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# Syllable Weakening in Kagoshima Japanese
## An Element-Based Analysis

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**Abstract** This paper examines syllable weakening or *nisshōka* (入声化) in Kagoshima Japanese (KJ), where high vowel apocope feeds lenition, leading to correspondences such as Tōkyō Japanese (TJ) [kaki] 'persimmon' and Kagoshima [kaʔ]. The traditional pattern noted in the literature is quite clear. Apocope elides stem-final /u/ or /i/. The preceding onset is lenited in one of four ways: 1) stops and affricates are debuccalised (/kaki/ > [kaʔ] 'persimmon'); 2) fricatives undergo voicing neutralisation (TJ [kazu] > KJ [kaz] 'number'); 3) nasals undergo place loss (TJ [kami] > KJ [kaɴ] 'paper'); 4) rhotics undergo gliding (TJ [maru] > [maj] 'round'). This paper presents an initial analysis of the data within Element Theory representational framework.

**Keywords** Japanese dialects. Phonology. Lenition. Kagoshima Japanese. Segmental Structure. Theory.



## 1 The Process at Hand

Kagoshima Japanese (henceforth KJ) is spoken in Kagoshima City and the surrounding area in the south of Kyūshū Island. This dialect has been well described, with a full description of its grammar and lexicon presented in a volume edited by Kibe (1997a). In an overview of the phonology of KJ, Kibe (1997b) discusses the process of *nisshōka* or syllable weakening. Syllable weakening (henceforth weakening), is a two-step process consisting of high

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vowel apocope and lenition of the preceding onset. As a result, Tōkyō Japanese (henceforth TJ) words terminating in a $CV_{[+high]}$ will correspond to C final words in KJ, as in TJ [kaki] 'persimmon', corresponding to KJ [kaʔ]. This chapter draws on Kibe (1997b) and Kaneko and Kawahara (2002) as well as field notes from April 2019 (17-20 April 2019, Kagoshima City), with additional cross-dialectal context given by Haraguchi (1984). Crucially, I present a first analysis of KJ weakening within the representational framework of Element Theory (Kaye, Lowenstamm, Vergnaud 1985; Charette, Göksel 1998; Backley 2011), with syllabic representations framed within Government Phonology (Kaye, Lowenstamm, Vergnaud 1990).[1]

## 2 Kagoshima Japanese Weakening in Detail

Weakening affects native Yamato words in KJ, including both nouns (e.g. /kaki/ 'persimmon') and consonant-final verb stems (e.g. /kam-/ 'chew'). All segments are affected and four output classes are identifiable; data drawn from Kaneko, Kawahara (2002) is given in (1).

1. Final apocope and lenition in KJ (Kaneko, Kawahara 2002, transcription from source):
   a. Stops and Affricates: {b, ts, tɕ, dʑ, dz, k, g} → [ʔ]

| | Tōkyō | Kagoshima | Gloss |
|---|---|---|---|
| i. | [tobu] | [toʔ] | 'fly-NP' |
| ii. | [kutsu] | [kuʔ] | 'shoes' |
| iii. | [kutʃi] | [kuʔ] | 'mouth' |
| iv. | [midzu] | [miʔ] | 'water' |
| v. | [adʑi] | [aʔ] | 'taste' |
| vi. | [kaki] | [kaʔ] | 'persimmon' |
| vii. | [ojogu] | [ojoʔ] | 'swim-NP' |

   b. Fricatives: {s, z, ʃ, ʑ} →[ʃ, s][2]

| | | | |
|---|---|---|---|
| i. | *kwaʃi | [kwaʃ] | 'snack' |

**1** I thank my consultants Shibayama-san, Anraku-san and Kawabata-san as well as Shimadzu-san for her wonderful assistance in finding these consultants and Matsuoka-san for her crucial help in organizing this network. I would also like to thank Rihito Shirata (Shigakukan University) for joining me in one of the sessions and helping to confirm my intuitions.
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**2** In contrast to Tōkyō and Kansai Japanese, Kagoshima Japanese retains labialized velar consonants and the *yotsugana* distinction, or the surface contrasts of four allophones of /d/ and /z/ before high vowels, giving a [dʑ]/[ʑ] contrast for /di/ and /zi/ and a [dz]/[z] contrast for /du/ and /zu/. See Shibatani (1990) for some discussion in English and Kibe (1997b) for discussion of this phenomenon in Japanese.

