Consonant Insertions:
A synchronic and diachronic account of Amfo'an

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This thesis represents an original piece of work, and does not contain, in part or in full, the published work of any other individual, except where acknowledged.

Kirsten Culhane
November 2018
Abstract

This thesis is a study of synchronic consonant insertions in Amfo’an, a variety of Meto (Austronesian) spoken in Western Timor. Amfo’an attests synchronic consonant insertion in two environments: before vowel-initial enclitics and to mark the right edge of the noun phrase. This constitutes two synchronic processes; the first is a process of epenthesis, while the second is a phonologically conditioned affixation process. Which consonant is inserted is determined by the preceding vowel: /ʤ/ occurs after /i/, /l/ after /e/ and /gw/ after /o/ and /u/. However, there is no regular process of insertion after /a/ final words.

This thesis provides a detailed analysis of the form, functions and distribution of consonant insertion in Amfo’an and accounts for the lack of synchronic consonant insertion after /a/-final words. Although these processes can be accounted for synchronically, a diachronic account is also necessary in order to fully account for why /ʤ/, /l/ and /gw/ are regularly inserted in Amfo’an. This account demonstrates that although consonant insertion in Amfo’an is an unusual synchronic process, it is a result of regular sound changes.

This thesis also examines the theoretical and typological implications of the Amfo’an data, demonstrating that Amfo’an does not fit into the categories previously used to classify consonant/zero alternations. I demonstrate that the form of consonant insertion in Amfo’an is inconsistent with the predictions of Optimality Theory, contending that there is a need for more cross-linguistic study of consonant/zero alternations, so that theoretical and typological models which can account for these processes may be developed.
Acknowledgements

This thesis would not have been possible without the encouragement and work of many people, who I would like to thank and acknowledge here.

Firstly, I would like to thank Laurence (Bapa) Jumetan and his family who generously hosted me in Lelogama. Bapa Jumetan is an excellent informant and highly skilled orator. The analysis I give in this thesis would not be possible if not for the many hours he spent discussing Amfo’an with me.

This thesis would not have been possible if it were not for the previous work on Meto by Chuck Grimes, Heronimous Bani, and Owen Edwards. Owen in particular requires acknowledgment for his work on Meto, without which I would not have been able to do this study of Amfo’an. It also would not have been possible without the opportunity I was given to study Amfo’an by Unit Bahasa dan Budaya. I owe enormous thanks to Yedida (Oma) Ora who transcribed an enormous number of Amfo’an texts, and who has been an excellent friend.

Beth Evans—thank you for being an excellent supervisor and for teaching me historical linguistics. You have made me a much better writer.

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Owen—Thank you for all the time you have spent discussing my analysis with me; my thesis is much better for it. Thank you for making the maps in this thesis, for teaching me how to use LaTeX, and for all of your support. Thank you also for proofreading my thesis. Au ‘neek ko.

Beta mo minta makasi buat keluarga besar Jumetan. Dong terima beta deng bae, lindingi beta deng kas makan beta. Makasai buat samua yang tahan beta pung tanya banyak, yang tahan be pung basa Kupang yang kurang bae. Be ju mo minta makasi buat samua orang Amfo’an yang kasi ijin sang beta buat rekaman. Tuhan memberkati.

Beta ju mo minta makasi buat samua kawan di UBB, khusus Kk Oma, yang beta pung kawan jalan. Beta ju mo minta Makasi buat Kk Ety yang urus samua, Om Nus yang antar beta pi mana-mana. Beta ingat be pung waktu di UBB deng hati senang.

Mum and Dad—thank you instilling in me a love of learning. I am so thankful for all of your love and support.

It has been a joy to study Amfo’an. I hope that in reading this thesis, you may also see its beauty.

God saw all that he had made, and it was very good. Genesis 1:31
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Chapter 1

Introduction

1.1 Overview

This thesis is a study of synchronic consonant insertion in Amfo’an. In Amfo’an, consonant insertion occurs after vowel final words in two environments: before vowel initial enclitics and to mark the right edge of the noun phrase. This constitutes two synchronic processes; the first is a process of epenthesis, while the second is a phonologically conditioned affixation process. Which consonant is inserted is determined by the preceding vowel: /ʤ/ occurs after /i/, /l/ after /e/ and /gw/ after /o/ and /u/. However, there is no regular process of insertion after /a/-final words. Examples of consonant insertion before the enclitic =ees ‘one’ are given in (1).

(1) fai + ees → faidjees ‘one night’
fee + ees → feelees ‘one wife’
meo + ees → meogwees ‘one cat’
hau + ees → haugwees ‘one tree’

This thesis provides a detailed analysis of the form, functions and distribution of consonant insertion in Amfo’an and accounts for the lack of synchronic consonant insertion after /a/-final words. Although these processes can be accounted for synchronically, a diachronic account is also necessary in order to fully account for why /ʤ/, /l/ and /gw/ are regularly inserted in Amfo’an. This account demonstrates that although consonant insertion in Amfo’an is an unusual synchronic process, it is a result of regular sound changes. This thesis also examines the theoretical and typological implications of the Amfo’an data, demonstrating that Amfo’an does not fit in to the categories previously used to classify consonant/zero alternations. I demonstrate that the form of consonant insertion in Amfo’an is inconsistent with the predictions of Optimality Theory; contending that there is a need for more cross-linguistic study of consonant/zero alternations in order to develop models which can account for these processes.
1.2 Language Background

Amfo’an is a variety of Meto, an Austronesian language cluster spoken on the western part of the island of Timor. Most of the Meto speaking area is located in the Indonesian province of East Nusa Tengarra, while one variety, Baikeno is spoken in the Oecusse enclave of Timor-Leste. The location of Meto, along with the other languages of Timor, is shown in figure 1.1.

There is significant morphophonological and lexical diversity between different varieties of Meto, to the extent that speakers report difficulty communicating with speakers from other varieties. It is a complex language/dialect chain comparable to the German language/dialect chain or the Romance language/dialect chain but is identified as a single language by its speakers (Edwards 2016a: 5). Speakers of Meto recognize numerous named varieties, which each have named dialects. Further differences are found between different villages and hamlets of a single dialect. The extent of the diversity within Meto is yet to be systematically studied. A map of the self-identified varieties of Meto is given in figure 1.2 below.

---

1 Meto has numerous other names including Bahasa Timor Bahasa Dawan, and Uab Meto. Meto is used in this thesis as it is the name used across all of the varieties. Not all varieties have the verb in *uab* 'speak', including Amfo’an.
Amfo’an is spoken in the northern part of the Meto area. Speakers of Amfo’an identify more than 14 different dialects of Amfo’an. There are two main types of Amfo’an dialects; Nai’benu, whose speakers trace their origins to Baikeno (see figure 1.2), and speakers of the ‘original’ Amfo’an dialects. There are several lexical and morphophonological differences between Nai’benu and the other Amfo’an dialects. One distinct difference is that Nai’benu Amfo’an has consonant insertion only after VV final words, and has /b/ insertion after /o/ and /u/, while all of the other Amfo’an dialects have /gw/ insertion. However, there are also lexical and morphophonological differences between all of the named Amfo’an dialects. A map of the named dialects of Amfo’an is shown in figure 1.3. The data in this thesis is from Nai’Bais dialect as spoken in the villages of Lelogama, Fatumonas and Binafun. The location of these villages can be also be seen in figure 1.3.

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2 Nai’benu speakers report that they left Oecusse during Portuguese occupation.
3 There are 6 administrative villages (desa) on the map for which the dialect of Amfo’an is unknown.
1.2.1 The Rote-Meto subgroup

Meto is part of the Austronesian language family and forms a subgroup with the languages of Rote island, which is located southwest of Timor. It has been placed in the Nuclear Timor and Timor-Babar branches of Central-Eastern Malayo-Polynesian (Edwards 2018b). However, although the Rote-Meto languages are Austronesian, there has been considerable non-Austronesian influence on these languages, which demonstrate regular sound correspondences in lexemes which are non-Austronesian in origin (Edwards 2016b). The position of Meto within the Rote-Meto subgroups is shown (2).
Within the Meto cluster, Amfo’an is most closely related to Molo and Fatule’u, which are located south of Amfo’an, as well as Baikeno, which is located to the east (see figure 1.2). These varieties share the sound change *n > l /IV_ (Edwards 2018b) as well as numerous lexical and morphophonological similarities. One of these similarities is final consonant insertion (see §1.2.2). Amfo’an is also closely related to Timaus, whose speakers trace their origins from Amfo’an, but now life in several different areas in the southwest of Timor.⁴

### 1.2.2 Consonant insertion in Meto

Synchronic consonant insertion processes are not restricted to Amfo’an and are attested in other varieties of Meto. Most varieties of Meto attest consonant insertion before vowel initial enclitics. However, the alternating segments vary considerably. Examples of consonant insertion in different varieties of Meto are given in (3).

<table>
<thead>
<tr>
<th></th>
<th>fire=DEF</th>
<th>water=DEF</th>
<th>lime=DEF</th>
<th>wood=DEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amanuban</td>
<td>aiˈjɛ</td>
<td>ˈoejɛ</td>
<td>ˈaowɛ</td>
<td>ˈhauˈwɛ</td>
</tr>
<tr>
<td>Ro’is</td>
<td>ˈaːdɡɛ</td>
<td>ˈoːdɡɛ</td>
<td>ˈaabwɛ</td>
<td>ˈhaabwɛ</td>
</tr>
<tr>
<td>Kotos</td>
<td>ˈaːdɡɛ</td>
<td>ˈoːdɡɛ</td>
<td>ˈaːɡwɛ</td>
<td>ˈhaaɡwɛ</td>
</tr>
<tr>
<td>Timaus</td>
<td>ˈaːrɛ</td>
<td>ˈoːɛlɛ</td>
<td>ˈaːɡwɛ</td>
<td>ˈhaaɡdɛ</td>
</tr>
<tr>
<td>Amfo’an</td>
<td>ˈaːdɡɛ</td>
<td>ˈoːɛlɛ</td>
<td>ˈaːɡwɛ</td>
<td>ˈhauɡwɛ</td>
</tr>
</tbody>
</table>

Final consonant insertion is also attested in other varieties of Meto, in those most closely related to Amfo’an: Baikeno, Fatule’u, Molo and Timaus (see §1.2.1). In these varieties, consonant insertion occurs after VV final nominals. Examples are given in (4).

---

⁴This is confirmed by Dutch colonial documents: in August 1683, the brother of the king of Amfo’an, prince Nai’ Toas, arrived in Kupang with 153 followers seeking asylum (Hägerdal 2012: 206) They eventually settled to the east of Kupang. The location of Timaus speakers can be seen in figure 1.2.
However, consonant insertion after all vowel final nominals is an uncommon feature in Meto. It is only attested in Amfo’an and in Timaus, whose speakers trace their origins to Amfo’an. Examples of final consonant insertion in Timaus and Amfo’an are given in (5) below.

<table>
<thead>
<tr>
<th>Nominal</th>
<th>Timaus</th>
<th>Amfo’an</th>
</tr>
</thead>
<tbody>
<tr>
<td>fafar</td>
<td>umal</td>
<td>nefugw</td>
</tr>
<tr>
<td>ume</td>
<td>umel</td>
<td>nefog</td>
</tr>
</tbody>
</table>

While consonant insertion is uncommon in Meto more broadly, it occurs frequently in Amfo’an. This is demonstrated in the text example below. In the following example, consonant insertion occurs before the vowel initial enclitic =ee and after vowel final nominals to mark the end of the noun phrase. Consonant insertion also marks a noun phrase boundary after *otu* 'burn', indicating that it has an object.\(^5\) The instances of consonant insertion are indicated in orange.

\(^5\)For a guide to the presentation of data, see §1.3. See appendix B for the rest of this text.
1.2.3 Consonant insertion and Amfo’an identity

Consonant insertion, in particular final consonant insertion, is a distinctive feature of Amfo’an. It occurs frequently, as demonstrated in (6) and is considered a mark of identity by its speakers. When I first arrived in Amfo’an, I was told: ‘Here in Amfo’an we add consonants at the end of sentences. That’s how you know someone is from Amfo’an’. Consonant insertion is also identified by speakers of other varieties as distinctive of Amfo’an; a speaker of Amanuban commented ‘all the words there end in /g/’ (Edwards 2016a: 362) (Amanuban does not have /g/). Consonant insertion is what speakers of other varieties imitate when talking about Amfo’an and comparing it to other varieties, often incorrectly. For example, after returning from a trip to Amfo’an, an Amanuban speaker reported to another Amanuban speaker ‘there they say fatuʤ’ (The correct Amfo’an citation form of fatu ‘stone’ is fatu). Although the correspondences are regular, speakers of other varieties of Meto find it difficult to correctly reproduce consonant insertion in the correct environments (Edwards 2016a).

Amfo’an consonant insertion has been maintained in intense contact situations. In the north of Amfo’an are there are numerous villages where speakers of both Nai’benu and other Amfo’an dialects live. In these villages, both dialects are spoken, and the speakers of ‘original’ Amfo’an dialects continue to insert /ʤ/, /l/ and /g/ after all vowel final nominals, while Nai’benu speakers only insert consonants after VV sequences and have insertion of /b/ rather than /g/.

1.3 Data presentation

Data from Amfo’an and other varieties of Meto is presented in blue, for example (ukiʤ). This is a phonemic transcription with morpheme breaks. Below this are the underlying forms and a gloss. Affixes are indicated by hyphens and enclitics by the equals sign. Word-initial epenthetic /a/ is separated in the transcription by the pipe (|). Words which are loans from Kupang Malay/Indonesian and have not been nativised are in black. An example is given in (7) below. The rest of this text can be found in appendix B.

(7) a|bjaan=ee náo ma n-etu leʔ aal tani-dʤ  karna
    bjaan=ee  n-nao ma n-etu leʔ ala tani-C  karna
    other=3DET 3-go and 3-look.for REL all  rope-NP.EDGE  because
    ‘the others would go and look for rope, because.’

This thesis employs Leipzig glossing conventions, and uses additional glosses. -C in the underlying form and the gloss -NP.EDGE refers to an unspecified consonant affix which marks the right edge of the noun phrase. The gloss \MET marks instances of metathesis. These glosses are used to indicate instances of consonant insertion and metathesis which are morphological processes. Phonologically conditioned consonant insertion and metathesis are not glossed.
1.4 Methodology

This thesis is based on a corpus of 27 recorded texts which have been transcribed, glossed and translated. This corpus totals around 3 hours and spans several genres, including stories, prayers, ritual poetry and conversations. This corpus is supplemented by several elicitation sessions in which I asked about features of the texts and tested the acceptability of different constructions. These texts were collected in 2017 by myself and Yedida Ora (Oma) under the auspices of the Unit Bahasa dan Budaya (Language and Culture Unit), UBB, Kupang. During this time Oma and I were hosted by Laurence Jumetan, a speaker of Amfo’an and his family in Lelogama. These texts were transcribed and translated by Yedida Ora and Dian Sol’uf and glossed with the assistance of Laurence Jumetan and Dian Sol’uf. All transcriptions were checked against the recordings and translated into English from Indonesian/Kupang Malay by myself.

1.5 Phonology

This section provides a description of Amfo’an phonology and phonotactics which informs subsequent sections of the thesis. There has been no previous published description of the phonology or grammar of Amfo’an, however a preliminary discussion of Amfo’an appears in (Edwards 2016a: 171). This section discusses the segmental inventory of Amfo’an (§1.5.1) and syllable, foot and word structure (§1.5.2). This section then discusses phonological processes which are informed by foot structure, before moving into a brief discussion of synchronic metathesis (§1.5.3).

1.5.1 Segmental inventory

1.5.1.1 Vowels

Amfo’an has five contrastive vowels. All lexical roots in Amfo’an have at least two vowels. These five vowels are given in (8) and their typical phonetic realisation is listed in (9).

<table>
<thead>
<tr>
<th>(8)</th>
<th>Front</th>
<th>Cent.</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>i</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>e</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(9)</th>
<th>Front</th>
<th>Cent.</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>i</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>ɛ</td>
<td>ɔ</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>ɐ</td>
<td>v</td>
<td></td>
</tr>
</tbody>
</table>

Amfo’an allows a maximum of two sequential vowels. All attested sequences of two vowels are given in (10).

---

6The data used in this thesis is archived at PARADISEC and can be found at http://catalog.paradisec.org.au/collections/KC1

7UBB is a unit of GMIT, Gereja Masehi Injili di Timor; ‘The Evangelical Protestant Church of Timor’.
1.5.1.2 Consonants

Amfo’an has 13 contrastive consonants. These consonants are listed in (11) and their typical phonetic realisation is listed in (12).

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Labial</th>
<th>Coronal</th>
<th>Dorsal</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiceless Stop</td>
<td>p</td>
<td>t</td>
<td>k</td>
<td>?</td>
</tr>
<tr>
<td>Voiced Stop</td>
<td>b</td>
<td>~β</td>
<td>gw</td>
<td></td>
</tr>
<tr>
<td>Affricate</td>
<td>dʒ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fricative</td>
<td>f</td>
<td>s</td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>Nasal</td>
<td>m</td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid</td>
<td>l</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Amfo’an does not have segmental glides; [w] and [j] only occur when a vowel is reduced in a sequence of two vowels, see (18). /dʒ/ and /gw/ have a limited distribution; /dʒ/ only occurs immediately before or after /i/ and /gw/ only occurs immediately before or after /o/ or /u/. These segments typically occur as a result of synchronic consonant insertion (see §3.1) or have been inserted word-medially as a result diachronic of glide fortition (see §5.3.1.1). The realisation of /dʒ/ is quite varied. Before a vowel it usually realised as [dʒ], however word-finally it is variably realised as [tʃ], [ʒ], [ɕ], [s] or [dʒ]. The glide component of /gw/ is only realised when it occurs before non-round vowels: /gw/ → [g] and _V[ROUND]. In this thesis I transcribe it as g or gw according to its phonetic realisation. Word-finally it is often unreleased [g] and slightly devoiced. Sometimes it is completely devoiced to [k].

1.5.2 Syllable, foot and word

The syllable in Amfo’an consists of (C)(C)V(C); consonant clusters may only occur in onset position. All lexical roots in Amfo’an are comprised of a foot, which is minimally ČVV; word stress falls on the penultimate syllable of the foot. In Amfo’an, the prosodic word is minimally composed of a disyllabic foot, as articulated by the principle of Foot Binarity (McCarthy and Prince 1986, Hayes 1995); extra material which is external to the foot, such as additional syllable or consonant, are dominated by the prosodic word. For example, maʔfénaʔ ‘heavy’ consists of one foot and one additional syllable. This structure is shown in (13).
The penultimate syllable of the foot is stressed and if the foot has a medial consonant (i.e. CV CVC), it is ambisyllabic. Evidence that feet are a distinct domain in Amfo’an prosodic structure comes from reduplication. Partial reduplication of the initial syllable of the final foot of a word is a productive morphological process in Amfo’an, which form an intensive. If the root is larger than a single foot, the reduplicant’s syllable is placed after the pre-foot material and before the foot. This also demonstrates that pre-foot material is not part of the same domain as the foot (Edwards 2018a). For example the reduplicated form of *abalat*, ‘forever’ is *abal-balat*. The reduplicated syllable *bal* is placed between the pre-foot syllable, *a* and the foot, *balat*. The structure of *abalat* and *abal-balat* are given in (14) and (15).

Other examples of reduplicants in which the reduplicated syllable is placed between the foot and prefoot material are given in (16).

Although all words have at least two underlying vowels, these vowels may coalesce and be realised as a single syllable (Edwards 2018a). Sequences of two identical vowels are realised as a phonetically long vowel. Examples are given in (17).
Sequences of two different vowels may optionally coalesce into a single syllable if the second vowel is higher than the first. When this occurs, the second vowel is realised as a glide.

(18) \[ \text{VV} \rightarrow [\text{VV}] \]

\begin{align*}
\text{ai-ʤ} & \quad [\text{ʔɐj}] \quad \text{‘fire’} \\
\text{hae-l} & \quad [\text{hajl}] \quad \text{‘foot, leg’} \\
\text{n-nao} & \quad [\text{naw}] \quad \text{‘go’} \\
\text{hau-g} & \quad [\text{hewg}] \quad \text{‘wood; tree’} \\
\text{klei-ʤ} & \quad [\text{klɛjʤ}] \quad \text{‘church’}
\end{align*}

Coalescence of two vowels into a single syllable also may occur when /o/ or /u/ is followed by /a/. When this occurs, /o/ or /u/ is often reduced to [w] and the /a/ is lengthened.

(19) \[ \text{VV} \rightarrow [\text{VV}] \]

\begin{align*}
\text{ta-guab} & \quad [\text{təɡwəb}] \quad \text{‘speak’} \\
\text{t-bgua} & \quad [\text{təbɡwə}] \quad \text{‘gather’} \\
\text{kuan} & \quad [\text{kweːn}] \quad \text{‘village’} \\
\text{noah} & \quad [\text{nəwəh}] \quad \text{‘coconut’}
\end{align*}

However, this coalescence is optional. In many instances, sequences of two vowels do not coalesce into a single phonetic syllable, but are realised as two separate syllables. Examples are given in (20) below.

(20) \[ \text{VV} \rightarrow [\text{V.V}] \]

\begin{align*}
\text{qit-nao} & \quad [\text{ʔətnəo}] \quad \text{‘go’} \\
\text{mauf} & \quad [\text{meːuf}] \quad \text{‘honey comb’} \\
\text{kuasa} & \quad [\text{kəu.əsaʔ}] \quad \text{‘strong’}
\end{align*}

Sequences of two different vowels do not coalesce if they are the same height, or if the first is higher than the second (with the exception of \text{ua} or \text{oa}, as illustrated in (19) above)

(21) \[ \text{VV} \rightarrow [\text{V.V}] \]

\begin{align*}
\text{nui-f} & \quad [\text{nui.ʃ}] \quad \text{‘bone’} \\
\text{oe-l} & \quad [\text{ʔo.ɛl}] \quad \text{‘water’} \\
\text{seo} & \quad [\text{se.o}] \quad \text{‘nine’} \\
\text{liatas} & \quad [\text{li.eːtəs}] \quad \text{‘praise’}
\end{align*}

All vowel-initial words undergo glottal stop epenthesis, as feet are obligatorily consonant-initial in Amfo’an. Examples are given in (22).

(22) \[ \text{#V} \rightarrow \text{#ʔV} \]

\begin{align*}
\text{ai-ʤ} & \quad [\text{ʔvjdʤ}] \quad \text{‘fire’} \\
\text{anah} & \quad [\text{ʔənah}] \quad \text{‘child’} \\
\text{oe-l} & \quad [\text{ʔəl}] \quad \text{‘water’} \\
\text{ume-l} & \quad [\text{ʔumɛl}] \quad \text{‘house’} \\
\text{uki-ʤ} & \quad [\text{ʔukidʤ}] \quad \text{‘banana’}
\end{align*}
When a word initial consonant cluster occurs after a pause or after another consonant from the preceding word, epenthesis of /a/ occurs. As this epenthetic /a/ is the first segment of the word, [ʔ] epenthesis also occurs in order to provide the foot with an onset, as illustrated in (22). Examples are given in (23).

(23) #CC → #ʔaCC

<table>
<thead>
<tr>
<th>word</th>
<th>pronunciation</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>bdgaan</td>
<td>[ʔbdʁən]</td>
<td>‘other’</td>
</tr>
<tr>
<td>klei-dgh</td>
<td>[ʔklejɻ]</td>
<td>‘church’</td>
</tr>
<tr>
<td>school</td>
<td>[ʔaskoːl]</td>
<td>‘school’</td>
</tr>
<tr>
<td>kninoʔ</td>
<td>[ʔkninoʔ]</td>
<td>‘clean’</td>
</tr>
</tbody>
</table>

1.5.3 Metathesis

Amfo’an attests synchronic CV → VC metathesis in certain environments. As a result, a large proportion of the Amfo’an lexicon has alternate metathesised and un-metathesised forms. This includes nouns, verbs, demonstratives, pronouns and numbers. In Nai’bais Amfo’an, all vowel sequences which result from metathesis fully assimilate and are realised as a phonetically long vowel. In other varieties of Amfo’an this does not occur. For example, in Nai’bais Amfo’an, oni + =aa ‘honey’ + DEF → oondsaa [ʔoːndʤə] wheresin Naitbelak oni + =aa → oindsaa. Examples of alternating forms of numbers, pronouns and verbs are given in (24).

(24) root metathesised form gloss

<table>
<thead>
<tr>
<th>root</th>
<th>metathesised form</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>nuga</td>
<td>nuug</td>
<td>‘two’</td>
</tr>
<tr>
<td>tenu</td>
<td>teen</td>
<td>‘three’</td>
</tr>
<tr>
<td>nima</td>
<td>niim</td>
<td>‘five’</td>
</tr>
<tr>
<td>ina-ini</td>
<td>iin</td>
<td>‘3SG’</td>
</tr>
<tr>
<td>hita</td>
<td>hiit</td>
<td>‘1PL.INC’</td>
</tr>
<tr>
<td>sina-sini</td>
<td>siin</td>
<td>‘3PL’</td>
</tr>
<tr>
<td>na-bsoʔo</td>
<td>na-bsoʔo</td>
<td>‘dance’</td>
</tr>
<tr>
<td>naʔapu</td>
<td>naʔaap</td>
<td>‘pregnant’</td>
</tr>
<tr>
<td>aʔn-bati</td>
<td>aʔn-baat</td>
<td>‘divide’</td>
</tr>
<tr>
<td>aʔn-lula</td>
<td>aʔnlulu</td>
<td>‘write’</td>
</tr>
</tbody>
</table>

One environment in which metathesis occurs is before enclitics. All CV or CVC final words undergo metathesis before vowel initial enclitics. This metathesis is triggered by the phonological shape of the enclitic; consonant initial enclitics do not trigger this process (see §4.4). Examples of metathesis triggered by the enclitic =ees ‘one’ are given in (25).

(25)

<table>
<thead>
<tr>
<th>word</th>
<th>enclitic</th>
<th>metathesised form</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>kili</td>
<td>+ ees</td>
<td>kiildjees</td>
<td>‘one bracelet’</td>
</tr>
<tr>
<td>ume</td>
<td>+ ees</td>
<td>uumlees</td>
<td>‘one house’</td>
</tr>
<tr>
<td>anah</td>
<td>+ ees</td>
<td>aanhees</td>
<td>‘one child’</td>
</tr>
<tr>
<td>feetoʔ + ees</td>
<td>feetʔees</td>
<td>‘one sister’</td>
<td></td>
</tr>
</tbody>
</table>

8 All varieties of Meto for which data has been collected attest synchronic metathesis. See (Edwards 2016a: 361) for a comparison of metathesis across varieties of Meto.
A full analysis of metathesis in Amfo’an is beyond the scope of this thesis, however it co-occurs with consonant insertion, and so is relevant to the analysis of consonant insertion presented in this thesis (see §4.4).

1.6 Thesis structure

This thesis begins in chapter 2 which is a typological and theoretical overview of consonant/zero alternations. This chapter reviews the different classifications and determines criteria which can be used to categorize these processes (epenthesis, deletion and morphologically conditioned). This chapter includes two case studies of consonant/zero alternation which demonstrate the importance of having sufficient data when analyzing these processes and the importance of examining consonant/zero alternations within the broader context of a language’s phonology. Subsequently, this chapter identifies cross-linguistic tendencies regarding the form, function and distribution of consonant/zero alternations.

In chapter 3, I provide a detailed description of the function and distribution of the consonant insertion processes in Amfo’an, examining how these processes can be classified using the criteria of epenthesis and morphologically conditioned consonant/zero alternations established in chapter 2, demonstrating that the Amfo’an data does not fit neatly into the categories which have previously been used to classify similar phenomena. Chapter 4 presents a synchronic analysis of the consonant insertion processes, reviewing the merits of different theoretical approaches. This chapter contends that consonant insertion before enclitics is process of epenthesis while final consonant insertion is affixation of a phonologically unspecified -C affix. This chapter demonstrates that Amfo’an consonant insertion is difficult to predict using standard Optimality Theory (OT), and calls for a model which can better account for these processes. However, although a synchronic analysis of these processes is possible, it provides only a partial account of why the segments /dʒ/, /ɡ/ and /l/ are regularly inserted in Amfo’an. Chapter 5 examines the diachronic sources of these processes within the Meto cluster and its subgroup, Rote-Meto, showing that the inserted segments are a result of regular sound change. This account takes into consideration the role of consonant insertion as a marker of Amfo’an identity. This thesis is concluded in chapter 6 with a review of its findings and a summary of the contributions it makes.

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9 see Edwards (2016a) for a description and analysis of metathesis in the Amarasi variety of Meto.
Chapter 2

Consonant/zero alternations

Synchronic processes by which a consonant occurs in certain environments, and not in others (consonant/zero alternations) are typically classified as either epenthesis, synchronic deletion or as morphologically conditioned. Epenthesis and synchronic deletion are phonological processes, while morphologically conditioned consonant/zero alternations are morphological processes which are restricted to a particular morphological process or class of morphemes.

This chapter presents a typological and theoretical overview of consonant zero alternations, beginning with a review of the three categories that have been used to classify consonant/zero alternations, and how these processes have been treated in phonological theory. This section also briefly discusses ‘thematic’ consonants in Oceanic languages, which are a well known case of consonant/zero alternation in Austronesian. Two case studies are then examined, Ajyíninka Apurucayali (§2.3.1) which attests a t-zero alternation and Halh Mongolian (§2.3.2), which attests a g-zero alternation (§2.3). These cases emphasize the importance of having sufficient data and the importance of examining consonant/zero alternations within the broader context of a language’s phonology. These cases also demonstrate the need for minimally theoretical study of these processes,¹ as accounts of consonant/zero alternations which are heavily embedded in a particular theory restrict cross-linguistic comparison.

