This paper examines the nature of the apparent consonant clusters in prevocalic position in Squiliq Atayal. Although the literature on Squiliq suggests that there is a vowel between sounds that are transcribed as consonant clusters in prevocalic position, quite a number of such vowels cannot be readily perceived, and nor could vowel structure be discerned on the waveforms in an acoustic analysis. Based on the segmental distribution of the consonants, the paper argues that these consonants belong to separate syllables, which implies that Squiliq does not tolerate syllable onsets composed of true consonant clusters. The paper further discusses the case of prevocalic consonant-glide sequences, and suggests that the onglides are presumably not in the onset either. Squiliq Atayal is therefore a language that disallows complex onsets in spite of the seemingly prevocalic consonant cluster pronunciations.

Key words: syllable onset, Austronesian phonology, vowel reduction, consonant cluster, phonotactics

1. Introduction

The organization of syllables is one of the most fundamental issues in understanding the phonology of a language. Many Formosan languages, however, remain under-investigated with respect to how syllables string consonants and vowels together and how segments are distributed within syllables. While descriptive generalizations regarding the phonotactics of consonants and vowels are available for many of the
languages, the ways that segments are organized into syllables await to be explicitly argued for.

Squliq Atayal, an Austronesian language spoken in northern Taiwan, is one such language in need of further investigation into syllable structure. Previous studies on Squliq seem to suggest that there are no consonant clusters (CC) on the surface. Li (1980:355) remarks that a phonetic vowel [ə] predictably appears between CC transcriptions. The list of Squliq canonical root forms given in Rau (1992:25) contains no consonant clusters either. However, quite a number of CC-sounding sequences can be heard in Squliq speakers’ pronunciation, especially in connected speech. A preliminary acoustic analysis carried out by the author also shows that there is no consistent vowel structure between the CC-sounding clusters. The nature of this discrepancy is one of the issues discussed in the paper. Does Squliq phonotactics allow surface consonant clusters? If such clusters exist, do the consonants belong to separate syllables or form part of complex onset/coda? Based on the internal evidence of segment distribution, which has not been furnished in the literature on Squliq, the paper argues that the apparent CC-like sequences are not real consonant clusters but are phonologically heterosyllabic, thus arriving at a no-surface-CC conclusion similar to that in previous studies.

The lack of true-consonant clusters in the onset raises the question of whether Squliq prevocalic consonant-glide (CG) sequences are the only type of complex onset permitted in the language. The absence of CC onset does not necessarily entail that CG onset cannot exist, and the non-syllabic property of the prevocalic glide does not necessarily mean that the glide belongs in the onset either. Possible evidence from related aspects of Squliq phonology must be examined. As will be discussed later, the patterns of pre-penultimate reduction in the language suggest that the onglides are better considered in the nucleus. If neither CC nor CG onset exists, Squliq is in fact a language that tolerates simple onsets only.

The paper is organized as follows. A brief background on Squliq Atayal is offered in Section 2. Section 3 spells out the issue of the pronunciation of consonant clusters based on previous descriptions and present findings. Section 4 deals with the case of apparent true-consonant clusters, and the syllabic constituency of consonant-glide sequences is addressed in Section 5. Section 6 concludes that despite the existence of CG and CC-sounding sequences in the language, complex onsets do not exist in Squliq.

2. Background on Squliq Atayal

The Atayal language can be classified into the two major dialect groups Squliq and C’uli’ (Li 1980, 1981, 1985). The differences among the various C’uli’ dialects are more

The paper is based on the Squliq dialect spoken in Jianshi Township, Hsinchu County. Squliq Atayal has the vowels /i e a o u/ and the nineteen consonants /p t k q b(β) c(ts) s z x g(γ) h m nŋ r l j w/, and stress generally falls on the final syllable (Li 1980). Here I follow the convention in the Atayal literature in using the symbols b and g to represent the sounds that are commonly realized as voiced fricatives [β] and [γ], respectively.