| | | | |
|---|---|---|---|
| ii. | *kwadʑi | [kwaʃ] | ‘fire’ |
| iii. | [usu] | [us] | ‘thin’ |
| iv. | [kazu] | [kas] | ‘number’ |

c. Nasals: n, (ɲ), m → [ɴ]

| | | | |
|---|---|---|---|
| i. | [taɲi] | [taɴ] | ‘valley’ |
| ii. | [inu] | [iɴ] | ‘dog’ |
| iii. | [kami] | [kaɴ] | ‘spirit’ |

d. Rhotic: r → [j]

| | | | |
|---|---|---|---|
| i. | [mari] | [maj] | ‘ball’ |
| ii. | [ɕiru] | [ɕij] | ‘afternoon’ |

Stops and affricates are realized as either [t] or [ʔ] (Kibe 1997b, 10) while fricatives are neutralized to [ʃ] or [s], nasals reduce to [ɴ] and the liquid [r] is reduced to the glide [j], as discussed by Kibe (1997b) and Kaneko and Kawahara (2002).

Kibe (1997b, 10) points out that the realization of weakened stops is in fact related to politeness; the polite realization is [t] and the elsewhere realization is [ʔ]. In examples, the weakened variant of stops is transcribed archiphonemically as <ᴛ>. I transcribe the final lenited obstruent as a glottal stop following the realization of my speakers in April 2019, with this transcription also used by Kaneko and Kawahara (2002). I take the above data as representative of the dialect, with the above words and others elicited from consultants in Kagoshima City, April 2019 who all exhibited [ʔ], [s] and [ɴ] as outputs of weakening.

What is different in the speakers I have surveyed is that fricatives in (1b) either remained unaffected by weakening and a full syllable was realized (with speakers giving TJ [kadʑi] for ‘fire’ rather than the expected *[kwaʃ]), while for /su/ final syllables, speakers exhibited final [s] in a possible interaction with TJ devoicing. No rhotic weakening as in (1d) was evidenced. I thus exclude the patterns in (1b) and (1d) from discussion as they were not active in the speakers I have consulted.

As a result of weakening, possible morpheme-final consonants in KJ are /ʔ, ɴ, s, ʃ, j/ in the surface forms of native Yamato verbs and nouns. For nouns, it is likely that weakening is diachronic as speakers produce consonant-final nouns such as [kaʔ] ‘persimmon’ and [kaɴ] ‘paper’ as such in citation form and preceding both consonant initial and vowel initial particles (field notes). It is clear, however, that weakening is active in verbal conjugations based on the available data (Kibe 1997b; Uemura, Nobayashi, Hidaka 1997; field notes). Consonant-final verb stems in the non-past such as /tat-/ ‘stand’ are realized with a lenited stem-final consonant, giving [taʔ] ‘stand-NP’. Addition of the negative suffix /-aɴ/ allows the underlying stem-final consonant to surface, giving [kakaɴ] ‘write-NEG’. This also occurs with m-final stems, as in /tanom-/ ‘ask, request’, [tanoɴ] ‘ask-NP’, /tanom-aɴ/ [tanomaɴ] ‘ask-NEG’.

