ↓ | ↓ | ↓ |
| Subject Affix | yi-tāta k raz | yi-tāta n na | yi-tāta w at |
| | ↓ | ↓ | ↓ |
| Syncopate | - | - | - |
| | ↓ | ↓ | ↓ |
| Output | *yitāta k raz→itātā k rāh | *yitāta n na→itātā n nâ | yitāta w at→itātā w ât |

4.2.2 Combined Verbal Stems

Unlike in Semitic, the Berber languages do not feature novel or innovative derived verbal types akin to the Semitic D- or L-Stems¹⁵⁴. They do, however, feature the combination of derivational affixes to form multiply derived stems. This formation of doubly derived verbal stems is far more common in Berber than it is in Semitic, and we may wish therefore to touch on them in slightly more detail. As was the case in Semitic, because the combined derived stems are formed from the transparent affixation of morphological material present in the Proto-Berber parent language, it is not clear that we need reconstruct such forms to Proto-Berber itself. Nevertheless, because the combination of multiple derivational affixes reveals the persistent application of syncope, albeit with a distinctive peculiarity, they are worth discussing in some form here.

Prasse (1973) lists a number of combined derived stem types including his so-called *réci-proque inmäkräs* (what we might call an NN-Stem), *causatif de réfléchi ismäkräs* (NS-Stem) *causatif de réci-proque isnämakräs* (NNS-Stem), *réfléchi de causatif imsäskär* (SN-Stem) *réci-proque de causatif inmägäzän* (SNN-Stem), *causatif de réfléchi de causatif ismäskär* (SNS-Stem), *passif de causatif itwäsätän* (ST-Stem), and *causatif de causatif issänkär* (SS-Stem).

The forms of the combined derived stems are quite striking, and require further comment. Doubly derived stems (NN-, SN-, and SS-Stems) are comparatively easy to generate under our theory, and require no special modification to the rules which we have presented to this point. Observe the simple derivation below.

(83) *Derivation of Berber Doubly Derived Stems*

¹⁵⁴We could briefly mention the formation of verbal participles, which are discussed in Chapter 8.5 of Heath (2005). It is unclear how far the participial formations of Berber should be reconstructed back into Afro-Asiatic history, since they do not match even the formations present in Semitic. Nevertheless, we can mention that forms Heath cites, such as *igäšän* "one who has entered" or *iswän* "who who has drunk" accord with the predictions of our theory.

| | |
|-----------------|---------------------------------------|
| Underlying Root | *kǃras |
| | ↓ |
| mǃ- Prefix | ma- kǃras |
| | ↓ |
| Syncopate | ma- kǃ ras |
| | ↓ |
| mǃ- Prefix | ma-ma kras |
| | ↓ |
| Syncopate | — |
| | ↓ |
| Prefix | ya-ma kras |
| | ↓ |
| Syncopate | ya-m a kras |
| | ↓ |
| Output | *yammakras→inmäkräs |

The triply derived verbal stems, such as the NSS-, NNS-, SNN-, and SNS-Stems, reveal an additional complication. If we follow the same simple derivation presented above, in which syncope applies after each instance of affixation of a derivational morpheme, our theory makes incorrect predictions about the precise shape of the concatenated string of derivational prefixes which precedes the verbal root. Consider the derivation below.

(84) *Incorrect Derivation of Berber Triply Derived Stems*

| | |
|-----------------|--|
| Underlying Root | *kǃras |
| | ↓ |
| mǃ- Prefix | ma- kǃras |
| | ↓ |
| Syncopate | ma- kǃ ras |
| | ↓ |
| mǃ- Prefix | ma-ma kras |
| | ↓ |
| Syncopate | — |
| | ↓ |
| sǃ- Prefix | sǃ-ma kras |
| | ↓ |
| Syncopate | sǃ-m a kras |
| | ↓ |
| Prefix | yasǃm kras |
| | ↓ |
| Syncopate | — |
| | ↓ |
| Output | **yasǃmkras→*issǃnmäkräs |

Our theory incorrectly predicts that the form of, for example, the NNS-Stem

in Tuareg ought to be *issūnmākṛās* rather than the actually attested *isnāmākṛās*. A similar situation applies to the other triply derived verb forms. Purely mechanically, we can rescue our theory. The triply derived stems of Berber consistently exhibit a shape as if the first derivational affix applied to them triggers a round of syncope, but all others do not, and syncopation applies at the surface level. It is not clear that this conclusion is preferable regarding the synchronic grammar of any single Berber language, or even the Proto-Berber language itself, but as a diachronic explanation, it is more palatable. We may envision a scenario, for example, in which Proto-Berber or Pre-Proto-Berber inherit a verbal and phonological system wherein the addition of derivational affixes triggers a round of syncopation on the verbal stem. This generates the characteristic *CCVC* root shape associated with the basic S-, T-, and N-Stems in Berber. Subsequently, at some point in the prehistory of the Berber languages, they undergo the same change which occurred in Cushitic, and which is partially complete in Semitic; namely, the loss of persistent application of syncope. Unlike in Semitic or Cushitic, the inherited derived stems are not remodeled to accord with the new syncope rule (the forms of the simple derived stems are fossilized in their original shape), but any novel derived stems, such as the larger double- and triple-derived stems, which are likely to have been formed independently by various Berber daughters, are now subject to only a single round of syncope beyond the archaic and fossilized initial derived stem formation. Such a state of affairs would generate the apparent synchronic discrepancy between singly derived stems, which behave according to the archaic, persistent syncope rule, the younger doubly and triply derived verbal stems, which show the initial rule, but appear to "switch," as it were, to a non-persistent syncope rule partway through their derivation. This explanation is speculative, and while it is not, to our knowledge, subject to any explicit objections, we provide it here merely as a possible explanation for any otherwise peculiar state of affairs, rather than as a fully formed hypothesis.

Chapter 5

Afro-Asiatic to Egyptian

Although the morphology of the Ancient Egyptian language is comparatively well-described, especially considering its immense antiquity, it presents a massive obstacle for analysis under our theory of syncopation. Since primary attested Old, Middle, and Late Egyptian texts provide neither vocalization nor syllable-structure information, we must rely heavily on the attestation of Coptic, the latest stage of the Egyptian language which came to be written in a Greek-derived alphabetic script. Nevertheless, while Coptic has been subject to a number of phonological developments which obscure the original phonology, a great deal of the phonological structure of older forms of Egyptian can be recovered from attested Coptic.

As far as the syncope analysis, the inherited morphological forms reconstructable for Egyptian from Coptic provide support that they were, at some point, subject to syncopation¹⁵⁵. We will discuss both those inherited forms with syncopation, and more recent forms without, and note a similarity between Egyptian and Semitic in terms of which pieces of morphology appear to have triggered syncopation.

5.1 Nominal Morphology

The nominal morphology of Egyptian is, in most cases, the more archaic element of the grammar. Although case marking is not present in any attested form, plural formation shows potential cognation with other Afro-Asiatic branches, and the ubiquitous feminine **-t* marker is also present. Nominal derivation shows its closest links with Semitic, particularly in the form of the so-called *nisba* formations (denominal adjectives productively derived from nouns). We

¹⁵⁵It is unclear whether syncopation was synchronically active in the grammar of either Old or Middle Egyptian. Few, if any, clear counterexamples exist, but without grammaticality judgments from native speakers, it is difficult to ascertain if this is the result of active synchronic syncope, or the fallout of a system which had already been subject to syncope, with any syncopated~non-syncopated alternations simply being inherited archaisms.

will examine each, and the ways in which the forms and alternations can be accounted for and explained by an analysis of syncope.

5.1.1 Case Inflection

As previously stated in section 1.3.1.4, overt case inflection on nouns is wholly absent from our attested corpus of Egyptian. It is not present on the surface in Coptic, where nouns inflect for "state" (akin to the concept of state described in Semitic), but have no overt case-marking endings. Neither can the presence of earlier case marking be inferred from alternations present in Coptic, the way the feminine and plural morphemes can be reconstructed. They are also not present in Egyptian words attested in Akkadian cuneiform in the Amarna letters. Here, forms such as <na-ta> for Egyptian <ntr> **nātar* or <ha-ti-ip> for Egyptian <ḥtp> **hātip* reflect that case marking was at least absent from the Middle~Late Egyptian of Egypt's 18th Dynasty circa 1350-1330 BCE.

Nevertheless, some scholars, such as Loprieno (1995), have argued that traces of case marking survive. Loprieno argues that the common suffixes of unclear origin *-*aw*, *-*uw*, and *-*iw*, which appear frequently on Egyptian nominal formations, ought to be interpreted not as *-*ǃw* suffixes, as is commonly supposed, but rather as remnants of the same *-*u* suffix which characterizes the nominative case of Semitic and may underlie the so-called construct-state prefix of Berber. In Loprieno's system, this case form, which was originally present on all nominals, was lost in consonant-final noun stems, but survived in *-*i*, *-*a*, and *-*u* stems, where it surfaced as a vocalic glide.

Loprieno's assertion is not the consensus viewpoint of the Egyptian *-*aw*, *-*iw* and *-*uw* terminations, so we will treat these forms as nominal suffixes in sections 5.1.2, 5.1.3 and 5.1.4 below. Nevertheless, it is worth mentioning briefly that such forms, whether they be opaque derivational suffixes or case endings as supposed by Loprieno, are consistent with an analysis of syncope and trigger it in such nominal forms as would be predicted using our analysis.

5.1.2 Gender Inflection

Like those of all archaic Afro-Asiatic languages, Egyptian nominals are all inflected for gender, which may trigger gender concord with other elements within the NP, as well as trigger agreement with the truly verbal stative suffix-conjugation. As expected, this gender system is divided between an unmarked masculine, and a feminine commonly marked with the inherited *-*t* suffix, with precious few exceptions. One striking feature of the inflection for gender in Egyptian is that, whenever recoverable from Coptic, the feminine suffix of non-pronominal, non-deictic nouns in Egyptian is always reconstructable as *-*ǃt*. This contrasts notably with Semitic and Berber, where we have argued that the *-*t* form is original and more basic, and the vocalized *-*ǃt* form is an allomorph which follows super-heavy syllables.

In section 1.3.1.2, we discussed the variability between *-*t* and *-*ǃt* feminine affixes in Afro-Asiatic, and concluded that the *-*t* form was more likely to be

original. We noted that, if the form of the affix were indeed *-*ʔt*, we would expect this morpheme to feed our rule of syncope, triggering an alternation in trilaterals between *CVCVC* masculine nominals, but *CVCC-ʔt* feminine, which is, generally speaking, not the case in Afro-Asiatic. In Egyptian, where the feminine affix does surface with a vowel as *-*ʔt*, ***we do indeed see such alternations***. Below, we will consider masculine and feminine noun paradigms, as reconstructable from Coptic. Our data will be drawn primarily from Osing (1976), who gives an extensive enumeration of Egyptian nominal forms.

| | | Bilateral | Trilateral | Quadrilateral |
|------------|------|--------------------|------------------|-------------------|
| sadmuw | M. | ροειϰ *ras(y)vw | κοοβε *qaʒbvw | – |
| | F. | μορϰ *marvt | οτοολεϰ *waʹrvt | – |
| sidmaw | M. | μιν *minvw | βίβε *qiʒbvw | – |
| | F. | τιπε *dipvt | οτλλε *wiʒrvt | – |
| sudmaw | M. | μντ *mud | κνβε *subʒaw | – |
| | F. | μνωτ *mudāwvt | ετνωτ *ʒutpāwvt | – |
| sadūmuw | M. | μσατ *saʒuw | δκρ *wasurvw | – |
| | F. | οτμν *wvhuyvt | ζρμψε *ʒutpāwvt | – |
| sidāmaw | M. | μρματ *hvmaw | κβωζ *sūbāhvy | κμοτε *svmʒāʹvy |
| | F. | ακωτ *ʒqāyv | πρω *pvrāwat | – |
| sudīmaw | M. | – | κμλε *sūkimvy | κελκλ *sulsil |
| | F. | ατε *ʹvdiiwvt | δμν *ʹvšiʒwvt | – |
| sādīm | M. | ζατ *hid | οτζε *wahʹvʹ | κοπτε *santvr |
| | F. | μινε *minvt | οτοοζε *wahʹvt | τλτιλε *daldilvt |
| sīdam | M. | ζολε *ham | οτνβ *wiʹvb | – |
| | F. | ποτπε *manvt | κβψε *sibhvt | – |
| sūdīm | M. | κιε *zūfvi | μν *mūʒvʹ | – |
| | F. | κιε *zūfvt | μλε *muʒʹvt | – |
| sidam | M. | – | κμοτ *svmad | εμπο *iʹvnbāʒ |
| | F. | ζωμλε *iʹv-hāwvt | εμπωτ *nʹvbadvt | κμπω *iʹvnbāʒvt |
| sadmīl | M. | – | ναψτ *nahʹtvi | – |
| | F. | – | κμμν *kammīvt | – |
| sadmaw | M. | ποεικ *nak(i)vw | ατπ *iatnvw | – |
| | F. | – | μμλεω *svmʒāyv | – |
| sudmiw | M. | – | κρμλε *svrmīw | – |
| | F. | – | ρμζν *rvmhīwvt | – |
| sadāmūw | M. | ρωτ *radvw | αχω *hʹkāʒuw | ααω *daʒdāʒuw |
| | F. | ζομλε *hanwvt | οτοοτε *wʹʒadwvt | – |
| sadāmūw | M. | ιβ *ʒihii | ψλιβ *svriqii | τεκτεικ *tvhtihii |
| | F. | κβι *qibivt | ψτμλε *hʹvtimivt | – |
| sadūmvw | M. | μαματ *iamaw | βερνβ *gvʹrūgvw | – |
| | F. | <ma-hu-ū> *mahūwvt | βρμπε *gvʹrūpvt | – |
| sādām | M. | οβ *ab | βκ *bāʒak | ψοτψτ *hathvt |
| | F. 1 | οπποτ *wʹvnāwvt | αοτω *iawāʒvt | – |
| | F. 2 | μοειϰ *mahhyvt | κοτπι *satpvt | – |
| sudīm | M. | ταϑ *taf | μπα *švnaʹ | – |
| | F. 1 | – | πολβϰ *palgvvt | – |
| | F. 2 | – | μωωμλε *iʹvhāmvt | – |
| sudīm | M. | ταϑ *taf | οτψαπ *wʹvšib | – |
| | F. 1 | – | ελκϰ *urqvvt | – |
| | F. 2 | – | εκιβε *qʹʒibvt | – |
| sadmīw | M. | – | πορκ *parqvʹw | – |
| | F. | – | κβν *sabʒiyvt | – |
| sidmaw | M. | μκρ *mir(i)aw | λεβψ *ʒibhvw | – |
| | F. | – | ναειω *nʹvʹiawvt | – |
| sudīmīw | M. | χιτ *šitvw | μβιν *švbinaw | κελκλ *svʹsilvw |
| | F. | βν *biʒyvvt | ναειω *nʹvʹiawvt | μκρ *svʹširwvt |
| sadmīw/-it | M. | – | μοψτε *maštvw | – |
| | F. | – | κοβ *hasbvt | – |
| sudmvw | M. | μκρ *mūrvw | νααϑ *nadhvw | – |
| | F. | ζν *huʒwvt | ζνπι *huʒpvt | – |

Figure 5.1: Egyptian Masculine and Feminine Noun Forms from Osing (1976)

Although Osing divides his noun patterns according to their vocalism (following the tradition of Semitic; **qatal*, **qital*, **qutul*, etc.), for our purposes we may group the nominal patterns according to their morphological shape and prosodic structure. Nouns formed with the common prefix **mǔ*- are handled in section 5.1.4.1 below, but of the remaining nouns, we may group them into three macro-classes: those with underlying *CVCVC* trilateral roots, those with *CVCVC* trilateral roots, and those with *CVCVC* trilateral roots. We will discuss each below, and demonstrate how the forms attested, both masculine and feminine, can be generated from syncope.

5.1.2.1 CVCVC Roots

The class of *CVCVC* trilateral roots includes the following patterns from Osing; *sādīm/sadmat*, *sādām/sidmit*, *sūdim/sudmut*, *sādām/sadmat*¹⁵⁶; and the suffixed forms *sadmūw/sadmut*, *sidmaw/sidmat*, *sudmaw/sudmāwat*, *sadmīl/sadmīlūt*, *sadmaw/sadmāwat*, *sudmiw/sudmīwut*, *sadmīw/sadmīwat*, *sidmaw/sidmāwat*, *sadmīw/sadmit*, and *sudmūw/sudmūt*.

The most striking shared features of the *CVCVC* class is that it is characterized by a fixed first-syllable stress in the underived forms, and an alternation between a *CVCVC* trilateral root shape in underived masculines, and a *CVCC* trilateral root shape in underived feminines. Suffixed masculine and feminine nouns both share the *CVCC* root shape.

We may begin our analysis with the underived root nouns, which are the simplest type. Here, the addition of the feminine affix, which always takes the form **-ūt*¹⁵⁷, triggers syncope of the trilateral *CVCVC* nominal roots, as in the derivation below.

(85) *Derivation of Masculine/Feminine CVCVC Trilateral Root Nouns*

¹⁵⁶We must here discuss some of the peculiarities of Middle Egyptian surface syllable-structure. Vowel length must be phonemically contrastive in the underlying representations of Middle Egyptian words, as the calculation of stress is critically sensitive to the weight of syllables, and reflects the presence of long vowels. In the surface forms, however, vowel length is a predictable outcome of stress and syllable structure. There can be only a single long vowel on the surface of a Middle Egyptian word, which will appear on any stressed open syllable. **All other syllables, regardless of underlying weight, will surface with short vowels.** All of the patterns presented here have underlying *CVCVC* roots, but surface with *CVCVC* masculine forms, due to the stressing of the first open syllable.

¹⁵⁷Though the quality of the vowel varies. It is often a copy of a vowel from the nominal root, and this may represent the original source of the variation.

| | | |
|---------------------------------------|--------------------------|-----------------------------|
| | Masculine | Feminine |
| Underlying Root | sad_dam | sad_dam |
| | ↓ | ↓ |
| -ṽt Suffix | – | sad_dam-at |
| | ↓ | ↓ |
| Syncopate | – | sad_damat |
| | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | sā_dam | – |
| | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – |
| | ↓ | ↓ |
| Output | sā_dam | sad_dmat |

In the case of those nouns exhibiting underlying *CVCVC* root and suffixes *-ṽw or *-ṽḷ, the same analysis holds, although the presence of the vowel-initial suffix means that even the masculine forms exhibit syncopation and a surface *CVCC* root shape.

(86) *Derivation Masculine/Feminine CVCVC Trilateral Suffixed Nouns*

| | | | |
|---------------------------------------|------------------------------|------------------------------|------------------------------|
| | Masculine | Feminine *-ṽt | Feminine *-ṽwṽt |
| Underlying Root | sad_dv̄m | sad_dv̄m | sad_dv̄m |
| | ↓ | ↓ | ↓ |
| -ṽw Suffix | sad_dv̄m-uw | – | sad_dv̄m-aw |
| | ↓ | ↓ | ↓ |
| Syncopate | sad_dv̄muw | – | sad_dv̄maw |
| | ↓ | ↓ | ↓ |
| -ṽt Suffix | – | sad_dv̄m-ut | sad_dmaw-at |
| | ↓ | ↓ | ↓ |
| Syncopate | – | sad_dv̄mut | – |
| | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | – | sad_dmāwat |
| | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | – |
| | ↓ | ↓ | ↓ |
| Output | sad_dmuw | sad_dmut | sad_dmāwat |

Bilateral and Quadrilateral root nouns have not been included here, as they are predictably invariant, since the addition of the feminine or derivational suffix fails to create the necessary environment for syncopation in all but the case of feminine biliteral nouns of the *-ṽwṽt type, such as **ḡo_oḷe** *ḡanwṽt. Again, we may account for these simply via syncopation as *ḡan-ṽw-ṽt → *ḡanḡwṽt → *ḡanwṽt.

5.1.2.2 CVC \bar{V} C Roots

The class of CVC \bar{V} C nominals includes Osing's patterns *sidam/sidāmat*, *sudim/sudīmit*, *sadam/sadāmat*, and the derived classes *sadūmuw/sadūmut*, *sidāmaw/sidāmat*, and *sadūmuw/sadūmūt*. The CVC \bar{V} C class is characterized by the absence of the CVCVC~CVCC alternation in masculine and feminine noun formation, or in derived *-*ṽw* nouns, as well as a fixed stress on the underlyingly long vowel which appears between the second and third root-consonant in trilateral nouns. Again, all such forms may be generated via syncope, as in the examples below.

(87) Derivation Masculine/Feminine CVC \bar{V} C Trilateral Root Nouns

| | | |
|---------------------------------------|--------------|-----------------|
| | Masculine | Feminine |
| Underlying Root | sidām | sidām |
| | ↓ | ↓ |
| - <i>ṽt</i> Suffix | – | sidām-at |
| | ↓ | ↓ |
| Syncopate | – | – |
| | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | – |
| | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | sidam | – |
| | ↓ | ↓ |
| Output | sidam | sidāmat |

(88) Derivation Masculine/Feminine CVC \bar{V} C Trilateral Suffixed Nouns

| | | | |
|---------------------------------------|-----------------|-----------------------|--|
| | Masculine | Feminine *- <i>ṽt</i> | Feminine *- <i>ṽwṽt</i> ¹⁵⁸ |
| Underlying Root | sadūm | sadūm | sadūm |
| | ↓ | ↓ | ↓ |
| - <i>ṽw</i> Suffix | sadūm-uw | – | sadūm-uw |
| | ↓ | ↓ | ↓ |
| Syncopate | – | – | – |
| | ↓ | ↓ | ↓ |
| - <i>ṽt</i> Suffix | – | sadūm-ut | sadūmuw-at |
| | ↓ | ↓ | ↓ |
| Syncopate | – | – | – |
| | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | – | sadūmūwat |
| | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | sadumūwat |
| | ↓ | ↓ | ↓ |
| Output | sadūmuw | sadūmut | sadumūwat |

¹⁵⁸It is unclear if any formations of this type are directly attested in Coptic or Ancient

5.1.2.3 C̄VCVC Roots

The C̄VCVC class primarily includes derived forms, such as the *sud̄imaw/sud̄imwat*, *sad̄amuw/sad̄amwöt*, *sad̄imi/sad̄imwöt* and *sud̄imiw/sud̄imwit* classes, as well as possibly the root-noun class *sād̄am/sad̄amat*, although this class is somewhat irregular, as discussed in section 5.1.2.4 below.