Using the classifications of epenthesis, synchronic deletion or as morphologically conditioned, this chapter presents a typological overview of of consonant/zero alternations; identifying cross-linguistically common characteristics of the form, function and distribution of these processes.

This chapter concludes by positioning Amfo’an within this typology, demonstrating that consonant insertion in Amfo’an is typologically uncommon in several respects: it has two consonant/zero alternations which have the same form but different functions, which is previously unattested. Further, NP-final consonant insertion in Amfo’an does not fit neatly into the categories of epenthesis, synchronic deletion or morphologically conditioned alternations, because it is both morphologically and phonologically conditioned.

¹I use the term ‘minimally theoretical’ rather than theory neutral or atheoretical because, as many have pointed out, there is no such thing as atheoretical language description (Gil 2001, Dryer 2006).
2.1 Three types of consonant/zero alternations

Consonant/zero alternations have been classified as either epenthesis, synchronic deletion or as morphologically conditioned. These three types of consonant/zero alternation are distinct from each other, and provide a framework for classifying and comparing the forms, functions and distribution of different cases of consonant/zero alternations. A summary of the characteristics of each type of consonant/zero alternation is given in (26).

<table>
<thead>
<tr>
<th></th>
<th>epenthesis</th>
<th>deletion</th>
<th>morphologically conditioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonologically conditioned</td>
<td>yes</td>
<td>yes</td>
<td>to some extent</td>
</tr>
<tr>
<td>Morphologically restricted</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Synchronously productive</td>
<td>yes</td>
<td>yes</td>
<td>sometimes</td>
</tr>
<tr>
<td>Alternating segment</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>phonologically predicable</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>demonstrates alternation with Ø</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

The form, function and distribution of each type of consonant/zero alternation is described with examples in the following sections.

2.1.1 Epenthesis

Epenthesis is a phonological process by which a segment which is not present in the underlying form is inserted, resulting in a preferred syllable structure. As it is a phonological process, the form of epenthesis, i.e. which segment is inserted, is phonologically predictable and its distribution is phonologically determined. Its distribution is not morphologically restricted (de Lacy 2006: 92), but is a general process in a given language.\(^2\) Epenthesis is a synchronically productive process which demonstrates alternation with zero (Morely 2015), such that the inserted segment occurs in certain phonological environments, but not in others. Consonant epenthesis most often occurs at prosodic boundaries to provide syllables with onsets or codas, and to break up sequences of two vowels from different syllables (vowel hiatus) (Uffman 2007: 458), which is dispreferred or disallowed in many languages (Ron Simango and Kadenge 2014: 79).

Epenthesis of ‘minimal’ segments tends to uncontroversially be accepted as epenthesis. ‘Minimal’ refers to segments which are minimally disruptive of the transition from one vowel to the next, from both a perceptual and articulatory perspective (Morely 2012: 61). This encompasses the insertion of glides to resolve hiatus and insertion of glottal stops at prosodic boundaries. For example, in Faroese (Indo-European, Faroe Islands) glide epenthesis of /j/ occurs after /i/ and epenthesis of /w/ occurs after /u/ to resolve vowel hiatus when a long vowel-final stem is followed by a vowel-initial suffix. This is illustrated in (27).\(^3\)

\(^2\)The term ‘epenthesis’ is also sometimes used to refer the addition of segmental material to satisfy a morphological template (Morely 2017). This is not a common use of ‘epenthesis’, and the processes it describes can be classified as morphologically conditioned (see §2.1.3).

\(^3\)This is a phonetic transcription rather than the Faroese orthography.
However, in cases when the alternating segment is not ‘minimal’, there is disagreement about whether the process in question is a legitimate case of epenthesis.

2.1.2 Synchronic Deletion

Synchronic deletion is the regular deletion of a segment in a certain phonological environment. In cases of synchronic deletion it is the deletion of the alternating segment which is phonologically predictable and which results in preferable syllable structures (Morely 2017). The value of of the alternating segment is not phonologically predictable, because it is determined lexically (Harris 2011). As it is a phonological process, synchronic deletion is not morphologically restricted (Morely 2015). Consonant deletion is a common strategy of cluster reduction, but also may result in a synchronic consonant/zero alternation that can look like epenthesis. For example, in Lardil (Pama–Nyungan, Australia) only apical consonants are permitted word-finally. Final consonants which are non-apical delete, but occur when a vowel-initial suffix is attached. Examples of citation and suffixed forms of nouns are given in (28). In examples (a.) and (b.), the final consonant is apical so is not deleted, whereas (c.-e.) have non-apical final consonants, which are deleted word-finally. However, these consonants occur when vowel-initial suffixes are attached.

(28) | citation form | + accusative | gloss |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. <em>pirŋen</em></td>
<td><em>pirŋen</em>-in</td>
<td>‘woman’</td>
</tr>
<tr>
<td>b. <em>kentapal</em></td>
<td><em>kentapal</em>-in</td>
<td>‘dugout’</td>
</tr>
<tr>
<td>c. <em>ŋalu</em></td>
<td><em>ŋalu</em>-in</td>
<td>‘story’</td>
</tr>
<tr>
<td>d. <em>taŋku</em></td>
<td><em>taŋku</em>-in</td>
<td>‘oyster’</td>
</tr>
<tr>
<td>e. <em>murkuni</em></td>
<td><em>urkuni</em>-an</td>
<td>‘nullah’</td>
</tr>
</tbody>
</table>

Data from Hale (1973), cited in Harris (2011: 3).

2.1.3 Morphologically Conditioned consonant/zero alternations

Other consonant-zero alternations are morphologically conditioned, which means the alternating consonant only emerges in certain morphological environments, specific to a particular morphological process or class of morphemes (Staroverov 2014: 182). The occurrence of the alternating consonant is not a general phonological process; but is determined morphologically, and as a result its occurrence tends not match the overall phonology of the language (Staroverov 2014: 183). While the occurrence of the alternating segment may be phonologically conditioned, to some extent (for example, occurring only between vowels), which segment occurs is not phonologically predictable.
Morphologically conditioned consonant/zero alternations have various functions; one common function is ‘linking’ segments in compounds. For example, in Anemo (Austronesian, Vanuatu) /ɾ/ is inserted in verb compounds between vowels (Lynch 2000). Examples are given in (29).

(29) awo-upni aworupni ‘do well’
do-good
awo-itai aworitai ‘to garden’
do-things
umu-umu umurumu ‘to grow well again’
REDUP-live

(Lynch 2000: 29)

The occurrence of /ɾ/ in Anemo is highly morphologically restricted: it only occurs in compounds and only when the first member is a verb (Staroverov 2014). While this process occurs between vowels, and so seems to be occurring as a resolution of vowel hiatus, it does not match the overall phonology of the language, which allows for vowel hiatus elsewhere such as /niom/ ‘house’; /ʔaek/ ‘2sg’.

Another kind of morphologically conditioned consonant/zero alternation is the situation in which a segment is obligatory in reduplication. For instance, in Southern Oromo (Afro-Asiatic, Kenya) reduplicants are derived from the initial CV of the base, followed by /m/. Examples are given in (30).

(30) base reduplicated gloss
eege emeege ‘he waited long’
fiugite fimfiugite ‘she raised some children’
harkifte hamharkifte ‘he pulled frequently’
teece temteece ‘she sat down a long time’


Another kind of morphologically conditioned consonant/zero alternation is ‘latent’ segments. In cases of latent segments, the alternating consonants are underlying and occur when followed by a vowel-initial word. However, this is not a regular process, and the realisation of latent segments is optional. As a result, deletion is not a possible analysis because deletion is a regular phonological process (Staroverov 2014) (see §2.1.2). For example, in French, many words have latent final segments which are realized optionally before vowel initial words, but are absent when the following word is consonant-initial (Spaelti 2011). The appearance of linking consonants depends on speech rate and style, as well as on frequency factors (Tranel 1981, Bybee 2001). Examples of French the realisation of the latent final /z/ of the plural determiner les are given in (31). The final /z/ of les is not realised in (a.) and (b.) before consonant initial words. Whereas in c. and d. it is realised before vowel initial words.

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4This phenomenon is also referred to as ‘ghost’, ‘stray’, ‘extra-metrical; floating’, or ‘extra-syllabic’ segments (Morely 2017).
2.1.3.1 Thematic consonants in Oceanic

"Thematic" consonants in Austronesian languages of the Oceanic region are a well-known case of consonant/zero alternation which has been the subject of much debate. In numerous Oceanic languages, there are consonants which occur when transitive suffixes are attached to verbs. For example, in Samoan (Samoa), intransitive verbs are vowel final; Samoan only permits open syllables. To form a transitive verb, a suffix is added. Examples are given in (32).

This pattern of thematic consonants is widespread across Oceanic. Examples of thematic consonants in Longgu (Solomon Islands) are given in (33).

Diachronically, thematic consonants are a result of deletion, by which final consonants of verbs were lost but retained in certain morphological environments (see §5.1). However, synchronically, the situation is more complex, and the most appropriate synchronic analysis has been debated.

Hale (1973) presented two analyses of thematic consonants. One is a phonological analysis, by which the consonants are underlyingly part of the stem, and are regularly deleted word-finally. However, the consonant occurs when a vowel-initial suffix is attached, such as in Lardil (§2.1.2). The other is a 'conjugation' analysis, by which the alternating consonants are analysed as part of the affix. The distribution of the various forms of the affix is determined lexically. However, Lichtenberk (2001) has since demonstrated that deletion is not an appropriate analysis of Manam (PNG) and Toqabaqita (Solomon Islands). In a deletion analysis, it would be expected
that the alternating consonant always occurs when a suffix is attached. However, in Manam and Toqabaqita, thematic consonants do not occur in all situations when a suffix is attached to a given verb. For example, in Manam *subarawa* ‘sweat’ does not occur with an alternating consonant when -i ‘3sg:O’ is attached. However the alternating consonant *ng* [ŋ] does occur when the transitive suffix -aq is attached. This is demonstrated in (34).

(34) a. *subarawa-i*
   sweat-3sg:O
   ‘pass one’s sweat on; soil with sweat’

   b. *subarawa-ng-aq-i*
   sweat-TC-TR-3sg:O
   ‘sweat out’

   (Lichtenberk 2001: 128)

Further, if the alternating consonant were part of the verb root we would expect that the same alternating consonant to occur with a verb when a suffix is attached. However, in Manam and Toqabaqita, the alternating consonant may vary depending on which suffix is attached. For example, different alternating consonants occur with *fita* ‘run’ in Toqabaqita when different transitive suffixes are attached. This is demonstrated in (35).

(35) a. *fita-l-i-a*
   run-TC-TR-3sg:O
   ‘run around in’

   b. *fita-tani-a*
   run-TC-TR-3sg:O
   ‘take s.o (somewhere) in a hurry’

   (Lichtenberk 2001: 128)

Typically, in Oceanic languages the thematic consonants are presented as part of the verbal suffixes, such as in Samoan (32) and Lonnggu (33). In this analysis, which consonant occurs is lexically determined. However, this analysis is inappropriate for Manam and Toqabaqita, in which the same verb may occur with multiple different thematic consonants, as in (35) above.

Lichtenberk (2001) concludes that the alternating consonant cannot be analysed as part of the root or suffix. Rather, they are best treated as a separate morpheme which occurs as a linking segment in this morphological environment; which consonant occurs is determined lexically. As result, these consonant/zero alternations can be treated as morphologically conditioned according to the three categories set out in §2.1, as they are specific to a morphological process. However, the cases of Manam and Toqabaqita are different from the other morphologically conditioned alternation processes discussed in this section, as there are multiple alternating segments which
are lexically determined. Manam and Toqabaqita are included as cases of morphologically conditioned consonant/zero alternations in the typological survey presented in §2.4.1. Other cases of thematic consonants in Oceanic could perhaps also be treated as cases of morphologically conditioned consonant/zero alternations, however a full study of the synchronic status of thematic consonants in Oceanic is beyond the scope of this thesis.

2.1.3.2 Suppletion

It has also been argued that suppletion can result in morphologically conditioned consonant/zero alternations (de Lacy and Kingston 2013, Staroverov 2014, Morely 2017). Suppletion is where there are multiple phonologically distinct forms which encode the same set of semantic or grammatical relations (Veselinova 2018: 1). While the phonological relationship between these forms is unpredictable, the grammar determines the distribution of the different forms which occur in complementary distribution (Paster 2016: 95). In some instances of suppletion, the distribution of different forms is phonologically conditioned. However, which form occurs is not a language wide phonological process but is a morpheme-specific preference (Kim 2016: 189). For example, in Korean, the nominative case marker has two distinct forms, -i and -ka. -ka occurs after vowel-final stems, for example se-ka 'bird-nom', while -i occurs after consonant final stems, for example kuk-i 'soup-nom'. (Cho 2015: 2)

Some cases of consonant/zero alternation have been analysed as suppletion. If an alternation is analysed as a result of suppletion, this means that the alternating consonant is part of a one of the alternating forms, and not part of another. For example, there could be two forms of a suffix -CV and -V whose selection is determined by the last segment of the stem to which they attach: -CV occurring after vowel final stems while -V occurs after consonant final stems. If the alternating consonant is part of an affix, this can explain why the occurrence of the alternating consonant is morphologically restricted and/or not phonetically natural.

However, if only one segment is different between two forms, it is difficult to argue that its a case of suppletion, as suppletion typically involves two or more segments that differ (Paster 2006: 29). Consonant/zero alternations, however, are characterised by the alternation of individual segments; alternations involving multiple adjacent segments are not consonant/zero alternations. Further, suppletion tends to be item-specific; it is not a regular process in a language (Hippisley et al. 2004: 1), whereas morphologically conditioned consonant/zero alternations tend to part of a morphological process, rather than restricted to a specific item. As a result, if a single alternating consonant occurs with multiple morphemes it seems unwarranted to analyse it as a case of suppletion, such as in the case of Buriat (Mongolic, Russia/Mongolia), which has been argued to be a case of phonologically-conditioned suppletion (de Lacy and Kingston 2013).

In Buriat, /ɡ/ occurs at the juncture of a vowel-final stem and vowel-initial suffix, if the final vowel of the stem is long. The quality of /ɡ/ is determined by the adjacent vowels: [ɡ] occurs after front vowels, sometimes undergoing lenition to [ɣ] or [ʁ]. After back-vowels it occurs as uvular [ɢ]s (Staroverov 2015a: 3). Examples of the
occurrence of /ɡ/ with the instrumental suffix -Aːr and imperfective suffix -Aː are given in (36).

(36) | stem | suffix | surface form | gloss |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>buː</td>
<td>-Aːr</td>
<td>buːʁaːr</td>
<td>'rifle-instr'</td>
</tr>
<tr>
<td>bajartAi</td>
<td>-Aːr</td>
<td>bajartɛːʁaːr</td>
<td>'pleasure-comit-instr'</td>
</tr>
<tr>
<td>xuːlɛː</td>
<td>-Aː</td>
<td>xuːsːgːː</td>
<td>'wait-imperf'</td>
</tr>
</tbody>
</table>

(Staroverov 2015a: 6,7)

Whereas after consonant final stems, /ɡ/ does not occur. Examples are given in (37)

(37) | stem | suffix | surface form | gloss |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>bʊrgɑːd</td>
<td>-Aːr</td>
<td>bʊrgɑːdør</td>
<td>'eagle-instr'</td>
</tr>
<tr>
<td>xataːr</td>
<td>-Aː</td>
<td>xataraː</td>
<td>'dance-imperf'</td>
</tr>
</tbody>
</table>

The occurrence of /ɡ/ is to some extent phonologically conditioned, occurring to resolve the vowel hiatus which results from a long vowel followed by another vowel. However, characteristic of a morphologically-conditioned consonant/zero alternation, the process is restricted to this morphological environment and is not a general phonological process in the language: it does not occur to resolve all sequences of vowel hiatus. For instance, if the final vowel in a sequence is short, it is deleted (Staroverov 2015a). For example fonɔːran → fonan ‘wolf- abl.dial’.

In Buriat, only one segment alternates, indicating that it probably is not a case of suppletion. Further, if it were a case of suppletion, it would be expected that only a small number of items are involved in the alternation, whereas in Buriat there are 10 suffixes that occur with /ɡ/ after stems which end in long vowel (Staroverov 2015a). This process demonstrates the characteristics of a morphologically conditioned consonant-zero alternation: it is morphologically restricted and is not a general phonological process in the language, and so can be classified as such, rather than as a case of suppletion.

2.1.4 Summary

These three different categories provide a framework for cross-linguistic comparison of consonant/zero alternations, and in the devising of typology (§2.4). However, instances of consonant/zero alternation attested in individual languages are not always clear cut, as the two cases studies in this chapter, Ajiýinka Apurucayali and Halh Mongolian illustrate (§2.3). This three-way categorisation of consonant/zero alternations also forms the basis of theoretical treatment of these processes.

2.2 Consonant epenthesis in Phonological theory

Consonant epenthesis has been the object of much discussion in phonological theory. Phonological theories are devised with the goal of explaining the variation observed in the sound systems of languages (Gordon 2007). For this reason, theoretical
predictions about consonant epenthesis are based on what has been previously attested in languages. Optimality Theory in particular makes constrained predictions about what motivates consonant epenthesis and about the kind of epenthetic consonants that are possible. In Optimality Theory, all changes between inputs (underlying forms) and outputs (surface forms) are driven by markedness constraints and are predicted to result in minimally marked syllable structures (Downing 2009: 2).

OT dictates that consonant epenthesis is either the insertion of one invariable segment (default epenthesis) or the insertion of phonetically predictable segments (assimilatory epenthesis). In cases of default epenthesis, a minimally marked segment is always inserted as a ‘repair’ strategy for marked structures such as sequences of two vowels or onset-less syllables, with no exceptions (Morely 2017). The quality of this ‘default’ consonant is fixed within a particular language (Morely 2012), and is minimally marked (Lombardi 2002, de Lacy 2006). The relative markedness of the place features of consonants is determined by a universal hierarchy. In this hierarchy, labial is the most marked place while pharyngeal is the least marked. This hierarchy is stated in (38).

(38)  *labial » *dorsal » *coronal » *pharyngeal

(Lombardi 2002: 4)

This hierarchy predicts that the optimal epenthetic consonant (in default epenthesis) is /ʔ/ or /h/ (Lombardi 2002). It also predicts that if /ʔ/ or /h/ are prevented from appearing, the epenthetic consonant will be a coronal (de Lacy 2006). Epenthesis in OT can only produce minimally marked consonants and as a result cannot produce labials or dorsals (Paradis and Prunet 1991, de Lacy 2007), which are the most marked consonants according to hierarchy in (38).

Assimilatory epenthesis, on the other hand, is the insertion of phonetically predictable segments, as determined by the place and manner of articulation by the adjacent vowels (de Lacy 2006: 101), such as insertion of /j/ after /i/ and /w/ after /u/.

These highly restricted definitions of epenthesis are based on a significant amount of cross-linguistic data. However, they also predict that there is specific set of possible epenthetic segments, to the exclusion of any attested cases of epenthesis that involve other segments. While this approach is empirically grounded, OT provides a rigid definition of epenthesis. However, the classification of cases of epenthesis is not always clear cut, as demonstrated by the cases of Ajyíninka Apuruucayali and Halh Mongolian. These cases show that more detailed studies of such alternations are needed in order refine current theoretical frameworks and better understand the cross-linguistic patterning of consonant/zero alternations.

2.3 Case studies

This section examines two cases of consonant/zero alternations and how they have been analysed. Both cases have been analysed as epenthesis which resolves vowel hiatus. However, examining more data from each language indicates that the occurrence of the alternating consonant is not phonologically predictable, and therefore not analysable as epenthesis.
2.3.1 Ajyíninka Apurucayali (Axininca Campa) /t/-zero alternation

Ajyíninka Apurucayali, also known as Axininca Campa (Arawakan, Peru) has a /t/-zero alternation which has been the object of much discussion. It has been used as an example of default epenthesis of coronal consonants (McCarthy and Prince 1994, Kager 1999) and as evidence for a particular view of place markedness of consonants in Optimality Theory (Lombardi 2002, de Lacy 2006) (see §2.2). However, examining more comprehensive data indicates that the alternation is, in fact, a deletion process.

In Ajyíninka Apurucayali, /t/ occurs at the juncture of verb stems and vowel initial suffixes. Examples are given in (39).

(39) i-N-koma-i \(\rightarrow\) iŋkoma
3PM-FUT-paddle-FUT 'he will paddle'

i-N-tʃik-aa-i \(\rightarrow\) iʃi̯katii
3PM-FUT-cut-REP-FUT 'he will cut again'

i-N-pisi-piro-i \(\rightarrow\) impisipiroi
3PM-FUT-sweep-VER-FUT 'he will really sweep'

(Payne 1981: 55,108)

If we only look at examples of verbs, it would seem that the occurrence of /t/ is a process of epenthesis. However, /t/ only occurs after verb stems. In other contexts, other processes occur to resolve vowel hiatus, depending on the quality of the vowels. This is demonstrated in (40) which gives examples of vowel final nouns followed by the diminutive suffix -iriki. When the second vowel in a sequence is higher, it is syllabified as a diphthong, such as in (a.) and (c.) If the two vowels in a sequence are identical, they are syllabified as a long vowel, as in (b.) and (d.) below.

(40) a. hito + iriki \(\rightarrow\) hitojiri
b. mapi + iriki \(\rightarrow\) mapiri
   'small rocks'
c. ana + iriki \(\rightarrow\) anajiri
   'small black dye plants'
d. t\textsuperscript{o}nk\textsuperscript{i} + iriki \(\rightarrow\) t\textsuperscript{o}nktiri
   'small ants'

(Payne 1981: 47,110)

If the the first vowel in a sequence is higher than the second, vowel deletion occurs. For example, i-tʃhik-i-ai \(\rightarrow\) [i]i̯hikai] 'he cut us' (Payne 1981: 36). These other strategies of vowel hiatus resolution indicate that the occurrence of /t/ is not a general phonological process in the language, and a result, does not demonstrate the accepted features of epenthesis. Rather, in order to predict the occurrence of /t/, it either must be part of the verb, which is deleted, or is a morphologically-restricted linking segment which occurs between vowel-final verb stems and vowel initial suffixes (such as in Anejom, see §2.1.3)

Further data from verbs supports a deletion analysis, as proposed by Staroverov (2014) and Morely (2015). This kind of analysis entails that all verb stems end in a consonant, which is otherwise the case. This deletion of /t/ is due to a broader restriction on CC sequences, which are not allowed in the language (with the exception of
NC clusters). The tC sequences which occur are resolved by deletion, whereas other CC sequences are resolved by /a/ epenthesis. Two examples of /a/ epenthesis are given in (41).

(41) $i$-N-tʃik-pirot-i$ \rightarrow$ iptʃikapiroti ‘he will cut it well’

$\text{3SG.M-FUT-cut-VER-FUT}$

$kant$-pirot-ants$^b_i$ $\rightarrow$ kantapirota:nts$^b_i$ ‘to say well’

$\text{say-VER-INF}$

(Payne 1981: 108,113)

That the verbs concerned are actually /t/ final explains why other vowel hiatus resolution strategies do not occur when a vowel-initial stem is attached. It also explains why /t/ only occurs after verbs, and not in other situations in which a vowel final stem is followed by a vowel initial suffix, as in (40).

In the case of Ajyíninka Apurucayali, if the only data studied is from verbs — such as in (39)— a /t/ epenthesis analysis can be justified, which fits the predictions of Optimality theory (§2.2). However, when Ajyíninka Apurucayali has been used to support the predictions of Optimality Theory, the data is obscured, restricting rigorous cross-linguistic comparison.

2.3.2 Mongolian /ɡ/-zero alternation

Halh Mongolian (Mongolic, Mongolia) attests a /ɡ/-zero alternation by which /ɡ/ occurs between vowels at morpheme boundaries. This occurs after nominal and verbal stems and after suffixes. /ɡ/ is realised as [ɡ] after vowels which have the feature [+atr] (Advanced tongue root) and as the voiced uvular stop [ɢ] after vowels are [-atr] (Staroverov 2014: 145). Examples are given in (42).

(42) $\text{oto-Es} \rightarrow$ oto:gos ‘now-ABL’

ai-ar $\rightarrow$ ai:car ‘category-INST’

$xu$-Er $\rightarrow$ xu:ger ‘boy-INST’

$sana$-iŋ $\rightarrow$ san:giŋ ‘thought-GEN’

$\text{tepE-in} $ $\rightarrow$ tepe:gin ‘swampland-GEN’

$\text{xi}$-Et $\rightarrow$ xi:get ‘do-PFG’


However, when attached to a C-final stem, these suffixes show no initial /ɡ/. Examples are given in (43).

(43) $\text{ar}$-iŋ $\rightarrow$ ar:iŋ ‘back-GEN’

$\text{pag-Es}$ $\rightarrow$ pag:as ‘team-ABL’

ux-Utsai $\rightarrow$ ux:utsai ‘die-PHG’
Such facts have led Staroverov (2014: 140) to analyse the occurrence of /ɡ/ in examples such as (42) as epenthesis.

However, the occurrence of /ɡ/ is restricted to morpheme boundaries. At morpheme boundaries, vowel sequences are resolved by /ɡ/, however within morphemes, sequences of two vowels are allowed, and are realised as diphthongs. This indicates that the occurrence of /ɡ/ is not a general phonological process, and therefore does not display the accepted features of epenthesis. Examples are given in (44).

(44)  
\begin{align*}
xui & \quad \text{‘group’} \\
ailz & \quad \text{‘family’} \\
sims & \quad \text{‘sock’}
\end{align*}

(Jan-Olof Svantesson and Franzén 2005: 9)

If this alternation is not a case of epenthesis, it can be classified as either deletion or as morphologically conditioned. If it were deletion this would entail that /ɡ/ were part of the suffix and is being deleted in a certain phonological environment, such as to avoid a consonant adjacent to another consonant. However, Mongolian allows consonant clusters, including clusters of two identical stops, and clusters with /ɡ/ such as caad’tgar ‘to sue-HAB.INST’ (Karlsson and Svantesson 2007: 1). Consonant clusters may also occur at morpheme boundaries such as ils-t-te [ilst.te] ‘sandy-com’. Therefore, if /ɡ/ were part of the affixes, we would expect /ɡ/ to occur when these suffixes are attached to consonant-final stems.

The occurrence of /ɡ/, therefore cannot be analysed as part underlyingly part of the affix, which is being deleted. Rather more data suggests that the alternation is morphologically conditioned, by which /ɡ/ is linking element which occurs in a specific morphological environment. The case of Halh Mongolian further emphasises the importance of having sufficient data to determine the nature of a consonant/zero alternation and the importance of examining consonant/zero alternations within the broader context of a language’s phonology. The account of Amfo’an presented in this thesis addresses these issues, showing how consonant insertion co-occurs with other phonological and morphological processes and how it fits within the phonology of the language more broadly (see chapter 3).

2.4 Typological overview

Previous typological work on consonant/zero alternations has divided these processes into the three types outlined in §2.1. These categories distinguish phonologically conditioned consonant/zero alternations (epenthesis and deletion) from morphologically conditioned alternations, and provides a framework for comparing the forms, functions and distribution of these processes. In this section, I use these categories to conduct a brief typological survey of consonant/zero alternations (§2.4.1), with the aim of identifying how widespread these processes are; including distribution is in terms of both geography and language families, and to determine the most
common types of consonant/zero alternations. The primary purpose of this typo-
logical survey is to identify what is cross-linguistically common in terms of conso-
nant/zero alternations, and place Amfo’an within this typology.

However, although the categories provide a useful framework for classifying and
comparing consonant/zero alternations, consonant insertion in Amfo’an does not fit
neatly into one of the categories, but is better analysed as two processes of conso-
nant/zero alternation which have the same form but different functions.

2.4.1 A brief typological survey

In this section, I present a typological survey of consonant/zero alternations based on
published sources. This survey uses a sample of 80 languages from 12 language fam-
ilies, and two isolates (see Appendix B for details) It is broken into three categories:
epenthesis, deletion and morphologically conditioned consonant/zero alternations,
and explores how the different cases of consonant insertion can be classified in terms
of the categories established in the literature.