Li (1980) gives a comprehensive survey of the major phonological processes in Squliq, including the alternation between voiced continuant obstruents (/z g/) and semivowels (/j w/), the loss of initial consonants, vowel alternation, contraction, and so on. Among these various rules, pre-penultimate reduction is one of the most prominent features of Squliq phonology. The following data illustrate the pattern that stem vowels are reduced when they are shifted to pre-penultimate position upon suffixation. The weakening process affects all pre-penultimate vowels.² (Also see Egerod 1965:255-257, Li 1980:369-371, and Rau 1992:27)

(1)  a. /kita, an/ ktan  [kətan] ‘see (LV)’³
     b. /huziq, an/ hziqan  [həziqan] ‘wet (LV)’

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¹ Sincere gratitude goes to the major Squliq consultant Kumai Silan (田子雄, born in 1935) from Hsinle Village, Jianshi Township, Hsinchu County.
² Sometimes even the vowels in penultimate syllables are reduced. The exact conditions for penultimate reduction await more research. Some vowels in pre-penultimate positions may remain unreduced; see the data (5) in Section 3.
³ The notations LV, PV, AV, IV, NAV, and Imp. in the paper stand for Locative Voice, Patient Voice, Agent Voice, Instrumental Voice, Non-Agent Voice, and Imperative, respectively. The symbol [i] here represents an apical vowel.
c. /?abi, an/  ?bian  [?objan]  ‘sleep (LV)’
d. /soja, un/  sjon  [sijon]  ‘like (PV)’
e. /betaq, an/  btaqan  [bətaqan]  ‘stab (LV)’

The resulted weak vowels, based on the author’s field notes, vary between a schwa and an apical vowel. Generally speaking, after the coronal sibilants /c s z/, the vowels tend to show up as an apical vowel homorganic to the preceding consonants; otherwise they surface more like a schwa. 4 This vowel reduction process will be shown to be related to the issue of whether there are true consonant clusters on the surface in Squliq. Notice that using the term ‘weakening’ or ‘reduction’ here implies the view that the affected vowels only undergo featural changes and are still present between the consonants. 5 The reduction process also bears on the issue of whether CG sequences are in the onset, as will be discussed in Section 5.

The weak vowels not only appear in words that have corresponding full vowels in morphologically related (unsuffixed) forms, such as /huziq, an/  hziqan  [həzɪqan] and mhuziq  [məhuzɪq] ‘wet (AV),’ but also in many words that do not have a related form containing corresponding full vowels, such as blaq  [bəlaq] ‘good.’ Both types of the weak vowels are commonly omitted in the transcriptions in the Atayal literature. For those weak vowels that correspond to a full vowel in the phonological paradigm, the vowels can be viewed straightforwardly as the result of reduction in prosodically weak positions, presumably outside the domain of a foot at the right word edge. For those that are not related to a full vowel, it awaits more research to determine whether they come from epenthesis or reduction of underlying vowels. Given the goal of understanding the phonotactics of consonants and vowels on the surface, there is no need to differentiate the two types of weak vowels as long as their pronunciation is not systematically different and correlated with the presence or absence of the full vowels in morphologically related forms. As will be discussed in later sections, it is the neighboring consonants, rather than whether a corresponding full vowel exists, that influence the phonetic realization of the weak vowel.

3. The issue

A number of previous studies have touched upon the issue of whether adjacent consonants exit in Squliq. Egerod (1965:255) uses the term *loss of vowels* to describe the pattern in (1), which appears to imply that the consonants are adjacent at a certain

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4 Sometimes after /r/, the reduced vowel is more like an apical vowel rather than a schwa.
5 The term ‘deletion’ is used in Li (1980:369).
level. However, it is made clear in Egerod (1966:121) and Egerod (1980:IV) that a short schwa is often heard between consonants. In Li (1980:369), although the term deletion is used to describe the phenomenon in (1), it is noted that a phonetic vowel [ə] appears between consonants (see also p.355). Notice that the appearance of a weak vowel between CC as stated in Egerod and Li encompasses the two different types of words discussed above, one with and the other without a morphologically related form containing a full vowel corresponding to the reduced vowel. Rau (1992:27), in contrast, uses the term reduction. As briefly mentioned in the Introduction section, Rau (1992:25) gives a list of Squliq canonical root forms (CV, CVC, CVVC, CVCVC, CVCVVC), none of which contains adjacent consonants. In addition, Rau (1992:22-23) states that there is always a schwa in CC transcriptions; the weak vowel is omitted due to its predictable nature. Rau’s descriptions, therefore, suggest that consonant clusters do not exist in the phonological output in either type of words. Similarly, it is explicitly stated in Cheng (2001:39-40) that a schwa is present between consonants. In the inventory of syllable types given in Cheng (2001:50-51) (CV, CVC, CVG, CGV, GVC, CVGC, CGVC, CGVG, CGGVC, CGVGC), no syllable beginning with CC is found.