In the suffixed nouns, the C̄VCVC class is characterized by an alternation between a surface CVCVC-*ṽw* masculine form and a feminine in CVCVC-*w-ṽt*. If we accept the inclusion of the *sād̄am/sad̄amat* class, we may say that root nouns of this type are characterized by a shift of stress from first to second root vowel, with no surface alternation between a CVCVC root and a CVCC. The absence of syncope in any of these forms (root/suffixed, masculine/feminine) may be derived succinctly from the postulation of an underlying C̄VCVC form (for trilaterals) along with our rule of syncope, since the first vowel cannot be syncopeated due to its weight, while the second cannot, since it will never be the second of adjacent light syllables. Example derivations are provided below.

(89) *Derivation of Masculine/Feminine C̄VCVC Trilateral Suffixed Nouns*

| Underlying Root | Masculine sūd̄im | Feminine *-ṽwṽt sūd̄im |
|---------------------------------------|----------------------------|----------------------------------|
| -ṽw Suffix | ↓ sūd̄im-aw | ↓ sūd̄im-aw |
| Syncopate | ↓ - | ↓ - |
| -ṽt Suffix | ↓ - | ↓ sūd̄imaw-at |
| Syncopate | ↓ - | ↓ sūd̄imaw |
| Stressed Open Vowel → \bar{v} | ↓ sūd̄imaw | ↓ - |
| Unstressed/Closed Vowel → \check{v} | ↓ sud̄imaw | ↓ sud̄imwat |
| Output | ↓ sud̄imaw | ↓ sūd̄imwat |

Again, biliteral and quadrilateral nouns have not been included as they are predictably invariant.

5.1.2.4 Irregular or Problematic Classes

Although the vast majority of nominal patterns in Osing (1976) exhibit the variation in shape (particularly among trilateral nouns) which our syncope rule

Egyptian. Nevertheless, they have been included here for the sake of completeness based on how our syncope analysis predicted such forms would have appeared.

predicts, it is worth mentioning that there are several classes which present difficulties both for our syncope theory and for general theories of Egyptian stress/stem formation. In most such examples, we find multiple noun patterns exhibiting the same vocalic sequence, but differing patterns of root/stem alternations. For example, Osing notes masculine vs. feminine forms such as *sādām/sadmat*~*sadāmat* (as well as *sadam/sadmat*) and *sudīm/sudīmit*~*sudmit*.

It is difficult to account for such forms using syncope, but before we can address such issues, we must also account for the irregular stress patterns which they exhibit. For example, the masculine *sudīm*, which must have an underlyingly long second vowel /*sudī̄m*/ in order to account for its final syllable stress, perfectly matches the attested feminine *sudīmit*, but is wholly incompatible with the likewise attested feminine *sudmit*, which **cannot** have an underlyingly long vowel between the second and third root-consonants, as such a long vowel would attract stress and could never be deleted (even under traditional theories of Egyptian phonology). The same holds true for the *sadam/sadmat* class, where the masculine form reflects an underlying /*sadām*/, while the feminine categorically cannot reflect such a form.

The simplest explanation for the apparent irregularity of these classes (given their shared vocalism), is that they represent the conflation of originally distinct underlying forms with coincidentally shared vocalism. If true, this means that such forms are not, as they appear, an irregularly stressed class which exhibits irregular syncope. Rather, they are a novel, innovative class generated by the combination of forms from distinct paradigms of inflection, which presumably originally exhibited more regular patterns of stressing and syncope in their natural paradigms.

5.1.3 Plural Formation

Egyptian plural formation is fairly unique within the Afro-Asiatic world. In contrast to the vast majority of Afro-Asiatic languages, where it is common to find a number of distinct "sound" plural affixes, Egyptian attests only one plural formative, hieroglyphic <.w>. More striking, this plural affix is found on effectively all plural forms. Even those that attest the characteristics of internal, "broken" plurals, such as ⲛⲟⲩⲧⲉ "god" vs. ⲛⲧⲏⲣ "gods," must be reconstructed as originally containing the sound-plural affix (**nātar* vs. **nū̄tūrōw*).

For our purposes, the important issue is to examine the form of such plurals as they survive down into Coptic, and examine whether the affixation of the plural <.w> suffix is consistent with the analysis of syncope presented above. This question is difficult to answer, since the majority of nouns in Coptic have no morphologically distinct singular and plural forms, with plurality being indicated solely by the presence of a plural article or deictic. Nevertheless, there are enough surviving archaic plural forms in Coptic to reveal at least in part the state of affairs in older forms of Egyptian.

As predicted by an analysis of syncope, biliteral nouns typically exhibit no syncope or stem manipulation, other than the surface-lengthening of stressed vowels in open syllables, which is clearly a secondary development

within Egyptian (and likely a surface-level phonetic one at that). Consider the masculine and feminine plural biliteral nouns below.

| | Masculine | | Feminine | |
|----------|------------|---------------|---------------|-----------------|
| | Sg. | Pl. | Sg. | Pl. |
| Coptic | ⲡⲟ "mouth" | ⲡⲱⲟⲣ "mouths" | ⲉⲓⲱⲉ "field" | ⲉⲓⲱⲟⲣⲉ "fields" |
| Egyptian | <rʔ> *raʔ | <rʔ.w> *raʔaw | <ʔh.t> *ʔahvt | <ʔh.wt> *ʔahwvt |

Figure 5.2: Singular and Plural Biliteral Nouns

| | Masculine | | Feminine | |
|----------|--------------|-----------------|------------------|--------------------|
| | Sg. | Pl. | Sg. | Pl. |
| Coptic | ⲓⲱⲧ "father" | ⲓⲱⲧ "fathers" | ⲉⲓⲱⲉ "woman" | ⲉⲓⲱⲟⲣⲉ "women" |
| Egyptian | <iti> *iatvi | <iti.w> *iativw | <h(i)m.t> *himvt | <h(i)m.wt> *himwvt |

Figure 5.3: Singular and Plural Triliteral Nouns

We may derive all such forms comparatively straightforwardly using our theory of syncope.

(90) *Derivation of Biliteral Singular and Plural Nouns*

| | M. Sg. | M. Pl | F. Sg. | F. Pl |
|---------------------------------------|--------|--------|--------|---------|
| Underlying Root | raʔ | raʔ | ʔah | ʔah |
| -vt Suffix | ↓ | ↓ | ↓ | ↓ |
| | - | - | ʔah-vt | - |
| Syncopate | ↓ | ↓ | ↓ | ↓ |
| | - | - | - | - |
| -w/-wvt Suffix | ↓ | ↓ | ↓ | ↓ |
| | - | raʔ-aw | - | ʔah-wvt |
| Syncopate | ↓ | ↓ | ↓ | ↓ |
| | - | - | - | - |
| Stressed Open Vowel → \bar{v} | ↓ | ↓ | ↓ | ↓ |
| | - | rāʔaw | ʔāhv̄t | - |
| Unstressed/Closed Vowel → \check{v} | ↓ | ↓ | ↓ | ↓ |
| | - | - | - | - |
| Output | ↓ | ↓ | ↓ | ↓ |
| | raʔ | rāʔaw | ʔāhv̄t | ʔahwvt |

(91) *Derivation of Triliteral Singular and Plural Nouns*

| | M. Sg. | M. Pl | F. Sg. | F. Pl |
|---------------------------------------|----------------|--------------------|------------------|-------------------|
| Underlying Root | iaṭṿi | iaṭṿi | hiiam | hiiam |
| | ↓ | ↓ | ↓ | ↓ |
| -ṿt Suffix | – | – | hiiam-ṿt | – |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | hiiamṿt | – |
| | ↓ | ↓ | ↓ | ↓ |
| -ṿw/-ẉvt Suffix | – | iaṭṿi-ṿw | – | hiiam-ẉvt |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | iaṭṿi-ṿw | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | iaṭṿi | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | iaṭṿi | iaṭi-ṿw | hiimṿt | hiiamẉvt |

We have here presented derivations only for the simple *CVVCV* root type, the most common formation. Presumably, in older forms of Egyptian, there would be plural patterns for the *CVCVC* and *CVCVC* root types described above, but as these were fewer in number than their simple counterparts, precious few (if any) have survived into Coptic, where we might have direct access to them. Examples of such singular/plural pairs are likely to be found in words such as **ⲁⲛⲁⲩⲱ**/**ⲁⲛⲁⲩⲱⲩ**, presumably descending from an original **ʿanaḥ*/*ʿanāḥṿw*~*ʿanawḥ*¹⁵⁹ and reflecting an underlying form */*ʿanāḥ*/, necessary to explain the word-final stress of the singular form.

5.1.4 Nominal Derivation

As with Semitic and Berber, a large portion of Egyptian nominal derivation takes the form of affixes which, we will argue, append directly to the vocalized root/stem. Before we begin our discussion of this affixing derivation, and its impact on the final root/stem shape of the fully derived word, we must briefly mention that vowel apophony plays a part in Egyptian nominal derivation, with certain vocalisms being more or less common, entirely absent, or exclusive to certain derived nominal meanings. As discussed in Section 2.3, we will not consider these alternations to be the same phenomenon as stem/root modification, and instead propose that such forms be examined in the same light of systematic vowel apophony which Kuryłowicz (1972) applies to Semitic. Whether such an analysis is applicable for Egyptian is an empirical question, and should be the subject of further research.

¹⁵⁹Metathesis of the original **-ṿw* ending to impact the vowel of the immediately preceding syllable is quite common from Middle Egyptian to Coptic, and has likely occurred here. The Coptic form therefore directly reflects *ʿanawḥ*, but ultimately derives from *ʿanāḥṿw*.

5.1.4.1 Prefix *mṽ-

Among the most common of Egyptian derivational morphemes, as well as the most clearly cognate across Afro-Asiatic, is the so-called preformative in *mṽ-. As we have seen in our discussions of Semitic and Berber, this prefix serves a number of distinct functions. As noted by Takács (2007), this prefix could form nouns of instrument and location, is common with participles and *nomina agentis* nouns, and is also used in the formation of abstract, derived verbal-nouns, a function which is known from the Semitic *maṣdar* but is exceedingly common in the Southern Afro-Asiatic languages. Osing notes four primary stem types which occur with the *mṽ- prefix: **miṣḏim*, **maṣḏam/maṣḏamīt*, **miṣūḏim/miṣudmīt*, and **miṣḏīmaw/*miṣḏimwöt*. Examples of each are provided below.

Three of the four forms presented by Osing are predicted perfectly from analysis of syncopation. The **miṣḏim* form, which is masculine only and only attested with trilateral roots, may be derived simply enough from the application of the *mṽ- prefix to a fully vocalized *CVCVC* root with no underlying vowels, as in the simple derivation below.

(92) Derivation of **miṣḏim* Form

| | |
|---------------------------------------|------------------|
| Underlying Root | siḏim |
| | ↓ |
| mṽ- Prefix | mi- siḏim |
| | ↓ |
| Syncopate | mi ṣ iḏim |
| | ↓ |
| Stressed Open Vowel → \bar{v} | - |
| | ↓ |
| Unstressed/Closed Vowel → \check{v} | - |
| | ↓ |
| Output | miṣḏim |

The same is true of the **maṣḏam/maṣḏamīt* and **miṣḏīmaw/*miṣḏimwöt* forms, though here we encounter feminine forms, which are likewise easily generable.

(93) Derivation of **maṣḏam/maṣḏamīt* Form

| | | |
|---------------------------------------|------------------|--------------------|
| | Masculine | Feminine |
| Underlying Root | sidam | sidam |
| | ↓ | ↓ |
| mǔ- Prefix | ma- sidam | ma- sidam |
| | ↓ | ↓ |
| Syncopate | mas idam | mas idam |
| | ↓ | ↓ |
| Feminine -it | – | mas dam -it |
| | ↓ | ↓ |
| Syncopate | – | – |
| | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | mas dā mit |
| | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – |
| | ↓ | ↓ |
| Output | mas dā m | mas dā mit |

(94) *Derivation of *misdāma/*misdimwūt Form*

| | | |
|---------------------------------------|--------------------|----------------------|
| | Masculine | Feminine |
| Underlying Root | sudim | sudim |
| | ↓ | ↓ |
| mǔ- Prefix | mi- sudim | mi- sudim |
| | ↓ | ↓ |
| Syncopate | mis udim | mǔ sudim |
| | ↓ | ↓ |
| -aw Suffix | mis d im-aw | mis d im-aw |
| | ↓ | ↓ |
| Syncopate | – | – |
| | ↓ | ↓ |
| Feminine -ūt | – | mis d imaw-ūt |
| | ↓ | ↓ |
| Syncopate | – | mis d imawūt |
| | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | mis dā imaw | – |
| | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – |
| | ↓ | ↓ |
| Output | mis dā imaw | mis d imwūt |

The **misdāma/*misdimwūt* form is particularly illuminating, as here the analysis of syncopation not only correctly produces the attested *-sdim-* stem shape generated by the **mǔ-* prefix, it also explains the alternation in the suffix between the masculine ending in **-aw*, and the feminine in **-wūt*, since the **a* of the masculine ending will naturally be targeted for syncopation in the

feminine form by the simple shape of the word.

The **misūdīm*/**misudmit* form is problematic for the analysis of syncopation, since masculine form shows no apparent syncopation at all, while the feminine shows apparent syncopation between the second and third root-consonants, inconsistent with the pattern typically found with the **mǔ-* prefix. We may note, however, that the difficulty with these patterns is not simply a matter of the their **mǔ-* prefixed forms, but also in fact is present in the basic underived stems. Osing (1976) states that these forms are derived from the **sudīm*/**sudmit*~**sudīmit* patterns. As already noted, these forms show an inconsistent placement of stress, as well as feminine forms which suggest *two* distinct underlying representations are present. For these reasons, we have previously suggested that the **sudīm*/**sudmit*~**sudīmit* pattern may in fact represent more than one type of noun with coincidentally similar vocalisms which have fallen together to form a less-than-coherent class of inflected nouns. Though speculative, the apparent difficulties with the **misūdīm*/**misudmit* class can also be resolved if we suppose that the form which underlies both the masculine and the feminine of the **mǔ-* prefixed class is in fact segolate.

(95) *Potential Segolate Derivation of *misūdīm*/**misudmit* Form

| Underlying Root | Masculine sudīm | Feminine sudīm |
|---------------------------------------|---------------------------|--------------------------|
| mǔ- Prefix | ↓ mi- sudīm | ↓ mi- sudīm |
| Syncopate | ↓ - | ↓ - |
| Feminine -it | ↓ - | ↓ misudīm-it |
| Syncopate | ↓ - | ↓ - |
| Epenthesis | ↓ misudīm | ↓ - |
| Stressed Open Vowel → \bar{v} | ↓ misūdīm | ↓ - |
| Unstressed/Closed Vowel → \check{v} | ↓ - | ↓ - |
| Output | ↓ misūdīm | ↓ misudmit |

While such an analysis mechanically generates the forms, it remains to be seen if further evidence can corroborate the hypothesis of underlying segolate root forms. Regardless, further investigation of the **misūdīm*/**misudmit* type is clearly required.

5.1.4.2 Suffix -i "Nisba"

The gentilic "nisba" suffix is directly attested only in Semitic and Egyptian, though as previously noted by Vycichl (1952) and Gordon (1957) claim to have found relics of the nisba formation in Berber nominal forms. In Egyptian, as in Semitic, the nisba suffix can be reconstructed with a structure $*-i$, though unlike Semitic, this form applies to masculine nisbas only. Feminine nisbas can be reconstructed with the form $(\check{v})-i\check{v}t$, or $-i\check{v}t$, though the source of the variation is not well-understood. Examples of nisba formations are provided below.

| | Bilateral | | Trilateral | | Quadrilateral | |
|----|-----------|----------|------------|------------------------|---------------|-----------|
| | Coptic | Egyptian | Coptic | Egyptian | Coptic | Egyptian |
| M. | Ⲭⲣⲏⲓ | *harii | ⲛⲟⲘⲓ | *nawḥi | ⲙⲉⲣⲣⲓⲧ | *mṛrwītvi |
| M. | | | ⲗⲟⲣⲓⲛ | *iawīnvi | | |
| F. | Ⲭⲣⲉ | ḥurit | ⲟⲣⲱⲧⲉ | *wi ^c wātvt | ⲙⲉⲓⲱⲧ | *miswātvt |
| F. | | | ⲙⲙⲕ | *maḥiwvt | | |

Figure 5.4: Nisba Formations in Egyptian

In contrast to Semitic, as we have seen, the formation of nisba adjectives in Egyptian is associated with a change in root/stem shape. For bilateral consonants, this alteration is not present, with simple bilateral forms such as $*ḥar$ "on" or $*ḥur$ "under" give rise to their nisba counterparts $*harii$ "top part, higher" and $*ḥurit$ "underside" without any associated alternations. Quadrilaterals, likewise, show no alternations to the root ($*marwut$ "love" → $*mṛrwītvi$ "amorous," $*miswat$ "birth" → $*miswātvt$ "young girl"). In each case, this is predicted by the analysis of syncope, since the addition of either the masculine or feminine nisba suffixes fails to create the necessary sequence of adjacent, internal, light syllables to trigger syncope.

For trilateral nouns, however, the expected syncope of the vowel between the second and third root-consonants is attested, though not in all forms. Syncope is attested in $*nawḥi$ "rope-maker" from $*nāwiḥ$ "rope" and $*wi^cwātvt$ "only, sole" from wi^cwat "a whole, unit," but it does not occur with those forms such as $*iawīnvi$ "jaundiced person" from $*iawin$ "color," or $*maḥiwvt$ "northwind" from $*māḥiw$ "Lower Egypt." But here, an interesting question presents itself. Since the presumably underived form of each nisba adjective differs in stress ($iawīn$ vs. $māḥiw$), how can we account for the fact that each shows no syncope in its nisba form, while a comparably stressed form such as $*nāwiḥ$ does. We may account for the full range of patterns attested in the nisba formation of trilateral nouns using syncope and a quantity-sensitive theory of Egyptian stress. Observe the derivations below.

(96) *Derivation of Syncopating and Non-Syncopating Nisba Forms*

| | | | |
|---------------------------------------|----------------|-----------------|-----------------|
| | <i>*nawḥṽi</i> | <i>ławīnṽ</i> | <i>*maḥīwṽt</i> |
| Underlying Root | nawḥ | ławīn | maḥīw |
| | ↓ | ↓ | ↓ |
| Nisba Suffix | nawḥ-ṽi | ławīn-ṽi | maḥīw-ṽt |
| | ↓ | ↓ | ↓ |
| Syncopate | nawḥṽi | – | – |
| | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | – | maḥīwṽt |
| | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | maḥīwṽt |
| | ↓ | ↓ | ↓ |
| Output | nawḥṽt | ławīnṽi | maḥīwṽt |

As we can see, under this analysis, the difference in syncopation between the **nawḥṽi* and **maḥīwṽt* forms reveals that, despite their similar stress placement, the two forms have distinct underlying representations which allow syncopation on the one hand, and block it on the other. Without syncope, we would otherwise have no forthcoming explanation as to why these two forms should display the different shapes which they attest.

5.1.5 Suffix Pronouns

The Egyptian Suffix pronouns bear a strong resemblance to their counterparts in Semitic, Berber, and Cushitic, excepting some minor phonological development internal to Egyptian. Coptic suffix pronouns, as well as Egyptian reconstructions, are provided below.

| | | Sg. | | Pl. | |
|-----|---|------------|---------------------|-------------------|--------------|
| | | Coptic | Egyptian | Coptic | Egyptian |
| 1st | | -i | <i>*-i/*-ī/*-yṽ</i> | -ṛ | <i>*-n</i> |
| 2nd | M | -κ | <i>*-k</i> | -ṛṛ | <i>*-tin</i> |
| | F | -ṛε | <i>*-ṭ</i> | | |
| 3rd | M | -q | <i>*-f</i> | -oṛ / -coṛ | <i>*-sū</i> |
| | F | -c | <i>*-s</i> | | |

Figure 5.5: Coptic and Egyptian Suffix Pronouns

As is apparent, both the Coptic forms, and the reconstructed Egyptian forms which they reflect, have lost the short, word-final vowels present (or reflected) in the other branches. Although in some cases the presence of these vowels can be discerned by their impact on adjacent consonants, they were certainly gone by the Middle Egyptian, which Coptic reflects, and likely in Old Egyptian as well. The loss of these final vowels is important because, as we have seen,

Egyptian has lost the allowance for word-final extra-syllabic consonants seen in Semitic and Berber. This means that the addition of the suffix pronouns to a nominal stem ought to result in an inarticulable *CVCC#* syllable. To remedy this illegal final syllable, the Egyptian suffix pronouns gained an epenthetic short vowel preceding their initial consonant and blocking the word-final cluster¹⁶⁰.

For our purposes, this epenthetic vowel is interesting, because it may create the conditions, particularly in trilateral nouns, for syncope to apply to nouns that would not otherwise have exhibited it. Although we have seen that the Berber and Semitic suffix pronouns (likely originally consonant-initial) could not trigger syncope, even if they date to a time when syncope was still active, we may question whether the innovative vowel-initial forms of Egyptian may have been subject to syncope. In order to do this, we must examine the form which nouns take when they are appended with the suffix pronouns.

The data of Coptic reveals that, like Semitic, Egyptian had a so-called construct state, which was the state of the noun which was bound or governed by some other word. In Egyptian, this construct form was characterized by the loss of the strong word-level stress which had such a great impact on the development from Middle Egyptian into Coptic. In addition to the construct state (as well as the unmodified absolute state), Coptic reveals an additional state, commonly referred to as the *status pronominalis* or pronominal state. This is the state form of the noun when modified by the suffix pronouns. Unfortunately, the pronominal state in Coptic is an archaism, with many nouns losing a morphologically distinct pronominal state and simply using the far more common absolute state form as a catch-all¹⁶¹. Nevertheless, enough nouns retain their distinct pronominal state forms (particularly body parts, attribute nouns, and other nouns which commonly exhibit inalienable possession), that we may recover the form of the *status pronominalis* for at least some Egyptian noun types. Forms are presented below.