2.4.1.1 Epenthesis

Consonant epenthesis occurs in many languages and is the most common type of
consonant/zero alternation in my sample, comprising 58 cases. In my sample, Con-
sont epenthesis has two main attested functions: occurring between vowels to
resolve hiatus and providing syllables with onsets at prosodic boundaries. The most
common epenthetic consonants were /ʔ/ (37 languages) /h/ (17 languages) and glides
(23 languages). To resolve vowel hiatus, glide epenthesis was most common (30 lan-
guages), whereas at prosodic boundaries, /ʔ/ and /h/ were most common (52 lan-
guages), while epenthesis alternations involving other consonants are uncommon
(6 languages) This survey is summarised in (45) below, which includes attestations
of different epenthetic segments and the environments in epenthesis which occurs.\(^5\)
The data in this table was compiled from: Christdas (1988: 164), Rubach (2000), Uff-

\(^{5}\) \[refers to a the boundary of a prosodic domain (word or phrase).\]
<table>
<thead>
<tr>
<th>segment</th>
<th>context</th>
<th>languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>ʔ</td>
<td>_pr[#_V</td>
<td>Muna, Anejoř, Rennellese, English, French, Nhanda, Washo, Kalaallisut, Bulgarian, Czech, Meto</td>
</tr>
<tr>
<td>V_#]_pr</td>
<td>Chintang, Atayal, Saisiyat, Pazeh, Bunun, Yami, Itbayaten, Ivatan, Casiguran Dumagat, Taboyan, Lawangan, Kapuas, Ba’aman, Murung, Tunjung, Lou, Sundanese, Puyuma, Paiwan, Sarawak Malay, Brunei Malay, Kavalan Chumburung, Amis, Katingan</td>
<td></td>
</tr>
<tr>
<td>#_a</td>
<td>Kanniyakumari Tamil</td>
<td></td>
</tr>
<tr>
<td>V-HIGH_V</td>
<td>Farsi</td>
<td></td>
</tr>
<tr>
<td>V_a-V_a</td>
<td>Madurese</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>_pr[#_V</td>
<td>Nhanda, Ritwan</td>
</tr>
<tr>
<td>V_#]_pr</td>
<td>Aklanon, Tagabili, Taosug, Miri, Berawan, Sebop, Kelabit, Dalat, Matu, Narum, Kiput, Western Penan, Serike Malanau, Yurok,</td>
<td></td>
</tr>
<tr>
<td>V_#, after enclitics</td>
<td>Achenese</td>
<td></td>
</tr>
<tr>
<td>j</td>
<td>i_V</td>
<td>Faroese, Dutch, Kalaallisut, Farsi, Madurese, Woleaian, Colloquial Slovak, Standard Polish, Czech, Cantonese</td>
</tr>
<tr>
<td></td>
<td>V_i</td>
<td>Colloquial Slovak, Standard Polish, Czech</td>
</tr>
<tr>
<td></td>
<td>e_V</td>
<td>Dutch, Woleaian</td>
</tr>
<tr>
<td></td>
<td>ε_V</td>
<td>Madurese</td>
</tr>
<tr>
<td></td>
<td>V-HIGH_i</td>
<td>Faroese</td>
</tr>
<tr>
<td></td>
<td>V_V</td>
<td>Washo</td>
</tr>
<tr>
<td></td>
<td>V-HIGH_V</td>
<td>Woleaian</td>
</tr>
<tr>
<td></td>
<td>i_V</td>
<td>Tamil</td>
</tr>
<tr>
<td></td>
<td>#_i</td>
<td>Rural Polish</td>
</tr>
<tr>
<td></td>
<td>#_i_e</td>
<td>Kanniyakumari Tamil</td>
</tr>
<tr>
<td></td>
<td>V_a-V_a</td>
<td>Zezuru (Shona)</td>
</tr>
<tr>
<td>w</td>
<td>u_V</td>
<td>Faroese, Kalaallisut, Farsi, Madurese, Standard Polish, Czech, Cantonese</td>
</tr>
<tr>
<td></td>
<td>V_u</td>
<td>Standard Polish, Czech</td>
</tr>
<tr>
<td></td>
<td>o_V</td>
<td>Madurese</td>
</tr>
<tr>
<td></td>
<td>u_V</td>
<td>Woleaian</td>
</tr>
<tr>
<td></td>
<td>#_o,u</td>
<td>Kanniyakumari Tamil</td>
</tr>
<tr>
<td>u</td>
<td>V-HIGH_o</td>
<td>Faroese</td>
</tr>
<tr>
<td></td>
<td>u_o_V</td>
<td>Dutch</td>
</tr>
<tr>
<td></td>
<td>V-HIGH_V</td>
<td>Tamil</td>
</tr>
<tr>
<td>v</td>
<td>V_:i</td>
<td>Kalaallisut</td>
</tr>
<tr>
<td>j</td>
<td>V_:u</td>
<td>Kalaallisut</td>
</tr>
<tr>
<td>q</td>
<td>y_o_V</td>
<td>Dutch</td>
</tr>
<tr>
<td>r</td>
<td>æ,æ,ɔ,ɔ̃_V</td>
<td>various non-rhotic varieties of English</td>
</tr>
</tbody>
</table>
2.4.1.2 Synchronic deletion

Regular deletion processes which result in consonant/zero alternations are much less common than epenthesis, occurring in 5/80 languages in my sample. In these 5 languages, there is no alternating segment which is more common. This is expected, as in a deletion alternation the deleted segment is not phonological predictable because it part of a lexical item (Harris 2011). However, from this limited sample there are some functions and distributions which are characteristic of deletion alternations. They have two identifiable functions: to fulfill restrictions on the occurrence of adjacent consonants (Eastern Massachusetts English, Catalan, Ajyíninka Apurucayali) or restrictions on what consonants can occur in certain contexts (Lardil, Uradhi). In the former, consonant deletion occurs before another consonant, while in the latter, it occurs in relation to domain boundaries, such as word boundaries in the case of Lardil. This survey of cases of synchronic deletion, including the alternating segments and context of deletion are given in (46).

(46) segment | context | language | reference
---|---|---|---
non-apical Cs | word-finally | Lardil | Hale (1973) see §2.1.2
Final stops | before another C | Catalan | Côte (2004)
ŋ | before suffixes or utterance-medially | Uradhi | Hale (1976); Staroverov (2014)
t | before another C | Ajyíninka | Staroverov (2015b)

2.4.1.3 Morphologically conditioned consonant/zero alternations

Morphologically conditioned consonant/zero alternations are found in 18 languages in the sample. In all these cases, the alternation involves a single segment, except in Chamorro and cases of thematic consonants in Oceanic (Manam and Toqabaqita). This segment typically occurs at the juncture of a vowel-final and vowel-initial morpheme in vowels from different morphemes. In many cases, the alternating segment only occurs with particular subset of morphemes. For example, in Anejom̃, /ɾ/ only occurs after verbs (followed by a suffix) and in Odawa Ojibwa /t/ only occurs after personal pronoun prefixes before vowel-initial verbs. The phonological or morphological function of the consonant in these alternations is unclear; especially in cases where the alternation is not a general morphological process, but is specific to a subset of morphemes. In my sample, voiceless stops are the most common alternating segment in this kind of consonant/zero alternation, occurring in 8 of the 18

---

6 This only includes cases of regular deletion and cases of deletion which result in a consonant/zero alternation.
7 This typological survey only features two cases of thematic consonants in Oceanic, which can be analysed as morphologically conditioned consonant/zero alternations (§2.1.3.1). For other cases it is more complex, and is subject of much discussion, and so have not been included in this survey. A full study of the synchronic status of thematic consonants is beyond the scope of this thesis.
languages. This is unexpected, as the selection of segments in this kind of alternation
is not determined phonologically (§2.1.3). There is no apparent phonological moti-
vation for the higher frequency of voiceless stops in this kind of alternation. This
survey is summarised in (47), which includes the alternating segments in each case
and the environments in which the consonant occurs.

<table>
<thead>
<tr>
<th>(47) segment</th>
<th>context</th>
<th>language</th>
<th>reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>certain root types in the gerund + passive V_V</td>
<td>Maori</td>
<td>Bauer (1993)</td>
</tr>
<tr>
<td></td>
<td>V final personal pronouns, before V-initial verbs</td>
<td>Odawa</td>
<td>Piggott (1980); Ojibwa</td>
</tr>
<tr>
<td></td>
<td>certain geminate verbs, fills template</td>
<td>Amharic</td>
<td>Morely (2015)</td>
</tr>
<tr>
<td></td>
<td>V final person prefixes, before V-initial verbs</td>
<td>Cree (Plains)</td>
<td>Wolfart (1973)</td>
</tr>
<tr>
<td>k</td>
<td>between roots ending in a V or /n/ and /a/ initial suffix</td>
<td>Kodáva</td>
<td>Ebert (1996); de Lacy (2006)</td>
</tr>
<tr>
<td></td>
<td>after /t/, before nasals that are part of a prefix</td>
<td>Seri</td>
<td>Marlett (1981); de Lacy (2006)</td>
</tr>
<tr>
<td></td>
<td>V final person prefixes, before V initial verbs</td>
<td>Waropen</td>
<td>Held (1942); Anceaux (1961)</td>
</tr>
<tr>
<td>g</td>
<td>between V-final verbs and V-initial suffixes</td>
<td>Halh Mongolian, see §2.3.2</td>
<td>Buriat</td>
</tr>
<tr>
<td>m</td>
<td>reduplication</td>
<td>Southern</td>
<td>Stroomer (1987); Oromo</td>
</tr>
<tr>
<td>n</td>
<td>v-final hosts+ V initial enclitics</td>
<td>Dutch</td>
<td>Morely (2015)</td>
</tr>
<tr>
<td>r</td>
<td>verb compounds, V_V</td>
<td>Anejom</td>
<td>Lynch (2000); see §2.1.3</td>
</tr>
<tr>
<td>kk</td>
<td>reduplication before V-initial stems</td>
<td>Trukese</td>
<td>Goodenough and Sugita (1980)</td>
</tr>
<tr>
<td>y</td>
<td>some vowel-initial reduplicants</td>
<td>Murut</td>
<td>Prentice (1971)</td>
</tr>
<tr>
<td>gw, dz</td>
<td>referential focus -i, after V final stems</td>
<td>Chammaro</td>
<td>Blust (2000)</td>
</tr>
<tr>
<td>r</td>
<td>after vowel final kin terms between V-final verbs and some V-initial suffixes</td>
<td>Southern Tati</td>
<td>Yar-Shater (1969)</td>
</tr>
<tr>
<td></td>
<td>Manam, Toqabaqita</td>
<td>Lichtenberk (2001); see §2.1.3.1</td>
<td></td>
</tr>
</tbody>
</table>

2.4.2 Findings

This typological survey found that consonant/zero alternations occur in many lan-
guages. Epenthesis is the most common type of consonant/zero alternation, while
alternations which result from deletion are quite rare. Austronesian languages were
overwhelmingly represented in the sample (44/80 languages, 55%), in particular in
cases of epenthesis (39/58, 67%). However, this does not necessarily mean that there are more consonant/zero alternations in Austronesian than in other language families, but could be because Austronesian is over-represented in the literature on these processes.

This survey identified characteristics which are cross-linguistically typical of epenthesis, deletion and morphologically conditioned consonant/zero alternations. These findings are summarised in (2.1).

Table 2.1: Typical characteristics of C/Ø alternations

<table>
<thead>
<tr>
<th>form</th>
<th>function</th>
<th>distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>epenthesis</td>
<td>ʔ, h, glides resolve vowel hiatus, V_V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>provide syllables with onsets at prosodic boundaries</td>
<td>#<em>V, V</em>#</td>
</tr>
<tr>
<td>deletion</td>
<td>varied fulfill restrictions on co-occurrence of Cs, or on what Cs can occur in a particular context</td>
<td>_C</td>
</tr>
<tr>
<td>morphologically conditioned</td>
<td>single language specific segment</td>
<td>V}{V</td>
</tr>
</tbody>
</table>

From this survey, it can be seen that consonant insertion in Amfo' an is typologically uncommon in several aspects. Consonant insertion constitutes two synchronic processes: epenthesis before enclitics (§3.3.1) and affixation which marks the right edge of the noun phrase (§3.3.3.2). Although these processes have different functions (one phonological, the other morphological), the two processes involve the same alternating segments (/ʤ/, /l/ and /ɡw/): this is previously unattested. Consonant insertion before enclitics, while it has a cross-linguistically common distribution (occurring between vowels), it involves previously unattested epenthetic segments.

Final consonant insertion, on the other hand, does not fit into any of the three categories used to classify these processes, which draw a distinction between phonological and morphological consonant/zero alternations. In Amfo' an, final consonant insertion is a morphophonological process: the distribution of the alternating consonants is determined by the boundaries of the noun phrase, while the quality of the inserted consonant is determined by the preceding vowel. The processes of consonant insertion in Amfo' an and how they can be analysed are described in detail in the next chapter.
Chapter 3

Consonant Insertion(s) in Amfo'an

3.1 Introduction

This chapter describes the forms, functions and distribution of consonant insertions in Amfo'an. Consonant insertion occurs after vowel final words in two environments: before vowel-initial enclitics (§3.3.1) and to mark the right edge of the noun phrase (§3.3.3). These processes are synchronically productive, applying to loan words (§3.5.2). However, there is no regular process of consonant insertion after /a/ final words. This is because there are almost no /a/ final nouns in Amfo'an; and their occurrence has been avoided both synchronically (§3.3.3.3) and diachronically (§5.4.1).

After describing the various contexts in which consonant insertion occurs, this chapter discusses how these processes can be classified (§3.7), demonstrating that consonant insertion before enclitics is a process of epenthesis, (§3.7.2), while NP-final consonant insertion is a phonologically conditioned affixation process (§3.7.3).

3.2 Forms

In Amfo'an, which consonant is inserted is determined by the preceding vowel: /ʤ/ occurs after /i/, /l/ after /e/ and /gw/ after /o/ and /u/; this is completely regular. /gw/ is realised as [gw] before a vowel and as [g] word-finally. For example, hau 'wood, tree' is realised as [hauɡw] before a vowel initial enclitic: [hauɡwe:] 'the tree' and as [hauɡ] noun-phrase finally.

3.3 Functions of consonant insertion

3.3.1 Consonant Insertion before vowel-initial enclitics

Consonant insertion occurs when a vowel final word is followed by a vowel initial enclitic to provide the enclitic with an onset, as all feet in Amfo'an must have an initial consonant (§1.5.2). Examples of consonant insertion after noun and verb hosts are given in (48).
If the host is of the shape VCV#, CV → VC metathesis occurs. In Nai’bais Amfo’an, (the dialect of Amfo’an described in this thesis) all vowel sequences which result from metathesis fully assimilate and are realised as a phonetically long vowel, while in other varieties of Amfo’an this does not occur. For example, in Nai’bais Amfo’an, oni+aa ‘honey’ + DEF → oondja [ʔoːndjə:] whereas in Naitbelak Amfo’an oni+aa → oindja. Examples of vowel final nouns with consonant insertion which have undergone metathesis are given in (49).

Consonant insertion does not occur if the clitic host is consonant final. Examples are given in (50).
CV → VC metathesis also occurs if the clitic host is CVC# final. This is demonstrated in (51).

\[
\begin{align*}
\text{(51)} & \quad kuan + =ee \rightarrow \text{kuane}e & \text{‘the village’} \\
& \quad neot + =ee \rightarrow \text{neote}e & \text{‘the time’} \\
& \quad tais + =ee \rightarrow \text{taise}e & \text{‘the cloth’} \\
& \quad puah + =ee \rightarrow \text{puahe}e & \text{‘the betel nut’} \\
& \quad luus + =ee \rightarrow \text{luuse}e & \text{‘the deer’}
\end{align*}
\]

3.3.2 Distribution of consonant insertion before enclitics

Consonant insertion before vowel initial enclitics is phonologically predictable; it only occurs after vowel final words. Additionally, which consonant is inserted is determined by the quality of the preceding vowel. This process is not restricted by word class and occurs after nouns, verbs, pronouns, demonstratives and numbers. It is phonologically predictable; occurring whenever a vowel final word is followed by a vowel-initial enclitic. In for example, consonant insertion is triggered by a final clitic host which is a pronoun, au (1sg), followed by a vowel initial enclitic =ee 3det, resulting in augwee ‘that’s me’. Similarly, in (52) the enclitic =een PERF triggers consonant insertion after tenu ‘three’, which has then undergone metathesis (see §4.4).

\[
\begin{align*}
\text{(52)} & \quad hai \ mi-honis \ anah \ teen=\text{gween} \\
& \quad hai \ mi-honis \ anah \ tenu=\text{een} \\
& \quad 1\text{EX} \ 1\text{EX-born child three}=\text{PERF} \\
& \quad \text{‘we have already born three children’}.
\end{align*}
\]

Consonant insertion also occurs to mark the right edge of the noun phrase. This process will be discussed in the following sections.

3.3.3 Consonant Insertion and the Noun Phrase

3.3.3.1 NP medial and final alternation in Amfo’an

In Amfo’an, all nominals have a distinct noun-phrase medial and final form. The phrase medial form is vowel final, while the phrase final form is consonant final. Medial and final forms are formed by consonant insertion and deletion in complementary environments. If a nominal is vowel final, such as asu ‘dog’, consonant insertion occurs to mark the NP-final form, asug. Examples are given in (53).
If a nominal has a final consonant, this final consonant is deleted in NP-medial position. Examples are given in (54).

(54)  
<table>
<thead>
<tr>
<th>NP-medial</th>
<th>NP-final</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>paku</td>
<td>pakug</td>
<td>‘lamp’</td>
</tr>
<tr>
<td>?bibī</td>
<td>?bibīg</td>
<td>‘goat’</td>
</tr>
<tr>
<td>fatu</td>
<td>fatug</td>
<td>‘stone’</td>
</tr>
<tr>
<td>bīfēe</td>
<td>bīfēel</td>
<td>‘woman’</td>
</tr>
<tr>
<td>flāʔe</td>
<td>flāʔel</td>
<td>‘coals’</td>
</tr>
<tr>
<td>nope</td>
<td>nopeel</td>
<td>‘clouds’</td>
</tr>
</tbody>
</table>

These processes are described in detail in the following sections.

### 3.3.3.2 NP-final consonant insertion

In (55) and (56) below, the medial and final forms of ume ‘house’ occur. In (55) ume occurs at the end of the noun phrase, and so consonant insertion occurs. Whereas in (56) ume is modified by bubuʔ, and so no consonant insertion occurs.

(55)  
in n-mees a/n-bi [ume-l]NP  
in n-mese n-bi ume-C  
3SG 3-alone\MET 3-LOC house-NP.EDGE  
‘s/he is alone at the house’

(56)  
hai anah a/n-toko n-bi [ume bubuʔ]NP  
hai anah n-toko n-bi ume bubuʔ  
1EX child 3-sit 3-LOC house round  
‘our children sat in a round house’

Isolated examples of the phrase medial and phrase final forms of nominals are given in (57).

(57)  
<table>
<thead>
<tr>
<th>NP-medial</th>
<th>NP-final</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>tani</td>
<td>tanidg</td>
<td>‘rope’</td>
</tr>
<tr>
<td>kaliti</td>
<td>kalitidg</td>
<td>‘scorpian’</td>
</tr>
<tr>
<td>kee</td>
<td>keel</td>
<td>‘turtle’</td>
</tr>
<tr>
<td>bid̑ae</td>
<td>bid̑ael</td>
<td>‘cow’</td>
</tr>
<tr>
<td>bnao</td>
<td>bnaog</td>
<td>‘boat’</td>
</tr>
<tr>
<td>neno</td>
<td>nenog</td>
<td>‘sky, day’</td>
</tr>
<tr>
<td>ʔlaʔu</td>
<td>ʔlaʔug</td>
<td>‘coconut husk’</td>
</tr>
<tr>
<td>nipu</td>
<td>nipug</td>
<td>‘fog’</td>
</tr>
</tbody>
</table>

34
One environment in which nouns are NP medial is when they are followed by an attributive modifier. Examples of a number of nouns followed by an attributive modifier are given in (58).

<table>
<thead>
<tr>
<th>citation form</th>
<th>modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>sisidʤ</code></td>
<td><code>meat</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
<tr>
<td><code>bidʤael</code></td>
<td><code>cow</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
<tr>
<td><code>nenoʤg</code></td>
<td><code>sky</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
<tr>
<td><code>asugʤ</code></td>
<td><code>dog</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
<tr>
<td><code>kaselʤ</code></td>
<td><code>foreigner</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
<tr>
<td><code>bnaoʤg</code></td>
<td><code>boat</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
<tr>
<td><code>fafidʤ</code></td>
<td><code>pig</code></td>
<td>+</td>
<td><code>metrical</code></td>
</tr>
</tbody>
</table>

3.3.3.3 NP medial consonant deletion

The NP-medial form of nominals which have a final lexical consonant are formed by final consonant deletion. The medial and final form of `baleʔ` ‘thing’ are shown in (59) and (60). In (59) `baleʔ` occurs at the end of the NP, and so its final consonant is present. Whereas in (60) it is modified by `pakel` ‘used’, and so its final consonant is deleted.

<table>
<thead>
<tr>
<th>citation form</th>
<th>modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>luuʤ</code></td>
<td><code>deer</code></td>
<td><code>metrical</code></td>
<td><code>wilddeer</code></td>
</tr>
<tr>
<td><code>manuʤ</code></td>
<td><code>betel pepper</code></td>
<td><code>metrical</code></td>
<td><code>betel pepper leaves</code></td>
</tr>
<tr>
<td><code>kautʤ</code></td>
<td><code>papaya</code></td>
<td><code>metrical</code></td>
<td><code>papaya blossoms</code></td>
</tr>
<tr>
<td><code>mukeʤ</code></td>
<td><code>lime</code></td>
<td><code>metrical</code></td>
<td><code>makrut lime</code></td>
</tr>
<tr>
<td><code>muʔitʤ</code></td>
<td><code>animal</code></td>
<td><code>metrical</code></td>
<td><code>wild animal</code></td>
</tr>
<tr>
<td><code>kuanʤ</code></td>
<td><code>village</code></td>
<td><code>metrical</code></td>
<td><code>villager</code></td>
</tr>
<tr>
<td><code>fee mnasiʔʤ</code></td>
<td><code>old woman</code></td>
<td><code>metrical</code></td>
<td><code>old sick woman</code></td>
</tr>
</tbody>
</table>

More examples of final consonant deletion before a modifier are given in (61).

<table>
<thead>
<tr>
<th>citation form</th>
<th>modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>t-eki</code></td>
<td><code>leʔ aal</code></td>
<td><code>[baleʔ]NP</code></td>
<td><code>thing</code></td>
</tr>
<tr>
<td><code>bale</code></td>
<td><code>pakel</code></td>
<td><code>use-C</code></td>
<td><code>use-thing.NP.MED use-NP.EDGE</code></td>
</tr>
</tbody>
</table>

If a nominal is aC# final, the final consonant is deleted and CV → VC metathesis occurs, followed by full assimilation of the vowels. For example, for `funan` ‘moon,
month’ final deletion results in *funa, which is /a/ final. Amfo’an avoids the occurrence /a/ final nominals (see §3.6 and §5.4.1); to avoid the occurrence of /a/ final nominals, metathesis occurs, and the NP-medial form is fuun. Examples of the citation and modified forms aC# final nominals are given in (62) below.

(62)  
<table>
<thead>
<tr>
<th>citation form</th>
<th>+C deletion</th>
<th>+metathesis</th>
<th>+vowel assimilation</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>utan</td>
<td>*uta</td>
<td>*uat</td>
<td>uut</td>
<td>‘vegetable’</td>
</tr>
<tr>
<td>bahak</td>
<td>*baha</td>
<td>baah</td>
<td>baah</td>
<td>‘fence’</td>
</tr>
<tr>
<td>penaʔ</td>
<td>*pena</td>
<td>*pean</td>
<td>peen</td>
<td>‘corn’</td>
</tr>
</tbody>
</table>

Examples of modified aC# final nominal, produced by consonant deletion and subsequent metathesis are given in (63) below.

(63)  
<table>
<thead>
<tr>
<th>citation form</th>
<th>+ modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>amaʔ</td>
<td>‘father’</td>
<td>babaʔ</td>
<td>‘grandparent’ → aam babaʔ ‘grandfather’</td>
</tr>
<tr>
<td>sulat</td>
<td>‘book’</td>
<td>metan</td>
<td>‘black’ → suul metan ‘black book’</td>
</tr>
<tr>
<td>nekaʔ</td>
<td>‘heart’</td>
<td>malinat</td>
<td>‘joyful’ → neek malinat ‘joyful heart’</td>
</tr>
</tbody>
</table>

3.4 Constructions marked by NP-final consonant insertion

This section draws up the analysis of Amarasi syntax in (Edwards 2016a: 243,256), demonstrating how consonant insertion marks certain syntactic constructions because it occurs at the right edge of the noun phrase. One example of this is that consonant insertion differentiates equative clauses and attributive phrases. Examples are given in (64).

(64)  
<table>
<thead>
<tr>
<th>noun + attribute</th>
<th>equative clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP[]ume anaʔ</td>
<td>‘a small house’</td>
</tr>
<tr>
<td>NP[]ume-ʔNP[]anaʔ</td>
<td>‘(the) house is small’</td>
</tr>
<tr>
<td>NP[]fafi anaʔ</td>
<td>‘a baby pig’</td>
</tr>
<tr>
<td>NP[]fafi-ʤNP[]anaʔ</td>
<td>‘(the) pig is small’</td>
</tr>
<tr>
<td>NP[]fafi fui-ʤ</td>
<td>‘a wild pig’</td>
</tr>
<tr>
<td>NP[]fafi-ʤNP[]fui-ʤ</td>
<td>‘(the) pig is wild’</td>
</tr>
</tbody>
</table>

The structures of fafi fui-ʤ and fafi-ʤ fui-ʤ are demonstrated in (65) and (66).

(65)  
```
S             NP
  |             |   |
  | N            N
  |   |   |
  | N  | N
  |   |   |
  | N  | N
  |   |   |
  | fafi fui-ʤ  |
```

(66)  
```
S             NP       NP
  |             |   |
  |             |   |
  | N            N
  |   |   |
  | N  | N
  |   |   |
  | N  | N
  |   |   |
  | fafi-ʤ      | fafi-ʤ |
  | fui-ʤ       | fui-ʤ  |
```
In (65) *fafi fui-ʤ* contains a single NP, with the second noun taking consonant insertion, which marks that it is the final member of the NP. *fafi* does not take consonant insertion, marking that it is medial in the NP. As a result (65) has an attributive reading.

On the other hand, in example (66) there are two NPs each containing only a single noun. As each of these nouns is the only noun of its NP, each is also the final N of the NP, and as a result takes consonant insertion.

The minimal pairs above have identical stress and intonation; forming one phonological phrase. These examples demonstrate that whether or not consonant insertion occurs is not predictable based on phonological phrase boundaries, but according to syntactic phrase boundaries.

Similarly, consonant insertion marks possessive constructions in which there are two NPs. In (67), the possessor NP, *uisneno-'God'* is the specifier of the possessed NP *alekot-'goodness*', with an optional possessive pronoun, *in* 3SG occurring between the possessor and possessed NPs. Consonant insertion marks the boundary between the possessor and possessed NPs.

(67)  

uisneno- in a-leko- 
uisneno-C in a-leko-t 
god-NP.EDGE 3SG NMLZ-good-NMLZ 

‘God’s goodness’

The structure of (67) above is illustrated in (68). (Following Edwards (2016a)’s analysis of possession in Amarasi)

(68)  

NP  

| PossP  |

NP  NP  Poss  N  N  N  uisneno- in alekot

Consonant insertion marks the boundary of the possessor NP (if the noun is V-final) even if there is no possessive pronoun. An example of this is given in (69) and illustrated in (70).

(69)  

in fee- ume- 
in fee-C ume-C 
3SG wife-NP.EDGE house-NP.EDGE
(70) np
   possp n
   | | np n
   possp n
   | | np n
   | | n
   | n
   in fee-l ume-l
   3sg wife house

(69) looks very similar to an equative clause, as in (64). However the context indicates that it is not a equative clause; ‘His wife is house’ is not a possible reading. Similarly, (71) below could be interpreted as an equative clause, however the nature of the nominals, umel ‘house’ and balel ‘place’ indicates that it is not (‘we return to the house is location’ is not a possible translation).

(71) m-fani m-o e ume-l bale-l
m-fani m-o e ume-C bale-C
1ex-return 1ex-dat house-np.edge place-np.edge
‘we return to the house’s location’

Consonant insertion also indicates the difference between cardinal and ordinal numbers. An example is given in (72) and (73).

(72) np[neno mese?] ‘first day’ (73) np[nenog] numb[mese?] ‘one day’

The structures of neno mese? and nenog mese? are illustrated in (74) and (75) below.
In (74) the nouns and number modifier occur in the same NP, and as result the noun occurs in medial form (i.e. no consonant insertion). This has an ordinal meaning. On the other hand, in (75), the noun is in a separate separate NP from the numeral. Because it is the only N in the NP, it occurs in final form, with consonant insertion. This has a cardinal meaning.

Similarly, the medial and final forms of consonant-final nominals differentiate cardinal and ordinal numbers. For example, *fuun haaʔ* means ‘the fourth month’ while *funan haaʔ* means ‘four months’. The structures of *fuun haaʔ* and *funan haaʔ* are illustrated in (76) and (77).

![Diagram](image.png)

In (76) *funan* occurs medially in the noun phrase, so occurs in medial the form *fuun*. This has an ordinal meaning. Whereas in (77), *funan* is the only noun in the NP, it occurs in final form; this has a cardinal meaning.