If there is always a vowel between CC transcriptions, there would be no consonant clusters in Squliq; neither medial closed syllables nor syllables with complex CC onset could exist in the language. The problem is that not all weak vowels can be equally well perceived. In a number of cases, whether the weak vowels are present is even questionable. In general, if the consonant cluster transcriptions contain a voiced segment followed by some other consonants, such as blaq [bəlaq] ‘good’ and mpuw [məpuw] ‘count (AV),’ a weak vowel after the voiced consonant can be heard systematically, which is assumed to occupy the syllable nucleus position and thus breaks up the adjacent consonants into separate syllables. However, when the preceding consonant is voiceless, it is unclear whether a vowel appears after the voiceless consonant. To illustrate the gap between the expected weak vowels and the pronunciation of native speakers, the waveforms of some Squliq words are given.

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6 Cheng (2001) is based on the Squliq dialect spoken in Taoshan Village, Wufeng Township, Hsinchu County, which is different from the Jianshi variety in a couple of features, such as the distribution of aj and aw.

7 The prevocalic sequence CGG proposed by Cheng is typologically quite unusual; whether such clusters are in fact the same as the prevocalic CG in Squliq needs further investigation. The permitted syllable types are the same in Taoshan and Jianshi Squliq except the absence of CVGC and CGVGC (and CGGVC) in the latter. Unlike many previous studies which use C for both true consonants and glides (semivowels), e.g. Rau (1992:25), Cheng uses G for glides and C only for true consonants. The paper maintains the distinction between C (i.e. [+consonantal] segments) and G in the discussion because it is not uncommon that their phonological behaviors are different.
below. All of the words for illustration contain CC in the conventional, broad transcriptions in the Atayal literature.

(2) mshomuh ‘lie prone’:

The expected pronunciation is [məsəhomuh] according to the stated rule in the literature that a schwa appears between the consonants. However, the waveform suggests that although there is indeed a vowel after the voiced /m/ that precedes /s/, there is no vowel after /s/, based on the lack of periodic wave forms between /s/ and /h/. The following waveform illustrates the same word mshomuh when the language consultant is asked to enunciate; in this case, there are clear vowel striations after /s/:

(3) mshomuh (the enunciated version):

Although (3) does follow the prediction that a vowel is present between CC transcriptions, the pronunciation is elicited on purpose for comparison and occurs much less often than that in (2) even in careful speech.

The unexpected absence of vowel-like articulation is also observed after other voiceless consonants. The following waveform illustrates the case of a preceding voiceless stop:

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8 The words were elicited in a data collection session in which the consultant responded to a vocabulary/sentence list prepared by the investigator. The capital letter ‘V’ in the annotations represents a weak vowel.
A weak vowel is expected to occur between /p/ and /s/. However, because in the actual pronunciation the /p/ is almost released into the articulation of /s/, an intermediate vowel is obviously lacking as suggested by the waveform.10

Given the phonetic characteristics of these apparent CC articulations, the generalization that a vowel predictably appears between CC is problematic without further justifications. If we assume the existence of such a vowel, how do we account for the seeming omission of the vowel in natural speech? Could it be the case that Squliq simply allows complex onset (e.g. [mə.sho.muh] and [psju.gi]? Before getting into the discussion on the controversy, a related issue on the pronunciation of CC transcriptions is in order. Given the prescribed rule that a schwa is present between CC, there are in fact two types of unexpectedly absent weak vowels. The first type has just been described above; whether the vowel is present or not is debatable. As to the second type, the vowel is unambiguously lacking, and the first member of the adjacent consonants is always introduced through affixation of the realis marker in,11 as illustrated by the following examples:

9 Notice that there is clearly no vowel between [s] and the following glide [j] in psjugi in the actual pronunciation; this means that the rule that a weak vowel is present between consonants does not extend to this case. Whether there is a weak vowel between C and G is variable in Squliq dialects and calls for a more in-depth study.

10 Given that there are nine voiceless consonants and eight voiced ones (excluding glides /j w/ for the moment), there would be logically 153 two-consonant combinations in which the preceding C is voiceless (9x(9+8)=153). A careful phonetic study which includes all the possible consonant combinations is needed before it can be concluded whether all voiceless consonants have similar influences on the following vowels in various environments.