¹⁶⁰Synchronically, scholars of Coptic have tended to treat this vowel as part of the nominal stem of the *status pronominalis* form, discussed below. While this may be synchronically the correct analysis for Coptic specifically, it is entirely clear the vowel is epenthetic in origin and allows for the articulation of the suffix pronouns.

¹⁶¹Note that unlike earlier forms of Egyptian, which we will argue develop a pronominal state due to syncope triggered by the epenthetic vowel necessary to break up illicit *CVCC#* syllables, Coptic has a very generous syllable structure, allowing both complex onsets ($\langle \text{ʁ} \lambda \text{t} \rangle$) and codas ($\langle \text{ʒ} \omega \text{t} \text{t} \rangle$). Since this liberal syllable structure allowed the suffix pronouns to be applied directly to effectively all nouns, it is not unsurprising that the more common absolute form would come to be used and generalized as the noun form before suffix pronouns.

| | Absolute | | Pronominal | |
|------------------------------|----------|----------|-------------|----------|
| | Coptic | Egyptian | Coptic | Egyptian |
| Bilateral | coi | *saʒ | cω . 9 | *sāʒ ʒf |
| Trilateral | ieipe | *iirv̄t | ειΔ . 7 . 9 | *iartʒf |
| Quadrilateral ¹⁶² | — | — | — | — |

Figure 5.6: Absolute and Pronominal State in Coptic and Egyptian

In each case, the alternation in the forms is easily derivable from simple Egyptian phonology along with syncope.

(97) *Derivation of Biliteral and Trilateral Absolute/Pronominal State*

| | Bi. Abs. | Bi. Pronom. | Tri. Abs. | Tri. Pronom. |
|---------------------------------------|----------|-------------|-----------|--------------|
| Underlying Root | saʒ | saʒ | iirv̄t | iirv̄t |
| Suffix Pronoun | ↓ | ↓ | ↓ | ↓ |
| | — | saʒ-ʒf | — | iirv̄t-ʒf |
| Syncope | ↓ | ↓ | — | iirv̄tʒf |
| | ↓ | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | — | sāʒ ʒf | iirv̄t | — |
| | ↓ | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | — | — | — | — |
| | ↓ | ↓ | ↓ | ↓ |
| Output | saʒ | sāʒ ʒf | iirv̄t | iirtʒf |

As with plurals, which survive in Coptic only as a relic class, the pronominal state is rare in Coptic. The surviving forms are therefore clustered around the more common *CVC* and *CVCCVC* root forms. It is likely that the long-vowel class nominals (*CVCV̄C*, *CV̄CV̄C*) also exhibited absolute vs. pronominal-state alternation in older forms of Egyptian, but such forms are difficult to recover from Coptic. Nevertheless, the attested pronominal states support the notion that syncope in Egyptian could be triggered by the innovative vowel-initial suffix pronouns.

5.2 Verbal Morphology

In contrast to its nominal morphology, the verbal morphology of Egyptian would appear to be comparatively innovative, with the entire prefix-conjugation having been lost by the time of Middle Egyptian. In its place, Egyptian has innovated

¹⁶²No unambiguous pronominal state forms for quadrilateral nouns survive. On the basis of the pronominal state verb forms discussed below, we may assume that they would have had the form Abs./Pronom. *CVCCVC/CVCCVCʒf.

a novel "suffix-conjugation," which is more rightly described as the use of the possessive suffix pronouns as verbal subject clitics. The original Afro-Asiatic suffix-conjugation, cognate with Semitic and Berber (and maybe Cushitic), survives into Middle Egyptian with its originally stative meaning clearly intact.

Our reconstruction of the Egyptian verbal system is hampered immensely by the fact that neither the original stative suffix-conjugation nor even the new suffix/clitic "conjugation" survive into Coptic, where an even simpler analytic verbal system of pronoun + verb has arisen. For this reason, Coptic cannot directly inform us as to the vocalization and prosodic structure of inflected Egyptian verbs, except in the case of a few surviving archaic forms.

5.2.1 Suffix-Conjugation – Stative

As discussed in section 1.3.2.2.2, Satzinger (1998), following the work of Schenkel (1994), believes that the conventionalized orthography of Egyptian in representing the suffix-conjugation reveals a distinction between a so-called short and long suffix-conjugation. The short suffix-conjugation is allegedly perfect in meaning, and features the verbal endings applied directly to the verbal root, while the long suffix-conjugation is semantically stative. Arguing from analogy with the spellings of *nisba* forms, such as those presented in section 5.1.4.2, Satzinger argues that the long suffix-conjugation is characterized by a long vowel **-ā-* which appears between the verbal root and the inflectional endings, and a *CVCC* root shape for trilateral verbs. Satzinger's paradigm is recapitulated below.

| | | Stative | Perfect |
|---------|---|-------------|-------------|
| 1st Sg. | | *satpākṽi | *satapkṽw |
| 2nd Sg. | M | *satpātṽi | *sataptṽi |
| | F | | |
| 3rd Sg. | M | *satpṽi | *satpṽi |
| | F | *sataptṽi | *satpṽtṽi |
| 1st Pl. | | *satpātṽi | *sataptṽi |
| 2nd Pl. | M | *satpatūtṽi | *sataptūtṽi |
| | F | | |
| 3rd Pl. | M | *satpṽwṽi | *satpṽwṽi |
| | F | *satpṽtṽi | *satpṽtṽi |

Figure 5.7: Egyptian Stative/Perfect Suffix-Conjugations

While Satzinger/Schenkel's argument is plausible and reasonably convincing, we cannot directly confirm this hypothesis, because the stative does not survive as a fully functional form of verb inflection into Coptic, and we therefore do not have direct attestation of such forms. However, while the full paradigm of stative inflection is not present in Coptic, individual stative forms *are* present in the

form of the Coptic "Qualitative Verb." As Satzinger points out, the majority of such forms are in fact fossilized old third masculine singular forms, but a few are third feminine singulars and even third masculine plurals, enabling us to examine at least part of the verbal paradigm. Sample forms are presented below.

| | Biliteral | | Triliteral | | Quadriliteral | |
|-----------|-----------|----------|------------|-----------|---------------|------------|
| | Coptic | Egyptian | Coptic | Egyptian | Coptic | Egyptian |
| 3rd M. Sg | ⲕⲏⲏ | *kūmṽi | ⲟⲣⲁⲛ | *waʿbṽi | ⲧⲏⲧⲱⲛ | *tṽntānṽi |
| 3rd F. Sg | ⲃⲉⲉⲧ | *gurtṽi | ⲭⲣⲁⲉⲓⲧ | *darittṽi | ⲧⲏⲧⲟⲛⲧ | *tṽntantṽi |
| 3rd M. Pl | — | | ⲧⲣⲉⲓⲱⲟⲣ | *tṽriāwṽi | — | |

Figure 5.8: Egyptian Stative/Perfect Suffix-Conjugations

The biliteral and quadriliteral forms are, as expected, typically invariant. Length alternations within the verbal stem are secondary, the result of the lengthening of stressed open vowels as well as the shortening of closed or unstressed vowels characteristic of Egyptian more generally. The trilaterals, however, are variable, attesting to an alternation between a *CVCC* root shape in the third masculine singular, but a *CVVC* form in the third feminine singular. The third masculine plurals also show a *CVCC* root shape, and likewise provide direct evidence for the presence of the *-ā- form, which Schenkel postulated to characterize the long-form stative (as well as all third plural forms more generally). Although it is not the full paradigm, the evidence of the surviving Coptic qualitative verb supports (albeit inconclusively) the Schenkel/Satzinger paradigm of the Egyptian stative.

The surviving forms attested from the Coptic qualitative are all consistent with an analysis via syncope. The bi- and quadrilaterals are expected not to syncope, since they do not exhibit the necessary environment, even after affixation. For trilaterals, the alternations are exactly as predicted in the derivations below.

(98) *Derivation of Coptic Qualitative/Egyptian Stative Forms*

| | | | |
|---------------------------------------|----------------------------|------------------|-------------------|
| | 3rd M. Sg. | 3rd F. Pl. | 3rd M. Pl. |
| Underlying Root | wa^ˈab | dariĭ | tṽrṽi |
| | ↓ | ↓ | ↓ |
| Stative Suffix | wa^ˈab-ṽi | dariĭ-tṽi | tṽrṽi-āwṽi |
| | ↓ | ↓ | ↓ |
| Syncopate | wa^ˈabṽi | – | tṽrṽiāwṽi |
| | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | – | – |
| | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | – |
| | ↓ | ↓ | ↓ |
| Output | wa^ˈbṽi | dariĭtṽi | tṽriāwṽi |

As in Semitic, the presence of zero or consonant-initial endings blocks syncope from occurring, resulting in the full *CVCVC* root surfacing, while vowel-initial endings, such as the 3rd M. Sg. and the 3rd M. Pl., feed syncope and, as such, surface with the syncopated *CVCC* root shape.

5.2.2 Suffix/Clitic "Conjugation"

The major "conjugation" of the Ancient Egyptian verb is neither strictly cognate with the verbal conjugations attested throughout Afro-Asiatic, nor is it truly a verbal conjugation at all. Rather, it consists of the appending of the suffix pronouns to a verbal root in order to function as a clitic subject pronoun. This status as a subject clitic rather than a true verbal inflection can be verified by comparing the behavior of Egyptian verbs with and without overt nominal subjects, as in the examples below from *The Tale of Sinuhe*.

- (99) *dd.in.sn* *ḥft* *ḥm.f*
say.RESULT.3rd.Pl before majesty.3rd.M.Sg
‘Then they said before his majesty...’

- (100) *dd.in* *ḥm.f*
say.RESULT majesty.3rd.M.Sg
‘Then his majesty said...’

Although this clitic conjugation is neither cognate outside of Egyptian, nor truly a form of verbal conjugation, we may still ask whether it exhibits evidence of syncope. This question is difficult to answer, because the clitic suffix-conjugation does not survive as such into Coptic, where we could directly examine the forms. Rather, Coptic has innovated a novel verbal system in which proclitic "prefixes" occur with an invariant form of the verbal stem. Observe the paradigm below.

| | | Sg. | Pl. |
|-----|---|--------|------------|
| 1st | | † nΔγ | τ̄n̄ nΔγ |
| 2nd | M | κ nΔγ | τετ̄n̄ nΔγ |
| | F | τε nΔγ | |
| 3rd | M | ϣ nΔγ | ce nΔγ |
| | F | c nΔγ | coγ nΔγ |

Figure 5.9: Innovative Coptic "Prefix" Inflection

There does exist, in Coptic, a form commonly referred to as the suffix-conjugation or old conjugation, due to the presence of the original suffix marking of verbal subjects. Unfortunately, all¹⁶³ such surviving verbs can ultimately be traced to compound verbal formations in Middle Egyptian, and therefore might not exhibit the same syncopated forms since the Coptic verbs are in fact univerbations.

To uncover the form of the Egyptian verb, then, we must turn to the only surviving Coptic form which may represent a survival of the *form* of the verb + suffix pronoun construction, if not its function; the pronominal state. We previously discussed the pronominal state in the context of nouns, where we mentioned that it functioned as a possessive, but this form is not unique to nouns. Many Egyptian verbs (though not all) have a distinct form likewise referred to as the *status pronominalis* or pronominal status. This is the form which the verb takes when it is appended with the suffix pronouns. Now, in Coptic, unlike in earlier Egyptian, the affixation of the suffix pronouns is not used to indicate the verbal subject, but rather is used to indicate verbal objects, being in this sense more similar in usage to the suffix pronouns previously discussed for Berber and Semitic. Keep in mind that the pronominal form of the Coptic verb is likely not the direct ancestor of the Middle Egyptian clitic "suffix-conjugation." It can, nevertheless, likely provide us with an example of the shape of the verbal stem appended with the suffix pronoun, albeit in a different function. Pronominal forms are presented below.

¹⁶³Some uncertainty surrounds the source of the Coptic form **neγp**. These are sometimes regarded as the outright survival of the Egyptian verb <nfr> "be good," but are also theorized to have descend from the phrase <nḥ nfr>, also meaning "be good." While its true etymology is uncertain, it is worth mentioning that its Coptic form **neγp** is consistent with a syncopated *nifr.

| | Absolute Form | | Pronominal Form | |
|--------------------------|---------------|----------|-----------------|----------|
| | Coptic | Egyptian | Coptic | Egyptian |
| Biliteral ¹⁶⁴ | – | – | – | – |
| Triliteral | ρωϣε | *rāḥṽt | ρΔϣΤ | *raḥt- |
| Quadriliteral | coλcλ | salsal | cλ̄cωλ | *salsāl- |

Figure 5.10: Coptic and Egyptian Pronominal State Verbs

The quadrilaterals show no variation in stem shape, and only attest to a shift in stress (and therefore the length of the stressed vowel) triggered by the addition of the suffix pronouns, which tend to appear as *-*ḥC*. The trilaterals, on the other hand, reflect an alternation between a **CV̄CVC* root shape (which surfaces as *CV̄CVC*) in the absolute state, and a *CVCC* root in the pronominal state. Again, we can generate this alternation, and predict the invariability of the quadrilateral verb root, using our analysis of syncope.

(101) *Derivation of Coptic Absolute and Pronominal State Verbs*

| | Tri. Abs. | Tri. Pronom. | Quad. Abs. | Quad. Prnom |
|---------------------------------------|--------------|-----------------|---------------|------------------|
| Underlying Root | rahṽt | rahṽt | salsal | salsal |
| | ↓ | ↓ | ↓ | ↓ |
| Suffix Pronoun | rahṽt | rahṽt-ṽf | salsal | salsal-ṽf |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | rahṽtṽf | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | rāḥṽt | – | – | salsālṽf |
| | ↓ | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | rāḥṽt | rahṽtṽf | salsal | salsālṽf |

While the forms of the Coptic *status pronominalis* are by no means conclusive proof that the Egyptian suffix-conjugated <sdm.f> verb was subject to syncope, they provide the only evidence one way or another regarding the potential shapes of the <sdm.f> verb, and they are entirely consistent with syncope being present into Egyptian at least until the point when the novel suffix/clitic conjugation was innovated within the development of Egyptian.

¹⁶⁴It is unclear if any originally biliteral verbs attest a pronominal form in Coptic. While a biliteral pattern of inflection is attested, with absolute/pronominal pairs such as **κωδ/κοδ** or **πωπ/ποπ** apparently reflecting biliteral pronominal forms, these clearly reflect <kḥb> and <pnn> respectively, and should therefore be considered late innovations for the expected ***κωωδ**/***κοοδ** and ***πωππ**/***ποππ** respectively.

5.2.3 Derived Verbs

Ancient Egyptian does not attest the full array of derived stem types attested throughout Afro-Asiatic. The T-Stem is completely absent, replaced by other analytic constructions expressing passive/reciprocal semantics. The N-Stem, if it survives at all, is a non-productive relic class even in Middle/Old Egyptian. The S-Stem survives as a relatively productive class into Egyptian. We will discuss the S-Stem and its forms, as well as analyzing the potential N-Stem forms.

5.2.3.1 S-Stem

The S-Stem is well-known from Egyptian, where it was a productive derivational process, forming causatives. From Middle Egyptian to Coptic, the S-Stem is displaced by a novel causative construction featuring a prefix **ⲧ-**. Despite its superficial formal similarity to the T-Stem, this Coptic causative is clearly the result of the univerbation and contraction of the verb **ⲧ** "give" along with the bare verbal stem, as the same construction of <rdi + VERB> is attested in Middle Egyptian.

Although the S-Stem is no longer a productive form of Coptic, numerous S-Stem forms survive into the language, allowing us to recover their form in Middle Egyptian. Such forms are presented below.

| | Absolute | | Qualitative | |
|---------------------------|--------------|-----------|----------------|-------------|
| | Coptic | Egyptian | Coptic | Egyptian |
| Biliteral | Ⲙⲁⲧⲉ | *sadbv̄ | – | – |
| | Ⲙⲉⲓⲛⲉ | sṽmīnṽ | Ⲙⲉⲓⲛⲧ | *sṽmantṽi |
| Triliteral ¹⁶⁵ | Ⲙⲟⲩⲧⲛ | *sawdṽn | Ⲙⲟⲩⲧⲟⲛ | *sawdānṽi |
| Quadriliteral | Ⲙⲟⲩⲕⲣ | *sṽkarkṽr | Ⲙⲟⲩⲕⲟⲩⲣ | *sṽkarkārṽi |

Figure 5.11: Coptic and Egyptian S-Stem Forms

Note that we have included two biliteral forms. This is to account for the presence in Egyptian of biliteral roots of both the *CVC* and *CVC* types. As with the forms of Berber and Semitic, the Egyptian S-Stem forms clearly exhibit the syncope triggered by the addition of the causative prefix. The biliteral forms have gained an unexpected additional vowel-initial syllable following the root. The nature of this extension is unclear, but what is clear is that the presence of this additional syllable, as well as its shape, feeds syncope for at least some biliterals. Derivations for each basic root type are provided below.

¹⁶⁵The form here is a metathesis of Middle Egyptian <s.dwn>, chosen because it has an attested Coptic qualitative form. The **sa-CCVC* shape of the absolute form may be confirmed by examining other verbs such as **Ⲙⲁⲁⲛⲱ** **sa* 'nṽb, or **Ⲙⲟⲩⲉ** **sa* 'hṽ'.

(102) *Derivation of Egyptian S-Stem Absolute Form*

| | | | | |
|---------------------------------------|---------------------------|-----------------|-----------------------------|-------------------|
| Underlying Root | dṽbṽ | mīnṽ | wṽdṽn | karkar |
| | ↓ | ↓ | ↓ | ↓ |
| sṽ- Prefix | sa- dṽbṽ | sṽ- mīnṽ | sa- wṽdṽn | sṽ- karkar |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | sa ṽ bṽ | – | sa wṽ dṽn | – |
| | ↓ | ↓ | ↓ | ↓ |
| Stressed Open Vowel → \bar{v} | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Unstressed/Closed Vowel → \check{v} | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Output | sadbṽ | sṽmīnṽ | sawdṽn | sṽkarkar |

In addition to successfully deriving the attested S-Stem forms as they appear in Egyptian, our analysis via syncopation also explains a striking feature of the Egyptian derived stems in contrast to those of Semitic and Berber (and, as we shall see, the prefixed derived stems of Cushitic): namely, the persistent **Cṽ*-shape of the prefix. As we saw in Semitic, while the S-Stem retains its **sṽ*-shape, the N-Stem has lost its characteristic vowel in most (but not all) forms. In Berber, we saw that the derived prefixes are mixed in form, but that there is a tendency for the form used with bilaterals to lose its vowel and appear as **C*-. We have speculated previously that this variability is a result of the fact that syncopation would be expected to delete this prefix for bilaterals, and that a transparent surface application of syncope would delete this vowel in all forms (see Cushitic for more).

This is entirely consistent with the data of Egyptian. Here, we find that the vowel of the prefix is never deleted in any form. Note also, that unlike Semitic and Berber, Egyptian lacks the actor-affix prefixes which would subsequently be applied to the left of the prefix, triggering the potential syncopation of the prefix vowel. Under this analysis, then, it is not coincidence that Egyptian preserves the fully vocalized **Cṽ*-derivational prefixes, in contrast to the other branches, where we find them in varying states of having lost their vowel. Rather, the loss of the prefix-conjugation effectively blocked any syncopation of the prefix vowels, allowing them to surface in all forms, until they, like most unstressed vowels, were lost in Coptic.

5.2.3.2 N-Stem

As discussed in section 1.3.2.4.3, the presence of the N-Stem in Egyptian is not entirely certain. It is clear that the N-Stem formation does not survive as a productive and semantically meaningful Egyptian verb form, and some scholars, such as Lipiński (2001) do not consider Egyptian as attesting a true cognate of the N-Stem. On the other hand, Derchain-Urtel (1973) notes a number of Egyptian verb pairs with and without an <n> prefix, and even notes passive or intransitive semantics associated with several such forms.

We are generally agnostic on the question of the N-Stem in Egyptian, but we will briefly discuss such forms as do exist, under the assumption that they are N-Stems, and demonstrate how these forms are predicted by syncope. We have previously stated that the proposed N-Stems in Egyptian have a particular predilection for quadriliteral verbal roots, a peculiarity shared with the Ethiopic Semitic languages. Nevertheless, potential N-Stems can likely be recovered for biliteral *CVC* and quadriliteral *CVCCVC* roots as well. In section 1.3.2.4.3, we provided some illustration of these proposed forms, including **𓏏𓏏𓏏𓏏** **nṽqad*, **𓏏𓏏𓏏𓏏** **nihsii*, and **𓏏𓏏𓏏𓏏𓏏** **nṽqadqad*. These forms are, of course, easily generable according to our theory of syncope, and they are effectively identical to the S-Stem forms presented above. Again, the biliterals and quadrilaterals are invariant, showing no changes in root/stem form from their simple, underived counterparts, while the trilaterals exhibit the characteristic *CCVC* root shape, which is shared with the S-Stem forms.

(103) *Derivation of Potential Egyptian N-Stem Absolute Form*

| Underlying Root | qad | hṽsiï | qadqad |
|---------------------------------------|--------------------|--------------------------------|-----------------------|
| nṽ- Prefix | ↓ nṽ-qad | ↓ ni-hṽsiï | ↓ nṽ-qadqad |
| Syncope | ↓ – | ↓ nihṽsiï | ↓ – |
| Stressed Open Vowel → \bar{v} | ↓ – | ↓ – | ↓ – |
| Unstressed/Closed Vowel → \check{v} | ↓ – | ↓ – | ↓ – |
| Output | ↓ nṽqad | ↓ nihsii | ↓ nṽqadqad |

We should mention in conclusion that the attestation of Coptic and therefore Middle Egyptian is ambivalent as it pertains to the question of persistent application of syncope versus a single round of syncope applying to the fully derived and inflected word. This is largely due to the absence of the prefixing conjugation, along with the relative scarcity of combined derived verbal stems. As we saw with both Semitic and Berber, the affixation of a derivational affix to a verbal stem, followed by the subject prefixes, is what revealed in most cases the behavior of the verb with respect to syncope. We saw, for example, that the prefix-conjugation of the Semitic Š-Stem and N-Stem differed in form (**yušaqtil* vs. **yanqatil*), which we attributed to the differences in the behavior of the syncope rule. Their imperatives, however, which lack the prefixed morphemes of the prefixing conjugation, are effectively identical in form (**šaqtil* vs. *naqtil*), because they will end up identical, regardless of whether syncope applied persistently through the derivation, or only at a single time before final output. This is precisely the situation in which we find Egyptian. Without the prefix morphemes to interact with the derivational affixes, Egyptian derived stems should have identical forms regardless of whether Egyptian has retained

or lost persistent syncopation.