### 3.5 Consonant Insertion after verbs

In Amfo’an, objects occur after the verb. The object NP is embedded in the verb phrase. This structure is illustrated for *in n-inu kofi-dʒ*, ‘s/he drinks coffee’ in (78).
In (78), *kofi* is the only noun in the NP, and so occurs in the NP-final form, with consonant insertion. However, in Amfo’an, consonant insertion also occurs after vowel-final verbs with no noun in the noun phrase. In this situation, consonant insertion indicates that the verb has an object. Examples of vowel final verbs with and without consonant insertion are given in (79).

\[
\begin{array}{ll}
(78) & S \\
 & NP \quad VP \\
 & | \\
 & N \quad V \quad NP \\
 & | \quad | \quad | \\
 & N \quad V \quad N \\
 & | \quad | \quad | \\
 & | \quad | \quad | \\
 & in \quad n-inu \quad kofi-dʒ \\
\end{array}
\]

\[
\begin{array}{ll}
(79) & au ?-lomi ‘I like’ \quad au ?-lomidʒ ‘I like it/him/her’ \\
 & in na-hine ‘s/he knows’ \quad in na-hinel ‘s/he knows it’ \\
 & in n-inu ‘s/he drinks’ \quad in n-inug ‘s/he drinks it’
\end{array}
\]

Like the other forms of phrase-final consonant insertion discussed in this chapter, I analyse this consonant insertion as marking the right edge of the noun phrase. In this case, the NP is otherwise empty and the value of the inserted consonant is determined by the proceeding vowel, which is the final vowel of the verb. This is illustrated in (80) below.

\[
\begin{array}{ll}
(80) & S \\
 & NP \quad VP \\
 & | \\
 & N \quad V \quad NP \\
 & | \quad | \quad | \\
 & N \quad V \quad N \\
 & | \quad | \quad | \\
 & | \quad | \quad | \\
 & in \quad n-inu \quad Ø-g \\
\end{array}
\]

The structure of (80) is the same as of a regular transitive verb, such as in (78); the only difference is that in (80) there is a null noun in the object NP.
Consonant insertion marks some possessive constructions, as discussed in §3.4. The structure of the possessive construction *binon muti? in kofi-ʤ* ‘the white girl’s coffee’ is given in (81).

(81) 

```
NP
   PossP  N
   /   \\
  NP  Poss
   |    |
binon muti?  in  kofi-ʤ
```

In (81) consonant insertion occurs after *kofi* because it is the only noun in the noun phrase, and therefore final noun in the noun phrase. However, consonant insertion also marks possessive constructions when there is an empty possessed NP. This NP is marked by consonant insertion. An example of this kind of possessive construction is given in (82) below.

(82)  

```
binon muti? ini-ʤ
binon muti? ini-C
girl  white 3SG-NP.EDGE
'(the) white girls’ (answering question about whose bag it was) observation, 10/08/2017
```

The syntactic structure of (82) is illustrated in (83) below. This structure is the same as (81), the only difference being that in (83) there is a null noun in the possessed NP.

(83) 

```
NP
   PossP  N
   /   \\
  NP  Poss
   |    |
binon muti?  ini  Ø-ʤ
```

### 3.5.1 Distribution of Final consonant insertion

Final consonant insertion is restricted to particular word classes (nominals and verbs) at noun phrase boundaries. Although the quality of the consonant is predictable from the preceding vowel, whether or not final consonant insertion occurs cannot be predicted from its phonological environment, such as phonological phrase boundaries. This is illustrated by minimal pairs such as *neno haa?* ‘fourth day’ and *nenog haa?* ‘four days’ which have identical stress and intonation and form one phonological phrase.
3.5.2 Synchronic productivity

Both processes of consonant insertion in Amfo’an are synchronically productive, occurring after loan words. Examples of loan words with final consonant insertion are given in (84).

(84)  
<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>kofi</td>
<td>‘coffee’</td>
<td>from Dutch koffie</td>
</tr>
<tr>
<td>teel</td>
<td>‘tea’</td>
<td>from Malay teh</td>
</tr>
<tr>
<td>fotog</td>
<td>‘photo’</td>
<td>ultimately from English photo</td>
</tr>
<tr>
<td>otog</td>
<td>‘car’</td>
<td>from Dutch auto</td>
</tr>
<tr>
<td>kulug</td>
<td>‘teacher’</td>
<td>from Malay guru</td>
</tr>
</tbody>
</table>

Similarly, borrowed vowel final nouns also undergo consonant insertion and metathesis before a vowel initial enclitic, demonstrated in (85) below.

(85)  
<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>suku</td>
<td>‘one tribe’</td>
<td>from Malay suku, ‘tribe/clan’</td>
</tr>
<tr>
<td>kilo</td>
<td>‘one kilometre’</td>
<td>ultimately from English kilo</td>
</tr>
<tr>
<td>kofi</td>
<td>‘one coffee’</td>
<td>from Dutch koffie</td>
</tr>
</tbody>
</table>

Such examples all but rule out an analysis of consonant insertion in Amfo’an as a case of deletion of underlying consonants. See §3.7.1 for more details.

3.6 What about /a/?

There is no regular pattern of synchronic consonant insertion after /a/ final words, either before enclitics or NP-finally. When the host of a vowel-initial enclitic is Ca#, no consonant insertion occurs, as demonstrated in (86).

(86)  
<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>paha</td>
<td>‘one land’</td>
<td></td>
</tr>
<tr>
<td>na-tona</td>
<td>‘tell him/herself’</td>
<td></td>
</tr>
<tr>
<td>ta-tefa</td>
<td>‘met already’</td>
<td></td>
</tr>
<tr>
<td>na-mnaha</td>
<td>‘already hungry’</td>
<td></td>
</tr>
</tbody>
</table>

No consonant insertion occurs after /a/ final nominals NP-finally. This is because there almost no /a/ final nouns in Amfo’an, which would trigger this process: of the 426 nouns in my dictionary, two are /a/ final. These are given in (87).

(87)  
<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>paha</td>
<td>‘land’</td>
</tr>
<tr>
<td>tafa</td>
<td>‘society’</td>
</tr>
</tbody>
</table>

These lexical items are highly restricted in their usage: paha is almost almost always cited as paah (metathesised form) and tafa only occurs in ritual speech. This lack of consonant insertion can be accounted for diachronically: it seems that there were not enough /a/ final words to result in a regular synchronic process of insertion after /a/. Both synchronically (§3.3.3.3) and diachronically (§5.4.1), Amfo’an demonstrates a tendency to avoid /a/ final nominals: there are so few /a/ final words in Amfo’an words because many historically /a/ final words underwent an *a > /e/ sound change (§5.4.1).
However, if the host of a vowel-initial enclitic is /Va/ final, /gw/ is inserted. However, there are only two lexical items which attest this process of this, given in (88).\footnote{I tried to elicit other examples of Va final words with a vowel initial enclitic but had no success.}

\begin{align*}
\text{na-bgua} & \ + \ = \text{een} \rightarrow \text{nabguagween} \quad \text{‘already gathered’} \\
\text{na-tgoa} & \ + \ = \text{een} \rightarrow \text{natgoagween} \quad \text{‘already filled’}
\end{align*}

For discussion of why /gw/ may be inserted in this context, see (§4.2.4).

### 3.7 Classification

In §2.4.2, I demonstrated that consonant insertion in Amfo’an does not fit neatly into the categories which have previously been used to classify similar phenomenon (epenthesis, synchronic deletion or as morphologically conditioned) because it consists of two synchronic processes involving the same segments, and because final consonant insertion is a morphophonological process. In this section, I examine how Amfo’an consonant insertion can be classified. I examine alternate analyses for each process, such as that consonant insertion is actually a case of deletion (§3.7.1), or that it is a fulfillment of a template (§3.7.3.1). Having examined alternative analyses, I contend that consonant insertion before enclitics is a process of epenthesis, (§3.7.2), while NP-final consonant insertion is a phonologically conditioned affixation process (§3.7.3).

#### 3.7.1 Are the segments underlying?

If the ‘inserted’ segments were underlying, this would mean /ʤ/, /l/, and /gw/ are part of each lexical item and that their occurrence is either a case of deletion or latent segments. A deletion analysis of the occurrence of /ʤ/, /l/, and /gw/ entails that the segments are part of each lexical item, and occur when a vowel-initial enclitic is attached or in phrase-final position, but are deleted phrase medially.

However, if /ʤ/, /l/, and /gw/ were part of the lexical items, we would also expect consonant-final forms of pronouns, demonstratives and numbers, as /ʤ/, /l/, and /gw/ occur when an enclitic is attached to these word classes. For example, /gw/ occurs when then the enclitic =ee (3DET) is attached to au (1SG), resulting in \textit{au=gwee}. However, this analysis would predict that consonant final forms of pronouns, demonstratives, and numbers, such as *\textit{aug} 1SG, or *\textit{tenug} ‘three’ would also occur when these words are phrase final. Such forms do not occur; as a result this analysis does not account for all the data in a consistent way.

A deletion analysis would also predict that the value of the alternating segments are not phonologically predictable because it is part of the lexical item. However, the occurrence /ʤ/, /l/, and /gw/ is predictable from its environment (§3.2), indicating that the occurrence of the segments is phonologically conditioned. As a result, it cannot be analysed as deletion. Diachronic evidence also indicates that the consonants have been added (see §5.1 and §5.2).
As /ʤ/, /l/, and /ɡw/ are not underlying but inserted, this indicates that consonant insertion in Amfo’an is not a case of latent segments. Final latent segments are optionally realized only before vowel-initial words (Staroverov 2014) whereas the inserted consonants in Amfo’an are inserted word-finally and before other consonants, such in the case of nenog meseʔ ‘one day’.

3.7.2 Consonant Insertion before vowel-initial enclitics

Consonant insertion in Amfo’an before enclitics fulfills the criteria of epenthesis (§2.1.1): it is phonologically predictable (de Lacy and Kingston 2013), it is not morphologically restricted (Staroverov 2014), and demonstrates synchronic productivity (§3.5.2). It demonstrates alternation with Ø (Morely 2012), consistently occurring in a certain phonological environment (before vowel-initial enclitics), and not in others. A typical example can be seen by the contrast between in (89). In (89a), oe ‘water’ occurs with the vowel-initial enclitic =aa (0GEN), triggering consonant insertion. On the other hand, in (89b) oe does not occur with a vowel-initial enclitic, and as a result, no consonant insertion occurs.

(89)  
a. oe=laa  
water=0GEN  
‘the water’  
b. oe  
maputuʔ  
water hot  
‘hot water’

3.7.3 Final Consonant Insertion

Final consonant insertion, however, is a morphophonological process determined by noun phrase boundaries. In this section, I examine the suitability of different analyses, showing that final consonant insertion is best analysed as an affix.

3.7.3.1 Template + process morphology analyses

Final consonant insertion could be analysed as a result of template or as a case of process morphology. In both of these types of analysis, the alternating consonant is part of the stem.

Templates are morphological constructions which constrain the phonological shape of the derived stem (Inkelas 2014: 84). Final consonant insertion in Amfo’an could be analysed as the fulfillment of a template in two ways. The first is to would be to analyse all words as having an underlying structure which includes empty final consonants, (as proposed by Edwards (2016a: 166,177). This analysis entails that that all seemingly vowel-final nominals end with an empty consonant, which is realised when it occurs in phrase-final position.

The second way would be to argue that there is a template which is being imposed on nominals which specifies the phonological shape of final and non-final forms as consonant and vowel final, respectively. This analysis predicts that the final-form
template has a final consonant, while the medial form does not. While this analysis correctly predicts that all nominals in Amfo’an have alternating medial and final forms (§3.3.3.1), this analysis is not suitable for analysing consonant insertion after pronouns and verbs. This is because a template analysis entails that the consonant is part of stem. However, when consonant insertion occurs after pronouns and verbs, the inserted consonant belongs to a different syntactic phrase from that of the stem to which it is attached. This structure is illustrated for *auʔ-lomi-ʤ* in (90).

(90)  
\[
\text{\textbf{S}}
\]
\[
\text{\textbf{NP}} \quad \text{\textbf{VP}}
\]
\[
\text{\textbf{N}} \quad \text{\textbf{V}} \quad \text{\textbf{NP}}
\]
\[
\text{\textbf{N}} \quad \text{\textbf{V}} \quad \text{\textbf{N}}
\]
\[
\text{\textbf{au}} \quad \text{\textbf{ʔ-lomi}} \quad \text{\textbf{Ø-ʤ}}
\]

1sg 1sg-like

*I like it/her/him*

In (90) -ʤ belongs to the embedded noun phrase, while the stem to which it is attached is part of the verb phrase. As a result, the inserted consonant, ʤ must be analysed as a separate morpheme from the preceding word.

Similarly if Amfo’an consonant insertion were analysed as a case of process morphology, this would mean that the alternating consonant would be analysed as part of the stem. Process morphology refers to when a morphological process is manifested as a phonological process rather than concatenation of morphemes (Inkelas 2014: 60). An example of process morphology in English is that stress shift marks the derivation of nouns from certain verbs:

(91)  
\[
\text{\textit{conduct}} \rightarrow \text{\textit{cond}}\textit{uct}
\]
\[
\text{\textit{abstract}} \rightarrow \text{\textit{ab}}\textit{stract}
\]
\[
\text{\textit{record}} \rightarrow \text{\textit{ré}}\textit{cord}
\]

(Inkelas 2014: 61)

A process morphology analysis of final consonant insertion Amfo’an would entail that in Amfo’an one segment is inserted to create the NP-final form of nominals. Like in a template analysis, this analysis is not suitable for cases of consonant insertion when the the inserted consonant belongs to a different syntactic phrase from that of the stem to which it is attached.
3.7.3.2 Is it a clitic or affix?

Final consonant insertion must be analysed as an independent morpheme. There are two ways this can be done; it can be analysed as a clitic or an affixation process. In this section I examine the typical characteristics of clitics and affixes, concluding that final consonant insertion is best analysed as an affix.

Clitics are typically defined as syntactically independent words which are phonologically bound to their host (Kroeger 2005, Dixon and Aikhenvald 2003). What is and is not a clitic is difficult to determine; there is no set of universally applicable criteria for defining clitic (Haurholm-Larsen 2015). However, there are various characteristics of clitics which have been proposed, and which will be used in this discussion. The most common characteristics of clitics are summarised in (92).

<table>
<thead>
<tr>
<th>characteristic</th>
<th>reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>exhibit a low degree of selection; able to attach to words of any class</td>
<td>Haurholm-Larsen (2015)</td>
</tr>
<tr>
<td>cannot form an independent phonological word (i.e. cannot occur in isolation)</td>
<td>Zwicky and Pullum (1983)</td>
</tr>
<tr>
<td>do not bear stress</td>
<td>van Gijn and Zúñiga (2014)</td>
</tr>
<tr>
<td>can attach to other clitics</td>
<td>Green and Morrison (2016)</td>
</tr>
</tbody>
</table>

While -ʤ, -l and -g cannot form independent phonological words, they demonstrate a higher degree of selectivity than enclitics in Amfo’an, which attach to nouns, pronouns, verbs, demonstrative and nouns; whereas -ʤ, -l and -g only attach to nouns and verbs (§3.5.1). This higher degree of selectivity indicates that -ʤ, -l and -g are an affix. Characteristic of an affix, they appear only appear with stems of a certain word classes (Kroeger 2005). However, the distribution of -ʤ, -l and -g is determined by the boundaries of noun phrases, rather than by individual words. For example, in (93) below there are multiple modifiers in an NP. Consonant insertion only occurs after the final nominal, fui ‘wild’.

(93) na-peni le? aal [sisi fafi fui-ʤ]NP na-peni le? aal sisi fafi fui-C 3-get rel all\\met meat pig wild-NP-EDGE

‘get wild pig meat’

As its distribution is determined by syntactic phrase boundaries, this process is best analysed as a phrasal affix. Phrasal affixes have most of the properties of a normal affix: they are always attached to another word; they do not fit into any of the established word classes of the language, and tend to express grammatical rather than lexical meaning (Kroeger 2005). However, the position of this kind of affix is determined by the boundaries of a particular kind of syntactic phrase (Kroeger 2005). The occurrence of this suffix is also determined by the phonological shape of its host; it only occurs at the right edge of the noun phrase if the final nominal is vowel-final, and its form is determined by the quality of the preceding vowel.
3.8 Summary

In Amfo’an, consonant insertion occurs after vowel final words in two environments: before vowel-initial enclitics (§3.3.1) and to mark the right edge of the noun phrase (§3.3.3). Consonant insertion constitutes two synchronic processes; the first is a process of epenthesis, while the second is a phonologically conditioned affixation process. NP-final consonant insertion occurs in conjunction with NP-medial consonant deletion, such that all all nominals have a distinct vowel-final NP-medial form and consonant final NP-final form. The distribution of the inserted consonants in Amfo’an (/ʤ/, /gw/ and /l/) is synchronically regular and predictable. A synchronic account of these processes is presented in chapter 4.
Chapter 4

Synchronic Account

This chapter presents a synchronic analysis of the two processes consonant insertion in Amfo’an, having established in §3.7.3.1 that these processes are not amenable to analysis as fulfillment of a template. This chapter combines the formalism of Auto- segmental phonology and Optimality theory to account for why the two processes of consonant insertion involve the same segments, and how consonant insertion interacts with other phonological processes. This theoretical approach is taken because Auto- segmental Phonology and Optimality Theory model different aspects of phonology; there are several aspects of Amfo’an phonology that would be difficult to account for using either model alone. Auto- segmental Phonology is primary concerned with phonological representations, while Optimality Theory is primarily concerned with computation; that is, how well-formedness conditions interact and result in phonological processes (Downing 2009: 1).

Auto- segmental Phonology models how prosodic structure and the representation of features predict phonological processes in Amfo’an, while OT constraints capture the phonological requirements which motivate the insertion of consonants before enclitics, and which motivate the selection of the epenthetic segments. This chapter contends that the consonant insertion processes in Amfo’an are optimally analysed as epenthesis and affixation of an underspecified consonant, into which the features of the preceding vowel spread. This analysis correctly predicts that the two processes involve the same segments. This chapter also demonstrates how the internal structure of prosodic words triggers metathesis before vowel initial enclitics (§4.4). The account presented in this chapter concludes by demonstrating how phonological processes in Amfo’an identify some predictive limitations of standard Optimality Theory; emphasising the need for models which can better account for these processes.

4.1 Background

The analysis presented in this chapter combines Auto- segmental phonology and Optimality Theory to account for consonant insertion and associated phonological pro-
Each approach is concerned with different aspects of phonology, and as a result are able to account for different aspects of consonant insertion in Amfo’an. The following sections provide a brief overview of each theory, emphasising the advantages and disadvantages of each approach.

### 4.1.1 Autosegmental phonology

Autosegmental phonology posits that the different aspects of phonological representation (tones, features, segments) exist autonomously, each on its own independent tier, organized by a central timing skeleton (Shih and Inkelas 2018). These different tiers are connected by association lines (Goldsmith 1976), which can be altered by phonological rules (Clements and Ford 1979). Autosegmental spreading is a type of rule by which the feature of one segment spreads onto an adjacent segment, causing the two segments to assimilate (McCarthy 2004: 1). Alternatively, if a feature spreads into an unassociated slot in the timing tier, this results the insertion of a segment. An Autosegmental spreading analysis of Amfo’an entails that the inserted segments are a result of vowel features spreading into an unassociated consonant slot. As a result, this inserted consonant shares the values of the preceding vowel. This spreading and insertion is illustrated using the example *fafi*=e.es ‘one pig’ in in (94) and (95).

\[
\begin{align*}
(94) & \quad \text{Ft1} = \text{Ft2} \\
& \quad \sigma \sigma \sigma \sigma \\
& \quad \text{C V C V C V C V C} \\
& \quad \text{fa fi e e s} \\
& \quad [+\text{COR}] \\
& \quad [+\text{HIGH}] \\
(95) & \quad \text{Ft1} = \text{Ft2} \\
& \quad \sigma \sigma \sigma \sigma \\
& \quad \text{C V C V C V C V C} \\
& \quad \text{fa fi dʒ e e s} \\
& \quad [+\text{COR}] \\
& \quad [+\text{HIGH}] 
\end{align*}
\]

This is the analysis proposed by Edwards (2016a) for a very similar process in Amarasi, another variety of Meto. This model predicts that only inserted consonants in this environment share the features of the preceding vowel (and not all VC sequences). However, it does not model what phonological requirement motivates the insertion of consonants, or why feature spreading occurs in order to fill the the empty consonant instead of another consonant.

### 4.1.2 Optimality theory

Optimality Theory (Prince and Smolensky 1993) posits that phonological processes result as the best satisfaction of conflicting constraints. These constraints predict the optimal output (surface form) from an input (underlying form); the ‘optimal’ output will have the least serious violations of the constraints (de Lacy 2007). Constraints are

---

1This approach has was proposed by McCarthy (2011) to account for assimilation phenomena which are difficult to capture in classical OT.
universal, however different languages have different constraint rankings (Downing 2009). When possible outputs are evaluated, lower ranked constraints may be violated so that higher ranked constraints are satisfied (Prince and Smolensky 1993).

In OT, there are two main types of constraints, markedness constraints and faithfulness constraints. Markedness constraints impose well-formedness requirements on the output, such as that all syllables must have an onset (Prince and Smolensky 1993). Faithfulness constraints require that segments present in the input must be present in the output (Downing 2009). In OT, any differences between input and output are motivated by highly ranked markedness constraints; any changes will result in minimally marked structures (Downing 2009). A major strength of Optimality theory is that it models the relationship between different processes that serve the same purpose by proposing that they are the result of the same constraints (Zuraw 2003). By comparing possible outputs and judging them, OT demonstrates why one processes occurs, and not others to avoid a dispreferable structure (van Oostendorp 2018). However, OT limits the abstractness of inputs by posing that there are only two levels of representation in phonology: inputs and outputs, with no intermediate levels of representation, such as prosodic structure, or unspecified segments (Downing 2009: 1). However, in Amfo’an, we find that underspecified segments and features best account for the insertion of /ʤ/, /gw/ and /l/ and that the internal structure of prosodic words causes metathesis before enclitics (§4.4).

4.1.3 Combining Autosegmental Phonology and Optimality Theory

As many have noted, Optimality theory and Autosegmental phonology represent different aspects of phonology, and should not be seen as incompatible opposing theories (Downing 2009). The account presented in this chapter follows the approach of McCarthy (2011), of combining Automsgamental spreading with OT. This approach was proposed by McCarthy to account for assimilation phenomena. However, it is also appropriate for accounting for the Amfo’an data, because it provides a way for accounting for derived environment affects, phonological processes which only occur after the application of another process (Kiparsky 1973, Blaylock 2017) (consonant insertion before enclitics and subsequent metathesis are both derived environment affects, see discussion below). One change is made at a time, and each change is evaluated in a separate tableau. The input of each tableau is the result of the previous change. The prosodic structure of the input before and after each change is represented in autosegmental diagrams which accompany each tableau.

4.2 Consonant insertion before enclitics

Consonant insertion before vowel-initial enclitics in Amfo’an fulfills the accepted criteria of consonant epenthesis: it occurs in a phonotactically well-defined environment; which segment occurs is phonologically predictable and the process is not morphologically restricted (§3.7.2).
This epenthesis is motivated by a requirement that all feet begin with a consonant (see §1.5.2 for evidence of feet as a distinct domain of prosodic structure in Amfo’an). The vowel initial enclitic has two vowels and so comprises a foot; consonant insertion provides it with an onset. This requirement that all feet have an onset also also motivates word-initial [ʔ] epenthesis. The epenthetic consonant which occurs before a vowel initial enclitic is most similar to the preceding vowel in terms of features (see (96)). The featural similarities between the inserted consonants and corresponding vowels are outlined in (96).2


Inserted consonants are the only segments which obligatorily shares the place features of the vowels; no other VC sequences are subject to this condition. All other possible VC sequences are attested in lexical roots, however some are much more frequent than others. Of most frequently occurring VC sequences (an, aʔ, en, ak and eʔ), none of the consonants and vowels have the same place features. All of the different possible VC sequences in Amfo’an and their attestations in lexical roots are given in (97).

\[ \begin{array}{c|ccccccccc} \hline p & b & t & k & g & ? & f & s & m & n \\ \hline \text{i} & 3 & 4 & 24 & 19 & 0 & 22 & 8 & 24 & 12 \ 
\text{e} & 12 & 22 & 42 & 35 & 0 & 46 & 8 & 31 & 27 \ 
\text{a} & 6 & 8 & 21 & 19 & 3 & 31 & 6 & 6 & 43 \ 
\text{o} & 7 & 2 & 26 & 19 & 3 & 41 & 9 & 20 & 9 \ 
\text{u} & 10 & 7 & 26 & 19 & 3 & 41 & 9 & 20 & 9 \\ \hline \end{array} \]

The quality of the epenthetic segment is always determined by the final vowel of the host. This is the case whether a sequence of three or four vowels results from the attachment of clitic to the host.

\[ \begin{array}{c|c|c|c|c|c|c|c} \hline \text{host+ clitic} & \text{+ consonant insertion} & \text{examples (before metathesis)} \\ \text{VV+} & \text{VV} & \text{VVCVV} & \text{oelee} \\ \text{CVV+} & \text{VV} & \text{CVV CVVV} & \text{faidg} \text{ee} \\ \text{CVCV+} & \text{VV} & \text{CVVV} & \text{fatu} \text{gwe} \text{e} \\ \hline \end{array} \]

However, while the inserted consonants in Amfo’an are featurally similar to the preceding vowels, glides would be more featurally similar, and would be expected in this context. Why glides are not inserted in this context is discussed in detail in §4.3.

\[ ^2\text{This analysis assumes that front vowels are [+CORONAL] and back vowels are [+DORSAL]} \quad \text{(Clements 1991, Clements and Hume 1995).} \]
4.2.1 Proposed analysis

This account follows (Edwards 2016a)’s analysis of Amarasi in treating consonant insertion in Amfo’an as a derived environment effect. That is, a phonological process which applies only after the application of another process (Kiparsky 1973, Blaylock 2017). If consonant insertion happened in a single derivation, this would mean that there is a default segment which is inserted, which assimilates. However, there is no evidence that there is a default segment that is inserted in this context; if there was it would be would be expected after /a/ final words (see §4.2.3).

Consonant insertion in Amfo’an is also treated as derived environment effect as it is only inserted consonants in Amfo’an which are subject to a requirement that they share place and height features with the preceding vowel (see (97) above). If this consonant insertion was not treated as a derived environment affect, an AGREE constraint could be used to account for featural similarities between adjacent segments (de Lacy 2006: 87). \textit{AGREE}[F] specifies that if a segment bears the feature [F], then the immediately preceding or following segment must also bear that feature (McCarthy 2011). However, using this constraint to account for Amfo’an would mean that all front (coronal) vowels must be followed by coronal consonants, and all back vowels are followed by dorsal consonants. Even if it was specified that \textit{AGREE} only applied at clitic boundaries, this still would not account for the Amfo’an data, as segments with different feature values occur at clitic boundaries in other contexts, such as \textit{hai m-toti=koo} ‘we ask you’ in which front (coronal) vowel is followed by a dorsal consonant at the clitic boundary.

Featural spreading into an unspecified consonant captures why the the inserted consonant and preceding vowel are featurally similar, but not all VC sequences in the language. Firstly, an unspecified C is added to the underlying representation to fulfill the requirement that all feet have onsets (§1.5.2). This segment is then linked to the preceding vowel, and the features of the vowel in this syllable spread into the unspecified consonant. This happens because the inserted consonants is subject to a constraint that requires that unspecified consonants share features with the preceding vowel, \textit{share}[F] (McCarthy 2011). This means that features spread from the preceding vowel to the unspecified consonant, while all other consonants and vowels remain the same. This process is illustrated in (99) for \textit{fai=ees} $\rightarrow$ \textit{faiʤees}.

(99) 
\begin{align*}
\begin{aligned}
a. \quad \text{input} & \quad \text{b. + unspecified C} \\
\text{Ft1} & = \text{Ft2} & \text{Ft1} & = \text{Ft2} \\
\sigma & \sigma & \sigma & \sigma \\
\bigwedge & \bigwedge & \bigwedge & \bigwedge \\
C & V & V & C \\
\bigwedge & \bigwedge & \bigwedge & \bigwedge \\
f & a & i & e & e & s \\
\end{aligned}
\end{align*}

52
The constraints that predict consonant insertion in Amfo’an are listed in ranked order in (100).

(100)  a. **ONSET, Ft**: Feet have onsets (McCarthy and Prince 1994)
       b. **SHARE:[place, height]** unspecified segments share place and voice with preceding segment
       c. **MAX-IO**: every segment of the input has a correspondent in the output (McCarthy and Prince 1995)
       d. **DEP-IO**: every segment in the output a correspondent in the input (McCarthy and Prince 1995)

These constraints are used to illustrate hau=ees → haugwees ‘one tree’ and the intermediate stages of this processes. The first derivation is the insertion of an unspecified C: hau=ees → hauCees.

The input of this change is illustrated in (101a) and the output is illustrated in (101b). In the output, an unspecified consonant is added to the underlying form to satisfy ONSET, Ft. Different possible outputs which could satisfy ONSET, Ft are evaluated in (102).

(101)  a. \[ Ft1 = Ft2 \]
       \[ \sigma \sigma \sigma \sigma \]
       \[ C V V C V V C \]
       \[ fa i e e s \]
       \[ [+COR] \]
       \[ [+HIGH] \]
       b. \[ Ft1 \]
       \[ \sigma \sigma \sigma \sigma \]
       \[ C V V C V V C \]
       \[ h a u e e s \]

(102)

<table>
<thead>
<tr>
<th></th>
<th>hau=ees</th>
<th>ONSET, Ft</th>
<th>SHARE[place, height]</th>
<th>MAX-IO</th>
<th>DEP-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>hau=ees</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>hauCees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The second derivation is conversion of the unspecified consonant into a /gw/: hauCees → haugwees.

Having chosen hauCees as the optimal satisfaction of ONSET, Ft., the input of this change is illustrated in (103a) and the output is illustrated in (103b). In (103a) /u/ is
linked with the underspecified C and its place features spread, resulting in insertion of /gw/ in (103b).