11 This marker contains the non-reduced vowel [i] ([in]) or a weak vowel (such as [ən]) on the surface; the term ‘in-affixed forms’ or ‘the in affix’ here does not entail that [in] is necessarily the basic allomorph.
Lack of expected weak vowels between CC: the second type

<table>
<thead>
<tr>
<th>Stem</th>
<th>Derived forms with –in–</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. sulin ‘heat’</td>
<td>pinsulin (Egerod 1980)</td>
<td>[pin.sulin]</td>
</tr>
<tr>
<td>b. turin ‘point’</td>
<td>pinturin (Egerod 1980)</td>
<td>[pin.turin]</td>
</tr>
<tr>
<td>c. pinqziwan</td>
<td>(Li 1980:357)</td>
<td>[pin.qə.zi.wan]</td>
</tr>
<tr>
<td>d. karaw ‘climb’</td>
<td>kinragan (Li 1980:359)</td>
<td>[kin.ra.gan]</td>
</tr>
</tbody>
</table>

In these in-affixed forms, the nasal /n/ of in forms the coda of the preceding syllable while the following consonant belongs to a separate syllable. The discussion below on the pronunciation of consonant clusters will not include the second type because the nasal /n/ of in and the following consonant are clearly heterosyllabic and do not contribute to the complexity of syllable margins. Notice that although the convention to omit weak vowels in the Squliq literature is well motivated by the need to simplify transcriptions, it obscures the distinction between the two types of words if no further explanations are given. The first type involves variable pronunciation of a presumably existing vowel while the second type contains real consonant sequences, both of which are however transcribed as CC under the convention.

4. Apparent true consonant clusters

As described in the preceding section, it is unclear whether the apparent consonant clusters (the first type) should be interpreted. Both perception and the acoustic analysis seem to suggest that there is no intervening vowel in such CC transcriptions, which is surprising given the generalization that there should be a vowel between the consonants. Because the phonetic signals do not provide clear clues to the phonological representation in this case, possible evidence from other aspects of Squliq phonology must be looked for.

A comparison with other closely related dialects may help shed light on the phonological organization of the Squliq dialect under investigation. Previous works by Li have clearly shown that in other Atayal dialects, full vowels are present between the consonants, which correspond to a string of CC in Squliq transcriptions as illustrated below.

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12 It could actually be pronounced as [pin.qə.ʔtan].
13 Li (1980) shows the morphological structure of this kind of words: k/in/rag-an.
14 The nasal coda introduced by in-affixation is in fact the only type of nonfinal coda consonants allowed in the language.
(6) Dialectal comparison (from Li 1980:377):

<table>
<thead>
<tr>
<th></th>
<th>Skilik</th>
<th>C’uli’</th>
<th>Mayrinax</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>qhoniq</td>
<td>kahawni?</td>
<td>kahuniq</td>
</tr>
<tr>
<td>b.</td>
<td>mqbaq</td>
<td>makba?</td>
<td>makibaq</td>
</tr>
<tr>
<td>c.</td>
<td>tmhok</td>
<td>tamahok</td>
<td></td>
</tr>
</tbody>
</table>

Based on the dialectal comparison, it is reasonable to assume that there is also a vowel between the consonants in Squliq and that one major difference between Squliq and other dialects lies in the quality of the vowels.

The reasoning is appealing in that it achieves a uniform view of the cross-dialectal differences; however, the argument is weakened by the possibility that different dialects could develop into different patterns in the course of time. It would not be surprising at all if one dialect allows complex onsets while others do not as the result of diachronic changes in individual dialects. Therefore, if resemblance with other dialects is the only type of evidence used to support the position that there are vowels separating the apparent consonant clusters in Squliq, the argument is relatively weak given the seeming lack of vowel-like articulations between the consonants both perceptually and acoustically.

One main goal of this paper is to identify internal evidence from Squliq phonology that could help disambiguate the status of these apparent consonant clusters. There are at least two hypotheses that need to be compared with each other. One is that the strings of sounds under discussion form consonant clusters in the phonological output. If this is the case, some of the consonants may be in the margins of the same syllable and complex onsets may be allowed to a certain extent. The other hypothesis is that there is a vowel between the seemingly adjacent consonants, which means that the consonants are in fact heterosyllabic. To choose between the two different ideas, we need to investigate the implications of each of the two proposals for other aspects of the phonological system of the language and see which one fares better.