Chapter 6

Afro-Asiatic to Cushitic (and Omotic)

As we turn our analysis to the southern Afro-Asiatic families (Chadic, Cushitic, and Omotic), we will necessarily have less to say, and less specificity to our analysis as it pertains to syncope. The reasons are three-fold. One, the individual modern languages in question are far more poorly attested than their northern sisters, and likewise subject to poorer scholarship. Second, these families are far more internally diverse than are Semitic or Berber, resulting in reconstructions of the proto-languages associated with these families which are significantly impoverished to the point that it is often difficult or impossible to ascertain in Proto-Chadic, Proto-Cushitic, or Proto-Omotic the precise phonological form of a word, or its prosodic shape. Finally, while it is true that apparently "templatic" morphological phenomena are found in all three of these branches, they are less common than in their northern counterparts, and they are more likely to take forms which do not require characteristically "templatic" morphological theories, such as alterations of tone/pitch accent or reduplication (particularly in Chadic).

For the purposes of this dissertation, we will discuss the development of our analysis of syncopation into Cushitic and Omotic in tandem. This is because, particularly as it pertains to the verb, and the weak verb especially, it is likely that the two branches have undergone shared innovations that affect the way syncope applies (or fails to apply) to given forms. In other circumstances, those in which the two branches differ meaningfully in ways we can securely reconstruct, we will discuss each in turn and analyze how syncope may have applied differently along each line of descent. Since the Cushitic branch is better attested, subject to more scholarship, and likely retains more of the archaic features of Afro-Asiatic nominal and verbal morphology, our focus will remain primarily on that family, with discussions of Omotic included insofar as we can construct distinctive forms and relate them to our analysis via syncope.

We should finally note and remind readers that Cushitic is one of the two

branches wherein we find direct evidence for a syncope rule of the sort which we have reconstructed for Afro-Asiatic (the other being Semitic). Recall from section 2.1.2 that the Lowland East Cushitic language(s) Afar-Saho exhibits a synchronically active syncope rule remarkably similar to that of Akkadian, and to our reconstruction for PAA. It differs in some small respects (it can be blocked by word-level stress, is sometimes sensitive to the segments adjacent to the targeted vowel, might exhibit some left-edge effects), but is otherwise remarkably similar. This fact is important to keep in mind as we present Cushitic forms, particularly those in which the Afar-Saho form, likely the output of syncope, is clearly cognate with that of another Cushitic language.

6.1 Nominal Morphology

The nominal morphology of the Cushitic languages shows a degree of diversity that, to this point, we have not encountered with any Afro-Asiatic daughter branch. The forms of the morphemes and even the basic structure of the inflection system can show notable variability from one daughter language to another. This variability will hamper our ability to speak generally about Cushitic as a whole family, as it is often difficult to reconstruct specific morphemes to specific functions. For this reason, we will tend to focus on the nominal morphology of Beja, as it is typically regarded as relatively archaic, as compared to some of the other Cushitic branches, and because it has been the subject of relatively complete scholarship. The morphology of other Cushitic languages will also be discussed where appropriate. Omotic is mentioned only where particularly relevant.

6.1.1 Gender Inflection

The Cushitic languages attest to the sharp and categorical split of nominals into two grammatical genders: masculine and feminine. But, as discussed in section 1.3.1.2, grammatical gender in the southern Afro-Asiatic languages behaves quite differently than in its northern counterparts. In Semitic, Egyptian, and Berber, gender is a wholly independent nominal category, having a binary value (M/F), which a given noun can exhibit regardless of its number. In the southern languages, including Cushitic, this is not entirely so. A number of Cushitic languages, such as Agaw (Hetzron, 1967), Somali (Lecarme, 2002), or Iraq^w (Mous, 1993), exhibit the peculiar phenomenon known as "gender polarity," whereby the gender of a given singular noun is inverted in the plural. Gender polarity is not unique to Cushitic, being known, for example, from the agreement behavior of numerals in Semitic, but the phenomenon is far more robust in Cushitic, applying not only to the behavior of numerals and the nouns modified by them, but to also effectively all nouns in the language¹⁶⁶. Somali

¹⁶⁶In many Cushitic languages, broken plurals do not exhibit gender polarity. This may further confirm the hypothesis that broken plurals were originally derived singular nouns which have become part of the paradigm of number inflection.

provides a number of examples, such as the following from Lecarme:

- libàax "lion" (m)
- libaaxyó "lions" (f)
- goól "lioness" (f)
- gooló "lionesses" (m)
- náag "woman" (f)
- naagó "women" (m)

Finally, it should be mentioned that although it is less common than in Cushitic, gender polarity of this sort also appears in Omotic languages, as stated by Simeone-Senelle and Kamil (2013), which may constitute further evidence for the existence of a Cushitic-Omotic sub-grouping, or of a general Ethiopic Sprachbund area where gender polarity occurs (there are some examples from Ethiopic Semitic languages, such as Amharic).

In addition to the peculiarity of the gender-polarity system, the basic markers of gender are also quite distinct in Cushitic. Beja exhibits the (presumably) most conservative of the gender marking-systems of Cushitic, in that it reflects the inheritance of the original Afro-Asiatic feminine suffix **-t*, which appends to the indefinite form of feminine nouns, as well as any concord elements within the NP: *'oor-t* "a girl," *'oor-t dawrii-t* "a pretty girl." The originally unmarked status of the masculine gender is preserved in Beja, though it is obfuscated by a suffix *-b* which appends to indefinite, accusative-case marked, vowel-final nouns; *kaam rihán* "I saw a lion," vs *hadḏaà-b rihán* "I saw a camel." Elsewhere in the family, the means of marking gender can vary significantly, but the most common system, as reflected in, for example, Somali, Iraq^w, and Oromo, is one in which the gender of basic nouns is unmarked, only being detectable through agreement and concord effects on verbs, adjectives and deictics¹⁶⁷. It should be mentioned that the inherited Afro-Asiatic **-t* affix *does* appear outside of Beja in Cushitic, but finds itself primarily restricted to articles and determiners as part of the innovative Cushitic *k/t* determiner system; Oromo *kun(i)* "this M." vs. *tun(i)* "this F.," or Burji *ninku/ninka* "ours M. Nom/Acc" vs. *ninči*¹⁶⁸/*ninta* "ours F. Nom/Acc."

Since the Beja system is presumably the most archaic, we can focus our attention there, remarking that the addition of the feminine suffix *-t* does not trigger any variability in the root/stem shape of the noun to which it appends. Given the form of the *-t* suffix, this is predicted by our theory of syncope, and is similar to the behavior of the **-t* suffix when it appends to nouns in Semitic and Berber. We could also consider the behavior of other Cushitic languages which have overt gender morphology on nouns. In Awngi, for example, masculine nouns are either unmarked or exhibit a final *-i* vowel¹⁶⁹, while feminines exhibit a uniform *-a* suffix. In each case, the shift in gender inflection has no overt

¹⁶⁷It should be rightly noted here that this is generally the same pattern of gender inflection which one finds in Omotic, in which gender remains operative as a category on nominals, but is not overtly marked.

¹⁶⁸Reflecting underlying *ninti*.

¹⁶⁹The final *-i* vowel in this case is likely actually a nominative-case marker in origin, here reanalyzed as a marker of masculine singular nominals.

impact on the shape of the nominal stem or root; *sén* "brother" vs. *séna* "sister," *deɣ^warí* "donkey" vs. *deɣ^wará* "she-ass." We may conclude that, as a generalization, the presence of an overt feminine morpheme causes no changes to the root or stem shape of nominals in Cushitic, and that this fact is in accord with the general behavior of Semitic and Berber (contra Egyptian), and in keeping with the form of the original feminine suffix as *-*t*.

6.1.2 Case Inflection

Case inflection in the Cushitic languages shows greater variability than in any other Afro-Asiatic branch. In Semitic and Berber we can reconstruct the form of the case inflecting morphemes with relative security, but such a reconstruction is quite difficult from Cushitic, as the forms attested in the daughter languages show surprisingly little cognation. We will briefly examine a number of case-marking systems throughout Cushitic, considering the interaction between case inflection and syncope.

In Beja, there are essentially three cases, a nominative, an accusative, and a genitive. In terms of true affixes appended directly to the noun, the nominative is unmarked. The accusative is likewise largely unmarked, excepting the *-b* accusative marker that appears on indefinite, masculine, vowel-final nouns. The final case, the genitive, is marked by an *-i* suffix, invariant for both masculine and feminine nouns, as well as for singular and plural nouns¹⁷⁰. This genitive-case marker may be related in origin to the nisba suffix of Semitic and Egyptian (and possibly Berber), and may therefore have originally been a clitic of some sort. Critically, it does not trigger any apparent change in the root or stem shape of the noun.

Case is far more robustly attested on the deictics appended to definite Beja nouns. Here, the nominative and accusative are fully distinct, for all genders and numbers, although the genitive is completely syncretic with the accusative, again suggesting that the genitive marker which appends to the noun is a later innovation. A full table of case-marking is presented below.

| | | Deictic | | Suffix | |
|------|----|---------|------|--------|-----|
| | | Sg. | Pl. | Sg. | Pl. |
| Nom. | M. | ʼuu- | ʼaa- | -∅ | -∅ |
| | F. | tuu- | taa- | -∅ | -∅ |
| Acc. | M. | ʼoo- | ʼee- | -b | -∅ |
| | F. | too- | tee- | -∅ | -∅ |
| Gen | | - | | -i | |

Figure 6.1: Case Inflection in Beja

¹⁷⁰The plural genitive takes the form *-e*, but this is commonly regarded, as in Appleyard (2004), as a contraction of an original plural suffix plus the genitive: *-a + -i*.

In the Central Cushitic Agaw language Awngi, the core cases of nominative and accusative are marked in the form of suffixes which appear on the noun. The nominative is unmarked, while the accusative has a number of exponents, including *-e* after nouns ending in /i/, *-o* after consonants, and *-wa* after vowel final stems other than /i/ according to Hetzron (1978a). Hetzron additionally notes the presence of other "cases" of various prepositional and adverbial function, but these are: a) likely adpositional in origin, and b) all consonant-initial and therefore unlikely to interact with syncope due to their shape. But this configuration is unique within Cushitic, because in all other branches within the family, it is the nominative case form that is marked, and the accusative is the unmarked default form¹⁷¹. Despite this shared system, the form of the morpheme which marks the nominative case can vary significantly. Observe the nominative and accusative pairs from various Cushitic languages presented below:

| Oromo | | Somali | | Afar-Saho | |
|--------|-------|---------|--------|-----------|-------|
| Nom. | Acc. | Nom. | Acc. | Nom. | Acc. |
| namni | nama | inan | ínan | afa | afa |
| dammi | damma | nin | nín | marub | marub |
| maqaan | maqaa | madax | mádax | awki | awka |
| lafti | lafa | warqadi | warqád | yalli | yalla |
| afaan | afaan | madaxi | madáx | giti | gita |

Figure 6.2: Case Inflection throughout Cushitic

The extreme variability of these systems makes the recovery of a single case-marking system for Proto-Cushitic quite difficult to reconstruct. Sasse (1984) believes that a Proto-Cushitic case system can be reconstructed as follows:

| | | |
|---|-------|-----|
| | M. | F. |
| A | *-a | *-a |
| N | *-u/i | *-a |

Figure 6.3: Proto-Cushitic Case System from Sasse (1984)

Note, however, as we have previously discussed, Tosco (1994) disagrees with this analysis, finding the origin of the majority of these morphemes in deictics,

¹⁷¹Appleyard (2012) mentions that in some Cushitic languages, such as Afar-Saho and Qimant, it is only masculine nouns which are marked for nominative case, while feminine nouns typically have zero case-marking, a system which Appleyard states "appears to be the original situation."

determiners and focus markers. Given the confluence of case-marking with definiteness in Cushitic, such an analysis is quite plausible.

For our purposes, we will not present a single picture of the system of case inflection present in Proto-Cushitic, as the nature of the system is, in our opinion, insufficiently clear to make specific claims about the shape of the morphemes in question. We will note, however, that across the whole of Cushitic, nominal inflection for case is not associated with a change in the shape of the nominal root or stem. This is true even in the case of Afar-Saho, *which has a synchronically active syncope rule*. This is because the marking of case in Afar-Saho is limited to a relatively small class of nouns, which, due to their unmarked accusative form (masculine, vowel-final nouns) do not syncopate with the addition of the nominative case morpheme.

If the situation were similar in Proto-Cushitic, it would explain the lack of widespread syncope associated with case inflection throughout the family. If, for example, overt morphological marking of case in Proto-Cushitic were limited only to masculine nouns, or to definite masculine nouns, or to definite masculine nouns ending in a vowel, then the number of instances in which syncope ought to have applied might have been sufficiently low that reflexes of such syncopation in the Cushitic daughters may have been either lost or leveled out in favor of the more common non-varying case-marked forms.

At present, our knowledge of the case systems of Cushitic, and of the status of case in Proto-Cushitic, is far too incomplete to assert that the data accord with our theory, or if they contradict it. Without further research and more complete reconstructions, we can only speculate.

6.1.3 Number Inflection

As we have perhaps come to expect from Cushitic, the inflection of number in that family is more variable, in both its form and its structure, than in any of the northern Afro-Asiatic languages. The Cushitic languages have no single, obviously shared sound-plural affix, and exhibit a wide array of broken-plural formations. An exhaustive analysis of the full range of plural affixes and "patterns," to use the templatic terminology, would be too extensive for the current work¹⁷². For this reason, in our discussion here, we will restrict our focus to the formation of plurals in Beja, referencing them in other Cushitic languages only where relevant or appropriate. It is important to note that we have chosen to focus on Beja not because it gives a complete view of all plural formations in Cushitic. No single Cushitic language can do so. Rather, we have chosen to focus on Beja because it is typically regarded as among the more morphologically conservative Cushitic languages, and is, under some analysis, one-half of the entire Cushitic family, with all other Cushitic languages forming a clade opposed to Beja.

¹⁷²Though see Andrzej Zaborski's (1986) excellent summation of the situation. An avenue for future research regarding syncope in Afro-Asiatic would be a categorizing of the plural formations cited by Zaborski, and an assessment of each in terms of its viability by generation from syncope.

In the Northern Afro-Asiatic languages, we have seen that number functions in much the same manner as it does in more familiar Indo-European languages. It is an independent nominal category that reflects either two or three basic numbers (Singular vs. Plural, with duals sporadically attested in Semitic and Egyptian). We have already seen that the independence of number and gender as categories is distorted in Cushitic, but even the basic orientation of the number categories is altered vis-a-vis the northern languages. The Cushitic verb confirms that the basic categories for nominals are singular and plural¹⁷³, but in contrast to Semitic, Egyptian, and Berber, there are a number of nouns in Cushitic that, rather than forming a plural, are inherently collective or paucal, and which instead form morphologically distinct singulative forms. Note that this is distinct from *pluralia tantum* or *dualia tantum* nouns well-known from northern Afro-Asiatic, such as Akkadian *mû* "water," Hebrew *ḥayyim* "life," Arabic *ʾitnān* "two," Egyptian <ḥnw> "ribs," Fingir *timzin* "barley." *Pluralia* and *dualia tantum* nouns only exhibit morphologically plural or dual forms, having no corresponding singulars. The collective and paucal nouns of Cushitic are similar, in that they are intrinsically plural, but quite distinct in that they have morphologically well-formed "singulatives" which are the marked member of their singular-plural pair.

In Beja, the more conventional singular-plural paradigm has largely taken over for the competing collective-singulative paradigm, but even here, Zaborski (1986) notes a handful of such nouns, including *taweg* "mosquitoes" to go with *tawīgay* "mosquito," *hami* "hair, wool" to go with *hamoyīay* "a single hair," *āši* "fish" to go with *ašōyay* "a single fish," *ʾarab* "highlanders" to go with *ʾarabīmay* "one highlander," and a handful of others. But this behavior is far more robust in other Cushitic languages. Zaborski notes, for example, that "the opposition singulative:collective is still functioning parallel to the opposition singular:plural" in Afar-Saho, such that a given noun may have up four potential forms; a collective, a singulative, a true plural formed to the collective (implying a multitudinous plural), and a paucal plural (implying a handful), as in the example inflection of the word *adám* "men" below.

| Collective | Singulative | Plural | Paucal |
|------------|-----------------------|--------|---------|
| adám | M: adámto / F: adámtó | adámum | adámtit |

Figure 6.4: Number-Inflected Noun in Afar-Saho

It should also be remarked that the form of the singulative morpheme in Afar-Saho, *-to*, appears to be more in keeping with the other Cushitic languages than does the *-ay* suffix of Beja¹⁷⁴. Observe collective/singulative pairs

¹⁷³These are the nominal number categories which can be reflected in verbal inflection.

¹⁷⁴Though this suffix may also appear in some other Cushitic languages, such as Somali and Burji.

from throughout the family: Bayso *arrī/arīti* "days/sun," Arbore *izze/izzet* "gazelle(s)," Elmolo *gāl/gálte* "camel(s)," Dasench *gúm/gumitti* "mountain(s)," Oromo *moti/ mōtītti* "king(s)/queen(s)," Konso *íska/ískitta* "worm(s)," Dirayta *tókoyya/tókoyt* "porcupine(s)."

In our discussion of number inflection in Cushitic, we will focus our attention for the most part on the singular-plural opposition. The widespread **-t* initial suffix of the singulative is likely to block syncope on any noun stem ending in a consonant. But equally importantly, the systematic collective-singulative opposition appears to be an innovation of a Cushitic-Omoti grouping, or else an areal feature of a possible Ethiopic Sprachbund, as proposed by Tosco (2000). Such a distinction is hardly unknown from the other Afro-Asiatic languages¹⁷⁵ but it is rarely as pervasive or systematic as it appears in Cushitic, with most or all nouns having a collective and singulative form.

With all these caveats in mind, we can now turn our attention in earnest to the question of plural formation in Beja. We find that plurals in Beja can be divided into the same two basic categories found in the other Afro-Asiatic languages: namely, affixing sound plurals and non-concatenative internal or broken plurals. We will begin with the sound-plural formations. Beja is somewhat atypical for a Cushitic language (and more like a Semitic or Berber language) in that it exhibits only one primary sound plural, formed by the addition of a suffix *-a*. This suffix appends to nominal stems ending in consonants, while vowel-final stems exhibit a different pattern¹⁷⁶. For our purposes, the most striking fact about Beja sound pluralization in *-a* is the change in stem shape of the noun to which it appends. Monosyllabic *CVC* nouns have no apparent changes associated with sound pluralization: *yaf/yafa* "mouth(s)," *san/sana* "brother(s)." By contrast, Zaborski (1986) states that in bisyllabic *CVCVC*, the short vowels /a/, /i/, and /e/ can be "elided" when they appear in the second syllable of the noun: *dirim/dirma* "herd(s)," *darab/darba* "road(s)." These alternations look very similar to those which our syncope theory produces, but the similarities are even deeper. For one, Zaborski notes that the elision of the vowel in the plural can be blocked by the presence of the accent (*kaleb/kaléba* "fence(s)"), precisely parallel in form to the syncope rule attested in Afar-Saho, which is sensitive to stress/accent. Zaborski also notes that the elision also can apparently be blocked if the vowel preceding the elision target in the root is long: *āgir/āgira* "virgin(s)." This fact seems to surprise Zaborski, since short syllables following heavy ones are a common environment for syncope cross-linguistically, but it

¹⁷⁵See, for example, the relatively large number of singulative nouns present in Arabic; *qamḥat* "grain of wheat" from *qamḥ* "wheatstuff," *baqarat* "a cow" from *baqar* "cattle," *ḥajarat* "a stone" from *ḥajar* "rock (the substance)." Note also that, as in Cushitic, these singulatives are apparently formed by the addition of the feminine suffix **-t*.

¹⁷⁶Zaborski (1986) reports that most vowel-final noun stems have "only one form for both plural and singular," noting additionally some nouns which replace their final vowels with *-a*, a type of partially sound-plural. For those vowel-final noun stems which have no overt pluralizing suffix, Zaborski notes that the plurals can show a difference in accentuation, with polysyllabic nouns showing a retraction of the accent one syllable from its position in the singular noun. It should also be noted that all definite nouns can be identified as singular or plural by the presence of the definite article, which inflects for both number and case.

is perfectly predicted by our syncope rule, which blocks syncope in such circumstances.

It is clear that syncope is not a synchronically active process in Beja the way that it is in Afar-Saho. Nor is it true that every sound plural which our theory predicts should exhibit syncope does so. Zaborski cites dialectal differences, with different Beja speakers producing syncopated (*hawil/hawla* "year(s)") and unsyncopated (*hawil/hawila*) singular and plural pairs. It is also unclear why short /u/ should apparently fail to participate in this "elision" if it is truly the result of our syncope rule. With these exceptions notwithstanding, however, the data of Beja seem relatively favorable to our analysis of syncope, though it seems clear that there must have been some leveling or loss of syncopated forms after the loss of the synchronic rule.

When we turn our attention to the internal or broken plurals, we again find that the Cushitic languages are far more variable and allow for less-secure reconstructions. Zaborski comments, for example, that while the internal plurals seen in Beja and Afar-Saho are "certainly archaic," he also remarks that "there are very few ablauts that Afar-Saho and Beja have in common." He further notes that the internal plurals seen in other Cushitic languages, such as Iraq^w, Alagwa, or Agaw are "obviously innovations." Indeed, it is difficult to reconstruct broken plurals of the sort which we have seen for Semitic and Berber for the Cushitic languages, and the types which we can reconstruct are quite different in form: plurals via vowel-shortening and plurals via right-edge reduplication. We will consider each in turn.