(103) a. Ft1 Ft2

\[
\sigma \sigma \sigma \sigma \\
C V V C V V C \\
h a u C e e s
\]

b. Ft1 Ft2

\[
\sigma \sigma \sigma \sigma \\
C V V C V V C \\
h a u g w e e s
\]

In (104) we see that insertion of /gw/ is the optimal satisfaction of SHARE [place, height], because no of the other consonants (in the other candidates) share the place and height features of /u/.

(104) | haucEes | ONSET, Ft | SHARE [place, height] | MAX-IO | DEP-IO |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>hauʔees</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hauhees</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hautees</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>haules</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*aʰ haugwees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2.2 Word-initial [ʔ] insertion

In word initial position, there is no preceding vowel for the a unspecified foot initial consonant to link to, and so feature spreading cannot occur. As a result, default of epenthesis of [ʔ] occurs, as [ʔ] is minimally marked (§2.2). This process is shown below for akum ‘dew’.


\[
\sigma \sigma \\
C V C V C \\
a k u m
\]

\[
\sigma \sigma \\
C V C V C \\
a k u m
\]

\[
\sigma \sigma \\
C V C V C \\
? a k u m
\]

4.2.3 No insertion after /a/

Insertion of an unspecified consonant also accounts for the lack of insertion after /a/. As for other vowel final words followed by enclitic, firstly an unspecified C is inserted to satisfy ONSET, Ft. This is process is demonstrated for paahees ‘one land’ in (106). The first derivation is the insertion of an unspecified C: paha=ees → pahaCees.

(106)
However, there are no features which can spread into the unspecified C as /a/ has no place features (Clements and Hume 1995, de Lacy 2006). The only way the C can be filled is by CV → VC metathesis. For example, in the case of *paha, metathesis results in paah. The final consonant, /h/ is associated with the unspecified C and provides the enclitic with an onset. To account for this metathesis, an additional constraint needs to be added:

(107) \textsc{linearity} \ S1 \text{ is consistent with the precedence structure of } S2 \text{ and vice-versa (no metathesis)} \ (\text{McCarthy and Prince 1994})

This constraint which penalizes the reversal of ordering among segments in a string, i.e. metathesis (Hume 1998: 149) However, in Amfo’an, metathesis is a strategy which provides the enclitic, =ees with an onset. This metathesis violates \textsc{linearity} (which is lowly ranked) in order to satisfy \textsc{onset}, Ft, which is more highly ranked. This is illustrated in (108). The second derivation is metathesis: *pahaCees → paahes

(108) \textsc{pahaCees} \text{ onset, Ft} \text{ share[place, height]} \text{ max-io} \text{ dep-io} \text{ linearity} \\
\begin{array}{|c|c|c|c|}
\hline
\text{paha?es} & \text{*!} & \text{*!} & \text{*} \\
\text{pahes} & \text{ } & \text{ } & \text{ } \\
\text{paahes} & \text{ } & \text{ } & \text{ } \\
\hline
\end{array}

In (108), we see that adding [ʔ] into the underspecified consonant is not a possible solution because [ʔ] does not share the features of the proceeding vowel, as specified by \textsc{share[place, height]}. Deleting the final vowel of the clitic host is also not a possible repair, as this is a fatal violation of \textsc{max-io}, which specifies that every segment present in the input has a correspondent in the output. As a result, the only way the unspecified C can be filled with a consonant, and satisfy \textsc{onset}, Ft, is to reverse the order of the final consonant and vowel of the host \textit{paha → paah}.

4.2.4 Insertion of /gw/ after Va final clitic hosts

After /Va/ final words, insertion of /gw/ occurs. Unlike for /Ca/ final words, \textsc{onset}, Ft. cannot be satisfied by metathesis when a clitic host is /Va/ final, as there is no medial consonant that can become the onset of the enclitic. There are two examples of this, given in (109).³

(109) \textit{na-bgua} + =een \rightarrow \textit{nabguagwen} \ ‘already gathered’
\textit{na-tgoa} + =een \rightarrow \textit{natgoagwen} \ ‘already filled’

Although there is no other examples of consonant insertion in this environment in Amfo’an, the same process is attested in Amarasi. Examples are given in (110)

(110) \textit{mria} + =een \rightarrow \textit{na-mriagwen} \ ‘fertile, lush’
\textit{tea} + =een \rightarrow \textit{n-teagwen} \ ‘arrived’
\textit{haa} + =een \rightarrow \textit{haagwen} \ ‘four’

³I tried to elicit other examples of Va final words with a vowel initial enclitic but had no success.
There is no clear synchronic explanation as to why /gw/ insertion occurs in this environment. If /gw/ were the default consonant for insertion before vowel initial enclitics, it would be expected after all /a/ final words. From a diachronic perspective, insertion of /l/ would be expected in this context, since there is evidence that formerly there was a process of /l/ insertion after /a/ final words, which is no longer productive in Amfo’an (see §5.4). From these two examples, no conclusions can be made. As other cases of consonant/zero alternations illustrate (§2.3), it would be problematic to devise an analysis based on so few examples.

4.3 Why not glide insertion?

While the inserted consonants in Amfo’an are featurally similar to the preceding vowels, glides would be more featurally similar. This raises questions as to why glides are not inserted in this context.

Here I follow the analysis of (Edwards 2016a), who notes that if a glide were inserted between the clitic host and enclitic, it would be ambisyllabic, functioning both as the coda of the clitic host and as the onset of the enclitic. This would happen as glides are highly sonorous. This structure is illustrated in (111) for *faijees ‘one fire’.

(111) \[ \begin{array}{c}
Ft1 = Ft2 \\
\sigma \sigma \sigma \sigma \\
C V V C V V C \\
f a i j e e s
\end{array} \]

While Amfo’an allows for ambisyllabic consonants within a foot (§1.5.2), a consonant may not be linked to multiple syllables across a prosodic domain boundary, motivated by a CRISP-EDGE constraint. This constraint prohibits segments from being linked to more than one syllable across a prosodic word boundary:

(112) \[ \text{CRISP-EDGE}[\omega]: \text{‘Multiple linking between prosodic words is prohibited’} \]

\[ \begin{array}{c}
\ast \omega \omega \\
\cdots \times \cdots
\end{array} \]

(Edwards 2016a: 193)

In Amfo’an, the clitic host is a prosodic word which is embedded within another prosodic word which includes the enclitic (see §4.4). This means that if a segment is linked to both the enclitic and the host, it is linked to two syllables across a prosodic word boundary. This structure is illustrated for *faijees ‘one fire’ in (113).
This structure is not allowed; if a glide was inserted in this context, it would result in this structure. As glides are highly sonorous, it would not be possible to unlink them from the final syllable of the enclitic in order to create a crisp edge between the clitic host and enclitic. However, /ʤ/, /ɡw/ and /l/ are less sonorous than glides, and as a result can be syllabified with the clitic in order to create a crisp edge at the clitic boundary. This structure is illustrated for *faiʤees* in (114).

(114) 

\[
\begin{array}{c}
\omega \\
\downarrow \\
Ft1 \\
\sigma \\
\downarrow \\
C \\
\downarrow \\
V \\
\downarrow \\
V \\
\downarrow \\
V \\
\downarrow \\
V \\
\downarrow \\
V \\
\downarrow \\
C \\
\downarrow \\
f \\
\downarrow \\
a \\
\downarrow \\
i \\
\downarrow \\
j \\
\downarrow \\
e \\
\downarrow \\
e \\
\downarrow \\
s
\end{array}
\]

In the following section, I show how CRISPEDGE also motivates epenthesis before enclitics in Amfo’an.

### 4.4 Consonant insertion and metathesis before enclitics

Metathesis of CV final words before enclitics occurs after consonant insertion, and is another derived environment effect. This process is illustrated in (115).\(^4\)

\(^4\)For evidence that this is metathesis, and not vowel deletion see §1.5.3. The intermediary forms of this process are marked with an asterisk * because they are unattested forms.
Which consonant is inserted is determined by the final vowel of the clitic host. However, this vowel is not present in the output. It is not present undergoes full vowel assimilation with the proceeding vowel following metathesis. For example, the final vowel of *ume*, /e/ determines that /l/ is inserted. However, /e/ is not present in the output of this process, *uumlees* because of full vowel vowel assimilation.

Vowel initial enclitics in Amfo’an trigger metathesis of their host, while metathesis is not obligatory before consonant final enclitics. Examples of consonant initial-enclitics attached to unmetathesised verbs are given in (116).

(116)  

a. *auʔ-toti* *simo=kau*  

1SG 1SG-ask receive=1SG.ACC  

‘I ask, receive me’  

b. *hai m-toti=koo*  

1EX 1EX-ask=2SG.ACC  

‘we ask you’  

c. *hai mi-tuku=sin*  

1EX 1EX-herd=3PL  

‘we herd them’

That metathesis is only obligatory after vowel-initial enclitics, and not consonant-initial enclitics indicates that the phonological shape of the enclitic triggers the metathesis.

In Amfo’an, enclitics are not prosodic words on their own, but are parsed with the host as one prosodic word. However, stress remains on the penultimate syllable of the host. This is not uncommon; clitics are often added as an additional unstressed syllable to a phonological word (Dixon and Aikhenvald 2003). This is lack of stress shift is illustrated in (117) which gives examples of two syllable words with enclitics and four syllable words, which have different stress assignment although the number of syllables is the same.

(117)  

<table>
<thead>
<tr>
<th><em>hai m-toti=koo</em></th>
<th><em>ask-2sg</em></th>
<th><em>mu-soit</em></th>
<th><em>2sg-open</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>n-béti=kau</em></td>
<td><em>select-1SG.ACC</em></td>
<td><em>mu-maitus</em></td>
<td><em>2sg-store</em></td>
</tr>
<tr>
<td><em>m-áni=siin</em></td>
<td><em>before-3PL</em></td>
<td><em>n-baisenu</em></td>
<td><em>honour</em></td>
</tr>
</tbody>
</table>

As stress does not shift when an enclitic is attached, this indicates that the domain of stress assignment is the prosodic word of host, which does not include the enclitic. This can be accounted for by analysing the clitic host as a prosodic word which is
embedded within another prosodic word which includes the enclitic: \( \omega_{[\text{host}=\text{cl}]} \). Whereas if the host and enclitic were included in one prosodic word with no embedded prosodic word i.e. \( \omega_{[\text{host}=\text{cl}]} \), we would expect the stress to shift to the penultimate syllable, i.e. the enclitic. This embedded prosodic word structure of a host and enclitic is illustrated in (118) below.\(^5\)

\[
\begin{align*}
\text{(118)} & \quad \omega \\
& \quad \omega \\
& \quad \text{Ft.} \quad \text{Ft.} \\
& \quad \sigma \quad \sigma \quad \sigma \quad \sigma \\
& \quad C V C V = C V C V
\end{align*}
\]

This kind of metathesis in Meto is motivated by a CRISP-\text{Edge} constraint (Edwards 2016a).\(^6\) This constraint prohibits segments from being linked to more than one syllable across a prosodic word boundary:

\[
\text{(119)} \quad \text{CRISP-\text{Edge}[\omega]}: \text{'Multiple linking between prosodic words is prohibited'}
\]

\[
\begin{array}{c}
\ast \quad \omega \quad \omega \\
\text{...} \quad x \quad \text{...}
\end{array}
\]

If a consonant initial enclitic is attached, this structure does not violate \text{CRISP-\text{Edge}[\omega]} because no segments are linked across the prosodic word boundary. This is illustrated for \text{simo=kau} ‘receive me’ in (120) below.

\[
\begin{align*}
\text{(120)} & \quad \omega \\
& \quad \omega \\
& \quad \text{Ft.} \quad \text{Ft.} \\
& \quad \sigma \quad \sigma \quad \sigma \quad \sigma \\
& \quad s \quad i \quad m \quad o \quad k \quad a \quad u
\end{align*}
\]

However, if the enclitic is vowel-initial, this means that the final consonant of the clitic host is linked to the enclitic in order to provide it with an onset. This is a violation of \text{CRISP-\text{Edge}[\omega]} as the final segment of the host is linked to more than one syllable across a prosodic word boundary. This is illustrated for \text{anah=ee} ‘the child’ in (121).

\[\text{---}
\]

\(^5\)This analysis of embedded prosodic words was first suggested by Daniel Kaufman and was developed by myself in discussion with Owen Edwards.

\(^6\)as first described by Itô and Mester (1999: 208)
CV → VC metathesis resolves this violation of Crisp-Edge[ω]. Metathesis of the clitic host, for example anah → anah results in a CC sequence in the coda of the clitic host. This is disallowed in Amfo’an (§1.5.2). To resolve this CC sequence, the consonants are linked to the coda of the clitic host and to the onset of the clitic, respectively.\(^7\) This means that the final consonant is no longer linked to two prosodic words, creating a crisp edge at the prosodic word boundary. This is illustrated in (122).

This process is the same if there is an inserted consonant. In this context, the inserted consonant is linked to the final vowel of the clitic host (§4.2.1), but is also linked to the enclitic to provide it with an onset. This is a violation of Crisp-Edge[ω]. This structure is illustrated for fafi=ʤee in (123) below.

---

\(^7\) See (Edwards 2016a) for an earlier version of this analysis.
and to the onset of the clitic. This means that /ʤ/ is no longer linked to two prosodic words, creating a crisp edge at the prosodic word boundary. This is illustrated in (124).

(124) 

![Diagram](image)

Metathesis after consonant insertion can be predicted using the constraints proposed in (§4.2.1), and (§4.2.3), adding the constraints Crisp-Edge [ω] and *ComplexCoda. The full constraint set is listed in ranked order (125) below.

(125) a. Onset, Ft: Feet have onsets (McCarthy and Prince 1994)
   b. Share: [place, height] unspecified segments share place and voice with the preceding segment
   c. Crisp-Edge [ω]: multiple linking between prosodic words is prohibited
   d. *ComplexCoda: more than one consonant in coda position is prohibited
   e. Max-io: every segment of the input has a correspondent in the output (McCarthy and Prince 1995)
   f. Dep-io: every segment in the output a correspondent in the input (McCarthy and Prince 1995)
   g. Linearity S1 is consistent with the precedence structure of S2 and vice-versa (no metathesis) (McCarthy and Prince 1994)

These constraints are used to account for fafi+ =ee → fafidee 'the pig' in the tableaux below.

Firstly, an unspecified consonant is added to the underlying form to provide the enclitic, =ee with an onset: fafi=ee → fafiCee.

(126) 

<table>
<thead>
<tr>
<th>fafi=ee</th>
<th>Onset, Ft</th>
<th>Share [place, height]</th>
<th>Max-io</th>
<th>Dep-io</th>
</tr>
</thead>
<tbody>
<tr>
<td>fafiee</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fafee</td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>*!fafiCee</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

Features of /i/ spread into the unspecified consonant, resulting in the insertion of /ʤ/: fafiCee → fafidgee. This is illustrated in (127).

---

8Not all constraints are included in each tableau in the interests of space
In the third derivation, metathesis occurs: \( \text{fafiʤee} \rightarrow \text{faifʤee} \)

The input of this process is illustrated in (128a). In the input, /ʤ/ is linked to both the prosodic word of the clitic host and the of the enclitic, and so is a violation of \( \text{Crisp-Edge} \). Metathesis of the final VC of the clitic host, \( \text{fa} \) occurs. This results in a coda cluster, /fdʤ/. To resolve this CC sequence, the consonants are linked to the coda of the clitic host and to the onset of the clitic, respectively. This satisfies \( \text{Crisp-Edge} \). The output of this process is illustrated in (128b).

In (129) below, different outputs are evaluated. The input, \( \text{fafiʤee} \) is a fatal violation of \( \text{Crisp-Edge} \) because /ʤ/ is linked to both the prosodic word of the clitic host and the of the enclitic. Metathesis without resyllabification, \( \text{faifʤee} \), fatally violates \( \text{Crisp-Edge} \) as well as ComplexCoda, because in this form there are two consonants in the coda of the clitic host. Deletion of segments, either \( \text{faifʤee} \) or \( \text{faiʤee} \) is a fatal violation of max-10. The winning candidate, \( \text{faifʤee} \) does not violate \( \text{Crisp-Edge} \) or ComplexCoda because the two consonants, /ʤ/ are syllabified to different syllables and to different prosodic words. \( \text{faifʤee} \) only violates linear which is lowly ranked.

Tableau (129) above predicts that metathesis occurs to resolve \( \text{Crisp-Edge} \). However, it does not predict the final output of this process, \( \text{faafʤee} \), in which the vowels fully assimilate. There is no clear phonological motivation for complete vowel assimilation after metathesis. This process only occurs after metathesis, and is another example of a derived environment effect in Amfo’an phonology.
### 4.5 Final consonant insertion

Final consonant insertion is a morphophonological process determined by noun phrase boundaries (§3.7.3). As a result, it requires a different type of analysis from consonant insertion before enclitics, although the alternation includes the alternating same segments, selection of which is determined by the preceding vowel.

In §3.7.3.1 I demonstrate that final consonant insertion in Amfo’an is not amenable to a template analysis because when consonant insertion occurs after verbs and pronouns the inserted consonant belongs to a different NP and as a result must be analysed as a separate morpheme from its host. In this situation consonant insertion occurs after vowel-final verbs with no noun in the noun phrase. In this context, consonant insertion indicates that the verb has an object (see §3.5). An example of consonant insertion after a verb, *au ʔ-lomi-ʤ ‘I like it/her/him’ is (130). This is given alongside a standard instance of consonant insertion after the object NP, *au ʔ-lomi kofi-ʤ ‘I like coffee’ in (131).

\[
\begin{align*}
(130) & \quad S \\
& \quad NP \quad VP \\
& \quad | \quad | \\
& \quad N \quad \bar{V} \quad NP \\
& \quad | \quad | \\
& \quad N \quad V \quad N \\
& \quad | \quad N \\
& \quad au \quad ʔ-lomi \quad -ʤ
\end{align*}
\]

\[
\begin{align*}
(131) & \quad S \\
& \quad NP \quad VP \\
& \quad | \quad | \\
& \quad N \quad \bar{V} \quad NP \\
& \quad | \quad | \\
& \quad N \quad V \quad N \\
& \quad | \quad N \\
& \quad au \quad ʔ-lomi \quad kofi-ʤ
\end{align*}
\]

In this section, I contend that final consonant insertion is best analysed as an unspecified -C affix, into which the features of the preceding vowel spread. This analysis means that that consonant insertion at NP boundaries is phonologically the same process as that before enclitics, and correctly predicts that the two processes involve the same alternating segments. This affix occurs after vowel final stems at the edge of the noun phrase. The strength of this analysis is that it accounts for all instances of final consonant insertion. However, before I present this analysis, I examine other ways final consonant insertion could be analysed, showing that other analyses would not adequately account for the Amfo’an data.

#### 4.5.1 Possible affixation analyses

This section examines the suitability of different types of affixation analyses for an account of final consonant insertion in Amfo’an, having ruled out deletion, suppletion, latent segments or template analyses in §3.7.3. There are two possible affixation
analyses: phonologically conditioned allomorphy and affixation of an underspecified segment.

4.5.1.1 Phonologically conditioned allomorphy

Phonologically conditioned allomorphy is the situation when an affix has different forms in different contexts, and the distribution of these alternate forms is phonologically conditioned (Inkelas 2014). The distribution of these alternative forms often increases phonological well-formedness (Nevins 2011: 23). There are two ways phonologically conditioned allomorphy can be analysed. The first way is to argue that a morpheme has multiple Underlying Representations (UR), the distribution of which is phonologically conditioned (Smith 2015: 1). This kind of analysis of Amfo’an would imply that there are three overt allomorphs, -ʤ- /l/ and -ɡ/, as well as a zero allomorph which occurs with consonant final stems. The kind of analysis relies on the notion of ‘default’ and ‘optimizer’ morphemes. The ‘optimizer’ is selected for in a certain phonological context, while the other occurs elsewhere (Nevins 2011, Smith 2015). The default is phonologically less marked than the optimizer (Nevins 2011). However, for Amfo’an, if there were a default, this would be expected after /a/.

The second type of analysis is to pose that there is a single UR, and alternate forms are derived by phonological rules (Nevins 2011: 24). This type of analysis also relies on the notion a default morpheme, from which the other forms are derived. However, for Amfo’an, there is no single form from which /ʤ/ /l/ and /ɡ/ can be derived using phonological rules.

4.5.1.2 Proposed account: Unspecified C analysis

Final consonant insertion in Amfo’an can be better analysed by proposing that there is an unspecified consonant affix -C. Phonologically underspecified morphemes, as I propose for Amfo’an, have been proposed previously to account for various phenomena. For example, numerous accounts have a analysed reduplication as affixation of a CV template which is phonologically underspecified and copies adjacent segments (Inkelas 2014). Arabic verb morphology has also been analysed using this approach by posing that there are abstract morphemes which consist of an unspecified vowel and consonant sequence which specifies the phonological shape of the word (McCarthy 1981, Boudelaa and Marslen-Wilson 2004).

For Amfo’an, this unspecified consonant affix analysis is much more straightforward than proposing that there are four different allomorphs. This analysis correctly predicts that the two processes of consonant insertion involve the same segments, because the selection of the inserted segment is the same phonological process (i.e. feature spreading). As /a/ has no features to spread (§4.2.3), no consonant is added after /a/ final words. After consonant final words, this -C is deleted as consonant clusters are not allowed in coda position (§1.5.2).

Firstly, the morpheme -C is added. The position of the morpheme is determined by ALIGN,R {M}, NP which specifies that the placement of -C must align with the right edge of the noun phrase. [C-hau]NP is a fatal violation of ALIGN,R {M},NP while
[hau-C]_{NP} is the winning candidate because it satisfies ALIGN,R {M},NP. This selection of hau-C is demonstrated in (132).

(132) 

<table>
<thead>
<tr>
<th>hau-C</th>
<th>SHARE [place, height]</th>
<th>MAX-IO</th>
<th>DEP-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>hau-C</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

As this is an unspecified C, the features of the preceding vowel spread into the consonant in order to satisfy SHARE [place, height]. This predicts that after hau ‘wood, tree’, /g/ will be added, as it shares the place features of /u/. This is illustrated in (133).

(133) 

<table>
<thead>
<tr>
<th>hau-C</th>
<th>SHARE [place, height]</th>
<th>MAX-IO</th>
<th>DEP-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>hau-ʔ</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>hau-h</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>hau-t</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>hau-l</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>hau-dʒ</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

*COMPLEXCODA, employed in §4.4 also predicts the lack of consonant insertion after consonant final nominals. If a nominal already has a final consonant, adding another consonant would be a fatal violation of *COMPLEXCODA. Epenthesis of a vowel between the two consonants, eg *ʔnaekaC would be a violation of DEP-IO. Deletion of affix -C satisfies *COMPLEXCODA. The unspecified consonant is deleted, rather than the final C of the stem. This is because deleting the final consonant of the stem would be a fatal violation of MAX-IO, which specifies that every segment in the input has a correspondent in the output. Whereas the -C suffix hasn’t yet been associated with a segment; deleting it is not a fatal violation of MAX-IO. This is demonstrated for ʔnaek ‘big’ in (134).

(134) 

<table>
<thead>
<tr>
<th>ʔnaek-C</th>
<th>*COMPLEXCODA</th>
<th>SHARE [place, height]</th>
<th>MAX-IO</th>
<th>DEP-IO</th>
</tr>
</thead>
<tbody>
<tr>
<td>ʔnaek-k</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>ʔnaek-ʔ</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>ʔnae-C</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

4.5.2 Theoretical implications

The phonological processes analysed in this chapter have several implications for phonological theory. Firstly, accounting for consonant insertion in Amfo’an identifies some of the predictive limitations of OT. Optimality theory predicts that all phonological processes will be motivated by markedness constraints. This includes epenthesis and the selection of the epenthetic segments (de Lacy and Kingston 2013). One prediction OT makes about the selection of epenthetic segments is that epenthesis cannot produce labials or dorsals (Paradis and Prunet 1991, de Lacy 2007). However, the choice of epenthetic segments in Amfo’an cannot be attributed to marked-
ness, as the inserted segments are highly marked, especially /gw/, which is both labial and dorsal.

Optimality theory also predicts that epenthesis will either be ‘default’ or ‘assimilatory’ (de Lacy 2006, Morely 2015), however consonant insertion in Amfo’an cannot be described as either of these kinds of epenthesis. Default epenthesis is the invariable insertion of one segment in a certain phonological context (§2.2), while assimilatory epenthesis involves multiple phonetically predictable segments, typically glides (Morely 2015). In this process, the epenthetic segment is as featurally similar as possible to the adjacent vowel; its quality is determined by assimilation to the place and manner features of an adjacent vowel (de Lacy 2006). It is hard to argue that consonant insertion in Amfo’an is a case of assimilatory epenthesis as described in the literature; the quality of the inserted consonants are not phonetically predictable, although they are phonologically predictable. Similarly, while the the epenthetic segments share the place features of the preceding vowels, the manner features of the inserted consonants differ greatly from the vowels.

Rather, consonant insertion in Amfo’an is a third kind epenthesis, in which the epenthetic consonants are to some extent faithful (featurally similar) to the adjacent vowels, but are not fully faithful to the adjacent vowels, as in the case of glide epenthesis (Kitto and de Lacy 1999). This kind of epenthesis results from the effect other constraints (Kitto and de Lacy 1999), such as in Amfo’an where glides are barred from epenthesis in this context because they would be ambisyllabic, and therefore a violation of a CrispEDGE[0] (§4.2).

In §4.2.1, I demonstrate that Consonant insertion must be treated as a derived environment affect. Metathesis and full vowel assimilation occur after consonant insertion, and so also are treated as derived environment affects (§4.4). However, as many have noted, it is difficult to account for derived environment effects in Classical OT, which does not allow for multiple stages of derivation (Kula 2008), but requires a transparent relationship between inputs and outputs (Downing 2009).

Accounting for final consonant insertion in Amfo’an also identifies some predictive limitations of OT approaches to morphophonological processes. In optimality theory, underspecified morphemes are not possible, and cases of phonologically conditioned allomorphy are conditioned by markedness constraints (Bye 2008). As a result, OT predicts that allomorph distribution results in less marked syllable structures (Bonet and Mascaró 2007). However, in Amfo’an final consonant insertion results in more a marked syllable structure (i.e. having a coda).

It has been observed that morpho(phono)logical processes overwhelmingly refer to left edges of domains (words, stems). As a result, it has been argued that that constraints that refer to right edges should be excluded from Optimality Theory (Bye and de Lacy 2000). However, Amfo’an, final consonant insertion is a morphophonological processes where the form is determined by the right edge of the word. Although morphophonological processes which refer to the right edges of domains are typologically uncommon, theories should be able to account for them.

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9 Differentiating a third kind of epenthesis is proposed by Kitto and de Lacy (1999), however it seems to have fallen out use since then.
4.6 Summary

Amfo’an has two processes of consonant insertion which are formally identical but are functionally different. These two processes are best analysed synchronically as the epenthesis and affixation of an underspecified consonant, into which the features of the preceding vowel spread. This analysis accounts for why the two processes involve the same segments; the selection of inserted segments is the same process. However, although a synchronic analysis of these processes is possible, it provides only a partial account of why the segments /ʤ/, /ɡ/ and /l/ are regularly inserted in certain phonological and syntactic environments in Amfo’an. In order to fully understand why these segments are inserted, the diachronic sources of these processes should also be examined.
Chapter 5

Diachronic Account

This chapter examines the diachronic sources of consonant insertion in Amfo’an. Although the form, functions and distribution of these processes can be accounted for synchronically (see chapter 4), this provides only a partial account of why the segments /ʤ/, /ɡ/ and /l/ are regularly inserted in certain phonological and syntactic environments in Amfo’an. Examining the diachronic sources of these processes within the context of the Rote-Meto subgroup (§1.2.1) and the Meto cluster more broadly (§1.2.2) provides a more complete account of consonant insertion in Amfo’an.

Comparative evidence indicates that the inserted consonants in Amfo’an are not a result of retention, but are innovation (§5.1). This account examines the origins of the inserted segments /ʤ/, /ɡ/ and /l/ (§5.3) and the distribution of these segments (§5.5) which constitute two synchronic processes: epenthesis before vowel-initial enclitics (§3.7.2) and phonologically-conditioned suffixation at the end of the noun phrase (§3.7.3). Epenthesis before vowel-initial enclitics preceded noun-phrase final consonant insertion; an account of the first is requisite for an account of the second.

The processes of consonant insertion in Amfo’an are not ‘minimal’, that is minimally disruptive of the transition from one vowel to the next, from both a perceptual and articulatory perspective (Morely 2012: 61). Insertion processes which involve non-minimal segments often are result of multiple changes which render the phonetic basis of the insertion unclear (Blevins 2008: 10). The inserted segments in Amfo’an are an example of this; /ʤ/, /ɡ/ and /l/ are a result of regular sound change (§5.3) by which epenthetic glides after /i/ /o/ and /u/ underwent fortition (§5.3.1) and a process of /r/ insertion after /e/ underwent *r > /l/ sound change (§5.4).

This analysis is supported by comparative evidence. Glide epenthesis after /i/, /o/ and /u/ is still attested in other varieties of Meto, as is insertion of /r/ (§5.4). These sound changes resulted in a process of epenthesis before vowel-initial enclitics, from which phrase-final consonant insertion developed by analogy (§5.5.1), assuming the function and distribution of an inherited process of NP final suffixation, which can be reconstructed for Proto-Rote-Meto (§5.5.3). This diachronic analysis also accounts for a lack of regular insertion after /a/ final words: there were not enough /a/ final words to result in a regular synchronic process of insertion (§5.4.1).