The major difference of the two proposals lies in their implications for the static distribution of consonants and vowels in the language. Suppose that the strings of consonants under discussion are real consonant clusters in the phonological output, and that the clusters are in the onset of the following syllable (e.g. [moˌʃo.ˈmuh]). Such hypothesized complex onsets would have the following characteristics. First, the initial member of the clusters is always voiceless, which is a direct consequence of the assumption that a voiced consonant is followed by a nucleus vowel as described in the previous section. Second, the complex onsets may occur in any syllables within a word. Although the distribution of CC in traditional transcriptions is skewed toward the left
word edge, as shown by the list of canonical word forms given in Li (1980:356-357),\textsuperscript{15} the actual distribution of the hypothesized complex onsets could occur in both initial and non-initial syllables, depending on where the voiced consonants break up the string of CC. For example, a complex onset would be found in the initial syllable of $C_1C_2C_3C_4VC$ if $C_1$ is voiceless and $C_2$ is voiced, in the second syllable if $C_1$ and $C_3$ are voiced but $C_2$ is voiceless, and in the third syllable if $C_1$ and $C_2$ are voiced but $C_3$ is voiceless.

The two generalizations regarding the hypothesized complex onsets are not unnatural from a theoretical point of view. The restriction of the initial consonant in a cluster to be voiceless is not problematic since many languages bans segments of certain features from appearing in a specific position in a cluster. For example, the second member of a two-segment cluster in English could only be a liquid (or a glide). The free occurrence of the complex onsets in syllables of any positions is just what the complex-onset hypothesis predicts.

However, although the positional distribution of the hypothesized complex onsets is unrestricted, their occurrence is mysteriously correlated with the quality of the preceding vowel. Take the above-mentioned form $C_1C_2C_3C_4VC$ as an example; no matter whether it is the second or the third syllable that contains a complex onset, the vowel preceding the onset must not be a full vowel. The word $[mə.sho.muh]$ mentioned above is just another example illustrates the observation that the hypothesized complex onset always follows a weak vowel. If the language does allow consonant clusters to appear in the prevocalic syllable margin, why would there be such a restriction between the complex onset and the preceding vowel? The surprising restriction on the quality of the vowel preceding a complex onset casts doubts on the validity of the complex-onset hypothesis.

An alternative version of this surface-consonant-cluster account is that the adjacent consonants belong to separate syllables instead of forming complex onsets. For example, the word $mshomuh$ could be syllabified as $[məho.muh]$ instead of $[ma.sho.muh]$ if codas are permitted. This coda hypothesis, however, would suffer from the similar problem of cooccurrence restriction as the complex onset approach does. Notice that the penultimate full vowel in the list of canonical forms (CV, CVC, CCVC, CCCVC, CCCCCVC, CVCV, CVCVC, CVCVC, CCCVCVC, CCCVCVC, and C(C)VVCVCVC) is always followed by a single consonant. The lack of consonant clusters after the penultimate full vowel entails the absence of a full vowel nucleus in a non-final closed syllable\textsuperscript{16}

\textsuperscript{15} The canonical forms include CV, CVC, CCVC, CCCVC, CCCCCVC, CVCV, CVCVC, CCVCVC, CCCVCVC, and C(C)VVCVCVC. There are two other forms, CVCCVC and CVCCVCVC, which presumably contain the infix $in$ and thus will not be discussed here.

\textsuperscript{16} Non-final closed syllables introduced by the $in$ affix could contain the full vowel $[i]$, as described in Section 3.
because the single consonant following the penultimate vowel is always syllabified as the onset of the following syllable. Adopting the coda approach would complicate the description of the language by giving rise to non-final closed syllables, especially given the fact that these non-final closed syllables would allow only weak vowel nuclei.

If coda consonants are a legitimate part of the syllable in the language, the cooccurrence restriction of non-final codas with a weak nucleus is unexpected, and the gap of a penultimate full vowel in a closed syllable is mysterious. It is possible to come up with ad hoc stipulations to restrict the occurrence of closed syllables with a full vowel nucleus to the final position, but the motivations of such stipulations are unclear. An account of this pattern would be rather complicated in that it seems to be related to both the position of the coda consonant in a word and to the quality of the preceding nucleus vowel. If the occurrence of coda consonants is licensed by the right word edge, non-final codas after a weak vowel are unaccounted for. If the appearance of codas is granted by a full vowel nucleus, the lack of codas following a penultimate full vowel calls for an explanation.