In Beja, one of the most common means for forming internal plurals is the shortening of the final long vowel of the nominal stem. This can occur with monosyllabic *CVC* biliteral nouns (*kām/kam* "camel(s)," *lāt/lat* "leaf/leaves"), as well as with bisyllabic *CVCVC* trilaterals (^ʾ*ihām/ʾihām* "leopard(s)," *gwārār/gwārar* "colon(s)"). This shortening can also coincide with apophonic changes to the final vowel (*anbūr/ānbir* "wing(s)," ^ʾor/^ʾar "son(s)"). Unlike the majority of other internal plurals in Cushitic, this form may indeed be ancestral to the family, because other Cushitic languages show similar behavior on plural nouns¹⁷⁷, as in Iraq^w *baala/balu* "day(s)" and *tliinta/tlitu* "corridor(s)," or Alagwa *kasaami/kasamu* "arrow(s)" and *q^waama/q^wamu* "fence(s)" (from Mous (1993, 2016) respectively). However, quite the opposite pattern is attested in Afar-Saho, in which nouns can be pluralized by the lengthening of the final vowel of the nominal stem (*ufuy/ufūy* "breath(s)," *dik/dika* "family(ies)"). Whether such forms are linked with their seemingly opposite Cushitic counterparts, with the Semitic broken plurals involving final-root-vowel lengthening, or unrelated entirely is not well understood.

The shortened plurals of Cushitic are fascinating from an etymological origin and are quite distinctive within the world of Afro-Asiatic, but as it pertains to syncope, they are essentially irrelevant. Since the shortening also appears on the final vowel of the nominal stem, it cannot have any impact on our predictions

¹⁷⁷Though sometimes co-occurring with additional sound-plural affixes, likely added at a later date by speakers failing to interpret the morphologically irregular internal plurals and true plurals.

of where syncope occurs, since all words that should have syncopated in the singular will still do so in their shortened plural, while all nouns which we predict not to syncopate will still fail to do so after shortening. This common type of Cushitic broken plural is therefore of little significance to our syncope proposal.

The other of the primary broken-plural types in Cushitic are formed by reduplication, and here we may observe two distinctive classes of reduplicative plurals: adjectival reduplication and nominal reduplication. In a number of Cushitic languages, including Beja, Somali, and Rendille, adjectives agreeing with plural nouns exhibit a morphologically distinctive form characterized by the reduplication of the initial portion of the nominal stem. This sometimes appears as reduplication of the initial *CV* sequence, and sometimes as reduplication of the full initial syllable. There is also a common tendency for the reduplicated syllable to exhibit vowel lengthening, though not all forms appear as such, and the distribution of this phenomenon is not clear. Sample forms are presented below, adapted from Zaborski (1986).

| Beja | | Somali | | Rendille | |
|------|-------|--------|--------|----------|-----------|
| Sg. | Pl. | Sg. | Pl. | Sg. | Pl. |
| deʼ | dádeʼ | ḍēr | ḍāḍēr | ḍér | ḍēḍér |
| wun | wáwun | weyn | wāweyn | wén | wewén |
| dis | dádis | ḥun | ḥunḥun | yeryér | yeryeryér |

Figure 6.5: Cushitic Plural Adjective Reduplication

This formation is unique to Cushitic, and therefore is unlikely to have been inherited from common Afro-Asiatic. It is possible, then, that these reduplicated adjectival plurals may have entered the grammars of the Cushitic languages after synchronic syncope was lost (the relative chronology of such changes is not well-understood). Even if syncope were still active, however, the peculiar shape of the reduplicated element likely would have blocked syncopation in any case. Since the initial reduplicated syllable often contains a lengthened vowel, and probably did so originally, its appending to the nominal stem should result in no further syncopation to the nominal stem, since the syllable which follows, if short, will not be the second such light syllable in an adjacent sequence. Our theory, then, predicts that Cushitic adjective reduplication should be a non-syncopating process, which is consistent with the admittedly sparse data recoverable from the Cushitic daughter languages.

The second primary type of reduplicated plural in Cushitic is the reduplicated nominal plurals, formed by the affixing of a $-VC$ suffix to the end of the nominal stem, in which the *C* matches the final consonant of the nominal root. Reduplicative plurals of this type are widespread throughout Cushitic, and are in fact attested in other Afro-Asiatic branches like Chadic and at least some

branches of Omotic, like Kaffa¹⁷⁸. Unhelpfully for our analysis, they are not present in Beja, so in order to fully discuss this common type of plural formation, we will have to turn our attention briefly to the other Cushitic languages. Zaborski (1986) states that plurals of this type are found in Afar-Saho, Somali, Rendille, Bayso, Arbore, Elmolo, Dasenech, Yaaku, Dahalo, sparsely in Iraq^w, but more frequently in Alagwa and Burunge and the other South Cushitic languages. He notes that there is even evidence for such forms in the extinct Cushitic language K^wadza. Examples are given below, adapted from Zaborski:

| Afar-Saho | | Somali | | Rendille | | Alagwa | |
|-----------|-------|--------|-------|----------|-------|--------|---------|
| Sg. | Pl. | Sg. | Pl. | Sg. | Pl. | Sg. | Pl. |
| af | áfof | af | afaf | af | afáf | tlūfa | tlūfafu |
| dik | dikák | ‘él | ‘élal | sam | samám | bale | balalu |
| ħaḏó | ħaḏoḏ | mur | murar | mān | mānán | kāmu | kāmame |

Figure 6.6: Cushitic Nominal Plural Reduplication

A full survey would be too extensive, so we will focus our attention on the comparatively better-studied Afar-Saho and Somali. In Somali, reduplicated plurals are restricted in distribution, occurring almost exclusively with monosyllabic (*CVC*) masculine nouns, as well as a few monosyllabic feminines¹⁷⁹. This distribution appears to be common to Cushitic, with a similar restriction to monosyllabic, often masculine nouns being found in Rendille and Arbore, and a general tendency throughout the family for nominal plurals formed in this fashion to belong to monosyllabic or originally monosyllabic nouns. Since, as Zaborski states, "all these nouns end in a consonant," the formation effectively takes the form *CṼC* singular, *CṼC-ṼC* plural, in which the vowel of the reduplicated element may exhibit vocalism seemingly copied from the nominal stem (*af/afaf* "mouth(s)"), but often appears to be subject to apophonic change (*fōl/fōlal* "face(s)," *tūg/tugeg* "thief/thieves"). Regardless of any possible apophony in the reduplicated suffix, the shape of the noun stems to which the affix attaches precludes any possibility of syncope. The addition of a *-ṼC* suffix to a *CVC* biliteral noun, regardless of whether it is reduplicated, should have no impact in terms of our theory of syncope.

In Afar-Saho, this plural is not restricted to monosyllables (*ikó/ikok* "tooth/teeth," *lafa/láfof*), though it is common with nouns of this sort (*af/áfof* "mouth(s)," *bar/báror* "night(s)"). Critically, bisyllabic *CVCV* nouns, when made into reduplicated plurals, are indistinguishable from the monosyllabic *CVC* coun-

¹⁷⁸Due to their superficial similarity, there is also some speculation that this process may underlie the rise of extended trilateral *C₁VC₂VC₂* and *C₁VC₂C₂* nouns in the Northern Afro-Asiatic languages, under the assumption that the reduplicative plurals, like other broken plural types, began as some sort of process of nominal derivation of uncertain origin and function.

¹⁷⁹Zaborski cites *ħaḏ/ħaḏaḏ* "hair(s)," *hog/hogag* "cave(s)," and *mur/murar* "path(s)" as reduplicated feminine nouns.

terparts¹⁸⁰. Synchronically, it may be possible to interpret this as a nominal stem *CVCV* being affixed with a reduplicated suffix *-VC*, along with some process of vowel coalescence. The apophony of the reduplicated suffix, however, is sensitive exclusively to root vowel, between the two root consonants, and wholly insensitive to the terminal vowel¹⁸¹. Indeed the reduplicative suffix seems to entirely overwrite whatever terminal vowel may be present, suggesting either that such vowels in Afar-Saho may not be original to the nominal root, and therefore not present at the diachronic stage at which reduplicative plurals were formed, or, alternatively, that the terminal vowels, though semantically vacuous, are morphologically separable from the nominal root, and can be blocked from appearing by the presence of the reduplicative affix.

Overall, across the entirety of Cushitic, reduplicative plurals do not appear to regularly cause any variability to the root or stem shapes of the nouns to which they apply, excepting apophonic vowel changes. Although work on the comparative morphology of the Cushitic languages is still far from complete, with our theory of syncope, we may now offer a tentative explanation for the lack of such changes. If, as we have speculated, reduplicative plural formation was a means for forming plurals solely from monosyllabic *CVC* nouns, as we see directly in some Cushitic daughters, and which is suggested by the strong association between reduplication and *CVC* roots in others, then as a process it cannot originally have triggered any syncope in the nominal stems to which it applied, as such forms should result only in $C\check{V}C\text{-}\check{V}C$ plurals, which should not be syncopeated.

6.1.4 Derived Nominals

Nominal derivation is immensely varied within the Cushitic languages. A wide array of affixes are used in the formation of nouns from verbs, adjectives and other nouns. Due to the internal diversity of the family, as well as the sparsity of scholarship and adequate reconstructions, it can be difficult to determine the direct cognation of many of these forms¹⁸². For our purposes, we will focus primarily on the **mṽ-* prefix used in the formation of verbal nouns, agent nouns, location nouns, and instrument nouns, as we can safely deduce the presence of this affix at the Proto-Cushitic stage via outgroup analysis.

This derivational prefix is clearly present in Cushitic, though it is not commonly productive in a generalized sense in the same way that it is in northern Afro-Asiatic languages, or even as it is in Chadic. Takács (2007), links this obviously cognate prefix with various derivational suffixes within both Cushitic and Omotic. The semantics of such a connection is not implausible, but the mech-

¹⁸⁰Compare *áfof* from *af* vs. *láfof*. from *lafa*

¹⁸¹Zaborski (1986) states that the reduplicative suffix is *-oC* or *-uC* when the root vowel is /a/ and *-aC* when the root vowel is any other (we might say, when it is any non-low vowel). This patterning is somewhat reminiscent of the conditioning of Barth's Law in Semitic.

¹⁸²Though see the work of Zaborski (1991), who proposes a number of derivational morphemes be reconstructed to the Proto-Cushitic stage. It should be noted that many of his reconstructions bear a striking similarity to those in Semitic.

anism whereby movement from a prefixed to a suffixed position might have occurred is not clear¹⁸³. For this reason, we will restrict our attention solely to the clearly cognate prefixed forms, and remain agnostic as to the origin of these suffixes.

The **mǔ-* prefix is far more productive in Afar-Saho, where it appears as a prefix which forms verbal nouns from verb roots. However, its productivity is limited, as it serves only to derive verbal nouns from roots which form strong (prefix-conjugated) verbs, which is a relatively small and archaic class in Cushitic outside of Beja. Thus, for example, from a verbal root such as *kom* "eat" which forms the strong verb *yokme* "he ate," we find the verbal noun *makmo* "eating." From the triconsonantal root *fakun* "turn," which forms the strong verb *yufkune*, we find the verbal noun *makfano*. The presence in Afar-Saho of the suffixed ending *-o* or *-a* on verbal nouns, in conjunction with the synchronic syncope rule, results in the hyper-short *CC* biconsonantal form, but note that the *mǔ-CCVC(-o)* root shape, which is clearly cognate with both the as well as the other forms outside of Cushitic, is unambiguously the result of syncope in Afar-Saho, and that this rule produces precisely those forms which we find throughout the majority of the family.

The similarity of the Afar-Saho forms to those of Beja, Semitic, Egyptian, and Berber is the most crucial of all the **mǔ-* prefixed forms we have here examined, since here it is not speculation or hypothesis that apparently templatic behavior is the result of syncope and unrelated vowel apophony. In describing the behavior of these verbal nouns, Bliese (1981) notes that the shape of the root is clearly the output of synchronic syncope applying to the verb stems. At the same time, however, he notes that the /a/ vocalism which characterizes the verbal noun stem is an entirely unrelated process, applying to the jussive, subjunctive and consultative, the perfect negative, nonpotential conditionals, *-i/-u* infinitives, and to verbal nouns formed with *-á*, *-a*, or *-iyya*, regardless of the presence or absence of the *m-* prefix, and regardless of whether syncope has applied to any of these forms. Afar-Saho, then, provides us with clear evidence for a language which has synchronic operation of both syncope and vowel apophony, and how the confluence of each can conspire to produce forms which are not only superficially indistinguishable from the operation of templatic morphology, but is also, in fact, directly cognate with it.

¹⁸³Notwithstanding our skepticism of the bulk of his work, Ehret (1995) makes the plausible connection between the agent/instrument/location Afro-Asiatic prefix **mǔ-* with the otherwise attested Afro-Asiatic interrogative pronoun in **m*. He suggests that, at the Pre-Proto-Afro-Asiatic stage, this prefix was originally a freestanding element, forming a relative clause of the form "who/which does X." If this proposal is correct, it provides a potential avenue for the apparent movement from prefixing to suffixing position in Cushitic. But this would require the univerbation which Ehret proposes to be a post-Afro-Asiatic innovation occurring in all non-Cushitic/Omoti branches, a timeline we find somewhat questionable.

6.2 Verbal Morphology

In contrast to the nominal morphology of Cushitic/Omotic, which is comparatively far more difficult both to reconstruct overall and to relate to cognate systems existing outside these two closely related families, the verbal morphology (of Cushitic in particular) bears many strong and remarkable resemblances to that of in Semitic, Berber, and to a lesser extent Egyptian in terms of the development of secondary forms of verbal inflection. As we shall demonstrate, the similarities between these verbal forms extends beyond cognation in terms of the verbal roots and inflectional affixes (although this is, of course, also true). It likewise includes a shared amenability to analysis in terms of syncopation in order to generate the full array of attested verbal formations (and to fail to produce those forms which are *not* attested). We will begin our analysis with the expected inherited verbal forms, including the old Afro-Asiatic suffix-conjugation, and the prefix-conjugation, with its split between perfective and imperfective aspectual forms. We will begin with the stative suffix-conjugation.

6.2.1 Suffix-Conjugation

The status of the original stative suffixing conjugation within Cushitic is, at present, uncertain. It is clearly unrelated to the novel, innovative suffix-conjugation class of Cushitic "weak verbs," described in section 6.2.3 below. More promising in terms of possible cognation, as we have previously discussed, is the presence in the East Cushitic languages of a suffix-conjugated verb form which, Banti (1987) refers to as "suffix-stativoid" or the "Cushitic Suffix-Conjugation 2" (SC2). These are verbs which describe attributes or properties of their subjects, semantically similar to the Akkadian and Egyptian statives, and to the Northern Berber *verbes qualitatifs*. And like these other, more clearly cognate suffix-statives, the SC2 is inflected solely by suffixes indicating the person, number, and gender of the subject. East-Cushitic suffix-stativoid verb paradigms are sampled below, adapted from Banti (1987).

| | | Somali | Jiiddu | Boni | Afar-Saho | Burji |
|---------|---|----------|--------|----------|-----------|---------|
| 1st Sg. | | cusbi | əkə | eheeyi | inniyo | anni |
| 2nd Sg. | | cusbid | əkɪt | eheed'i | innito | andu |
| 3rd Sg. | M | cusub | ehee | eheeyi | inna | anni |
| | F | cusub | ehee | eheed'i | inna | anni |
| 1st Pl. | | cusbin | əkɪn | eheeni | innino | anninu |
| 2nd Pl. | | cusbidin | əkədɪn | eheed'ii | innitin | ancingu |
| 3rd Pl. | | cusub | ehee | eheeyii | innun | anningu |

Figure 6.7: East-Cushitic Suffix-Stativoid Conjugation

On the basis of these these attested forms, Banti (2001) reconstructs the suffix-stativoid conjugation with the following inflectional paradigm.

| | Sg. | Pl |
|---------|------|-------|
| 1st Sg. | -iyi | -inu |
| 2nd Sg. | -itu | -itin |
| 3rd Sg. | ∅ | |

Figure 6.8: Reconstructed Suffix-Stativoid Paradigm

There are two theories regarding the origin of the East-Cushitic suffix-stativoid conjugation. The first, advanced by Banti (1987), is that this verbal form is directly cognate with the Semitic and Egyptian stative and the Berber *verbes qualitatifs*, reflecting a direct inheritance of the original Afro-Asiatic suffix-conjugation. The second, argued by Banti (2001) against his previous theory, is that these verbs are an innovation internal to Cushitic, resulting from the application of the possessive suffix pronoun to an original verbal noun or adjective. We will discuss the merits of each interpretation, incorporating our theory of syncope into the analysis.

The simplest argument supporting the idea that the East-Cushitic suffix-stativoid is inherited from the original suffix-conjugation statives is simple: they are almost perfectly overlapping in function. If Semitic, Berber, and Egyptian all exhibit a shared class of verbs reflecting attributes, qualities, or states, then one may suspect possible cognation upon finding a similar class of state or attribute verbs in a related language. There are additional structural parallels. Obviously, both are inflected with suffixes, and their form does sometimes match those of the original stative suffix-conjugation in Afro-Asiatic, particularly the second persons in *-t, and the weak or zero marking of the third persons.

In favor of the idea of the East-Cushitic suffix-stativoid conjugation as an innovation featuring the suffix pronouns and some nominalized verbal form is the peculiar shape of the first singular, with *-iyi, quite distinct from Akkadian *-āku*, Egyptian <-k(w/i)>, and Berber *-γ, but similar to the possessive pronouns (Semitic *-ī/-ya, Egyptian <-i>, Berber *ī/-iy). Banti (2001) also notes that the complete absence of marking in the third persons (which is uncharacteristic of the suffixing conjugation, where the masculine may have been unmarked, but the feminine seemed to have regular marking with the feminine *-t) is consistent with the behavior of the Egyptian clitic "conjugation," in which the third-person clitics are blocked by the appearance of an overt nominal subject, and therefore leave a number of third-person verbs unmarked. Such unmarked third-person forms could have been generalized to all third persons, even those without nominal subjects if they were frequent enough in use.

To adjudicate between these two theories, we can use our theory of syncope, and ask if it makes any predictions about which the behavior of the

East-Cushitic suffix-stativoid conjugation should look like depending on its two origins. As discussed in section 6.2.3, one of the characteristics of the Cushitic weak verb, which is formed originally from the univerbation of a presumably verbal noun or infinitive along with a prefix-conjugated auxiliary, is the invariance of the basic verbal root. We explain this invariance as a result of univerbation. Since the inflectional "suffixes" were originally distinct words, the syncope process could not cross the word boundary, yielding an invariant root. This suggests that our theory predicts that, at least in Cushitic, verbal forms arising through univerbation should not exhibit any syncope-related variability in the shape of the verbal root or stem. By contrast, in the case of the East-Cushitic stative, we find that it is frequently true that the verb stem alternates frequently, and often in ways reminiscent of the original Afro-Asiatic suffix-conjugation. Consider, for example, the variation between Somali *cusbi/cusbid* "I am new/you are new" and *cusub* "he/she is new," perfectly parallel in shape to Akkadian *parsāku/parsāta* vs. *paris* or the variation between Afar-Saho prefix-conjugation *yikxine* "he fell in love with" and suffix-stativoid conjugation *kixna*¹⁸⁴ "he/she loves." The presence of this variation in stem form and shape for suffix-stativoid verbs, under our theory of stem variation by syncope, suggests that this verbal form arose not from univerbation, where syncope should not be able to cross word boundaries as in the weak verb, but rather, are truly suffix-inflected verbs. This is consistent with the analysis whereby the suffix-stativoid conjugation of East-Cushitic is indeed linked with the original stative suffix-conjugation, and shows cognate variability in stem formation.

6.2.2 Strong Verb

The Cushitic strong verb, absent at least in the synchronic grammars of the Omotic languages, is the inheritor of the old Afro-Asiatic prefix-conjugation. In no Cushitic language does the strong verb survive as the sole or primary form of verbal conjugation (as the prefix-conjugation is in Berber or Semitic), coexisting to a greater or lesser extent with the innovative Cushitic weak verb, in a fashion much akin to the weak and strong verbs of the Germanic languages, from which the categories clearly derive their names. Nor is the strong verb evenly distributed across the branches of Cushitic. In Beja, the strong verb survives as a large and robust class of verbs, and is a more or less synchronically functional component of the grammar. In Afar-Saho (Lowland East Cushitic), strong verbs are only slightly less common, still forming a functional class of verbal inflection. In the other branches, the strong verb tends to survive not as a class of verbal inflection, but rather as a handful of irregular verbs. Awngi, for example, (Agaw) has retained a total of five strong verbs.

Nevertheless, by considering the behavior of the strong verbs from all of these Cushitic languages, with special attention to Beja, which exhibits the most morphologically conservative verbal system within Cushitic/Omotic, we

¹⁸⁴Note the variability within Afar-Saho between syncopated *kixna* and *kixina*, in which the presence of stress blocks such syncope, as discussed in section 2.1.2 above.

can begin to piece together the behavior of the prefix-conjugation in Cushitic. The picture that emerges is largely in accord with the analysis of syncope that we have here proposed. We will begin with our examination of the underived G-Stem verbal forms.

6.2.2.1 G-Stem

Any discussion of the inherited prefix-conjugation in Cushitic must begin with the consideration of the Beja verbal system, which is the most typically conservative, and in which the strong verb survives as a large, relatively productive class. Unlike in Semitic, where no verbs exhibit truly biconsonantal inflection, or in Berber, where biconsonantal verbs exist but are typically considered secondary to their more common triconsonantal counterparts, in Cushitic (including Beja), biconsonantal verbs are far more common, both in that they occur more frequently, and also in that the inflection of biconsonantal verbs is a common and basic type, not regarded as an irregular process modeled on the inflection of triconsonantal verbs. We therefore begin our analysis primarily with the verbal system of Beja, supplementing information from the other Cushitic languages where appropriate.