This account also examines the sociolinguistic meaning that has become associated with consonant insertion and how this may have played a role in the develop-
ment of consonant insertion (§5.5.4). Amfo’an consonant insertion developed in a region in which most languages attest medial/final alternations in the noun phrase; this areal feature is also taken into consideration by this account (§5.6).

5.1 Retention?

Retention of consonants in certain environments is an attested source of consonant/zero alternations. A retention analysis entails that consonants present in the ancestor language underwent loss in certain environments accompanied with reanalysis of the morpheme boundary, resulting in a synchronic consonant/zero alternation. A retention analysis would entail that the inserted consonants in Amfo’an are cognate with final consonants in an earlier stage of the language.

There are many instances in Austronesian languages where consonants were lost word-finally but retained in certain morphological environments. In such cases, final consonant loss triggered a morpheme boundary shift, by which the final consonant of a morpheme was retained in environments other than-word final position. This resulted in a synchronic consonant/zero alternation, by which the final consonant does not occur word-finally but occurs in when a suffix is attached. For example in Samoan, intransitive verbs are vowel final. To form a transitive verb, a suffix is with an initial consonant is added. Examples are given in (135) below.

<table>
<thead>
<tr>
<th>(135)</th>
<th>intransitive</th>
<th>transitive</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>maʔalili</td>
<td>maʔalili-ŋia</td>
<td>‘feel cold’</td>
<td></td>
</tr>
<tr>
<td>tu:</td>
<td>tu-ia</td>
<td>‘stand’</td>
<td></td>
</tr>
<tr>
<td>valu</td>
<td>valu-sia</td>
<td>‘scrape’</td>
<td></td>
</tr>
<tr>
<td>anu</td>
<td>anu-sia</td>
<td>‘spit’</td>
<td></td>
</tr>
</tbody>
</table>

(135) intransitive transitive gloss

(Moore-Cantwell 2008: 3,4)

Which consonant occurs with -ia is variable, and is not phonologically predictable because it is a retention of Proto-Oceanic final consonants (Moore-Cantwell 2008). This correspondence between final consonants in Proto-Oceanic (POc) and alternating consonants in Samoan demonstrated in (136).

<table>
<thead>
<tr>
<th>(136)</th>
<th>intransitive</th>
<th>transitive</th>
<th>POc</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>inu</td>
<td>inu-mia</td>
<td>*inum</td>
<td>‘drink’</td>
<td></td>
</tr>
<tr>
<td>taŋi</td>
<td>taŋi-sia</td>
<td>*taŋis</td>
<td>‘cry’</td>
<td></td>
</tr>
<tr>
<td>mataʔu</td>
<td>mataʔu-tia</td>
<td>*matakut</td>
<td>‘fear’</td>
<td></td>
</tr>
</tbody>
</table>

(136) intransitive transitive POc gloss

Crowley and Bowern (2010: 123), POc from Blust and Trussel (ongoing)

5.1.1 Retained consonants in Amfo’an?

Retention is not a plausible diachronic analysis of Amfo’an consonant insertion as there is no correspondence between inserted consonants in Amfo’an and final consonants in Proto-Malayo-Polynesian (PMP). In all varieties of Meto, including Amfo’an,
PMP word-final consonants have typically been lost, with the exception of *s and *n which are sometimes retained as /s/ and /n/ (Edwards 2016b: 62). Examples of final consonant loss in Amfo’an are given in (137).

<table>
<thead>
<tr>
<th>PMP</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>*salaq</td>
<td>n-sana</td>
<td>‘be wrong’</td>
</tr>
<tr>
<td>*mamaq</td>
<td>n-mama</td>
<td>‘chew betel’</td>
</tr>
<tr>
<td>*inum</td>
<td>n-inu</td>
<td>‘drink’</td>
</tr>
<tr>
<td>*takut</td>
<td>na-mtau</td>
<td>‘afraid’</td>
</tr>
<tr>
<td>*ənəm</td>
<td>nee</td>
<td>‘six’</td>
</tr>
<tr>
<td>*əpai</td>
<td>haa</td>
<td>‘four’</td>
</tr>
<tr>
<td>*ma-buhɔk</td>
<td>n-mafu</td>
<td>‘drunk’</td>
</tr>
<tr>
<td>*balik</td>
<td>n-fani</td>
<td>‘go back’</td>
</tr>
<tr>
<td>*bahuq</td>
<td>n-foo</td>
<td>‘stink’</td>
</tr>
<tr>
<td>*basəq</td>
<td>n-fase</td>
<td>‘wash’</td>
</tr>
</tbody>
</table>

PMP from Blust and Trussel (ongoing)

The inserted consonants in Amfo’an do not correspond to the regular sound changes in Meto which have been established by Edwards (2016b). Examples of consonant final forms in PMP, their corresponding forms in Amfo’an, and relevant regular PMP > Meto sound changes in word final position are given in (138).

<table>
<thead>
<tr>
<th>PMP</th>
<th>Amfo’an</th>
<th>gloss</th>
<th>regular sound change</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Rumaq</td>
<td>ume-l</td>
<td>‘house’</td>
<td>q &gt; Ø</td>
</tr>
<tr>
<td>*zauq</td>
<td>na-ʔlooq</td>
<td>‘far’</td>
<td></td>
</tr>
<tr>
<td>*kemiq</td>
<td>mii-ʤ</td>
<td>‘urine’</td>
<td></td>
</tr>
<tr>
<td>*tasik</td>
<td>tasi-ʤ</td>
<td>‘sea’</td>
<td>k &gt; Ø</td>
</tr>
<tr>
<td>*manuk</td>
<td>manu-g</td>
<td>‘chicken’</td>
<td></td>
</tr>
</tbody>
</table>

As demonstrated in (138), there is no regular correspondence between final consonants in PMP and the inserted consonants in Amfo’an, indicating that the inserted consonants are not retentions of original word final consonants, but are an innovation. Further, consonant insertion occurs after many forms which are reconstructed as vowel final in PMP. Examples of vowel final forms in PMP, their corresponding forms in Amfo’an (with consonant insertion) are given in (139).
5.2 Innovation

Processes of consonant insertion before enclitics are found in other varieties of Meto (§1.2.2), but are not found in the languages of Rote, with which Meto forms a subgroup (§1.2.1). This indicates that the process was an innovation in Meto. The position of Meto within Rote-Meto is shown (140) below.

The enclitics that trigger consonant insertion in Amfo’an have corresponding forms in the languages of Rote, and can be reconstructed for Proto-Rote-Meto (PRM) (Edwards 2018b). However, the enclitics demonstrate no consonant insertion in the languages of Rote. Examples from Landu of vowel final hosts with the definiteness marker =a are given in (141).
As no consonant insertion does not occur before enclitics in the languages of Rote, this further demonstrates that consonant insertion is an innovation in Meto.

5.3 Diachronic sources of inserted segments

The segments /ʤ/ and /ɡ/ were not inherited from PMP, and do not correspond to any of the regular sound changes in Meto (Edwards 2016b). These segments are highly restricted in their distribution; /ʤ/ only occurs in the context of /i/ and /ɡ/ only occurs in the context of /o/ or /u/. My account proposes that /ʤ/ and /ɡ/ are a result of regular glide fortition. This analysis is supported by comparative evidence from other varieties of Meto (§5.3.1) which attest glide epenthesis in the same environment as /ʤ/ and /ɡ/ insertion in Amfo’an. This analysis is also supported by the occurrence /ʤ/ and /ɡ/ in word-medial position, which indicate that glide fortition was not restricted to clitic boundaries.

However, insertion of /l/ has a different diachronic source. /l/ is an inherited segment which resulted from *r > /l/ sound change in most varieties of Meto including Amfo’an. The distribution of /l/ is not phonologically restricted. I propose that /l/ insertion developed from a process of /r/ insertion after /a/ and /e/ final forms before enclitics (§5.4). Like glide fortition, *r > /l/ was a sound regular, unconditioned sound change in Amfo’an and is attested in other contexts.

This analysis entails that a number of other changes occurred before glide fortition. Glide fortition would have been preceded by phonetic glide epenthesis which was then phonologised. After becoming a phonological rule, epenthesis of /w/ would have been extended to after /o/ final words, and epenthesis of /j/ extended to after /e/. This kind of glide epenthesis is attested in the Amanuban variety of Meto (see §5.3.1.1). At some point, /r/ insertion after /e/ and /a/ developed. Glide fortition and *r > /l/ then occurred, resulting in regular insertion of /ʤ//ɡw/ and /l/.

5.3.1 Glide Fortition

Glide fortition is an attested sound change which results in processes of non-minimal consonant insertion (Blevins 2008: 11). Glide fortition occurs by an increase in the velar constriction of /w/ and the palatal constriction of /j/, resulting in a change of *w > /ɡw/ and *j > /ʤ/ (Blust 2005: 232). For example, in Chamorro (Austronesian, Mariana Islands) epenthetic glides underwent fortition, *w > gw and *j > ḡ (Blust 2000: 87). In (142) below, examples of insertion of /ʤ/ and /ɡw/ are given. In these examples, insertion occurs after verb stems before -i, a referential focus suffix.

(141)  
<table>
<thead>
<tr>
<th>Landu</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>ani=a</td>
<td>‘the wind’</td>
</tr>
<tr>
<td>oe=a</td>
<td>‘the water’</td>
</tr>
<tr>
<td>tane=a</td>
<td>‘the mud’</td>
</tr>
<tr>
<td>keo=a</td>
<td>‘the black one’</td>
</tr>
<tr>
<td>ledo=a</td>
<td>‘the sun’</td>
</tr>
</tbody>
</table>

(Edwards 2017)
5.3.1.1 Comparative evidence for glide fortition

A glide fortition analysis is supported by data from other varieties of Meto attest synchronic glide epenthesis before vowel initial enclitics. This epenthesis of /j/ and /w/ corresponds regularly with the insertion of /ʤ/ and /ɡ/ before enclitics in Amfo’an. For example, in Amanuban /j/ is inserted after /i/ final words, while /w/ is inserted after /o/ and /u/ when a vowel final host is followed by a vowel initial enclitic. Examples of glide epenthesis in Amanuban are given with the equivalent Amfo’an form in (143) below.

<table>
<thead>
<tr>
<th>Amanuban</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>ai + ees</td>
<td>aijkees</td>
<td>aijkeees ‘one fire’</td>
</tr>
<tr>
<td>fai + ees</td>
<td>faijkees</td>
<td>faijkees ‘one night’</td>
</tr>
<tr>
<td>meo + ees</td>
<td>meoewees</td>
<td>meoeweex ‘one cat’</td>
</tr>
<tr>
<td>ao + ee</td>
<td>aoeweex</td>
<td>aoeweex ‘the slaked lime’</td>
</tr>
<tr>
<td>hau + ees</td>
<td>hauweex</td>
<td>hauweex ‘one tree’</td>
</tr>
<tr>
<td>kiu+ ees</td>
<td>kiuweex</td>
<td>kiuweex ‘one tamarind tree’</td>
</tr>
</tbody>
</table>

In Amanuban, /j/ epenthesis also occurs after /e/ final words before enclitics. For example fee+ees→feijees. A glide fortition analysis would predict that /ʤ/ insertion should also occur after /e/ final words in Amfo’an. Whereas after /e/ final words /l/ is inserted, indicating that /l/ insertion probably has a different diachronic source (see §5.4).

Glide fortition, however, did not only occur at clitic boundaries. In Amfo’an, /ʤ/ and /ɡ/ are attested word-medially in contexts where there was historically no consonant. Like other instances of /ʤ/ and /ɡ/, the occurrence of these segments is phonologically predictable: /ɡ/ only occurs in the context of /o/ and /u/ and /ʤ/ only occurs in the context of /i/. This entails that /w/ and /j/ developed in the context of /o/, /u/ and /i/ in certain words, after which all glides underwent fortition. This process is demonstrated in (144) below using idja ‘IDEM’, which is cognate with PMP *ia.

\[
(144) \quad {\text{idja}} > {\text{ija}} > {\text{idja}}
\]

Medial /ɡ/ and /ʤ/ was an innovation in Amfo’an, as indicated by comparison with other varieties of Meto. Examples of words with medial /ɡ/ and /ʤ/, with corresponding forms in other varieties of Meto and PMP are given in (145). ¹

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¹The last three examples in (145) above have an epenthetic /a/, indicated by the |. This is because all CC initial words in Amfo’an are cited with an epenthetic /a/ (§1.5.2). aipguah is not found in all villages which speak Naitais Amfo’an. I only came across this form in Fatumonas (see map of Amfo’an in §1.2).
5.3.1.2 Development of /ʤ/ and /ɡ/ before vowels word-medially

/ʤ/ and /ɡ/ has been added word-medially to various words with a vowel sequence, the first of which is /i/, /o/ or /u/. For example the word for ‘fill’ in Amfo’an is na-tgoa which corresponds to na-tua in other varieties of Meto. This occurred as a result of the stress shifting onto the second vowel, followed by reduction of the initial vowel to a glide, which then underwent subsequent glide fortition. This analysis is supported by variants of puah ‘betel nut’ and fo-1 ‘bean’ which attest the proposed intermediary stage, in which the glide is present and the stress has shifted onto the second vowel. 

Thanks to Owen Edwards for suggesting this analysis. In (146) below, the stress on the second vowel, which has been lengthened and the initial vowel has been reduced into a glide.

(146) hai miʔsosa? naʔsosaʔ aal pwaah manus a|sboot utan
    hai miʔsosa? naʔsosaʔ ala puah manus shoot utan
    1EX 1EX-sell 3SG-sell all\MET betel.nut betel.vine tobacco vegetable
    ‘We sell all kinds of betel nut, betel vine, tobacco, vegetables’

Similarly, in (147), the second vowel bears stress and has been lengthened. The initial vowel has been reduced into a glide and the /fw/ sequence has been analysed as a consonant cluster, as indicated by the epenthetic /a/, which occurs in Amfo’an when a word-initial consonant cluster is preceded by another consonant from another word (§1.5.2). The hypothesized pathway for the development of puah > pguíah ‘betel nut’ is given in (148). Stress is indicated by an acute accent.2

(147) aan=laa=m penaʔ aifswaa-1 laku-g
    aane=aa=ma penaʔ foe-C laku-C
    field.rice=1DEM=and corn bean-NP.EDGE tuber-NP.EDGE
    ‘field rice and corn, beans and tubers’

(148) puah > *puáh > pwáh > *pgwáh > pguíah

2 Both puah and pguíah are attested in my corpus. There is variation between speakers and between different hamlets.
5.4 Diachronic source of /l/ insertion

Insertion of /l/ in Amfo’an has a different diachronic source from /ḍ/ and /g/. /l/ in Amfo’an generally reflects Pre-Meto *r (Edwards 2016b). However the /l/ segments which occur in consonant insertion are not reflexes of original *r segments; there is no correspondence between the inserted /l/ in Amfo’an and *r in Pre-Meto. Some examples of Amfo’an words occur with inserted /l/ and their corresponding forms are given in (149).

(149) 
<table>
<thead>
<tr>
<th>Pre-Meto</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>*rene</td>
<td>lele-l</td>
<td>‘field’</td>
</tr>
<tr>
<td>*ŋgae</td>
<td>n-kae=leen</td>
<td>‘cry(=PERF)’</td>
</tr>
<tr>
<td>’kote</td>
<td>n-ote-l</td>
<td>‘cut (it)’</td>
</tr>
</tbody>
</table>

The insertion of /l/ probably developed from either insertion of *j or *r. This is proposed on the basis of synchronous insertion of /j/ and /r/ after /e/ final words in other varieties of Meto which regularly correspond to /l/ insertion in Amfo’an. In Amanuban /j/ is inserted after /e/ final forms when they are followed by a vowel-initial enclitic. Whereas in Kusa-Manea, /r/ occurs in this context. Examples of corresponding /e/ final forms followed by enclitics in Amanuban, Kusa-Manea and Amfo’an are given in (150) below.

(150) 
<table>
<thead>
<tr>
<th>Ammanuban</th>
<th>Kusa-Manea</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>oe + aa</td>
<td>oejaaj</td>
<td>oeaa</td>
<td>oelaa</td>
</tr>
<tr>
<td>fee + aa</td>
<td>feejaaj</td>
<td>feeraa</td>
<td>feelaa</td>
</tr>
<tr>
<td>noe + aa</td>
<td>noejaa</td>
<td>noeraa</td>
<td>noelaalaa</td>
</tr>
</tbody>
</table>

Kusa-Manea data from Edwards, p.c February 2018

There are two possible accounts that can be proposed from this comparative data. The first is to argue that /l/ insertion in Amfo’an is a result of *j > l sound change. There is some phonological basis for /l/ insertion after /e/ rather than /j/; as /l/ shares more phonological features with /e/ than /j/. /l/ shares the features [+CORONAL] and [-HIGH] with /e/ whereas /j/ is does not share these features; it is [-CORONAL] and [+HIGH] (see §4.2). If a *j > l sound change occurred, this would have been a process of height assimilation. However, this is an uncommon sound change and there is no other evidence that it occurred.

The other possible diachronic source of /l/ insertion is to argue that /l/ insertion is a result of a former process of /r/ insertion before enclitics for /e/ and /a/ final roots which underwent *r > /l/ sound change, along with other instances of *r in Amfo’an. There is more evidence to support this analysis; as /r/ insertion before vowel initial enclitics is attested in the Kusa-Manea variety of Meto, after /e/ and /a/ final clitic hosts. Examples of consonant insertion before enclitics in Kusa-Manea are given in (151).
If /l/ insertion in Amfo’an is cognate with /r/ insertion in Kusa-Manea insertion of /l/ after /a/ would be expected. Although Amfo’an does not attest synchronic insertion of /l/ after /a/ final words (see §3.6), two historically /a/ final words are /l/-final in Amfo’an. These forms are susa! ‘difficult’ and fia! a type of taro. The final /l/ of these forms is an insertion: it was not inherited. susa! is a borrowing from Malay susah; other varieties of Meto have borrowed this form as susa. fia! is corresponds to *biRaq. The final /l/ could not possibly be a retention of *q (see §5.1.1). *biRaq is reflected as fia in the languages of Rote, having undergone a regular *q>Ø sound change. We can thus conclude that the final /l/ of fial has been added. The addition of this final /l/ would have occurred by analogy during the extension of consonant insertion (see §5.5.2). However, the final /l/ of susal and fial does not behave like other types of NP final C insertion; the consonant remains when the noun is modified. This is demonstrated in (152) and (153).

Neither susal nor fial undergo final consonant deletion and subsequent metathesis, which occurs to all other aC# final nouns when modified (see §3.3.3.3). These attestations of /l/ after /a/ final words support the hypothesis that /l/ insertion in Amfo’an is cognate with /r/ insertion in Kusa-Manea.

However, although the parallel process of /r/ insertion in Kusa-Manea provides the most probable explanation of the origins of /l/ insertion in Amfo’an, there are some aspects of this analysis which are unresolved. The origins of /r/ insertion after /e/ and /a/in Kusa-Manea is unknown; there is no apparent phonological basis for the insertion of /r/. With current data, no further conclusions can be made about the source of /l/ insertion after /e/.

### 5.4.1 What about /a/?

There is no process of synchronic consonant insertion after /a/ final words in Amfo’an, either before enclitics or NP-finally (see §3.6). There are very few /a/ final words which would trigger consonant insertion; in my corpus there are only two /a/ final nominals, which have restricted usage (§3.6). However, susal and fial illustrate that there was formerly a process of /l/ insertion after /a/ final words, but that it is no longer synchronically productive. This lack of /a/ final words is because many historically /a/ final words in Meto underwent the sound change *a > e. Examples of
words with a final *a in PMP and the corresponding /e/ final form in Amfo’an are given in (154).

(154) | PMP       | Amfo’an | gloss  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*ma-asa</td>
<td>n-mese</td>
<td>‘alone’</td>
</tr>
<tr>
<td>*Rumaaq</td>
<td>ume-l</td>
<td>‘house’</td>
</tr>
<tr>
<td>*ma-hataq</td>
<td>n-mate</td>
<td>‘raw’</td>
</tr>
<tr>
<td>*qaRta</td>
<td>ate-l</td>
<td>‘slave’</td>
</tr>
</tbody>
</table>

As a result, there were not enough /a/ final nominals for a regular process of consonant insertion to develop for such stems.

5.5 Development of Phrase-final consonant in Amfo’an

Regular sound changes (glide fortition and *r > l) resulted in a regular process of consonant insertion before enclitics, from which final consonant insertion developed. The correspondence between the two processes of consonant insertion is unambiguous: they have the same form. While consonant insertion before enclitics is found in almost all varieties of Meto, final consonant insertion is only found in the varieties of Meto most closely related to Amfo’an, indicating that this change only occurred in this subgroup of Meto varieties. These varieties include Amfo’an, Baikeno, Fatule’u and Molo. In addition to final consonant insertion, these varieties of Meto also share numerous lexical and morphophonological similarities, and a regular sound change which is not found in the other varieties of Meto, *n > l /lV. Final consonant insertion is also found in Timaus, whose speakers trace their origins to Amfo’an (see §1.2.1).

5.5.1 Analogy

I propose that final consonant insertion developed from consonant insertion before enclitics by reanalysis and subsequent analogical extension. As this extension occurred, consonant insertion assumed the function and distribution of an inherited process of noun phrase final suffixation, which can be reconstructed for Proto-Rote-Meto (§5.5.3).

In the first stage inserted consonants at clitic boundaries were reanalyzed as part of the host. Reanalysis is a mechanism by which the underlying structure of a form is changed, but its surface manifestation remains the same (Harris 2003: 532). Reanalysis of the clitic boundaries made the phonological shape of (formerly) VV final forms the same as VVC final forms. In (155), the the inserted /l/ after oe ‘water’ is reanalyzed as part of the host. This makes it the same phonological shape as kaut ‘papaya’.

(155) | before reanalysis | after reanalysis | gloss  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kaut=ee</td>
<td>kaut=ee</td>
<td>‘the papaya’</td>
</tr>
<tr>
<td>oe=lee</td>
<td>oel=ee</td>
<td>‘the water’</td>
</tr>
</tbody>
</table>

This reanalysis served to make the distribution of VV final forms the same as VVC final forms. In (156), we see that reanalysis inserted consonants as part of the citation.
forms. That is, insertion of final consonants in forms such as *oel* ‘water’ and *faikʤ* ‘night’ makes their distribution the same as that of *tais* ‘cloth’ and *puah* ‘betelnut’.

<table>
<thead>
<tr>
<th>citation form</th>
<th>modified</th>
<th>before enclitic</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>tais</em></td>
<td>‘cloth’</td>
<td><em>tai mutiʔ</em></td>
</tr>
<tr>
<td><em>puah</em></td>
<td>‘betelnut’</td>
<td><em>pua pinit</em></td>
</tr>
<tr>
<td><em>oel</em></td>
<td>‘water’</td>
<td><em>oe maputuʔ</em></td>
</tr>
<tr>
<td><em>faikʤ</em></td>
<td>‘night’</td>
<td><em>fai knutuʔ</em></td>
</tr>
</tbody>
</table>

This hypothesis that consonant insertion first applied to VV final words is supported by data from other varieties of Meto which attest consonant insertion after VV final nominals, but not after all vowel final words. Examples of VV final nominals with consonant insertion in Baikeno, Fatule’u and Amfo’an are given in (157).

<table>
<thead>
<tr>
<th></th>
<th><em>ai</em> ‘fire’</th>
<th><em>oe</em> ‘water’</th>
<th><em>ao</em> ‘lime’</th>
<th><em>hau</em> ‘wood, tree’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baikeno</td>
<td><em>aidʤ</em></td>
<td><em>oel</em></td>
<td><em>aob</em></td>
<td><em>haub</em></td>
</tr>
<tr>
<td>Fatule’u</td>
<td><em>aadʤ</em></td>
<td><em>oel</em></td>
<td><em>aob</em></td>
<td><em>haub</em></td>
</tr>
<tr>
<td>Amfo’an</td>
<td><em>aidʤ</em></td>
<td><em>oel</em></td>
<td><em>aog</em></td>
<td><em>haug</em></td>
</tr>
</tbody>
</table>

However, in Amfo’an, consonants are inserted after all vowel final nominals, indicating that a subsequent change occurred in Amfo’an. I propose that this occurred by analogy, which is a diachronic process by which one form in a language becomes more like another (Blevins and Blevins 2009: 4). I propose that in Amfo’an, final consonants were added to all vowel-final words by analogical extension; a process by which an already existing alternation of some pattern is extended to new forms which previously did not undergo the alternation (Campbell 2013: 95).

Furthermore, there are a number of non-nominals in Amfo’an to which consonant insertion has been extended. There is no synchronic explanation as to why these forms have final consonants as these forms do not belong to the classes of words which undergo synchronic final consonant insertion (i.e nouns and transitive verbs, see §3.1). In other varieties of Meto, these forms do not have final consonants. These forms are listed in (158) below.

<table>
<thead>
<tr>
<th></th>
<th>other Meto</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>susal</em></td>
<td><em>susa</em></td>
<td>‘difficulty’</td>
</tr>
<tr>
<td><em>sekog</em></td>
<td><em>sekau</em></td>
<td>‘who’</td>
</tr>
<tr>
<td><em>on meel</em></td>
<td><em>on mee</em></td>
<td>‘how?’</td>
</tr>
<tr>
<td><em>n-peʔu</em></td>
<td><em>n-peʔu</em></td>
<td>‘to be sleepy’</td>
</tr>
<tr>
<td><em>naʔbaʔe</em></td>
<td><em>naʔbaʔe</em></td>
<td>‘play’</td>
</tr>
</tbody>
</table>

These examples indicate that consonant insertion was extended to all vowel-final forms, however, that this process is no longer productive for all word classes. The final consonants of these forms are part of the lexeme; they do not alternate with vowel final forms. These examples indicate that while consonant insertion formerly applied to all vowel final words, the domain of this process has been narrowed to noun phrase boundaries. I argue that this occurred because consonant insertion assumed the function and distribution of an inherited process of noun phrase final suffixation.
5.5.2 Development of NP-final suffixation

In Amfo’an, final consonant insertion only occurs after nominals in NP-final position. While analogical extension accounts for the spread of consonant insertion to word-final position, it does not explain its function and distribution. However, comparative evidence indicates that Meto inherited a process of noun phrase final suffixation, with a suffix *-k, which can be reconstructed for Proto-Rote-Meto (§5.5.3). This process has a very similar function and distribution to consonant insertion in Amfo’an, although its form is different. During extension of consonant insertion, it is likely that consonant insertion assumed the function and distribution of the inherited process of suffixation. The emergence of NP-final insertion of /ɡ/ /ʤ/ and /l/, and the loss of the former process of *-k suffixation would not have been an abrupt change, but would have emerged and become regularized after a period of variant forms. However, although almost all historically vowel-final nominals adopted final consonant insertion; Amfo’an has irregularly retained reflexes of the *-k suffix on some forms, which are relics from the former process of NP final suffixation. The correspondence between Amfo’an identity and consonant insertion (§1.2.3) probably also played a role in the regularisation of consonant insertion (§5.5.4).

5.5.3 NP final suffixation in Rote-Meto

Comparative evidence from the languages of Rote, which forms a subgroup with Meto (§1.2) indicates that that Meto inherited a process of noun phrase final suffixation with *-k (Edwards 2018b). This process is found across all the Rote languages, including those that subgroup subgroup most closely with Meto. These languages have a suffix, -ʔ or -k which occurs after certain nouns in noun-phrase final position; this suffix does not occur if a noun is modified by another noun or adjective. As it is found with this function across the different subgroups of Rote-Meto, the form and function of this process can reconstructed for Proto-Rote-Meto (PRM).

For example in Termanu -k occurs after certain nouns when in NP-final position. Whereas if there is a modifier, -k does not occur. Examples are given in (159).

(159)

<table>
<thead>
<tr>
<th>noun</th>
<th>modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>lima-k</td>
<td>kuʔu-k</td>
<td>lima kuʔu-k</td>
<td>'finger’</td>
</tr>
<tr>
<td>lima-k</td>
<td>dale-k</td>
<td>lima dale-k</td>
<td>'palm’</td>
</tr>
<tr>
<td>neʔe-k</td>
<td>ngeo-k</td>
<td>neʔe ngeo-k</td>
<td>'black ant’</td>
</tr>
<tr>
<td>timi-k</td>
<td>dui-k</td>
<td>timi dui-k</td>
<td>'jaw bone’</td>
</tr>
</tbody>
</table>

Data from (Jonker 1908) as given in (Edwards 2018b: 78)

Similarly, in Dela, -ʔ occurs after certain nouns in NP-final position. This is productive. Examples are given in (160).

(160)

<table>
<thead>
<tr>
<th>noun</th>
<th>modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>nieʔ</td>
<td>ngeoʔ</td>
<td>nie ngeoʔ</td>
<td>'black ant’</td>
</tr>
<tr>
<td>maneʔ</td>
<td>manjeo</td>
<td>mane manjeo</td>
<td>'bold king’</td>
</tr>
</tbody>
</table>

Tamelan (In preparation)
In Dela, the occurrence of the nominal suffix -ʔ NP-medially (i.e. before a modifier) can result in a different meaning. For example faiʔesa means ‘one day’ and whereas fai esa ‘for the duration of one day’.

Unlike the languages of Rote, Meto does not attest a synchronic process of NP-final -ʔ or -k. However, there are numerous nominals in Meto which have a final /ʔ/ which are cognate with nouns which take -k or -ʔ in Rote. These final consonants are not synchronic affixes in Meto and are not inherited from PMP. This is evidenced by the fact that cognate glottal stop final forms in Amfo’an and suffixed forms in Rote correspond to vowel-final forms in PMP. These final glottal stops are sporadic retentions of *-k. Examples of Amfo’an forms with a final glottal stop which are cognate with forms in Rote (with -k or -ʔ) and corresponding PMP forms are in (161).