Weakening also affects the phonotactics of syllables word-medially in nouns and in compounding contexts, where possible consonants consist of the first portion of a geminate (or the *sokuon* Q), the moraic nasal N, and ʔ (Kibe 1997b; Kaneko, Kawahara 2002). Drawing from these sources, (2a) provides examples of medial ʔ, while (2b) simply exemplifies that as with TJ, N and Q are found word medially in KJ. (2c) exemplifies assimilation of medial nasal geminates and voiced geminates, with [ɴ] and [ʔ] undergoing assimilation. KJ thus has NC clusters, glottal-consonant clusters, voiceless geminates and voiced geminates. I complement the KJ data with TJ correspondences.

2. Word-medial consonants

a. Medial ʔ (KJ data – Kaneko, Kawahara 2002)

| | Tōkyō | Kagoshima | Gloss |
|---|---|---|---|
| i. | [kitsune] | [kiʔne] | ‘fox’ |
| ii. | [sukunai] | [suʔnaka] | ‘little, few’ |
| iii. | [matsunoki] | [maʔnoʔ] | ‘pine tree’ |

b. Medial N and Q (KJ data – Kaneko, Kawahara 2002)

| | | | |
|---|---|---|---|
| i. | [ɕindzoː] | [ʃinzo] | ‘heart’ |
| ii. | [attɕi] | [attɕi] | ‘there’ |

c. Medial nasal and voiced geminates (Field notes; see also Uemura, Nobayashi, Hidaka 1997 for alternative transcription)

| | | | |
|---|---|---|---|
| i. | [kaminari] | [kannaisaː] | ‘thunder’ (*kaminarisama) |
| ii. | [butsudaɴ] | [budːaɴ] | ‘home shrine’ |

Of particular note is the transcription of voiced geminates in KJ as in (2c.ii). Kibe (1997b) notes that the assimilation of morpheme final consonants affects 1) weakened nasals when adjacent to another nasal, as in *kaminari-sama now realized as [kannaisaː] ‘thunder-HON’ and 2) weakened glottal stops when adjacent to another stop. Formation of voiced geminates through assimilation of a weakened stop has previously been noted by Kibe (1997b, 10) under suffix fed assimilation, namely /kuʔ-ga/ [kugga] ‘mouth-NOM’ (Kibe 1997b, 10), c/w Tōkyō [kutɕiga]. Voiced geminates can also be found word-internally; the Tōkyō word [butsudaɴ] is given as [obuᵈdaᵑ] in Uemura, Nobayashi, Hidaka (1997, 185). In my recording sessions in Kagoshima City, I verified the pronunciation of medial assimilated contexts in cooperation with two consultants, who ruled out a pronunciation *[buʔdan] with a voiceless glottal stop and rejecting *[budan], maintaining that the voiced consonant should be long. While further investigations of this particular facet of KJ phonology is intriguing in light of voiced geminate markedness (Kawahara 2015), I leave the details of assimilation to further investigation.

I now turn to the formal representation of KJ weakening and consider variation found in my fieldwork. Section 3 briefly introduces the framework of Element Theory and provides representations of Jap-

anese consonants, while section 4 revisits weakening and frames it in terms of element suppression.

## 3 A Brief Introduction to Element Theory

Element Theory (Kaye, Lowenstamm, Vergnaud 1985; Charette, Göksel 1998; Harris, Lindsey 1995; Backley 2011) represents all segments using a restricted set of 6 unary primes. Recent review of Element Theory is found in Scheer and Kula (2017). Elements have their roots in Dependency Phonology (Anderson, Jones 1974; Anderson, Ewen 1987), and unary primes are found also in Particle Phonology (Schane 1984). These three theories of segmental structure can collectively be classified as |AIU| models (Harris 2005). Privative feature approaches may also be found in works building on the binary features of Chomsky and Halle (1968), namely Feature Geometry (Clements 1985; Clements, Hume 1995), but the move to privative features here is not complete.