One of the primary archaisms of the Beja verbal system is the presence of distinct perfective and imperfective verbal forms. As in Semitic and Berber (and possibly Egyptian), the perfective verbal stem is characterized by the simple verbal root along with the affixation of the subject prefixes (and any syncope which this affixation triggers), while the imperfective is characterized by an infix $\langle n \rangle$ morpheme. As we shall see, the position of the $\langle n \rangle$ infix is closely paralleled by the position of the geminated consonant of the Semitic and Berber imperfective stem, and has similar impacts on where and if syncope occurs in the verbal stem. Let us begin by analyzing the form of the perfective verb.

Of the three primary verbal roots (*CVC*, *CVCVC*, *CVCV*¹⁸⁵), we find syncope of the verbal root in the *CVCVC* and *CVCV* forms, while the *CVC* roots are invariant. Sample forms are presented below from Kuryłowicz (1972) and Wedekind et al. (2008); Wedekind and Musa (2010).

¹⁸⁵In the traditional grammatical description of Beja verbal roots, the *CVCV* roots are commonly regarded as arising from original *CVCVy* and *CVCVw* roots, and can therefore be regarded as akin to Egyptian and Semitic *verbae tertiae infirmae*.

| | | CVC | CVCVC | CVCV |
|---------|----|---------|----------|----------|
| 1st Sg. | | ʾabís | ʾadbíl | ʾadgì |
| 2nd Sg. | M. | tibisà | tidbilà | tidgiià |
| | F. | tibisì | tidbilì | tidgù |
| 3rd Sg. | M. | ʾibís | ʾidbíl | ʾidgì |
| | F. | tibís | tidbíl | tidgì |
| 1st Pl. | | nibís | nidbíl | nidgì |
| 2nd Pl. | | tibisnà | tidbilnà | tidgiinà |
| 3rd Pl. | | ʾibisnà | ʾidbilnà | ʾidgiinà |

Figure 6.9: Beja Perfective/Past Verb Inflection

Outside of Beja, and to a lesser extent Afar-Saho, the prefix-conjugation in its entirety survives exclusively as an archaism relegated to either small classes, or to individual "irregular" verbs. Nevertheless, sufficient traces of the prefixing verbal inflection remain scattered throughout the family to confirm that the Beja perfective system is ancestral to the family as a whole. A sampling of Cushitic strong verbs is provided below, adapted from Heine (1976) (Rendille), Bliese (1981) (Afar-Saho), and Hetzron (1978b) (Awngi).

| | Redille | | Afar-Saho | | Awngi | |
|---------|----------|-----------|-----------|----------|--------------------|-------|
| | CVC | CVCVC | CVC | CVCVC | CVC | CVCVC |
| 1st Sg. | idəḥ | abḥub | able | ikxine | aqe ¹⁸⁶ | – |
| 2nd Sg. | M. | tiḍəḥ | tabḥub | table | taqe | – |
| | F. | | | | | |
| 3rd Sg. | M. | yiḍəḥ | yabḥub | yable | yikxine | yaqe |
| | F. | tiḍəḥ | tabḥub | table | tikxine | taqe |
| 1st Pl. | niḍəḥ | nabḥub | nable | nikxine | aqne | – |
| 2nd Pl. | tiḍaaḥin | tabḥuubin | tablin | tikxinin | taqana | – |
| 3rd Pl. | yiḍaaḥin | yabḥuubin | yablin | yikxinin | yaqana | – |

Figure 6.10: Perfective Prefix-Conjugation outside Beja

Notwithstanding the variations particular to each language in question, such as the syncope in Afar-Saho of the *CVC* roots resulting from the presence of a terminal vowel, it seems relatively clear that the other Cushitic languages confirm that Proto-Cushitic inherited basically the same system as is present in Semitic or Berber. Namely, that it inherited a system of prefixing perfective-verb inflection of the sort *yǎ-CVC*, *yǎ-CCVC*. As we have previously demonstrated, these forms are easily generable via our theory of syncopation, and are likely

¹⁸⁶Reflecting an original ʾa-ʾaq, ta-ʾaq, ya-ʾaq, etc.

the synchronic output of syncope in Afar-Saho. Observe the sample derivations below.

(104) *Derivation of Cushitic G-Stem Perfectives/Pasts*

| | | |
|-----------------|-----------------------------|-------------------------------|
| Underlying Root | CVC bis | CVCVC dabil |
| Subject Affix | ↓ yǎ- bis | ↓ yǎ- dabil |
| Syncopate | ↓ yǎ bis | ↓ yǎ dabil |
| Output | ↓ *yǎ bis → 'ibís | ↓ *yǎ dbil → 'idbil |

In both Semitic and Berber, we saw that imperfective G-Stem verbs were morphologically distinct from their perfective counterparts. Specifically, the imperfective forms were characterized by the presence of a geminated root consonant, as in Berber *iggât* or *ikârräs*, or Semitic **yaqattal*. This geminated imperfective form is paralleled in Cushitic, albeit only in Beja. In this language, there is a distinctive present/progressive form characterized by the infixation of a morpheme <n>. Strikingly, the position of the <n> infix is perfectly parallel to the geminated root consonant of the Berber and Semitic forms. Namely, in *CVC* biconsonantal roots, in which the first root-consonant is geminated (Tuareg *i-ggât*), we find in Beja forms such as 'i-nliiw or 'i-nriib, in which the would-be geminated consonant is preceded by the <n> infix. In *CVCVC* verbal roots, in which the second root-consonant would be geminated (Tuareg *i-kârräs*, Semitic **ya-qattal*), we find Beja forms such as *šanbiib* or *danbiil*. The full paradigm of Beja present/progressive forms is presented below.

| | | CVC | CVCVC | CVCV |
|---------|----|------------------|-------------------|----------|
| 1st Sg. | | 'an bíis | 'adan bíil | 'adangì |
| 2nd Sg. | M. | tin biisà | dan biilà | dangiià |
| | F. | tin biisì | dan biilh | dangíí |
| 3rd Sg. | M. | 'in bíis | dan biil | dangì |
| | F. | tin bíis | | |
| 1st Pl. | | nee bís | need bíl | nidèeg |
| 2nd Pl. | | tee bisnà | teed bilnà | tideegnà |
| 3rd Pl. | | 'ee bisnà | 'eed bilnà | 'ideegnà |

Figure 6.11: Beja "Present/Progressive" Imperfective Verb Inflection

There are a number of distinctive features of the present/imperfective paradigm of Beja that merit some mention or discussion. The first, and most

obvious, is that the <n> infix which characterizes the imperfective forms appears (at least in the standard dialects) to occur solely with singular subjects. Supposing that the Beja form is truly cognate with its Berber and Semitic counterpart, we would have to conclude that the absence of the <n> infix in the plural is an innovation. Indeed, we find evidence of this, as Zaborski (1975) cites forms from Reinisch (1893), drawn from the Hadendowa dialect of South-Eastern Egypt, North-Eastern Sudan, and Eritrea, which attests the following paradigm (in which the <n> infix appears in all forms, including the plurals):

| | | CVC |
|---------|----|------------------------|
| 1st Sg. | | ʾarank ^w fi |
| 2nd Sg. | M. | ránk ^w iia |
| | F. | ránk ^w ii |
| 3rd Sg. | M. | ránk ^w ii |
| | F. | |
| 1st Pl. | | neránk ^w ii |
| 2nd Pl. | | teránk ^w ii |
| 3rd Pl. | | ʾeránk ^w ii |

Figure 6.12: Hadendowa Beja Fully <n>-Infixed Paradigm

If we assume, as did Greenberg (1952), that the <n>-infixed presents of Beja represent direct cognations with the Berber and Semitic geminated imperfectives, we should assume that the Hadendowa paradigm is original, and that the loss of the infix in the plural forms is an innovation internal to Beja¹⁸⁷. This is the analysis which we will adopt here.

Another somewhat striking feature is the absence of the inherited prefix-conjugation affixes in the second (*tǝ-) and third (*yǝ-/*tǝ-) person singulars of triconsonantal verbs, as illustrated by forms as 2nd M and F *danbiilâ/danbiili* (instead of expected **tidanbiilâ/*tidanbiili*), or common 3rd person forms such as *šanbiib* (for expected *ʾ*išanbiib/*tišanbiib*). It seems clear that we can again agree with Greenberg in dismissing the absence of the prefixes in these forms as "clearly secondary," given the archaic nature of the prefix-conjugation within Afro-Asiatic, and the retention of these prefixes, in precisely the expected forms and patterns, in the biconsonantal verbal forms (typically regarded as the more archaic verbal roots within Cushitic).

We should finally mention the presence of distinctive long vocalisms in the subject prefixes of the plural (*nee-*, *tee-*, *ʾee-*) as well as in the final vowel of the verbal root (*ʾinbiis*, *danbiil*). The lengthening of the prefixes can rightly

¹⁸⁷The reason as to why the marker of the present/imperfective form should be lost in the plural is not abundantly clear. It is perhaps worth noting that between the first plural prefix in **nǝ-*, and the second and third person plural suffixes *-nâ*, that all plural forms in Beja exhibit an independent /n/ elsewhere in the inflected form, which could, in principle, have triggered a dissimilatory change, but such a change is purely speculative.

be regarded as a simple innovation given the presence of more typical short vowel prefixes in the singular forms. The lengthening of the final vowel of the verbal root is more interesting, since it potentially reflects some type of templatic behavior or, under our analysis, a common morphological process in the formation of the present/imperfective stem. Nevertheless, we will not focus a great deal on this lengthening, since it has little impact on the analysis we will present, as the final root syllable is never targeted for syncope in the verbal system which Cushitic inherited from Afro-Asiatic.

As mentioned, the <n>-infixated presents of Beja are directly parallel to the geminated imperfectives of Berber and Semitic, with the -nC- clusters appearing in precisely the same positions in Beja as the geminated consonants in the other families (-nCVC/-CCVC, CVnCVC/CVCCVC).

(105) *Derivation of Cushitic G-Stem Imperfectives/Duratives*

| | | |
|-----------------|-----------------------------------|-------------------------------------|
| | CVC | CVCVC |
| Underlying Root | biis | dabiil |
| | ↓ | ↓ |
| <n>-Infix | <n> bis | da <n> biil |
| | ↓ | ↓ |
| Subject Affix | yǎ- nbiis | yǎ- danbiil |
| | ↓ | ↓ |
| Syncopate | - | - |
| | ↓ | ↓ |
| Output | *yǎ nbiis →'in bfis | *yǎ danbiil → danbiil |

The marking of imperfective/present/progressive verbal forms with either the infixation of <n>, or the gemination which may have arisen from it, is unattested outside of Beja, and is not found in any of the other major Cushitic languages. In this respect, we can think of Cushitic as a family as similar to Semitic, in that the original gemination/<n>-infixation of the imperfective verbal form is retained only in a few relatively conservative branches (East Semitic/South Semitic vs. Beja for Cushitic), while in the remainder of the family, an innovative verbal system based either around the original perfective stem or periphrastic verbal forms has come to predominate.

6.2.2.2 Derived Stems

Cushitic reflects the full range of derived stem types (S-Stem, N-Stem, T-Stem) attested elsewhere in the family. Indeed, in all three major-order branches in which the prefix-conjugation survives as a fully functional inflectional category (Semitic, Cushitic, Berber), the full complement of derived-stem types are attested. By contrast, in Egyptian and Chadic, in which the prefixing conjugation is absent, the derivational system has atrophied considerably, with Egyptian reflecting only the S-Stem and possible archaic reflexes of the T- or N-Stems, and Chadic only debatably exhibiting any of the primary derived verbal types at

all. For the discussion of the derived stem types in Omotic, see section 6.2.3.2 below, in which we consider the derived stem forms present in the Cushitic weak verb, and likely shared with Omotic, as well as their likely common origin in the prefixing conjugation.

In Cushitic, these derived verbal stems attest the basic semantic functions which we would come to expect. The S-Stem functions as a causative, factitive, or general verbal transitivizer, while the N- and T-Stems function interchangeably as passives, reciprocals, or middle voice formatives, with the various Cushitic languages not always exhibiting agreement as to which of the T- or N-Stems takes which of these various valence-reducing functions. A sample of derived strong-verb forms is provided below.

| | | Beja | Afar-Saho |
|--------|-------|-----------|-----------|
| S-Stem | CVC | ʼisoodir | yuybulle |
| | CVCVC | ʼisdabil | yiskiriye |
| N-Stem | CVC | ʼimoodaar | yindixide |
| | CVCVC | ʼimdabaal | yumbulle |
| T-Stem | CVC | ʼitoodaar | yubbulle |
| | CVCVC | ʼitdabaal | irrixide |

Figure 6.13: Derived Strong Verbs in Archaic Cushitic Languages

Each language is, of course, subject to different changes particular to its own line of descent. Beja has developed innovative lengthened prefixes *sō-*, *mō-*, and *tō-* which append to biconsonantal roots. Afar-Saho verbs have gained their characteristic terminal vowels, and biconsonantal roots show unexpected gemination of the final root consonant, unattested in the other branches or outside of Cushitic. Strong verbs entirely, to say nothing of derived strong verbs, are increasingly uncommon in the other Cushitic daughters. Nevertheless, the commonalities of these two more conservative Cushitic languages, and their shared commonality with languages outside of Cushitic, allows us to piece together the system of derived verbs at the Proto-Cushitic stage, particularly if Beja is the most divergent Cushitic branch, and constitutes half of the family. Biconsonantal *CVC* verbal roots point to a proto-form *yǔ-D-CVC* in which *D* represents the consonant which characterizes the derivation prefix, still more or less attested directly in Afar-Saho. It is striking that such forms are unattested in Beja (typically thought of as the most morphologically conservative Cushitic language), instead being replaced by forms reflecting **yǔ-DV̄-CVC*, in which the derivational prefix not only appears with a concomitant vowel, but with such vowel always appearing as long. This formation is quite unique, not only within Cushitic (with Beja's Cushitic sisters having no direct parallel to this kind of obligatory lengthening with *CVC* roots) but also within Afro-Asiatic more generally, since, as we have described, derivational forms associated with

CVC roots in both Berber and Egyptian do not reflect mandatory lengthening of the prefix vowel. For this reason, we should rightly regard the lengthened prefix vowels of Beja as an innovation particular to that language, albeit one whose origin and cause is not particularly well-known.

Notwithstanding the innovative Beja forms, the Afar-Saho forms are identical with their Berber counterparts¹⁸⁸, with forms such as *yumbulle* or *yuybulle* effectively identically paralleling forms such as Tuareg *isyān*, with the prefix directly adjacent to the initial consonant of the root. In the case of Berber, we suggested that this pattern arose naturally from syncope, and the same analysis is applicable in the case of Cushitic ($CVC \rightarrow s\check{v}-CVC \rightarrow y\check{v}-s\check{v}-CVC \rightarrow y\check{v}-s\check{v}-CVC \rightarrow *y\check{v}-s-CVC$). A full derivation is provided below.

More striking from a cross-Afro-Asiatic perspective, is the distinctive form of the triconsonantal *CVCVC* roots. We have previously suggested that derived triconsonantal *CVCVC* roots in Afro-Asiatic exhibited an original shape *y \check{v} -D \check{v} -CCVC*. Such forms are universal in Berber, for all derived stem types, and they also characterize the S-Stem in Semitic, regarded as the most conservative of the derived stem formation. This **y \check{v} -s \check{v} -CCVC* form is wholly absent from Cushitic, with derived triconsonantal verbal stems uniformly reflecting a form **y \check{v} -D-CVCVC*, as in Beja *’isdabil* or Afar-Saho *yindixide*. Generating this form using our proposed rule of syncope requires only one of two potential changes, namely the re-ordering or the re-analysis of the sequence of phonological rules present at the Proto-Cushitic stage, or the re-analysis of the derivational prefix as consisting of a single consonant with no accompanying vocalism.

Specifically, this re-analysis would require speakers to interpret the syncope rule as applying only once, at the end of the phonological derivation, acting as a constraint on the surface form before output, rather than as an iterative rule applying at multiple stages throughout the course of the derivation. Examples of such a re-analyzed derivation, using both *CVCVC* triconsonantal and *CVC* biconsonantal roots, are provided below, demonstrating how the attested forms can be generated with comparative ease after supposing such a re-ordering.

(106) *Derivation of Cushitic Derived Stem-Perfectives*
(*Rule-Reordering*)

¹⁸⁸Recall that Semitic has no verbal roots which exhibit biconsonantal finite inflection outside of the imperative, and therefore we have no direct comparisons available from attested or reconstructable Semitic languages.

| | CVC | | CVCVC | |
|---------------------|-----------------|---------------|-------------------|-----------------|
| | Perfective | Imperative | Perfective | Imperative |
| Underlying Root | dṽr | dṽr | dṽbṽl | dṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Derivational Prefix | sṽ-dṽr | sṽ-dṽr | sṽ-dṽbṽl | sṽ-dṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Subject Affix | yṽ-sṽdṽr | – | yṽ-sṽdṽbṽl | – |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | yṽsṽdṽr | – | yṽsṽdṽbṽl | sṽdṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yṽsdṽr | *sṽdṽr | *yṽsdṽbṽl | *sṽdbṽl |

This simple re-ordering will allow us to easily generate attested forms such as Beja perfectives *ʾišbašik^w* and *isookin*, along with imperatives *sirhūisa* and *sookina* or Afar-Saho *yindixide/eyyece* but the shape Afar-Saho imperatives are unexpected: *ynibib*.

The imperatives of Afar-Saho provide potential evidence for our alternative proposal: that it was not the sequence of phonological rules that was re-analyzed, but the derivational prefixes were re-segmented, with the consonant being identified as the true prefix, and the accompanying vowel being misidentified as part of the verbal root/stem. A sample derivation is provided below.

(107) *Derivation of Cushitic Derived-Stem Perfectives (Prefix Re-analysis)*

| | CVC | | CVCVC | |
|---------------------|----------------|----------------|------------------|------------------|
| | Perfective | Imperative | Perfective | Imperative |
| Underlying Root | dṽr | dṽr | dṽbṽl | dṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Derivational Prefix | s-dṽr | s-dṽr | s-dṽbṽl | s-dṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Subject Affix | yṽ-sdṽr | – | yṽ-sdṽbṽl | – |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | – |
| | ↓ | ↓ | ↓ | ↓ |
| Epenthesis | – | s-ṽ-dṽr | – | s-ṽ-dṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Syncopate | – | – | – | sṽdṽbṽl |
| | ↓ | ↓ | ↓ | ↓ |
| Output | *yṽsdṽr | *sṽdṽr | *yṽsdṽbṽl | *sṽdbṽl |

The primary difference between the Beja and Afar-Saho forms, under this analysis, would be the placement of the epenthetic vowel. In Beja, the vowel would be inserted between the cluster of the derivational prefix and the root

initial consonant, whereas in Afar-Saho, it would take the form of an initial prosthetic vowel, which would not break up the cluster, but would serve to make it articlable.

Although there is little difficulty in modifying our theory in either of these ways so as to generate such forms, we must ask if there is reason to suppose that such a change ought to have occurred in Cushitic, when, as we have seen, no parallel change has occurred in either Semitic or Berber. Indeed there is, and it pertains to the nature of common root shapes in each of these languages. Recall, as we have previously discussed, that in Semitic, effectively all verbs exhibit triconsonantal inflection when finite (except imperatives). Similarly, in Berber, biconsonantal inflection exists for finite verbs, but the triconsonantal form is significantly more common. This is not so in Cushitic. In Cushitic, it is the biconsonantal roots which are more common, numerically (Cohen (1988) states that Beja is the Cushitic language with the largest number of triconsonantal verbal roots, and that even in this language, they represent only a little under 53% of the vocabulary), as well as with respect to the most common roots reconstructable for Proto-Cushitic. This fact is of critical importance because, under a theory of syncopation which applies persistently throughout the derivation, a *CVC* verbal root and a *CVCVC* verbal root would be expected to produce two distinctive forms: *yǔ-D-CVC* for *CVC* roots, but *yǔ-Dǔ-CCVC* for *CVCVC* roots. In the case of Cushitic, this means that a large number of verbs, including many of the most basic vocabulary items, would only have ever appeared on the surface with a derivational prefix which was ***a single consonant with no accompanying vowel***¹⁸⁹. Given this distribution of surface forms in derived stems, it is not unreasonable to suppose that Cushitic may have undergone a re-analysis (of either sort), whereby the numerically less common *CVCVC* derived verbal stems are modified to more closely resemble the dominant *CVC* type.

As it pertains to the imperfective stem, the Beja forms are again generally parallel to the forms in Berber and Semitic¹⁹⁰ in that the gemination/*<n>*-infixation, which is the hallmark feature of the imperfective in the G-Stems, is entirely absent in the derived stems, as illustrated in the simple comparison below

¹⁸⁹Excepting the imperative forms, in which the vowel is both predicted to surface and known to appear in attested languages

¹⁹⁰At least the Š-Stem of Semitic, which seems to exhibit the most archaic forms of inflection among the derived stems in that family.

| | CVCVC | | CVC | |
|----------|----------|-----------------------|--------|---------|
| | G-Stem | S-Stem | G-Stem | S-Stem |
| Beja | ašanbiib | išbašiik ^w | inrib | isoorib |
| Tuareg | ikârräs | isâkräs | iwwât | isâyân |
| Akkadian | iparras | ušapras | – | – |

Figure 6.14: G-Stem and S-Stem Verbs in Cushitic, Berber and Semitic

In the case of the *CVC* verbal roots, the forms are identical, excepting the clearly innovative lengthening which characterizes the vowel of the Beja prefixes (and, coincidentally, the lengthening by position seen in Tuareg). The *CVCVC* roots show the same variability between *yǔ-Dǔ-CCVC* in Semitic/Berber vs. *yǔ-D-CVCVC* which we encountered in the G-Stem, and both reflect the absence of overt infixes or geminated marking of the imperfective. This feature would appear to be clearly inherited from the common Afro-Asiatic ancestor, and has been subject only to the minimal change in the status of the derivational prefixes described above.

6.2.3 Weak Verb

6.2.3.1 G-Stem

The "weak verb" is an innovative verbal formation which is shared throughout Cushitic as a whole, and may potentially be shared with Omotic, though the evidence is less concrete in that family. In contrast to the strong verb, which features both stem-shape alternation and vowel apophony, the weak verb features an invariant verbal stem to which inflectional suffixes are appended. For this reason, in Cushitic studies, the weak verb is somewhat unhelpfully referred to as the "suffix-conjugation," though it is important to note that this form is not directly genetically related to the archaic Afro-Asiatic suffix/station conjugation, whose potential reflexes are discussed in section 6.2.1¹⁹¹. The weak-verb suffix-conjugation is widespread throughout Cushitic as a family and is, in fact, the only verbal formation common to all major branches of Cushitic, as illustrated in the sample forms provided below from Banti (2001).