<table>
<thead>
<tr>
<th>PMP</th>
<th>Rote</th>
<th>Tii</th>
<th>Bilbaa</th>
<th>Rikou</th>
<th>Dengka</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>*bulu</td>
<td>bulu-k</td>
<td>bulu-ʔ</td>
<td>bulu-ʔ</td>
<td>fulu-ʔ</td>
<td>Alu-ʔ</td>
<td>funu-ʔ</td>
<td>‘hair, fur’</td>
</tr>
<tr>
<td>*ama</td>
<td>ama-k</td>
<td>ama-ʔ</td>
<td>ama-ʔ</td>
<td>ama-ʔ</td>
<td>ama-ʔ</td>
<td>ama-ʔ</td>
<td>‘father’</td>
</tr>
<tr>
<td>*ina</td>
<td>ina-k</td>
<td>ina-ʔ</td>
<td>ina-ʔ</td>
<td>ina-ʔ</td>
<td>ina-ʔ</td>
<td>ina-ʔ</td>
<td>‘mother’</td>
</tr>
<tr>
<td>*masu</td>
<td>masu-k</td>
<td>masu-ʔ</td>
<td>masu-ʔ</td>
<td>masu-ʔ</td>
<td>masu-ʔ</td>
<td>masu-ʔ</td>
<td>‘smoke’</td>
</tr>
</tbody>
</table>

Edwards (2018b), Jonker (1908). PMP forms are from Blust and Trussel (ongoing)

In cases where a affixed forms in Rote and consonant final forms in Amfo’an correspond to a consonant final-form in PMP, the consonants are not cognate and do not conform to regular sound correspondences attested in in Rote-Meto. For example, *hikan is the etymon of ika-k/ʔ in Rote and ika-ʔ ‘fish’ in Amfo’an. However, the final consonant, *n is regularly reflected in other word positions as /n/ in Rote and Meto. This lack of correspondence between final consonants in PMP, suffixed forms in Rote and glottal stop final forms in Amfo’an can be seen in (162).

<table>
<thead>
<tr>
<th>PMP</th>
<th>Termanu</th>
<th>Dela-Oenale</th>
<th>Dengka</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>*läsun</td>
<td>nesu-k</td>
<td>nesu-ʔ</td>
<td>nesu-ʔ</td>
<td>esu-ʔ</td>
<td>‘mortar’</td>
</tr>
<tr>
<td>*daRaq</td>
<td>daa-k</td>
<td>raa-ʔ</td>
<td>raa-ʔ</td>
<td>naa-ʔ</td>
<td>‘blood’</td>
</tr>
<tr>
<td>*qatluR</td>
<td>tolo-k</td>
<td>telo-ʔ</td>
<td>telo-ʔ</td>
<td>teko-ʔ</td>
<td>‘egg’</td>
</tr>
<tr>
<td>*dalɔm</td>
<td>dale-k</td>
<td>rala-ʔ</td>
<td>rala-ʔ</td>
<td>nana-ʔ</td>
<td>‘inside’</td>
</tr>
<tr>
<td>*hikan</td>
<td>iʔa-k</td>
<td>-</td>
<td>-</td>
<td>ika-ʔ</td>
<td>‘fish’</td>
</tr>
</tbody>
</table>

Edwards (2018b), Jonker (1908). PMP forms are from Blust and Trussel (ongoing)

Additionally, there are a number of corresponding suffixed forms in Rote and glottal stop final forms in Amfo’an which are specific to Rote-Meto and are not known to reconstruct to PMP, see Edwards (2016b). These examples further support that proposal that *-k was present in Proto-Rote-Meto but was not inherited from PMP. Examples of lexical items which occur with -k/-ʔ in Rote and have final /ʔ/ in Amfo’an, which are not known to reconstruct to PMP are are given in (163).
These correspondences between -k/? suffixation and final consonants in Amfo’an which are not consistent with other PMP > Meto sound changes indicate that nominal suffixation of *-k was present in Proto-Rote-Meto. The distribution of this process can be inferred from the distribution of nominal suffixation in the languages of Rote. However, Amfo’an attests a synchronic process NP suffixation with the forms -ʤ, -ɡ and -l rather than -ʔ or -k. The process of suffixation inherited from Proto-Rote-Meto has been lost in all known Meto varieties. In Amfo’an, the function of *-k has been retained while the form of this process changed, although a reflex of this suffix has been sporadically retained non-productively on some forms. The loss of this suffix would have occurred as consonant insertion was extended. This extension was applied to all vowel-final nominals, whereas the nominal suffix -ʔ/-k was restricted, only applying to some forms. Consonant insertion probably first applied to forms which did not take -ʔ/-k, and then gradually extended to forms which took -”k in Proto-Rote-Meto.

5.5.4 Role of speakers and identity

The role of speakers in the extension of consonant insertion should also be taken into consideration, as the this change would have been perceptible to speakers. Consonant insertion has gained socio-linguistic meaning (§1.2.3). It would seem that it gained this meaning as it was extended and that the change was implemented by speakers to index group membership, perhaps accelerating the extension. Language is often employed a marker of identity (Edwards 2009, Fishman and García 2010) This is the case in Western Timor, where the four ethnic identities of the region are defined in terms of language; Helong, Rote, Tetun and the Atoni, who speak Meto (Edwards 2016a). Although Meto speakers self-identify as one linguistic and cultural group, they acknowledge internal cultural and linguistic differences, such as that some varieties of Meto have /r/ while most have /l/. Final consonant insertion is a highly salient feature of Amfo’an, both to its speakers and to speakers of other varieties (see §1.2.3). For example, a speaker of Amanuban commented ‘all the words there end in /ɡ/’ (Edwards 2016a: 362) (Amanuban does not have /ɡ/). Consonant insertion is a point of difference from neighbouring varieties of Meto. Choosing among variant forms to index membership of a certain group is a well-documented phenomenon (Labov 2001, Michael 2014). In the case of Amfo’an, adding final consonants could have been an assertion of difference from other varieties of Meto.

<table>
<thead>
<tr>
<th>(163)</th>
<th>Rote</th>
<th>Rikou</th>
<th>Dela-O</th>
<th>Dengka</th>
<th>Amfo’an</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tii</td>
<td>bona-k</td>
<td>bona-k</td>
<td>bona-k</td>
<td>bona-k</td>
<td>bonaʔ</td>
<td>‘fragrant pandanus’</td>
</tr>
<tr>
<td>bisa-k</td>
<td>lasi-ʔ</td>
<td>lasi-ʔ</td>
<td>lasi-ʔ</td>
<td>mnasiʔ</td>
<td>‘old, aged’</td>
<td></td>
</tr>
<tr>
<td>latu-k</td>
<td>latu-ʔ</td>
<td>latu-ʔ</td>
<td>latu-ʔ</td>
<td>mnatuʔ</td>
<td>‘ripe’</td>
<td></td>
</tr>
<tr>
<td>pela-k</td>
<td>pela-k</td>
<td>mbela-ʔ</td>
<td>mbela-ʔ</td>
<td>penaʔ</td>
<td>‘corn,maize’</td>
<td></td>
</tr>
<tr>
<td>baʔe-k</td>
<td>bake-ʔ</td>
<td>bake-ʔ</td>
<td>bake-ʔ</td>
<td>sbakeʔ</td>
<td>‘branch’</td>
<td></td>
</tr>
</tbody>
</table>

81
5.6 Parallel processes in other languages in the Timor region

Alternating phrase-medial and phrase-final forms of nouns are a feature of languages in the Timor region. Many Austronesian languages of this region have distinct phrase-medial and phrase-final forms for nouns, both in the Rote-Meto subgroup and in Austronesian languages which are less closely related. Medial-final alternations are also found in several non-Austronesian languages of this region. This indicates that there is more to the history of these processes than just NP-final suffixation in Rote-Meto. However it remains unknown why so many languages of this region attest these processes. There are numerous parallels between forms and functions of medial/final alternations in Amfo’an (§3.3.3.1) and other languages of this region. In several languages, the alternating medial and final forms are consonant and vowel final, respectively. While a detailed study of these processes and their diachronic origins is beyond the scope of this thesis, it is important to mention this areal feature when examining the development of consonant insertion in Amfo’an.

5.6.1 Medial-final alternations in Rote-Meto

Languages of the Rote-Meto subgroup attest morphophonological medial/final alternations. In the languages of Rote, the medial and final forms of nouns are marked by affixation and deletion, while in many varieties of Meto, the medial and final forms of nouns are marked by synchronic metathesis.

5.6.1.1 Dela

Dela (Rote), express a medial/final alternation through the alternation of vowel final and consonant final forms, similar to the system found in Amfo’an. In noun phrase-medial position, the final consonant of consonant-final nominals is deleted. Examples are given in (164).

<table>
<thead>
<tr>
<th>noun</th>
<th>modifier</th>
<th>phrase</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>hiek</td>
<td>‘goat’</td>
<td>monaeʔ-a ‘big-DEF’</td>
<td>→ hie monaeʔ-a ‘the big goat’</td>
</tr>
<tr>
<td>hiek</td>
<td>‘goat’</td>
<td>ƞgeoʔ-a ‘black-DEF’</td>
<td>→ hie ƞgeoʔ-a ‘the black goat’</td>
</tr>
<tr>
<td>ʔanaʔ</td>
<td>‘child’</td>
<td>ƞgoɗaʔ-a ‘skinny-DEF’</td>
<td>→ ʔana ƞgoɗaʔ-a ‘the skinny child’</td>
</tr>
<tr>
<td>ʔanaʔ</td>
<td>‘child’</td>
<td>naruʔ-a ‘tall-DEF’</td>
<td>→ ʔana naruʔ-a ‘the tall child’</td>
</tr>
</tbody>
</table>

This means that when there are multiple modifiers, only the final nominal occurs with a final consonant. For example, hiek + monaeʔ + ƞgeoʔ-a → hie monae ƞgeoʔ-a ‘the big black goat’.

5.6.1.2 Metathesis in Amarasi

In Amarasi (Meto) CV → VC metathesis marks attributive modification (Edwards 2016a). Nominals which are non-final in the NP undergo metathesis, whereas final nominals do not. The distribution of metathesised nouns in Amarasi is identical to that of vowel final forms in Amfo’an. Examples are given in (165).
Medial-final alternation are also found in numerous other languages of the region. In several Austronesian languages, medial and final forms are marked by metathesis. This includes Leti (van Engelenhoven 2004), Helong (Balle 2017) and Mambae (Grimes et al. 2014, Fogaça 2017). However, medial/final alternations which involve alternating vowel and consonant final forms are also found; Central Lembata is an example of this.

5.6.2.1 Central Lembata

In Central Lembata (Lembata, Austronesian) 60 % of alienable nouns have two distinct forms which occur in different syntactic environments (Fricke 2017). Of these nouns, one form is longer and consonant final, while the other shorter and is almost always vowel-final. Isolated examples are given in (166).

<table>
<thead>
<tr>
<th>short form</th>
<th>long form</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>liso</td>
<td>lisor</td>
<td>‘rice plant’</td>
</tr>
<tr>
<td>piri</td>
<td>pirin</td>
<td>‘plate’</td>
</tr>
<tr>
<td>bine</td>
<td>binen</td>
<td>‘woman, female’</td>
</tr>
<tr>
<td>una</td>
<td>unan</td>
<td>‘house’</td>
</tr>
<tr>
<td>kara</td>
<td>karadž</td>
<td>‘grain’</td>
</tr>
<tr>
<td>kopo</td>
<td>kopon</td>
<td>‘young person, child’</td>
</tr>
</tbody>
</table>

The two forms occur in different syntactic contexts. The shorter form occurs when a noun is modified, either by another noun or numeral. For example, in (167) below, kopo ‘child’ is modified, and so occurs as kopo. Similarly, in (168), bine ‘woman’ is modified, and so occurs as bine.

5.6.2 Medial-final alternations in other languages of the Timor region

Edwards (2016a: 243)
Whereas if a noun occurs in isolation, it occurs in the longer, consonant-final form. An example is given in (169).

(169)  
\[
[\text{kopoŋ}]_{\text{NP}} \text{ wo } \text{ro } \text{krəka-ŋa} \\
\text{child \ DIST \ DISC \ startle-3SG} \\
\text{‘that child is frightened’}
\]

5.6.3 Alor-Pantar languages

Medial-final alternations are also found in non-Austronesian languages of the Timor region. In Sawila and Kula, two closely related Timor-Alor-Pantar languages spoken in Alor, some lexical roots have distinct final and non-final forms. The final form is typically vowel-final, while non-final forms tend to be consonant-final. In these languages, final forms occur (syntactic) phrase-finally, whereas non-final forms occur elsewhere (Kratochvíl 2014, Williams 2016). This alternation affects not only nouns, but verbs, adverbs, conjunctions, and aspectual markers (Kratochvíl 2014). Examples of alternating forms in Sawila are given in (170).

(170)  
<table>
<thead>
<tr>
<th>final</th>
<th>non-final</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>atooka</td>
<td>atook</td>
<td>‘intestine’</td>
</tr>
<tr>
<td>yoor</td>
<td>yoor</td>
<td>‘scrape’</td>
</tr>
<tr>
<td>naanu</td>
<td>naan</td>
<td>‘not’</td>
</tr>
<tr>
<td>daapuru</td>
<td>daapur</td>
<td>‘kitchen’</td>
</tr>
</tbody>
</table>

(Kratochvíl 2014: 360)

In (171) below show the medial and final forms of giana ‘travel’ in Kula. In (171-a) it occurs phrase-finally, and so occurs in final form. Whereas in (171-b), giana occurs phrase-medially in non-final form, giaŋ.

(171)  
a. gi-pa ai kelen opas awa giana  
3POSS.II-FATHER INTERJ NOW commander then FIN.travel  
‘His father (said), “Hey! Opas, get going now!”’

b. opas awa giaŋ aku=ŋa  
commander then NFIN.travel stay=DIST  
‘(After) the commander had been going for a while …’

(Williams 2016: 64)

5.7 Summary

This chapter has presented a diachronic account of consonant insertion in Amfo’an, accounting for the source of the inserted segments /ʤ/, /ɡ/ and /l/ (§5.3) and the distribution of these segments which constitute two synchronic processes: vowel-initial enclitics (§3.7.2) and phonologically-conditioned suffixation at the end of the noun phrase (§3.7.3).
Using comparative evidence, this chapter has demonstrated that the consonants inserted in Amfo’an are not retentions (§5.1), and that the processes of consonant insertion are an innovation (§5.2).

This chapter has demonstrated that the inserted segments /ʤ/, /ɡ/ and /l/ can be accounted for as a result of regular sound change, by glide fortition affected glides inserted under a former process of glide insertion after /i/, /o/ and /u/ (§5.3.1). While the change *r > l affected earlier instances of /r/ which were inserted after /e/ and /a/ (§5.4).

This chapter has shown that NP-final consonant insertion developed from consonant insertion before enclitics by analogy (§5.5). As consonant insertion was extended to all vowel final forms, consonant insertion assumed the function and distribution of a process of NP suffixation which was inherited from Proto-Rote-Meto (§5.5.3). The lack of regular insertion after /a/ can also be accounted for diachronically; There were not enough /a/ final nominals for a regular process of consonant insertion to develop for such stems (§5.5.1). Consonant insertion has come to be associated with Amfo’an identity; this association evidently had an important role in development of consonant insertion §5.5.4. Consonant insertion developed in a region in which most languages — both Austronesian and non-Austronesian — have morphophonological final/non-final alternations, indicating that there is more to the history of these processes than NP-final suffixation in Rote-Meto alone.
Chapter 6

Conclusions and Implications

6.1 Conclusions

This thesis has presented a synchronic and diachronic study of the forms, functions and distribution of consonant insertions in Amfo’an.

The data presented in this thesis has various implications for the study of consonant/zero alternations. In Amfo’an, the two processes of consonant insertion have the same form, namely /ʤ/, /l/ and /gw/, but different functions. This has not previously been described in typologies of consonant/zero alternations and these processes do not fit neatly into the categories used to classify consonant/zero alternations: epenthesis, synchronic deletion or as morphologically conditioned. These categories draw a distinction between phonological and morphological consonant/zero alternations. Epenthesis and synchronic deletion are phonological processes, while morphologically conditioned alternations are morphological processes. On the other hand, in Amfo’an, final consonant insertion is a morphophonological process (§3.3.3). As this process does not fit into the categories used in previous typologies, it calls for a revision of how typologies of consonant/zero alternations are devised (§6.2.2).

Examining previous studies of consonant/zero alternations also indicates that more detailed study of these processes is needed; as many previous studies have relied on small amounts of data, have been heavily embedded within a certain theory or have not examined the position of a consonant/zero alternation within the broader context of a language’s phonology and morphology. The description of Amfo’an consonant insertions in this thesis has addressed these issues, showing how consonant insertion co-occurs with synchronic consonant deletion (§3.3.3.3) and metathesis (§4.4).

The processes of consonant insertion in Amfo’an also has implications for how consonant epenthesis and phonologically conditioned morphophonological processes are accounted for in phonological theory, in particular Optimality Theory (OT). Consonant insertion before enclitics does not adhere to the predictions of OT, which dictates that consonant epenthesis is either the invariable insertion of one particular segment (default epenthesis) or the insertion of phonetically predictable segments (assimilatory epenthesis). Consonant insertion in Amfo’an, while phonologically predictable is neither default nor phonetically predictable; but is a third kind epenthesis,
in which the epenthetic consonants are to some extent faithful (featurally similar) to the adjacent vowels, but are not phonetically predictable (i.e. glides). Further, Optimality Theory predicts that both epenthesis and phonologically conditioned allomorphy results in less marked syllable structures (Bonet and Mascaró 2007), while both processes of consonant insertion in Amfo’an result in more marked syllable structures. However, the alternating segments in Amfo’an can be accounted for by looking at models of phonology other than classical OT, namely combining OT with Autosegmental phonology (§4.2.1). Although it is possible to account for the insertion of /ʤ/, /l/ and /ɡw/ synchronically, examining the diachronic sources of these segments demonstrates that they result from regular sound change. The case of Amfo’an emphasises the importance of a diachronic perspective and of looking at the diachronic origins of phonetically unnatural phonological processes which may be difficult to account for if only a synchronic approach is taken. As many have commented, to truly understand a linguistic phenomenon, we must consider its diachronic sources (Blevins 2004).

6.2 Implications

6.2.1 Phonology

This study of consonant insertion in Amfo’an has raised some broader questions about how phonological theories are devised. In order to be useful, a theory should be able to capture the diversity of processes attested cross-linguistically and what motivates them (Uffman 2007). As a result, phonological theories make predictions are based on what has been previously attested in languages (Baković 2014, van der Hulst 2017), with the goal of capturing cross-linguistic variation observed in the sound systems of the world’s languages (Gordon 2007).

Optimality theory in particular aims to explain phonological typology and makes claims about the phonology of all languages (McCarthy 2002), such as that all changes between inputs (underlying forms) and outputs (surface forms) are driven by markedness constrains and result in minimally marked syllable structures (Downing 2009).

However, all theories have limitations (van Oostendorp 2018). One limitation a theory may have is if it under-generates by failing to capture patterns that have been found in one or more languages (Gordon 2007). In this thesis, I have made the claim that OT is unable to predict the consonant epenthesises attested in Amfo’an by having a highly restricted definition of what constitutes epentheses and because it proposes that there is a limited set of possible epenthetic consonants. In order to account for consonant epentheses of segments such as /ʤ/, /l/ and /ɡw/, Optimality Theory requires revision.

However, theories loose their explanatory power if they overgenerate; a major strength of Optimality theory is that its predictions are constrained and based on a large amount of cross-linguistic data. An ’everything is possible’ approach would result in theories with little explanatory power. This then raises the question of how a theory, such as Optimality theory may retain its explanatory power but be able to account for unusual and phonetically unnatural phenomena such as epenthetic /ɡw/
in Amfo’an. In this thesis, I have proposed one solution to this problem in order to account for Amfo’an, which is to for OT to incorporate aspects of Autosegmental Phonology, in particular unspecified segments and feature spreading (§4.2.1).

6.2.2 Typology

This study of consonant insertion in Amfo’an also has implications for how typologies of consonant/zero alternations are devised. In this thesis, I have shown that better tools for cross-linguistic comparison are required, as the categories of epenthesis, deletion and morphologically conditioned consonant/zero alternations are insufficient. This calls for a revision of the categories, which could be done in two ways. The first approach would be to devise new categories such as morphophonological consonant insertion in order to account for the Amfo’an data. The second way would be to use the approach of Canonical Typology. In this approach to typology, the canonical or best instance of a phenomenon is defined through a set of converging criteria. The various instances of a phenomena are plotted in terms of how well they approximate the canonical ideal (Corbett 2007, Brown and Chumakina 2012). As a result, the canonical approach defines the range of possible ways a certain phenomenon may be realised (Hieber 2011). This approach divides cross-linguistic variation into fine-grained variables rather than binary categories (Bond 2018), and so is a more nuanced tool for cross-linguistic comparison. Another strength of this approach, in contrast to classical typology, is that the canonical instance of a phenomena may be rare or even unattested, and means that no particular instance of a phenomena is used as a point of comparison, recognizing that the most common or well known instances of particular phenomenon may not actually be the best example (Brown and Chumakina 2012).

In canonical typology, criteria are used to assess which points represent more and less canonical instances of the phenomena (Brown and Chumakina 2012). These criteria are typically binary, such there are two possible values: the canonical value and the non-canonical value for a given dimension (Bond 2018: 8). In the case of consonant/zero alternations, the criteria would include: whether an alternation is morphologically conditioned, whether the alternating segment is phonologically predicable, whether the alternation is a regular process, and whether segments are being added or subtracted. These criteria for characterising consonant/zero alternations are outlined in (172).

(172) |                           | value 1 | value 2 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>morphologically conditioned</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>phonologically conditioned</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>segment phonologically predicable</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>segment phonetically predictable</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>regular process</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>segments added</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

In the case of consonant/zero alternations, epenthesis, (phonological) deletion, and morphologically conditioned consonant/zero alternations could represent canonical
instances of consonant/zero alternations; while other types of consonant/zero alter-
nations, such as in Amfo’an, can be plotted in relation to these. (173) below uses
the criteria outlined in (172) to compare the canonical types of consonant/zero alter-
nations with the two processes of consonant insertion in Amfo’an.

(173)

<table>
<thead>
<tr>
<th></th>
<th>canonical C/Ø alt.</th>
<th>Amfo’an C/Ø alt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ephenthesis</td>
<td>phon. deletion</td>
</tr>
<tr>
<td>morphologically conditioned</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>phonologically conditioned</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>segment phonologically predicable</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>segment phonetically predictable</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>morphologically restricted</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>segments added</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>synchronically productive</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

In (173), we see that the processes of consonant insertion in Amfo’an demonstrate
different characteristics from the three canonical types of consonant/zero alter-
nations. Although the criteria can be used to describe the three canonical types
of consonant zero alternations, there are also many other possible types of consonant
zero alternation which also can be described using the criteria. The three types
of consonant/zero alternations in Amfo’an are an example of this. With more study
of these processes, perhaps more non-canonical cases of consonant/zero alternation
will be found to exist.

Fully implementing the suggestions made in this chapter is beyond the scope
of this thesis. However, the issues discussed in this chapter, and this thesis as a
whole emphasize what study of (morpho)phonology should involve; it should include
study of phenomena both in both breadth and depth, and consider a wide range of
explanatory sources in order to address the question of why a languages have the
properties they do. As Hyman (2014: 114) comments, ‘It is only in so doing that we
will attain a complete picture of what phonology can vs. cannot do and why.’
Appendix A

Cross-linguistic survey of consonant/zero alternations

This appendix gives a brief overview of each case of consonant/zero alternation included in the typological survey in §2.4.1. Languages are listed in alphabetical order. AN refers to Austronesian languages, and IE refers to Indo-European languages.

<table>
<thead>
<tr>
<th>language</th>
<th>segment</th>
<th>type</th>
<th>context</th>
<th>reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achenese (AN, Indonesia)</td>
<td>h</td>
<td>epenthesis</td>
<td>V_#, after enclitics</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Ajyíninka Apurucayali (Arawakan, Peru)</td>
<td>t</td>
<td>deletion</td>
<td>before another C</td>
<td>Staroverov (2015b)</td>
</tr>
<tr>
<td>Aklanon (AN, Phillipines)</td>
<td>h</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Amharic, (Semitic, Ethiopia)</td>
<td>t</td>
<td>morph. cond.</td>
<td>certain geminate verbs</td>
<td>Morely (2015)</td>
</tr>
<tr>
<td>Amis (AN, Taiwan)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Atayal (AN, Taiwan)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Ba’aman, (AN, Borneo)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Berawan (AN, Sarawak)</td>
<td>h</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Brunei Malay (AN, Brunei)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Bunun (AN, Taiwan)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>language</td>
<td>segment</td>
<td>type</td>
<td>context</td>
<td>reference</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------</td>
<td>----------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Taiwan</td>
<td>g</td>
<td>morph. cond.</td>
<td>between V-final verbs +V-initial suffixes</td>
<td>Staroverov (2015a)</td>
</tr>
<tr>
<td>Buriat (Mongolic, Russia)</td>
<td>j, w</td>
<td>epenthesis</td>
<td>i_V, u_V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Cantonese (Sino-Tibetan, China)</td>
<td>j</td>
<td>epenthesis</td>
<td>before another C</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Catalan (IE)</td>
<td>final stops</td>
<td>deletion</td>
<td>before another C</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Colloquial Slovak (IE, Slovakia)</td>
<td>j</td>
<td>epenthesis</td>
<td>i_V, V_i</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Casiguran Dumagat (AN, Philippines)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Chammaro (AN, Mariana Islands)</td>
<td>gw, dz</td>
<td>morph. cond.</td>
<td>referential focus -i after V final stems</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Chintang (Sino-Tibetan, Nepal)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Chumburung (Niger–Congo, Ghana)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Cree (Plains) (Algic, USA /Canada)</td>
<td>t</td>
<td>morph. cond.</td>
<td>V final prefixes, before V-initial verbs and nouns</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Czech (IE, Czech Republic)</td>
<td>j, w</td>
<td>epenthesis</td>
<td>i_V, u_V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Dalat (AN, Sarawak)</td>
<td>h</td>
<td>epenthesis</td>
<td>V_#_pr</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Dutch (IE, Netherlands)</td>
<td>j, v, n</td>
<td>epenthesis</td>
<td>i_V, e_V, u_o_V, a-final hosts+ V initial enclitics</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>English</td>
<td>?</td>
<td>epenthesis</td>
<td>pr[#_V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>English, Eastern Mass.</td>
<td>r</td>
<td>deletion</td>
<td>word-final, before another C</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>English, non-rhotic varieties</td>
<td>r</td>
<td>epenthesis</td>
<td>a;o; x; V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Faroese (IE, Faroe Islands)</td>
<td>j, w, v</td>
<td>epenthesis</td>
<td>i_V, V-HIGH_i, u_V, V-HIGH_u</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Farsi (IE,</td>
<td>?</td>
<td>epenthesis</td>
<td>V-HIGH_V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td></td>
<td>j</td>
<td>epenthesis</td>
<td>i_V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>language</td>
<td>segment</td>
<td>type</td>
<td>context</td>
<td>reference</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------</td>
<td>---------------------</td>
<td>---------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Iran)</td>
<td>w</td>
<td>epenthesis</td>
<td>u _ V</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>French (IE, France)</td>
<td>?</td>
<td>epenthesis</td>
<td>p_V[#_ V</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Itbayaten (AN, The Phillipines)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_ #)_{PR}</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Ivatan (AN, The Phillipines)</td>
<td>?</td>
<td>epenthesis</td>
<td>V_ #)_{PR}</td>
<td>Blevins (2008: 8)</td>
</tr>
<tr>
<td>Kalaallisut (Eskimo–Aleut, Greenland)</td>
<td>j</td>
<td>epenthesis</td>
<td>p_ V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Kalaallisut (Eskimo–Aleut, Greenland)</td>
<td>w</td>
<td>epenthesis</td>
<td>i_ V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Kalaallisut (Eskimo–Aleut, Greenland)</td>
<td>v</td>
<td>epenthesis</td>
<td>u_ V</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Kalaallisut (Eskimo–Aleut, Greenland)</td>
<td>j</td>
<td>epenthesis</td>
<td>V_ i</td>
<td>Staroverov (2014)</td>
</tr>
<tr>
<td>Kanniyakumari</td>
<td>?</td>
<td>epenthesis</td>
<td>#_ a</td>
<td>Christdas (1988)</td>
</tr>
<tr>
<td>Tamil (Dravidian, India)</td>
<td>j</td>
<td>epenthesis</td>
<td>#_ i,e</td>
<td></td>
</tr>
<tr>
<td>Tamil (Dravidian, India)</td>
<td>w</td>
<td>epenthesis</td>
<td>#_ o,u</td>
<td></td>
</tr>
<tr>
<td>Kapuas (AN, Borneo)</td>
<td>?</td>
<td>epenthesis</td>
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<td>Zezuru (Shona) (Niger–Congo, Zimbabwe, Mozambique)</td>
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<td>epenthesis</td>
<td>$V_αV_α$</td>
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Appendix B

Selected Amfo'an texts

In this appendix, two Amfo'an texts are presented. Each line represents an intonation unit.