The surface-consonant-cluster hypothesis, no matter whether the consonants form complex onsets or appear in codas, is challenged by the disadvantages described above. Therefore, the other approach, which assumes that a vowel is present between CC, must be seriously considered.

Under the assumption that CC are separated by a vowel and in different syllables, the reasons that the vowel preceding C₁ (the first member of the consonant cluster) must be weak become clear. The skeletal slot between the two heterosyllabic consonants is associated with the features of a weak vowel due to the reduction rule (described in Section 2). Because the vowel between CC is reduced, the vowels to the left of C₁ are necessarily reduced too since they must be pre-penultimate by appearing before C₁. The apparent correlation between C₁ and the reduced quality of the preceding vowel is actually a reflex of the phonological reduction rule that targets pre-penultimate vowels. In contrast, under the approach assuming surface consonant clusters, the cooccurrence restriction between C₁ and the preceding vowel cannot be readily related to the effect of pre-penultimate reduction; the complex onsets (or the coda plus onset sequences) can appear before final or non-final vowels in a word, and the reduced quality of the vowel preceding C₁ cannot be inferred from the occurrence of the consonant clusters.

The weakness of the adopted proposal that a vowel is present between the CC lies in the mismatch between the phonetic signals and the phonological representation. The lack of discernible vowel structure between CC in the waveforms and the proposal of a vowel between CC appear contradictory with each other. Given the unstable pronunciation of the weak vowel between the consonants, it is speculated here that the weak vowel is often a voiceless one due to the preceding voiceless consonant. Another
possibility is that the vowel could even be lost in some speech registers, and the preceding consonant takes up the nucleus position and realizes more like a syllabic consonant. No matter whether the vowel is devoiced or lost, what is crucial is that the consonants in the CC transcriptions belong to separate syllables and do not form real surface consonant clusters. Only by maintaining the heterosyllabic generalization in the phonological output can we account for the distribution of consonants and vowels in a more natural way.

5. Prevocalic consonant-glide sequences

In the previous section it is concluded that there is no true consonant cluster in Squliq, which implies that complex syllable margins are not allowed in the language. The strings of prevocalic CC in the conventional transcriptions of Squliq in fact do not form complex onsets. The lack of true consonant clusters in the syllable onset raises the question regarding the syllabic affiliation of consonant-glide (CG) sequences. If the onglides are in the onset, Squliq would be a language that tolerates complex onsets of CG but not other true consonant combinations. If there is evidence suggesting that the onglide is closer to the nucleus, the language in fact allows simple onsets only.

Prevocalic CG sequences are abundant in Squliq, as suggested by the syllable shapes CGV, CGVC, and CGVG, among other forms given in Cheng (2001:50-51). Some Squliq words illustrating the prevocalic CG sequences are given below:

(7) a. [kwara] ‘whole’
b. [mʊqwas] ‘sing (AV)’
c. [qwaw] ‘wine’
d. [twahiq] ‘far away’
e. [kja] ‘there is’
f. [sjam] ‘meat’
g. [ləpjun] ‘guest, relative’

The syllabic affiliation of the onglide is a controversial issue in many languages that have prevocalic CG sequences. What is of interest is that the pronunciations of the CG sequences are phonetically similar across languages but the phonological status of the glides commonly varies. Arguments for the structural status of the onglides could come from external evidence such as speech errors, psycholinguistic experiments, and language games, or from internal evidence such as cooccurrence restrictions and relevant phonological processes in the language. For example, it is argued that postconsonantal onglides in Isbukun Bunun (a Formosan language spoken in southern Taiwan) are not in the onset based on the internal evidence of stress patterns (H. Huang 2005). Stress rules treat the onglides as weight-carrying, which implies that the glides are not in the onset since onset consonants are widely considered to be non-moraic.
Stress assignment in Squliq does not provide decisive evidence for the structural affiliation of the onglides/offglides, since stress most often falls on the final syllable in the dialect under investigation and does not exhibit the kind of phonologically conditioned variable patterns as in Isbukun. The following discussion will show that Squliq onglides are better considered in the nucleus too. Recall that vowels are reduced to a weak one when they are shifted to pre-penultimate syllables upon suffixation. An examination of the postconsonantal glide-vowel sequences in the penult of a root shows that the onglides and the following vowels are replaced by a weak vowel upon reduction.