¹⁹¹Banti (2001) refers to the novel Cushitic weak verb form as Suffix-Conjugation 1 (SC1), while he refers to the potential reflexes of the Afro-Asiatic stative/suffix-conjugation as Suffix-Conjugation 2 (SC2).

| | | Beja | Awngi | Somali | Burunge |
|---------|----|-----------|----------|----------|---------|
| 1st Sg. | | tam-an | des-é | tum-aa | koom-a |
| 2nd Sg. | M. | tam-taa | des-té | tun-taa | kon-ta |
| | F. | tam-tay | | | |
| 3rd Sg. | M. | tam-ya | des-é | tum-aa | kon-a |
| | F. | tam-ta | des-té | tun-taa | kon-ta |
| 1st Pl. | | tam-na | des-né | tun-naa | kon-a |
| 2nd Pl. | | tam-taana | des-tànà | tun-taan | kon-tay |
| 3rd Pl. | | tam-yaana | des-ànà | tun-aan | kon-ay |

Figure 6.15: Cushitic Weak Verb Conjugation

Recall that the weak verb's most defining feature vis-à-vis the strong verb is the absence of internal stem alternations, which we have already hypothesized and analyzed as arising from our rule of syncopation. If we have explained the stem alternations of the strong verb via syncope, we must now ask whether there is a similar explanation to be found for the lack of stem alternations in these weak verbs. As we shall see, our theory of syncopation not only accommodates the lack of stem alternation seen in weak verbs, it in fact predicts that such forms *ought* to have had invariant verbal stems. In order to explain this prediction, we will need to discuss the origin of the Cushitic weak verb, as this will prove crucial to our analysis.

As previously mentioned, the Cushitic weak verb conjugation is not shared with any other major-order Afro-Asiatic family, and is rather an innovation at the Proto-Cushitic (or potentially at the Proto-Cushito-Omotiic stage; see more on this later). It is the precise nature of the innovation that gave rise to the weak verb that interests us here. Consider the comparison below of the reconstructed endings of Cushitic weak verb inflection as compared to those of the original prefix and suffix-conjugation as reconstructed for Semitic:

| | | Beja | Semitic PC | Semitic SC |
|---------|----|--------------------|-------------------|------------|
| 1st Sg. | | *- ^ʾ v̄ | * ^ʾ a- | *-ku |
| 2nd Sg. | M. | *-tṽ | *ta- | *-ta |
| | F. | | | *-ti |
| 3rd Sg. | M. | *-i | *ya- | *-∅ |
| | F. | *-tṽ | *ta- | *-(a)t |
| 1st Pl. | | *-anṽ | *ni- | *-na |
| 2nd Pl. | M. | *-tin | *ti- | *-kan(u) |
| | F. | | | *-kin(u) |
| 3rd Pl. | M. | *-in | *yi- | *-ū |
| | F. | | | *-ā |

Figure 6.16: Cushitic Weak Verb vs. Semitic Prefix and Suffix-Conjugation

The weak-verb endings, as reconstructed by Banti (2001), are more similar to those of the Semitic prefix-conjugation than to those of the original suffixed conjugation. While some forms, particularly the second person, or first Pl. forms are indistinct between the two, the first Sg., the third Sg. M, and the third Pl. forms are all more similar to the prefix-conjugation affixes than to those of the suffix-conjugation. And this similarity is no accident. Since the initial postulation of Reinisch (1893) and Praetorius (1893, 1894), it has long been supposed that the origin of the weak verb can in fact be found in an originally periphrastic construction featuring an infinitive or participial verb form unverbated with a prefix-conjugated auxiliary which immediately follows. This explains the presence of the prefix-conjugation morphemes as suffixes (as well as the suffixed position of the originally derivational prefixes, as we will see later).

For our purposes, this origin in a periphrastic construction with a prefix-conjugated auxiliary is vital for our prediction that the weak verb should not exhibit stem alternations, as our theory differs radically from a traditional templatic approach, in terms of the meaning and import of forms arising from univertation. Under a conventional templatic theory, the originally periphrastic nature of the form should be of no consequence, as the infinitive/participial verb form still would consist of manipulable root consonants, and could, in principle, have a number of different templates applied to it. The fact that it does not, under a root/template theory, must be regarded as happenstance.

In our theory, however, root alternations are the not result of abstract templates applied to consonantal roots, but rather the output of syncope and therefore *cannot occur* without some other morpheme being affixed to the root to trigger a change in its shape. For this reason, the weak verb, which originates in a non-affixed non-finite verb form, should therefore *never* be predicted to exhibit stem alternations, since the forms which become the "suffixes" are originally independent freestanding words. It should also be noted that even if we

suppose that univerbation of the weak verb occurred at a time when syncope was still synchronically active in the grammar of the ancestral language, we would *still* predict that the affixes should not trigger syncope with either *CVC* or *CVCVC* verbal roots, since all of the "suffixes" are in fact originally consonant-initial prefixes. The affixation of such morphemes would therefore be incapable of generating the necessary sequence of light syllables (*CVC-CV*, *CVCVC-CV*) to trigger syncope.

In our theory, therefore, the invariant nature of the verbal root and stem in the Cushitic verb arises not as a happenstance of which templates apply to which verbal forms, but rather emerges naturally from the interactions among affixation, periphrasis, and syncope.

6.2.3.2 Derived Stems

The Cushitic weak verb can also exhibit the same basic derived verbal formations as are present in the prefixing strong verb. And it is in these derived verbal stems that we may draw the strongest link between the Cushitic weak verb and the Omotic verbal system. In weak verbs, the derivational affixes which characterize the derived stems appear as suffixes, rather than in their typical position as prefixes appearing between the verbal root and the inflectional prefix, as they do in Semitic or the Cushitic strong verb. Consider the forms below, drawn from numerous Cushitic languages:

| | | Beja | Afar-Saho | Iraq ^w | Awngi |
|--------|-------|--------------------|-----------------|----------------------------|---------|
| S-Stem | CVC | tamsiya | xabsiise | na ^ʿ aas | – |
| | CVCVC | kaḍawšiya | kaclisa | ^ʿ aktiis | – |
| N-Stem | CVC | tamamiya | fakkiime | xawiim | tasəŋt |
| | CVCVC | ʾajjaramiya | wagrime | hamtliim | digəŋəŋ |
| T-Stem | CVC | – | caste | qawiit | – |
| | CVCVC | – | kaclite | hamtliit | – |

Figure 6.17: Cushitic Derived Weak Stems

It is in the formation of derived weak verbal stems that Cushitic shows its strongest similarities to Omotic. Because in this family, derived verbal stems are likewise characterized by the presence of the typical Afro-Asiatic derivational affixes (**s*, **t*, and **n*). Most strikingly, they are characterized by the presence of these affixes as suffixes appearing at the end of invariant verbal roots. Consider the examples below from several Omotic languages illustrating the parallels between the derived verbs of that family and the weak verbs of Cushitic.

| | Wolaytta | Koré | Yemsa | Dizoid | Aari | Mao |
|--------|---------------------|-------------------|--------------|---------------------|---------------------|------------|
| S-Stem | immis | woḍus | tamars | Dizi: cans | wursis | kešišē |
| N-Stem | Malé: tiḳint | – | – | Dizi: wuḡgin | Dimé: ḩohinḑ | – |
| T-Stem | meḩet | ^ʾ ušut | ḳont | Sheko: duft | diber | – |

Figure 6.18: Omotic Derived Stems Parallel to Cushitic Derived Weak Stems

It is these similarities, along with a few others, that lead Zaborski (1991) to state the Omotic should rightly be considered to constitute merely the "western branch" of Cushitic. While we remain agnostic regarding that particular claim, given the peculiar and distinctive shift of the derivational affixes from prefixing to suffixing being shared only between these two groups, and the fact that the origin of such a shift can be distinctly identified in Cushitic, it seems likely that Omotic also underwent change to a periphrastic verbal inflection with subsequent univerbation, either as an independent parallel development, or perhaps more likely, as a shared innovation along with Cushitic. This is, indeed, one of the strongest pieces of evidence for a cladistic unity between Cushitic and Omotic at some point in their history.

Chapter 7

A Brief Discussion of Chadic

In contrast to the other major Afro-Asiatic branches, we will not discuss the behavior of Chadic in great detail in this dissertation. The reasons for this are multiple. First, and most simply, our reconstructions of the morphological structure of Proto-Chadic are more sparse than for any other except Omotic, in which the shared similarities with Cushitic allow us to reveal some of the history which might otherwise be obscured. In the case of Chadic, there is no such obvious external comparanda which illuminate the structure of Proto-Chadic. The situation is compounded by the remarkable degree of internal diversity and variety of Chadic languages, a fact which greatly hampers our ability to reconstruct the proto-language. Second, from the perspective of Afro-Asiatic, the morphology of the Chadic languages appears to be remarkably innovative, with a large number of the characteristic morphological behaviors which other branches inherited from the proto-language having been lost, in both the realm of nominal morphology (overt gender marking on nouns, potential case marking), and verbal morphology (the absence of both the prefixing and suffixing conjugation). Finally, and more practically, Hausa, the Chadic language which has by far the greatest scholarship and attestation, is almost universally regarded as one of the least archaic, most innovative members of the family, and is therefore not particularly helpful in providing us with a clear picture of archaic Chadic morphology. This contrasts with, for example, Semitic, where reasonably archaic languages such as Arabic, Akkadian, Ge'ez, and even the Modern South Arabian languages have been described in at least reasonable detail, or even Cushitic, in which the remarkably archaizing Beja is among the best-studied languages in the family.

Nevertheless, we will briefly touch on each of the major topics which we have discussed to this point, describing what is generally known and accepted about Chadic as a family, and the ways in which this recoverable morphology might be generated or explained in terms of our analysis of syncope.

7.1 Nominal Morphology

7.1.1 Case Inflection

It is commonly supposed that Chadic, as a family, does not exhibit nominal case inflection. Diakonov (1988), for example, regards the Chadic family as belonging to the class of Afro-Asiatic branches which have "lost, for the most part, their external inflexion." Hasselbach (2013) concurs: "The second branch of Afro-Asiatic that has no inflectional case morphology is Chadic. None of the languages which have been described and studied so far show any evidence for morphological case markers." These observations are not, in the strictest sense, empirically true. Schuh (2019), for example, cites the presence of an optional accusative-case prefix *tó-* in the Central Chadic language Gude, which can appear with semantically definite direct objects¹⁹², both nominal and pronominal, as in the following examples.

(108) kó àly úzén tó-Húmtí
COMPL look for child ACC-Humti
'The child looked for Humti'

(109) kó àli Húmtí tó-ny
COMPL look for Humti ACC-me
'Humti looked for me'

Wolff (2015) has likewise demonstrated the existence of a presumably cognate accusative case morpheme *tá-* in the related Central Chadic language Lamang.

What is true, however, is that there is little evidence that Proto-Chadic itself had a system of morphological case inflection whatsoever, much less one that could be plausibly linked to the attested case systems reflected in other Afro-Asiatic branches. The case systems attested are restricted to a single sub-branch of the Chadic family, with no obvious external parallels in West Chadic or in East Chadic, the branch commonly regarded as the most morphologically archaic within the family. Additionally, in terms of both the structure of the alignment and the shape of the morphemes, the Central Chadic case systems share no obvious similarities with the systems found in the other Afro-Asiatic daughters, where we find marked-nominative systems¹⁹³ (or the likely remnants of a marked-nominative system, as in Semitic), and case morphemes in which the marked nominative seems to have some common association with vowels **u/*i*, and the accusative either unmarked or occasionally with **a*.

¹⁹²The connection between definiteness and overt case marking is something which Gude and Lamang share with the Cushitic languages where, recall, in a number of instances, case is overtly marked only on definite nouns. Unlike in Cushitic, however, where it is the nominative case that is commonly marked, while the accusative is the nominal default, in Central Chadic, it is definite accusatives which show overt morphological realization.

¹⁹³The likely footprint of this original marked nominative system may still be found in the pronominal system of the Chadic languages, where the functions of the distinctive forms may reflect this original situation, as argued by Satzinger (2000).

For this reason, we will follow common scholarly consensus and suppose that Proto-Chadic had no overt nominal morphology for the marking of case, and did not directly inherit whatever system of nominal case inflection may have been present in the common Afro-Asiatic parent language. It would therefore have no impact on our theory of syncopation, since there would be no overt realization of case as a category.

7.1.2 Number/Gender Inflection

In the Chadic languages, we cannot speak of number and gender inflection as wholly separate categories, but rather must consider them simultaneously. This is because throughout the Chadic family, number and gender do not behave as independent nominal categories, but rather, as a single category with three mutually exclusive values: masculine, feminine, and plural. Unlike in Semitic or Berber, where a given noun can be either masculine or feminine, and separately, either singular or plural, in Chadic, a noun can be either masculine, or feminine, or plural, but not more than any one of those categories in a single instance. And this ternary opposition is true not only of nouns, but also of the entire grammatical system of Chadic more generally¹⁹⁴, including on deictics and determiners, pronouns, and even in verbal inflection. In each instance, gender oppositions are present exclusively in singular nouns/deictics/pronouns/verbal inflections, while the plural in effect functions both as an exponent of grammatical number, but also effectively as a derived third gender to the exclusion of masculine or feminine.

This state of affairs is notable to a speaker (or scholar) of an Indo-European language, but it may represent one of the most important archaisms preserved by Chadic as a family, because there is evidence from the other Afro-Asiatic branches that this was the system inherited from Proto-Afro-Asiatic. Such evidence may be found in the persistent *n/t/n* agreement pattern described by Greenberg (1960), which exhibits only a single, gender-neutral morpheme as the exponent of the plural, the persistent tendency throughout Afro-Asiatic for the gender of nouns to be inverted in the plural¹⁹⁵, and the absence of gender distinctions in the pronominal verbal-inflection paradigms of Chadic, Cushitic¹⁹⁶, and Egyptian.

If Chadic resembles Cushitic in strongly preserving the apparent relationship between number and gender which characterized the proto-language, it likewise

¹⁹⁴The indication of gender in the plural is sporadically attested in a few Chadic languages, but such marking is "clearly a more recent innovative overlay" according to Schuh (2003).

¹⁹⁵A phenomenon well-known in Semitic with respect to the inflection of numerals, as well as some nouns, such as Akkadian *libbum/libbātum* "heart(s)." It is also likely reflected in the Arabic rules pertaining to the number and gender agreement of non-human plural nouns with feminine singular concord. This phenomenon, of course, finds its strongest realization in the Cushitic languages, where such polarity of gender with respect to number is almost universal for all nouns.

¹⁹⁶Appleyard (2012) states that "Most Cushitic languages have a seven-term personal pronoun system, in which gender is only distinguished in the 3 SG.," though he does note that some have innovated gender distinctions in the plural, as in Beja.

shares with Cushitic a striking absence of overt gender morphology on the noun itself. In contrast to Semitic, Berber, and Egyptian, where feminine nouns are largely marked by the reflex of the inherited and original **-t* feminine suffix, in Chadic, the gender of a given noun is commonly morphologically unmarked. Schuh (2019) states: "For many, perhaps most, Chadic languages that retain grammatical gender, nouns themselves have no overt gender marking." For such languages, obviously, we need not consider the impact of gender inflection as it pertains to syncope, as there are no affixes which could trigger syncope. But we may ask about the behavior of those somewhat rarer Chadic languages which exhibit overt morphology associated with gender. Might we expect these languages, and therefore Proto-Chadic itself, to exhibit syncope associated with gender inflection?

Even in this case, the answer is likely no, because the gender marking morphemes in these languages are, almost without fail, innovations which developed from an older system in which gender was not marked directly on the noun. Schuh (2019), for example, characterizes the Chadic languages into four basic types using the schema proposed by Greenberg (1978):

1. Those lacking overt gender marking, only exhibiting agreement on pronouns and deictics
2. Those which have developed clitic or affixing articles which append to the noun and reveal the gender
3. Those in which such affixed or clitic articles have lost marking of definiteness, serving solely as gender-marking affixes
4. Those in which the original affixed or clitic articles have lost all semantic function, even gender-marking, and have become a fossilized component of the noun stem

The many Chadic languages described by Schuh (2019) as lacking any overt gender morphology belong to this first stage, in which information about the gender of a noun can only be identified through agreement with freestanding and phonologically independent deictic or pronominal elements. As we have stated, these languages cannot directly bear on the question of whether gender inflection in Chadic is associated with syncope.

The second stage is exemplified by the best-known Chadic language: Hausa. In Hausa, individual nouns are not overtly marked for their gender, but commonly (though non-obligatorily!) co-occur with suffixed or enclitic articles which reflect the gender of the noun.

| | M | F | Pl. |
|------------|-----------------|--------------------|---------------------|
| Indefinite | ràgo "ram" | tunkiya "ewe" | tumāki "sheep" |
| Definite | ràgòn "the ram" | tunkiyār "the ewe" | tumākin "the sheep" |

Figure 7.1: Definite and Indefinite Nouns in Hausa

The third stage is represented by more innovative languages such as Warji or Musey. In these languages, gender is indicated by suffixes (clearly cognate with the deictics of stage-2 languages), but these elements are no longer separable, and no longer impart a definite semantics to the nouns to which they affix, instead having become solely a marker of grammatical gender.

| | M | F | Pl. |
|-------|---------------|-----------------|------------------|
| Warji | çicana "goat" | awai "she-goat" | tsuwana "goats" |
| Musey | gàmlànà "ram" | tímíra "ewe" | tímígína "sheep" |

Figure 7.2: Gender Suffixed Nouns in Warji and Musey

The fourth stage is present only in the most morphologically innovative Chadic languages. In this stage, the innovative gender markers have themselves lost all semantic or morphological function, having instead become fossilized as part of the basic lexical root morpheme. Schuh (2019) notes that such development is particularly characteristic of the West-Chadic Bade-Ngizim group. Compare, for example, the Bade and Ngizim nouns presented below with their Bole counterparts (Bole being likewise West-Chadic, but belonging to the distinctive Bole-Angas or Bole-Tangale group, Blench's West Chadic A.2):

| Meaning | Ngizim | Bade | Bole |
|---------|--------|-------|------|
| "ram" | gōmàk | gōmâk | gam |
| "pole" | zhiràk | zəlâk | zàla |
| "oil" | mèràk | mèlâk | mòr |

Figure 7.3: Fossilized Articles in Bade-Ngizim

Regardless of the "stage" at which a given Chadic language finds itself, the picture this paints of the comparative morphology of Chadic seems to be clear. Nouns in Proto-Chadic seem to have been morphologically unmarked for gender, and the subsequent gender-marking systems which developed in the daughter

languages are innovations, and more specifically univerbations of originally free-standing elements with the otherwise unmarked nouns. Given what we have seen with other univerbations in Afro-Asiatic daughter branches, such as the weak verb in Cushitic, we would predict then that the newly innovated gender suffixes in the Chadic daughters should have no appreciable impact on syncope, as it is likely that synchronic syncope was no longer active in the distinct Chadic daughters during the periods when each underwent its individual univerbation of nouns and gender-marking deictics. And indeed this appears to be true, as there are no obvious variations in noun root or stem shape on the basis of overt gender marking.

7.2 Verbal Morphology

When we turn our attention to the verbal morphology of the Chadic languages, we once again find a system that is remarkably different from that of almost any other Afro-Asiatic branch. We should rightly regard it as in many respects the least archaic and most innovative verbal system found in any major Afro-Asiatic family except possibly Omotic. It exhibits no trace of the prefixing conjugation common to Semitic, Berber, and Cushitic. It likewise shows no cognate to the suffixed stative conjugations of Egyptian, Semitic, and Berber. This makes Chadic the only Afro-Asiatic branch which shows no attestation of at least one of the characteristic systems of verbal inflection common to the rest of the family¹⁹⁷.

The Chadic verb itself is comparatively sparse in terms of inflectional morphology compared to the more familiar verbal formations of the other branches. It exhibits little in the way of overt subject-agreement morphology, or explicit tense and aspect marking internal to the verb, more commonly co-occurring with overt nominal subjects and subject pronouns, or freestanding tense/aspect mood morphemes, as in Hausa. Herman Jungraithmayr (1974, 2012) divides the verbal system of Chadic into four basic categories, corresponding to a chronology of their development, ranging from the most archaic systems, still exhibiting some Afro-Asiatic characteristics, to the most innovative systems, showing almost none. Jungraithmayr himself uses the somewhat confusing terminology of "Semitoid," "Cushitoid," and "Sudanoid" to describe these stages/categories, but we would likely be better served in following Zaborski (2014) and referring to these stages as Old Chadic, Middle Chadic, Late Chadic, and Neo-Chadic respectively.

Jungraithmayr's "Semitoid" or Old Chadic verbal system is, unsurprisingly,

¹⁹⁷The Omotic branch does not directly attest either the prefix or suffix-conjugation in the synchronic grammar of any single language or group of languages. However, the suffixed position of the morphemes associated with the derived stem types suggests a shared history with the Cushitic weak verb, in which the derivational morphemes occupy a similar suffixal position. If true, this implies the one-time presence of the prefix-conjugation at some point within the historical development of Omotic, as the weak verb and suffixed-derivational stems result from the univerbation of a prefix-conjugated freestanding auxiliary with some invariant verbal form, such as a participle or verbal noun.

the most archaic form of verbal inflection found within the family. It is characterized by the presence of segmental (non-tonal) vowel gradation or other manipulation internal to the verbal root indicating tense or aspect, and sometimes number, as illustrated in the case of verbal pairs such as Mubi perfective/imperfective *lilíc/liléc* "taste." It is important to note that, in addition to archaic Afro-Asiatic vowel gradation, the Chadic languages additionally show examples of umlaut and other assimilatory vowel changes (e.g. Kulere Perf. *fwod* vs. Impf. *fwádáy* "beat, strike"). Because these are later, Chadic-internal developments, we should rightly exclude such forms from our discussion of Old Chadic "Semitoid" inflection. The original archaic inflection is, for the most part, restricted in Chadic to the relatively conservative East Chadic grouping, where Zaborski notes forms (primarily drawn from Jungraithmayr) in Mubi, Migama, Mokilko, all of which are East Chadic. He does further note, however, that a similar process seems to occur in some West Chadic languages, citing forms in the Ron group and the Angas-Sura group. Of the stem alternations, found in Old-Chadic-type inflection, Zaborski notes three primary types of morphological alternations: vowel gradation and apophony of the sort attested in Mubi, length alternations within the root, as in Migama Perf./Impf. *mâté/mátá* "die," and gemination of the final root consonant as in Migama Perf./Impf. *kútùmé/kótómmá* "roll." On formal grounds, Zaborski likens these latter two to similar formations in Semitic, comparing the Chadic alternations of length to the Semitic L-Stem (**qātal*), and the gemination of consonants to the Semitic D-Stem (**qattal*) and Arabic form IX (*yafʿallu*)¹⁹⁸, suggesting an inheritance from Proto-Afro-Asiatic.