B.1 Yanti Story

Table B.1: Meta Data

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<td>Recorded by</td>
<td>Yedida (Oma) Ora, Kirsten Culhane</td>
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<td>Transcribed by</td>
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<td>Interlinear by</td>
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<td>Free Kupang</td>
<td>Yedida (Oma) Ora</td>
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<td>Free English</td>
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<td>Summary</td>
<td>Yanti tells a story about going into the forest to harvest honey when she was young</td>
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</tbody>
</table>

(174)  
 hai fe? an-ana?
 1EX still rdp-small
‘we were still small’

(175)  
 le? au aam baab?=ee nitu-n fe? a/n-moon
 le? au ama? baba?=ee nitu-n fe? n-moni
TOP 1SG father grandparent=3DET spirit-3GEN still 3-live\MET
‘my grandfather who is now dead was still alive’
(176) a/n-muu? in paah=ees, es tuka-n neef meto? n-muʔi in paha=ees es tuka-n nefo meto? 3-exist\MET 3sg land=one LOC end-3GEN lake\MET dry
‘there was a place, at the end of a dry lake’ 20170406, 45.103

(177) iʤ kalo hai m—
idge kalo hai 1DET if
‘if we...’ 20170406, 47.894

(178) a. mi-skola mi-snaas, iʤ
mi-skola mi-snasa idga 1EX-school\MET 1EX-stop\MET 1DET
‘school had finished,’

b. nana=t n-ok ok fuun hitu-?
nana=te n-oka funan hitu-? inside=TOP 3-with\MET month seven-ORD
‘in july ’ 20170406, 57.09

(179) hai m-nao=ma m-hel h oni-dʤ m-oe le? paah=ii
hai m-nao=ma m-heli oni-C m-oe le? paha=ii 1EX 1EX-go=and 1EX-cut.off honey-NP.EDGE 1EX-DAT TOP land=1DET
‘we went to cut honey in this place’ 20170406, 61.20

(180) kalo haim
kalo hai m—
if 1EX
‘if we’ 20170406, 62.301

(181) hai he m-nao=gween hai maʔko Lelogwaam hai m-sae
hai he m-nao=een hai m-aʔko Lelogwaam hai m-sae 1EX IRR 1EX-go=PERF 1EX 1EX-from Lelogama 1EX 1EX-ascend
oto-g
oto-C car-NP.EDGE
‘we went from Lelogama, we got into a car’ 20170406, 68.042

(182) a. lo le? oto-g tuna-n nee bale? na-mfa-fau?,
lo leʔ oto-C tuna-n nee bale? na-mfa-fau? and TOP car-NP.EDGE top-3GEN 3GEN thing 3-RDP-many
‘and on the car there were lots of things,’

b. leʔ aal kene-l leʔ aal boslak
leʔ aal kene-C leʔ aal boslak TOP all container-NP.EDGE TOP all mattress
‘many containers, many mattresses’ 20170406, 75.684
(183) mansian a/msaʔ=te hai m-nao mi-mfau?
mansian msaʔ=te hai m-nao mi-mfau?
human also=TOP 1EX 1EX-go 1EX-many
‘people also, we went, many (of us)’

(184) a. of hai m-aʔko Lelogwaam ma m-tee-b Binafun
of hai m-aʔko Lelogwaam=ma m-tee-b Binafun
later 1EX 1EX-from Lelogama=and 1EX-until-TR Binafun
‘later, we from Lelogama got to Binafun’
b. hai m-sanu=m hai m-nao hae=laah
hai m-sanu=ma hai m-nao hae=aah
1EX 1EX-descend=and 1EX 1EX-go leg=just
‘we got out of the car and we went on foot’

(185) mes a/jt-nao hae msaʔ t-eki leʔ aal bale?
mes t-nao hae msaʔ t-eki leʔ aal bale?
but 1IN-go leg also 1IN-carry TOP ALL thing
‘we walked on foot, carrying all the things’

(186) a/jt-suuy leʔ aal ta-bale t-eki aal kene-l leʔ aal
t-suuy leʔ aal ta-bale t-eki aal kene-C leʔ aal
1IN-carry.on.head TOP all put 1IN-carry ALL container-NP.EDGE TOP all
‘we carried (them) on our heads, many containers’

(187) lipaʔ baleʔ na-mfa~fauʔ
lipaʔ baleʔ na-mfa~fauʔ
sarong thing 3-RDP-many
‘cloth, many things’

(188) leʔ aal ʔnaaʔi-iʤ, idغا tefes=at hai m-sae
leʔ aal ʔnaaʔi-C idغا tefes=ate hai m-sae
TOP all type.of.cloth-NP.EDGE 1DEM sometimes=TOP 1EX 1EX-ascend
‘there was cloth, sometimes we would get on...’

(189) bidҗakase-l, hai mi-sae-b leʔ aal baleʔ nee n-oe
bidҗakase-C hai mi-sae-b leʔ aal baleʔ nee n-oe
horse-NP.EDGE 1EX 1EX-ascend-TR TOP all thing 3DEM 3-DAT
‘horses, we’d put up our things on...’

(190) dҗakase-l, lalan a/ʔlooɡ
djabi-C, lalan aʔluoɡ
horse-NP.EDGE road far
‘horses, the road was far’

(191) a. idغا kalo hai m-tea nai mi-snaas, lait leʔ au
idغا kalo hai m-tea nai mi-snaas, lali=te leʔ au
1DEM if 1EX 1EX-until already 1EX-stop\MET CMPL=TOP REL 1SG
‘when we got there, we’d stop, then my’
b. *aam baab?=aa=m le? au iin baab?=ee ama’ baba?=aa=ma le? au ina? baba?=ee father grandfather=0DET=and TOP 1SG mother grandfather=3DET leek=kai=ma m— leka=kai=ma order-MET=1EX.ACC=and
grandfather and my grandmother would tell us’

(192) painote-l le? hai laa?
painote-C le? hai laa? store-NP.EDGE TOP 1EX campsite
‘...to store it. Our campsite’

(193) a. *mi-sone bale-l, a|m-painote-l le? laa?
mi-sone bale-C, m-painote-C le? laa? 1EX-clean place-NP.EDGE STAT-store-NP.EDGE TOP campsite
‘to clean the place, to put away (things), the campsite’,
b. lait=am ?onen a|m-ʔonen mi-laal
lait=ma ?onen m-ʔonen mi-lali CMPL=and pray 1EX-pray 1EX-CMPL\MET ‘then pray, after praying’

(194) le? au aam baab?=ee nitu nee a|n-mulai na-molok=een
le? au ama? baba=ee nitu nee n-mulai na-molok=een TOP 1SG father grand=3DET corpse 3DEM 3-start 3-speak=PERF
‘my grandfather who is dead would start to speak’

(195) kalo hai mi-m-tee=m
kalo hai mi-m-tea=ma
if 1EX 1EX-STAT-until=and
‘when until’

(196) neen=gween maab=leen, a|n-toko=m na-molok=een
neno=een mabe=een, n-toko=ma na-molok=een sky=PERF evening=PERF 3-sit=and 3-speak=PERF
‘it was evening, he’d sit and talk’

(197) le? fai-dg naan he n-moe? saʔan
le? fai-C naan he n-moʔe saʔan TOP night-NP.EDGE 2DEM IRR 3-do\MET what
‘do some things in the evening’

(198) he n-poi he n-poo? naʔ ka, lait
he n-poi he n-poʔa naʔ ka, lait IRR 3-come.out IRR 3-hunt\MET then NEG CMPL
‘went out hunting, then’
In the morning, sometimes they’d split up.

The others would go and cut all kinds of bamboo.

Others would go and look for rope.

Because at night they tied.

Honey trees to cut off (honey).

If we got there before.

If it was still daytime, sometimes.

They’d put (things) away.

'Going hunting.'
(207) a. lo kalu a/n-poo? naa=m na-peni le? aal
    lo kalu n-poo? a naa=ma na-peni le? a fisi
    so if 3-hunt|met 0dem=and and 3-get top all
    ‘so they’d hunt and get’
    b. si si fasi fui-d greeting le? aal luu fui-d greeting
    si si fasi fui-C le? a luus fui-C meat pig wild-np.edge top all deer wild-np.edge
    ‘wild pig meat, wild deer’ 20170406, 229.288

(208) a. le? aal bidga fui-d, manu fui-d greeting
    le? a bidga fui-C manu fui-C, rel all cow wild-np.edge chicken wild-np.edge
    ‘or wild cows or chickens,’
    b. t-eku si si-d greeting kalu a/n-heli=n
    t-eku si si-C kalu n-heli=n 11n-eat meat-np.edge if 3-cut.off=pl
    ‘(we) ate meat, we cut off’ 20170406, 238.07

(209) a. a/n-heli=n oni-d greeting neem, t-inu le? aal oni
    n-heli=n oni-C nema, t-inu le? a ala oni
    3-cut.off=pl honey-np.edge 3\come-\met 11n-drink top all honey
    oef
    oef liquid
    ‘cut off honey, drink honey’
    b. t-eku le? aal mauf
    t-eku le? a mauf 11n-eat top all honeycomb
    ‘and eat honeycomb’ 20170406, 246.176

(210) le? aal oni ?naka-f
    le? a ala oni ?naka-f top all honey head-0gen
    ‘and the honey’s head’ 20170406, 249.497

(211) t-eku=m ta-mseen, he t-haan noka? msa?=t esa=n
    t-eku=ma ta-msena, he t-hana noka? msa?=te esa=n 11n-eat=and 11n-full\met irr 11n-cook\met tomorrow also=top loc=pl
    ‘we ate and were full, the next day we’d cook’ 20170406, 255.781

(212) ai? ta-luu tamsaa=t esa=n, loi-d greeting kalu a|n-heli=ma
    ai? ta-luu tamsaa=te esa=n, loi-d greeting kalu t-heli=ma or 11n-make chilli.sauce=top loc=pl carry-np.edge if cut.off=and
    oke?
    oke? after that

101
‘or make chilli sauce and carry it. When we’d finished cutting (honey), after
that’

(213) at-painote=m
t-painote=ma
1IN-store=and
‘we’d store (it) and’

(214) a. at-loi bale?=am loi oon=dgaa=m,
t-loi bale?=am loi oni=aa=ma
1IN-carry thing=and carry honey=0DET=and
‘we’d carry things, and carry the honey’
b. loi a|bdgaa=en loi oon=dgaa=t,
loi bdgaa=en loi oni=aa=te
carry other=PL carry honey=0DET=TOP
‘carry the others, carry the honey’
c. a|bdgaa=en loi=at mauf=at,
bdgaa=en loi=at mauf=at
carry other=PL carry=TOP honeycomb=TOP 1IN
‘carry the honey comb’
d. hit a|bdgaa=ee loi le? aal bale? bale?=am
hit bdgaa=ee loi le? aal bale? bale?=ma
1EX other=3DET carry TOP all thing=thing=and
‘we others carried all the other things’

(215) a. fani teem at-nao hae-1 a|mza?,
fani tema t-nao hae-C mza?,
return 1IN\come\M 1IN-go leg-NP.EDGE also
‘go home on foot, also’
b. t-eki le? aal sisi-dg le? aal sisi meto?
t-eki le? aal sisi-C le? aal sisi meto?
1IN-carry TOP all meat-NP.EDGE TOP all meat dry
‘carrying meat, dried meat’

(216) a. naʔko hit, he na? he at-loi ta-beʔ?
naʔko hit, he na? he t-loi ta-beʔi
3-from 1IN IRR then IRR 1IN-carry 1IN-be.strong\MET
‘from us, we carried it, we were strong’
b. at-fani teem=ma n-tea Binafun=at
t-fani tema=ma n-tea Binafun=ate
1IN-return 1IN\come\MET=and 3-until Binafun=TOP
‘we came back to Binafun’

(217) ta-sae-b le? aal bale? n-oe oot=gwee=m
ta-sae-b le? aal bale? n-oe oto=ee=ma
1IN-ascend-TR TOP all thing 3-DAT car=3DET=and
‘we put all the things in the car’

(218) a. *hit a|msaʔ a|t-sae oot=gwa=m*
   hit msaʔ t-sae oto=aa=ma
   1IN also 1IN-ascend car=0DET=and
   ‘we also got in the car and’

b. *a|t-faan teem t-oe Leelogwaam*
   t-fani tema t-oe Leelogam
   1IN-return\MET 1IN\COME\MET 1IN-DAT Leelogama
   went back to Leelogama’

(219) a. *leʔ oon=dja=m mauf es esa=t*
   leʔ oni=aa=ma mauf es esa=te
   TOP honey=0DET=and honeycomb one one=TOP
   ‘the honey and each of the honeycombs’

b. *iin=dgee kuu-n, leʔ kalu ta-peen*
   ini=ee kuu-n leʔ kalu ta-peni
   3SG=3DET alone-3GEN TOP if 1IN-get\M
   ‘that was each person, if they had gotten (it)’

(220) a. *leʔ au aam baabʔ=ee na-pala=kit=am es esa=te*
   leʔ au ama? baba=ee na-pala=kit=am es esa=te
   TOP 1SG father grand=3DET 3-divide=1IN.ACC=and one one=TOP
   ‘my grandfather divided it for us’

b. *ina n-huku kuu-n in-dg,*
   ina n-huku kuu-n ini-C
   3SG 3-carry alone-3GEN 3SG-NP.EDGE
   ‘and carried theirs alone’

c. *n-loi kuu-n in-dg*
   n-loi kuu-n ini-C
   3-carry.on.shoulder alone-3GEN 3SG-NP.EDGE
   ‘carried theirs alone’
B.2 Honey story

Table B.2: Meta Data

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(221) \( \text{kalo he t-heli oni-dg} \)

kalo he t-heli oni-C

if IRR 1IN-cut.off honey-NP.EDGE

‘if going to cut off honey’

20170802-1, 09.397

(222) \( \text{a|n-tee nasi-dg} \)

n-tea nasi-C

3-until forest-NP.EDGE

‘into the forest’

20170802-1, 15.861

(223) \( \text{leʔ hau oni=n=ee} \)

leʔ hau oni=n=ee

TOP tree honey=PL=3DET

‘the honey trees’

20170802-1, 18.681

(224) \( \text{n-bi-n keen, hau oni a|nbi-n} \)

n-bi-n keen hau oni nbi-n

3-LOC-PL many tree honey 3-LOC-PL

‘there is lots of honey trees there’

20170802-1, 28.496

(225) \( \text{a|t-nao a|t-ʔote elak} \)

t-nao t-ʔote elak

1IN-go 1IN-cut stairs

‘we go, cut stairs’

20170802-1, 33.322
226. *kakaʔ* ?ote elak
kakaʔ ʔote elak
bamboo cut stairs
‘bamboo, cut stairs’

227. a. a|lt-feek tani-d, lali=t t-eki neem n-oe
t-feka tani-d, lali=te t-eki neem n-oe
1IN-pull\MET rope-NP.EDGE cmpl-TOP 1IN-carry 3\come-MET 3-DAT
‘pull the rope, then carry (it) to’
b. hau oon=dgee uu-n
hau oni=ee uu-n
tree honey=3DET tree-3GEN
‘the honey tree’

228. ta-bgoa-b=een n-bi-n, t-ail=ee=m nogah
ta-bgoa-b=een n-bi-n, t-ail=ee=ma nogah
1IN-gather-TR=PERF 3-LOC-PL 1IN-look.at=3DET=and enough
‘gather there, see if there is enough’

229. a|lt-mulai ta-teta elak a|n-sae na-nete hau=gwee taʔu-n
t-mulai ta-teta elak n-sae na-nete hau=ee taʔu-n
1IN-start 1IN-stand.up stairs 3-ascend 3-climb tree=3DET trunk-3GEN
‘start putting up the stairs, climb up the tree trunk’

230. laal t-aiti tani-dʒ a|t-sae=ma t=futu elak
lali t-aiti tani-C t-sae=ma t=futu elak
cmpl-MET 1IN-take rope-NP.EDGE 1IN-ascend=and 1IN-tie stairs
‘then take the rope, go up and tie the stairs’

231. futu elak
futu elak
tie stairs
‘tie the stairs’

232. a. lek-lekaʔ a|n-sae n-fini n-oe hau=gwee keno-n,
lek-lekaʔ n-sae n-fini noe hau=gwee keno-n
RDP-when 3-ascend 3-pass 3-DAT tree=3DET big,branch-3GEN
‘when going up to the big branches’
b. n-tea hau=gwee keno-n, kalo
n-tea hau=ee keno-n, kalo
3-until tree=3DET big,branch-3GEN if
‘up to the big branches’

233. hau=gwee keno-n he maʔelak
hau=ee keno-n he maʔelak
tree=3DET big,branch-3GEN irr adj-stairs
‘the tree’s big branches, that have stairs’
(234) a|tao n-teni elak, a|n-teek=ee=te n-ak
    tao n-teni elak, n-teka=ee=te n-ak
put 3-again stairs 3-call=3SG.ACC=TOP 3-speak
‘put more stairs, called’ 20170802-1, 89.463

(235) a|ʔpaʔuf, a|ʔpaʔuf, kalo le?
    ?paʔuf ?paʔuf kalo le?
stair.joint stair.joint if REL
‘stair joint, stair joints which...’ 20170802-1, 92.813

(236) a|n-tao na-huun le? a|n-teek n-aka teet hae-l
    n-tao na-hunu le? n-teka n-aka tetu hae-C
3-put 3-first\MET TOP 3-call-MET 3-speak stand.upright\MET leg-NP.EDGE
‘first put up what is called the standing legs’ 20170802-1, 102.455

(237) a|n-sae n-fini=m n-oe sbake=n berarti
    n-sae n-fini=ma n-oe sbake=n berarti
3-asce 3-pass=and 3-DAT forked.branches=PL mean
‘go up through forked branches, meaning’ 20170802-1, 108.838

(238) nane nogah le?, a|t-sanu t-faan ta-loitan
    nane nogah le?, t-sanu t-fani ta-loitan
2DEM enough TOP 1IN-deced 1IN-return\MET 1IN-prepare
‘that’s enough, go down and prepare’ 20170802-1, 116.943

(239) a|ʔtaʔan
    ?taʔan
basket
‘baskets’ 20170802-1, 121.908

(240) benas besi-ʤ lali=t
    benas besi-C lali=te
machete knife-NP.EDGE CMPL=TOP
‘machetes, knives, then’ 20170802-1, 128.143

(241) a|t-sae
    t-sae
1IN-ascend
‘go up’ 20170802-1, 129.71

(242) a. t-sae=t halı-t bonı=t eelk=ee kinan,
    t-sae=te halı-t bonı=te elak=ee kinan
1IN-ascend-TOP step-NMLZ through-TOP stairs=3DET branch.node
‘go up, stepping through the stairs’

b. t-sae lek-lekaʔ t-sae t-fini=ma=te
    a|t-sae lek-lekaʔ t-sae t-fini=ma=te
1IN-ascend RDP-when 1IN-ascend 1IN-pass=and=TOP
‘go up, go up and pass’ 20170802-1, 138.277
(243) hau=gwee sbake-n, ta-neet, ta-nete a|t-nao on le? hau=ee sbake-n ta-neete ta-nete t-nao on le? tree=3DET branches-3GEN 1PL.IN-climb\MET 1PL.IN-climb 1PL.IN-go like TOP belo-g belo-C monkey-NP.EDGE
‘the tree’s branches, we climb them like a monkey’ 20170802-1, 146.669

(244) bi hau=gwee tuna-n, ta-nete=ma t-nao=ma n-tea bi hau=ee tuna-n ta-nete=ma t-nao=ma n-tea LOC tree=3DET top-3GEN 1PL.IN-climb=and 1PL.IN-go=and 3-until oni-dj oni-C honey-NP.EDGE
‘to the top of the tree, we climb to the honey’ 20170802-1, 152.061

(245) a|t-sae t-eki luu-g luu-g a|t-pake noa ?laʔu-g, t-otu-g t-sae t-eki luu-C luu-C 1PL.IN-ascend 1PL.IN-carry honey.tool-NP.EDGE honey.tool-NP.EDGE a|t-pake noah ?laʔu-C t-otu-C 1PL.IN-make coconut husk-NP.EDGE 1PL.IN-burn-NP.EDGE
‘we climb carrying honey tools, made from coconut husk; we burn it’ 20170802-1, 160.544

(246) in ka n-pina, lo mes ina flae n-tuta n-tepo noa ?laʔu in ka n-pina, lo mes ina flae n-tuta n-tepo noa ?laʔu 3SG NEG 3-blaze but but 3SG coals 3-continue 3-cut.down 3-DAT coconut ‘it doesn’t catch fire but the coals cut down the coconut husk’ 20170802-1, 168.569

(247) na-laal=gwee le? in ahhhh na-lalu=ee le? in ahhhh 3-CMPL=3SG.ACC TOP 3SG pause ‘then’ 20170802-1, 177.502

(248) sasiu-g sasiu-C spark-NP.EDGE ‘sparks’ 20170802-1, 180.248

(249) a|n-mofu=ma n-nao oni kaat?=ee n-nao na-tuin le? sasiu=gwee a|n-mofu=ma n-nao oni kata?=ee n-nao na-tuin le? sasiu=ee 3-fall=and 3-go honey queen.bee=3DET 3-go 3-follow TOP spark=3DET
‘fall, the queen bee follows the sparks’

(250) a.  *ina n-mofu n-ok*  *mele=t ina n-mofu=ma*
ina n-mofu n-oka  mele=te  ina n-mofu=ma
3SG 3-fall  3-with\MET way-TOP 3SG 3-fall
‘she falls through, she falls and’

b.  *n-nao na-tuin n-oe muni naidjan, mofu*
 n-nao na-tuin  n-oe muni nai?jan mofu
3-go  3-follow 3-DAT later ground fall
‘falling down to the ground’

c.  *a|t-sapu=t mofu-g oke? oke?*
t-sapu=t  mofu-C oke? oke?
1IN-sweep-TOP fall-NP.EDGE all all
‘sweeping all that falls’

(251)  *oni kaat?=ee n-mofu oke? n-oe naidjan t-aiti benas*
oni kata?=ee  n-mofu oke? n-oe nai?jan t-aiti benas
bee queen.bee=3DET 3-fall  all 3-DAT ground 1IN-take machete
‘the queen bee falls to the ground, we take machetes’

(252) a.  *a|t-saal, saal=ee n-boni hau=gwee i?id*
t-sala  sala=ee  n-boni hau=ee i?da
1IN-cut.free\MET cut.free=3SG ACC 3-through tree=3DET 1DEM
‘we cut (it) free, though the tree’

b.  *sala t-poi ne na-ʔko hau-g, t-aiti in*
sala  t-poi ne na-ʔko hau-C t-aiti in
1IN-cut.free\MET 1IN-come.out so 3-from tree-NP.EDGE 1IN-take 3SG
mauf mauf honeycomb
‘we cut (it) free, it comes out from the tree, its honeycomb’

(253) a.  *tanab, futu t-eki tani-ʤ nane n-ak tanab*
tanab futu t-eki  tani-C nane n-ak tanab
tie.repeatedly tie 1IN-use rope=NP.EDGE 2DEM 3-speak tie.repeatedly
‘tie it multiple times using ropes, called tanab’

b.  *a|t-heli ina ?naka-n le? ma-ʔoef*
a|t-heli ina ?naka-n le? ma-oef
1IN-cut.off 3SG head-3GEN REL ADJ-liquid
‘we cut off its head, that is wet’

(254)  *a|t-taogw=ee n-oe ?taʔan*
t-tao=ee  n-oe ?taʔan
1IN-put=3SG ACC 3-DAT basket
‘we put it in a basket’
(255) a/n-bi-n lali=t
n-bi-n   lali=te
3-LOC-N CMPL-TOP
‘it’s inside, then’ 20170802-1, 227.324

(256) a. a/t-sanu  t-faan  fani=t
ts-sanu  t-fani  fani=te
1IN-descend 1IN-return\MET 1IN-return=TOP
‘go down and return’
b. t-eki  baut ma?fena?, a/t-panat
t-eki  baut ma?fena?, t-panat
1IN-carry load heavy  1IN-guard.carefully
‘carrying a heavy load, guarding (it) carefully’ 20170802-1, 234.282

(257) hau=gwee oni-d3  ta-nete a/t-panat  he nee ka
hau=ee oni-C  ta-nete t-panat  he nee ka
tree=3DET honey-NP.EDGE 1IN-climb 1IN-guard.carefully  IRR 3DEM NEG
‘climbing the honey tree, guarding (it) carefully’ 20170802-1, 239.20

(258) n-nao=m  leka?  tee
n-nao=ma leka? tea
3-go=and when until
‘keep going until’ 20170802-1, 241.63

(259) hau=gwee keno-n,  a/t-sanu  t-fani  t-ok  ?elak
hau=ee keno-n,  t-sanu  t-fani  t-ok  ?elak
tree=3DET big,branch-3GEN 1IN-descend 1IN-return 1IN-with stairs
‘go down to the big branch, then go back down the stairs’ 20170802-1, 246.721

(260) sanu=te  naidʒan,  t-aiti  le? oni  mauf  tas oni-d3
sanu=te  naidʒan  t-aiti  le? oni  mauf  tas oni-C
decend=TOP ground  1IN-take TOP honey honeycomb bag honey
‘return to the ground, take the honeycomb bag’ 20170802-1, 253.978

(261) poli=n  le? meto?  t-eki  le?  a-leko-t  aahh  le?
poli=n  le? meto? t-eki  le?  a-leko-t  ahh  le?
throw=PL REL dry  1IN-carry REL NMLZ-good-NMLZ pause TOP
‘throw away the dry (honey comb), keep the good (honey comb)’ 20170802-1, 262.81

(262) oon=d3aa  ?naka-n
oni=aa  ?naka-n
honey=0DET head-3GEN
‘the honey’s head’ 20170802-1, 264.384
(263)  

a.  
\[ t\text{-aes} \quad \text{tumes=ee} \quad \text{on} \quad \text{iidj} \]
\[ t\text{-aes}, \quad \text{tumes=ee} \quad \text{on} \quad \text{idja} \]
1IN-squeeze squeeze=3SG.ACC like 1DEM 'squeeze it like this'

b.  
\[ \text{oe=n=ee} \quad \text{n-poi} \quad \text{n-taam} \quad \text{n-oe} \]
\[ \text{oe=n=ee} \quad \text{n-poi} \quad \text{n-tama} \quad \text{n-oe} \]
water=PL=3SG.ACC 3-exit 3-enter\MET 3-DAT 'its liquid comes out and goes into'

c.  
\[ ?\text{ta?an} \quad \text{a|t-tisi} \quad \text{oe=n=ee} \quad \text{n-oe} \quad \text{leli-dj} \]
\[ ?\text{ta?an} \quad \text{t-tisi} \quad \text{oe=n=ee} \quad \text{n-oe} \quad \text{leli-C} \]
basket 1IN-pour water=PL=3SG.ACC 3-DAT container-NP.EDGE 'the basket, pour its liquid into the container'

(264)  
\[ \text{lali=t} \quad \text{t-eki=ma} \quad \text{t-fani} \quad \text{t-oe} \]
lali=te t-eki=ma t-fani t-oe CMPL=TOP 1IN-take=and 1IN-return 1IN-DAT 'then take (it) and return to'

(265)  
\[ \text{laa?} \quad \text{tee} \quad \text{laa?} \quad \text{na?} \quad \text{t-ail=ma} \]
laa? tee laa? na? t-ail=ma campsite until campsite then 1IN-see=and 'the campsite, then see and'

(266)  
\[ \text{painoot} \quad \text{ta-bgua-b} \quad \text{ta-lek-leko} \quad \text{lali=t} \quad \text{na?} \quad \text{ta-snaas} \]
painote ta-bgua-b ta-lek-leko lali=te na? ta-snasa store\MET 1IN-gather-TR 1IN-RDP-good CMPL=TOP then 1IN-stop\MET 'store it well, then stop'

(267)  
\[ \text{a|n-miu} \quad \text{n-fini=m} \quad \text{t-ail} \quad \text{bale?} \quad \text{na-mfau} \quad \text{baut} \quad \text{ta-peni} \]
n-miu n-fini=m t-ail bale? na-mfau baut ta-peni 3-bright 3-pass=and 1IN-see thing many load 1IN-get 'the next day, see all the things, get'

(268)  
\[ \text{oni-dj} \quad \text{mauf} \quad \text{oef}, \quad \text{ta-sae=m} \]
oni-C mauf oef ta-sae=ma honey-NP.EDGE honeycomb liquid 1IN-ascend=and 'the honey comb and liquid, go up and'

(269)  
\[ \text{t-eki=m} \quad \text{teem} \quad \text{t-aat} \quad \text{n-oe} \quad \text{kuan} \]
t-eki=ma tema t-ata n-oe kuan 1IN-carry=and 1IN\come\MET 1IN-conduct\MET 3-DAT village 'take it back to the village'
‘after that, go cutting (honey) again. That’s the end’

20170802-1, 319.47
References


Hieber, Daniel W. 2011. Canonical typology. Talk given to the Content Development Department, Rosetta Stone, Harrisonburg, VA.


Karlsson, Anastasia Mukhanova, and Jan-Olof Svantesson. 2007. What happens to consonant clusters in Mongolian speech? Rossijskaja akademija nauk / Russian Academy of Science,


Staroverov, Peter. 2015a. Buriat dorsal epenthesis is not reproduced with novel morphemes. MS.

Staroverov, Peter. 2015b. [t]-epenthesis revisited. the case of Apurucayali. MS.