(8) Squliq onglides:

a. /Vm, hjapas/ [həmjapas] ‘joke, AV’
   /hjapas, un/ [həpasun] ‘joke, PV’

b. /qwalax/ [qwałax] ‘rain, AV’
   /qwalax, an/ [qałaxan] ‘rain, LV’

The pre-penultimate reduction patterns bear on the status of the onglides if we assume that the reduction rule targets the nucleus constituent of a syllable. Together with the additional assumption that onglides are affiliated under the Nucleus node with the following vowel, the disappearance of the onglides could be viewed as the direct consequence of the nucleus-targeting reduction rule. In this account, the reduction rule converts the complex nucleus, which is composed of an onglide and a vowel, into a simple one by retaining one single skeletal slot and eliminating all marked features, resulting in a schwa vowel. The account implies that the reduction patterns could be interpreted as evidence supporting the nucleus status of the onglides since the analysis is possible only when we assume that the onglides are in the nucleus. If the onglides are instead in the onset, it would be strange that part of the onset is simultaneously affected when the nucleus is simplified by the reduction rule.

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17 However, some words seem to carry a penultimate stress pattern, e.g. [tari] ‘knee.’ Whether the variable stress patterns are conditioned phonologically awaits more research.

18 More examples of this type can be found in Li (1980:369-371), where the term loss of diphthongs is used to describe the phenomenon.

19 The underlying representation of the onglides is assumed to be a glide in the data (8). An alternative is that the onglides correspond to an underlying vowel, which undergoes glide formation in order to avoid onsetless syllables on the surface. Because the choice between the two proposals is related to a separate issue regarding the variable pronunciation between a single glide and a vowel-glide sequence, it will not be discussed here. Notice that the choice of the underlying representation does not entail the syllabic affiliation of the onglide and thus does not affect the arguments in the paper.
Since the nucleus status of the onglides is primarily based on the pre-penultimate reduction rule, the nature of this rule must be carefully thought over. The above account is built on the assumption that reduction affects the syllable nucleus. However, if what the reduction rule targets is the whole syllable, the structural status of the glides would not be able to be inferred from their loss upon reduction. Under this syllable-targeting approach, one could reason that the reduction rule affects every component of a syllable (including the onset, the nucleus, and the coda) and that each part undergoes simplification. If this is the case, the data are compatible with the interpretation that the onglides are in the onset: the complex onsets simplify to a single segment and the nucleus vowels weaken to a schwa as the result of whole syllable reduction. The data are also compatible with a nucleus analysis of the onglides too: the complex nuclei undergo reduction both in quantity and in quality while the simple onsets retain the only consonant.

If the syllable-targeting approach to reduction is the correct analysis, the reduction phenomenon would in fact become ambiguous in the issue of the syllabic affiliation of the onglides since either assumption of the glides, in the onset or nucleus, is tenable. The nucleus-targeting approach, in contrast, entails that the onglides must be in the nucleus. Put another way, a nucleus analysis of the onglides works well in both approaches, but an onset analysis of the glides means that the syllable-targeting approach to reduction must be adopted. If the nucleus-targeting approach to reduction is incorrect, a nucleus analysis of the onglides is still viable since allocating the onglides to the nucleus position is compatible with the syllable-targeting approach to the reduction phenomenon. If the syllable-targeting approach is shown to be unfavorable, however, an onset analysis of the onglides can be ruled out. It is therefore suggested here that Squliq onglides are better considered in the nucleus unless evidence to the contrary is found in future research.

6. Conclusion

This paper examines the nature of the apparent consonant clusters in prevocalic position and shows that Squliq in fact does not allow complex onsets. The paper first of all observes that there is a mismatch between the traditional view that a vowel is present between the consonants and the lack of seeming vowel articulation in the corresponding phonetic signals. It is then argued that an intervening vowel is indeed present in the phonological output based on the evidence of segmental distribution. Having established the generalization that Squliq does not allow true consonant clusters in the onset, the paper examines the case of prevocalic consonant-glide sequences and suggests that onglides are better considered in the nucleus. Since neither true consonant
clusters nor consonant-glide sequences are allowed in the onset, it is concluded that Squliq does not have complex onset despite the apparent consonant cluster pronunciation in prevocalic position.

References