The Middle Chadic languages (Jungraithmayr's Cushitoid group) lack the segmental apophony, ablaut, and gemination of the Old Chadic group, but still exhibit overt affixal morphology indicating tense and aspect. Particularly, the Middle Chadic systems attest to a simple suffixal system featuring a perfective suffix *-i/-e and an imperfective suffix *-a. These inflectional systems are likewise more common among East Chadic languages, co-occurring alongside the ablauting/apophonic systems, as in Sokoro *tédè/táđà* "climb," in which the imperfectives show both suffixal -a and -a- internal apophony. Voigt (1987) attempts to connect these suffixes with the tense/aspect markers appearing in the Cushitic (Impf -a, Perf -i/-e, Subjunctive -u/-o) suffixing weak verb based on formal similarity, but such a connection is somewhat dubious since we know the vowels of these endings in Cushitic are originally part of the auxiliary verb which univertates in the formation of Cushitic weak verb, and these forms occur

¹⁹⁸The semantic connection between the Semitic L-Stem, which forms conative verbs like Arabic *sālama* "make peace with" (*salama* "be peaceful"), and the lengthened variants in Chadic seems tenuous, since these forms are typically perfective/imperfective pairs, or singular/plural pairs. Likewise, the connection between the Semitic D-Stem (factive) and Arabic form IX *yafʿallu* (typically indicating color or anatomical defects). Given the analysis presented here, we would rather argue that this gemination should instead be connected with the formation of imperfective verb stems in East and South Semitic, Berber, and Beja. The discrepancy between the second radical gemination of Semitic and the final radical gemination of Chadic follows naturally in the same manner as it does for forms such as Tuareg *ibáss* or Beja *ʾadangí*.

simultaneously with overt inflectional prefixes revealing their former status as an independent verb, markers that are wholly absent in Chadic. Voigt (1987) mentions the potential parallel of the Somali restrictive paradigm, in which some of the characteristic person and number markers of the Cushitic weak verb are lost, but this seems speculative in a family like Chadic, where no evidence can be solicited that such forms ever existed.

The Late Chadic and Neo-Chadic systems share the fact that the verb itself is segmentally invariant, having no variation in apophony or syllable structure corresponding with tense, aspect, mood, or number. In the Late Chadic system, however, such verbs can still be distinguished by the fact they may exhibit distinctive tonal melodies (which Zaborski refers to as apotony), as in Jungraithmayr's examples from Mushere *kūlik/kūlik* "lock." Systems of tonal inflection are relatively widespread throughout the family, being common to both West and Central Chadic. Despite their commonality, such systems cannot be projected back to Proto-Chadic, and are therefore likely to be of particular importance with respect to our analysis of syncopation. This is because the tonal systems of the Chadic are themselves innovations internal to the family and not inherited from Proto-Chadic. Rather, each branch has undergone independent tonogenesis resulting from the behavior of neighboring consonants as so-called depressor, non-depressor, or neutral consonants, resulting in low, high and mid/high tones respectively. For further details on the rise of tonal systems in Chadic, see Wolff (1987).

The Neo-Chadic stage, then, is characterized by a wholly invariant verb, exhibiting no morphological distinction between tense or aspect forms. In these languages, tense and aspect information in the clause is indicated by freestanding tense/aspect/mood clitics which precede the verb (sometimes erroneously referred to as "subject pronouns"). It is to this stage which the verbal system of the best-known Chadic language, Hausa, belongs. Consider the pair of simple Hausa sentences *nā shā shāyī* "I drank tea" and *zān shā shāyī* "I will drink tea," in which only the freestanding TAM marker varies.

Having discussed the innovative nature of the diverse verbal systems seen within Chadic, we can now comment on how our syncope analysis applies. We may begin by observing that, in contrast to many of the other Afro-Asiatic families, the Chadic verb shows surprisingly little in the way of outright non-concatenative manipulation of the stem. In contrast to Semitic, where we find verbal stems varying between the forms *CVCVC*, *CCVC*, *CVCC*, *CVC₁C₁VC*, *CVCVC*, all for a single verb, in Chadic, we effectively only find lengthening of the vowel or gemination of the final consonant. The apparent weakness of non-concatenative morphology in the Chadic verb under the traditional root-and-template theory is a phenomenon without an explanation. Since the templates operate directly on the root and are in a sense pre-specified for certain forms and not others without reference to specific affixes or phonological environments surrounding the root, there is no reason under the traditional theory why Chadic should be any less likely than branches like Semitic or Berber to either retain archaic templatic alternations, or fail to develop novel ones.

But under our account of syncopation, the picture is radically different.

Under this theory, the variability seen in the form of the Semitic verb stem is the output of syncopation after affixation of various morphemes has taken place. Without affixation, our theory predicts that the verbal root should remain relatively invariant in shape (excepting vowel apophony, which we argue was a different process originally). Chadic is the only major Afro-Asiatic branch (assuming a common branch for Cushitic and Omotic) that lacks *both* of the archaic verbal inflections inherited from the parent language and therefore the only major branch which fails to exhibit forms in which the verbal root is affixed with either the prefixes or suffixes which characterize those two paradigms. Chadic is likewise the only major branch (this time even including Omotic) that entirely lacks the derived verb stems (the S-, N-, and T-Stems) and therefore entirely lacks forms modified with the derivational prefixes (or suffixes in the case of Cushitic/Omotic) which characterize such stems. Indeed, Chadic is the only family in which no verbal forms exhibit regular affixation as part of their inflection, and will exhibit no affixation of an archaic Afro-Asiatic origin. In our theory, all of these facts predict that Chadic should exhibit significantly less variability in the shapes of verb roots and stems, where affixing verbal morphology is more common. Since root and stem alternations in our theory are an epiphenomenon resulting from the triggering of syncope by morphological affixation, a verbal root which is unaffixed should be invariant.

In this way, our theory provides a more elegant explanation for the apparent disparity in so-called root-and-template modifications across the different branches of the family. Such alternations are in fact positively correlated with the inheritance of archaic Afro-Asiatic morphological material. In a family such as Semitic, retaining both prefix and suffix-conjugation, the derived verbal stems, as well as nominal derivational morphemes/broken-plural formations, such alternations will be abundant. In a family such as Chadic, which has lost both archaic verbal inflections, all derived verbal stems, all overt nominal gender morphology, and all possible inherited case morphemes, and shows only a few cognate plural formatives, we should expect little in the way of root/stem alternations.

Chapter 8

Conclusions

In this dissertation we have examined a great many topics from all across an ancient and widespread language family, and done so in as much detail as time and present scholarship permits. Let us now, in summation, attempt to take a larger view, and consider the broader implications of the hypothesis and analysis presented here. We will divide these broader conclusions and implications into two basic types: those pertaining directly to Afro-Asiatic as a family and its internal diachronic development, and those pertaining to languages and families beyond Afro-Asiatic and to the field of linguistics more generally.

8.1 Regarding Afro-Asiatic

8.1.1 Afro-Asiatic and the Development of Templatic Morphology

Clearly the most important outcome for Afro-Asiatic as a family, if this proposal is correct, is a fully formed diachronic explanation for how non-concatenative "templatic" morphology arose within the family. Under this analysis, the archaic stages of Afro-Asiatic were not altogether different from those more familiar to us in ancient Indo-European languages or in Uralic languages. That is to say, it was characterized by a mixture of phonologically conditioned vowel deletion and morphophonologically conditioned vowel apophony. These two processes were, in their origin, quite distinct, as we have argued above. The addition of a single morpheme, however, could in principle be associated with an apophonic change, as well as create the environment necessary for syncope to occur.

This fact is pivotal because it provides us with the link in understanding how speakers reanalyzed this system, one which was fundamentally affixing (albeit a rather complex affixing system), to one which seems to be, at least in some instances, fundamentally templatic (Classical Arabic would appear to be almost inarguably templatic in structure). With this new understanding, we transform the way we perceive the Afro-Asiatic Languages, and languages

exhibiting non-templatic morphology more generally. They no longer appear as fundamentally and qualitatively different from their more common affixing kin. Instead they present us with the most extreme types of morphophonological development and reanalysis which we have on record. Seen in this new light, the Afro-Asiatic languages are not so different from, for example, Irish Gaelic, in exhibiting the morphophonologically conditioned variation in root shapes associated with vowel deletion. They are not dissimilar from the Germanic languages in exhibiting apophony between different vowels within single verbal and nominal roots as a function of morphological categories. They are not out of place compared to the archaic Indo-European languages in that the vowels present in such roots, though subject to frequent gradation and change, can and must be projected into underlying forms. The theory presented here paints a picture of the Afro-Asiatic languages as simply more extreme Gaelic, more innovative German, or more distinctive Greek. But critically, the difference has been reduced to one of degree: degree of difference, change and reanalysis, rather than one between fundamentally and intractably templatic morphology and purely affixing morphology. To us, this seems a more palatable state of affairs. One in which the Afro-Asiatic family is not wholly unique and distinctive, a single language-family with a unique morphology all its own, but rather, an unusual and intriguing collection of languages, but belonging firmly to the same world as all other languages in terms of its morphophonology.

8.1.2 Synchronic Syncope?

The account presented in this dissertation is intended primarily to be a diachronic account of how Afro-Asiatic languages could have progressed from a morphological system consisting of more common affixing processes to one resembling the root-and-template grammars typically postulated for the family. It is not intended to be a synchronic explanation or account for the present-day grammar of any specific Afro-Asiatic language, as such. Indeed, it is quite clear that the syncope rule which we have postulated here *cannot* be synchronically active in a number of Afro-Asiatic languages such as Classical Arabic (*kataba*), Hausa (*bishiyà*), or Beja (*hadalu*). In these languages, numerous apparent counterexamples to our syncope rule can be found, and a root-and-template account may prove to be more fruitful.

It is clear, however, that the syncope rule presented here cannot be consigned entirely to the prehistory of the Afro-Asiatic family. As we have discussed in previous sections, the Cushitic language Afar-Saho is known to synchronically possess a syncope rule that amounts to the rule proposed here with a few minor exceptions based on prosody and phonology. The syncope rule is likewise supposed to have been synchronically active in Akkadian. While it is true that there are some attested exceptions to the stated syncope rule, which suggest the possibility that the rule was no longer active by the time of attested Akkadian, it is clear that the rule was either active in Akkadian itself, or had been active in the almost immediate prehistory of Akkadian. And as demonstrated by Bacovcin and Freeman (2015), the supposition of a syncope rule in Akkadian

can produce a number of the forms for which we might otherwise require the presence of root-and-template morphology. Upon closer inspection, the same is likely true of Afar-Saho.

Given the presence of these two attested Afro-Asiatic daughters, in which a syncope rule that we propose to be of great antiquity within the family survives into synchronic attestation, we may wonder whether other daughter languages exist in which syncope can be determined to be or to have been synchronically active, and therefore need not be analyzed as exhibiting the same sort of templatic grammars which characterize more innovative Afro-Asiatic daughter languages. One such possibility is Ancient Egyptian. It is clear that Coptic possesses no active syncope rule, and indeed, the Coptic language has essentially destroyed the pristine Afro-Asiatic syllable-structure rules which create the phonological environments necessary for syncope. Consider, for example, Coptic words exhibiting: 1) syllable-initial consonant clusters (Ⲙⲁⲓⲛⲉ), 2) syllables lacking onset consonants/vowel hiatus (Ⲓⲓⲱⲙⲉ), 3) syllable-final consonant clusters (Ⲙⲟⲣⲕⲣ). The picture of Middle Egyptian that emerges from reconstructions based on Coptic, however, is a different story. There are precious few counterexamples to syncope recoverable in reconstructed Middle Egyptian, and there are a number of alternations such as stative ⲟⲩⲗⲗ **waʿbʿi* (CVCC-Vi) vs. ⲭⲣⲗⲉⲓⲩⲧ **dariʿtʿi* (CVCVC-tʿi), or absolute/pronominal ⲣⲱⲙⲉ **rahʿt* (CVCVC) vs. ⲣⲗⲩⲧ **rahʿt-ʿt* (CVCC-Vf) which suggest the possibility of synchronic syncope active in the grammar of the language. Because Middle Egyptian has no native speakers, and has not for several millennia, we cannot, of course, directly corroborate the hypothesis that syncope was active in the grammar by testing the native intuitions of speakers about licit and illicit phonological forms of words. However, a more thorough examination of the forms of Middle Egyptian words recoverable from attested Coptic data can reveal whether or not any explicit counterexamples to the idea of synchronic syncope can be found within that language. The absence of such counterexamples is not, in and of itself, probative, but it means that the hypothesis that syncope was still active in Middle Egyptian is plausible, and we should therefore consider whether the grammar of the language can be streamlined and simplified compared to templatic theories using syncope and vowel apophony in its place.

It is unlikely that contemporary Berber languages would maintain active syncope since, like Coptic, many have altered the syllable-structure rules characteristic of the family to the point that the environments wherein syncope might occur are relatively infrequent, or would be unrecoverable, even if they were present in earlier stages of the language. Unfortunately, we can recover little about the syllable structures of earlier Berber languages such as Libyco-Berber Numidian or old Guanche, since each is written almost solely in a purely consonantal script, or comes to us only in the form of words or names attested in other languages. The same is likely true of Chadic, where we have no truly ancient attestation, and the vowel systems of syllable structures have altered to such a significant degree as to make the retention of synchronic syncope of the sort described here unlikely.

In our estimation, the most likely source for additional languages retaining syncope is Cushitic. The Cushitic languages are reasonably archaic and conservative vis-a-vis Proto-Afro-Asiatic, and they commonly retain many of the basic syllable-structure restrictions which favor syncope. Additionally, at least some Cushitic languages retain the morphophonemic alternations such as in the strong verbs which we have attributed to syncope, a factor which may either indicate or favor the retention of synchronic syncope among these languages. Whether any such Cushitic languages will prove to be amenable to such an analysis requires further investigation, but considering the apparent survival of such a rule in Afar-Saho, it would be well worth the effort to determine if any of its Cushitic sisters can bear similar witness.

8.2 Beyond Afro-Asiatic

8.2.1 Other Non-concatenative Languages

Because of the close association between the Afro-Asiatic family itself and the notion of templatic morphology as a theoretical proposition, it can at times be easy to conflate the two. After all, the Afro-Asiatic family is typically regarded as the morphologically templatic family *par excellence* and it is by a significant degree the most widely known and widely spoken family of languages exhibiting this distinctive, morphological structure. It should be noted, however, that templatic morphology and Afro-Asiatic morphology are not, by any means, interchangeable concepts. In this dissertation, we have discussed the diachronic process whereby the specific forms of non-concatenative templatic morphological structures native to the Afro-Asiatic family could have arisen. We make neither direct reference to, nor specific claims about, the templatic structures which may exist in other families or non-related languages.

But what can we learn from our investigation of the morphophonological history of Afro-Asiatic that we may apply to the phenomenon of templatic morphology more broadly? The conclusion here is not, of course, that all instances of templatic morphology should be understood in terms of syncope. This would be a grossly literal interpretation of the results of this study. Rather, this should inform us that templatic, non-concatenative, or otherwise unusual morphological structures likely have complex histories, involving the interaction between originally phonological and morphological processes and that these unusual morphologies need not be projected back into an indefinite past as if they have neither a specific origin, nor a diachronic trajectory, unlike other, more common morphological systems.

Let us consider, in brief, the case of another language which exhibits so-called templatic or prosodic morphophonology: Tonkawa. Tonkawa was a language isolate spoken in what is today Oklahoma, Texas, and New Mexico which died out in the mid-20th century. In describing the morphophonology of Tonkawa, Wier (2016) describes the processes in that language as "like Semitic" and suggests that the language appears to have a prosodic preference for maximizing

CVC syllables, and notes a number of phonological processes which conspire to produce this apparently desired result:

- Conflation: /awe/, /owe/ → [o]
- Word Final Vowel Deletion: /V/ → ∅ / _ #
- Vowel Harmony: /V₁?V₂/ → /V₁?V₁/
- Vowel Elision: V → ∅ / CVC _ C [V_{STEM}]

Interestingly, the final rule of Vowel Elision bears an almost uncanny resemblance to the syncope rule which we have proposed for Afro-Asiatic, perhaps suggesting that the templatic structures there may likewise have had a prosodic origin in that family as well. But knowing that even in Afro-Asiatic these templatic behaviors arose from simple phonological processes, and that some languages like Akkadian, Afar-Saho, and possibly others, still generate their apparently templatic grammars more or less from phonology should incline us to consider the grammar of Tonkawa in these terms also, both in terms of its diachronic trajectory, but also as to whether we can do away with templatic considerations from the language if we can develop a concise and accurate-enough set of morphophonological rules and conditions.

8.2.2 Synchrony vs. Diachrony

Another larger-picture discussion to which we hope this dissertation has contributed is the balance between synchronic and diachronic explanations of the forms present in a given language. Much of modern linguistics has concerned itself with how to account for the structures and forms found in the world's languages solely in terms of synchronic theory. There is, of course, good reason for this. The speaker of a given language has access only to the data of their immediate contemporaries in the form of spoken or written utterances which they encounter. They have no direct access to the grammars of their contemporary speakers, and they certainly have no access to the grammars of their linguistic ancestors some thousands of years before their own births.

This is an ironclad limitation imposed on all speakers of all human languages. As such, *any* component of the grammar of *any* language must have an adequate theoretical explanation in reference only to the synchronic structures available to the native speaker. We neither refute nor deny this fact. And yet, it seems to us a unique peculiarity of linguistics as a field of inquiry that the presence of clear synchronic laws and theories are taken to invalidate the presence of a diachronic trajectory in the development systems under study. The presence of laws of structural engineering and load-bearing are not typically taken as mutually incompatible with the notion that, for example, the architectural tradition of the Byzantine Empire drew heavily on its Roman Imperial predecessor. That we understand the laws of natural selection and genetics is not a refutation of the fact that fins of cetaceans take the form which they do

in part because they evolved in their origin from a terrestrial mammalian paw. Rather, our knowledge of how the anatomy of cetaceans developed from terrestrial mammals enhances our understanding of how and why, under the selective pressure of hydrodynamic fitness, the cetacean fin has the distinctive form it does.

We can take this biological analogy even further. In considering why, for example, all cetaceans have fins, any answer to this question which does not make direct reference to diachrony is missing in important generalization. Of course the genetics of whales, dolphins, porpoises, must, by definition, be the ultimate governing factor as to why any member of these species has fins (a synchronic explanation). But if we fail to note that these species have fins precisely because they all share an immediate common ancestor which itself had fins, a trait which each has inherited, we have not adequately explained the presence of this structure in these related species. As in the case of language, the DNA of living organisms does not have direct access to the lineage of that organism, nor to the DNA of its ancestors. Nevertheless, diachrony and genetic relationship are factors of primary importance in explaining how and why species look and behave the way they do. While synchronic explanations must of course be available at the genetic or epigenetic, or biological, or even social level, any explanation which has no diachronic component is necessarily incomplete in understanding and explaining the state of affairs of any system which evolves naturally and continuously from a prior system. This is no less true of language than it is of biology. Which level of explanation we choose to focus on may vary depending on the object of our inquiry, of course, but we would argue that it is fundamentally incorrect at a theoretical level to consign diachrony to a secondary position, or assume that it has nothing to contribute at an explanatory level.

This is one of the most valuable contribution which we believe this dissertation makes to linguistic theory: the provision of an example and illustration of the importance and value of diachrony in understanding synchronic structure. Understanding the circumstances under which Afro-Asiatic templatic morphology arose within that family, the conditions necessary for speakers to reinterpret more conventional morphological processes as this novel and distinctive grammatical system, informs us as to the kinds of processes which are likely or even possible in the daughter systems. It is not coincidence, for example, that the templatic system described by McCarthy (1981) fundamentally involves the manipulation of syllable structure, the apparent deletion or insertion of vowels, the presence or absence syllable weight, and an apparently stipulated sensitivity to the presence of affixes. Clearly, these constitute the bounds of Arabic templatic morphology because they are precisely the elements which were necessary to either trigger or block the operation of syncope. Likewise, the fact that Arabic templatic morphology does not appear to include variations in tone, stress, voicing, phonation type, or any of the other countless phonological properties which can be and often are intertwined with morphology in other languages is not an accident. It is a reflection of the fact that, in its origin, the templatic morphology of Arabic (our syncope rule) was not sensitive to stress or tone, involved

neither voicing nor de-voicing, nor any alternations of phonation type. This is not an intrinsic theoretical limitation of McCarthy-type templatic morphology. If such alternations occurred, McCarthy could have easily adapted his theory to include slots which had pre-specified voicing or phonation properties. Or adapted his theory to include templates containing prespecified stress patterns or tonal melodies, as is basically the case in archaic Indo-European languages and their patterns of accent/ablaut alternations. We cannot explain the absence of these cross-linguistically common types of non-affixing morphological structures in terms of the boundaries or structures of templatic theory. Rather, we must account for and explain their absence by understanding precisely what Afro-Asiatic morphology looked like in the speech generations preceding the re-analysis, whereby its affixing system transformed into the templatic one which we recognize today. This is an understanding we can come to only through the incorporation of diachrony into our theoretical understanding, and the recognition of the role which it plays in how and why languages take the forms which they do.

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