The choice of Element Theory and associated Government Phonology representations is motivated by a few factors related to desiderata for a phonological theory. The first is the reduction of generative capacity through the reduction of primes and application of privativity, a goal for the theory from Kaye, Lowenstamm, Vergnaud (1985) onwards (see also Bafile 2017). Breit (2013b) outlines possible generative capacities for Element Theory and binary Feature Theory and shows that Element Theory using six elements generates 256 expressions (assuming only one head in an expression), while Feature Theory generates 1,048,576 possible expressions with 20 binary features. The 256 expressions is more than sufficient to capture the phonology of the world's languages (in combination with syllable structure), and the generation of elements is further restricted through the use of Licensing Constraints (Charette, Göksel 1998) or element tiers (Kaye, Lowenstamm, Vergnaud 1985, 1990; Harris, Lindsey 1995).

Two further interlinked benefits are the unification of vocalic and consonantal primes (Charette, Göksel 1998; Backley 2011), and the possibility of a unified analysis of consonant lenition (Kaye, Harris 1990; Harris 1992, 1997, 2005) and vowel weakening as element suppression. Let us first consider the role of unified features between consonants and vowels. In both Feature Geometry work (as in Clements, Hume 1995) and early Element Theory work (Kaye, Lowenstamm, Vergnaud 1990) some features appear in both consonantal and vocalic domains and they may also be privative, such as [labial] or the element |U|. However, in both Feature Geometry and early Element Theory, certain features are restricted only to the consonantal domain, e.g. the early element |h| for consonants and |v| for vowels in Element Theory (Kaye, Lowenstamm, Vergnaud 1985) or the aperture node

found only in vocoids in Feature Geometry (as discussed in Clements, Hume 1995). A desirable goal pursed throughout Element Theory was not only the reduction of primes but also the pursuance of a unification in elements which can be realized in both the onset and the nucleus (Harris, Lindsey 1995; Charette, Göksel 1998). Within the version of Element Theory developed in recent years (e.g. Backley 2011), all elements may appear in both consonantal and vocalic contexts.

The benefit is that, on the one hand, we see all assimilation processes between vowels and consonants as the sharing of an element, and on the other hand, we can analyse disparate processes such as lenition and vowel reduction in English dialects (Harris 1994) and syllable weakening in Kagoshima Japanese as having one unified analysis: the suppression of elements triggered by the syllabic context. Assuming a Government Phonology (Kaye, Lowenstamm, Vergnaud 1990) view of syllable structure, a further benefit is a linked triggering context for reduction, where weakness leads to element suppression. Here there is a direct and visible link between the nucleus (and its content) on the surrounding segmental and syllabic environment (Charette 1991; Harris 1992; Cyran 2010): if a vocalic position (or nucleus) is empty or is weakened through the suppression of an element, it does not have the same strength as a nucleus containing a full vowel to license a preceding onset and its full elemental content (Harris 1992). Likewise, if a vowel is not the source of licensing (i.e. the head of a foot), it is then a potential target for reduction (Harris 1994). "Lenition" is element suppression preceding an empty nucleus, while "vowel reduction" is element suppression in the weak position of a foot (understood to be two projected nuclei in a licensing relation). I propose that "syllable weakening" is similar, with the delinking of a final vowel triggering concomitant element suppression. While Feature Geometry and Feature Theory in conjunction with traditional syllable theory can adequately capture lenition, weakening and reduction through the loss of a node or change of a feature, the three processes require disparate analyses, with lenition relying on the coda or positional rules, vowel reduction relying on the foot, and syllable weakening relying on resyllabification in conjunction with coda rules and the reversal of these rules upon the addition of a suffix. Returning to Kagoshima Japanese, I will show that the analysis of syllable weakening can be rather straightforward.[3]

**3** I note that the Government Phonology conception of an environment for lenition involving emptiness is similar to what Labrune (2012) considers to be a deficient mora; a deficient mora is defined in Youngberg (2017) as a consonant vowel (or CV) pair with one position being externally licensed or governed, whether it is empty or full.

## 3.1 The Basics of Element Theory

In Element Theory, all segments are composed of one or more elements, which are used for segmental representations in both vowels and consonants. These elements are |A|, |I|, and |U| for place of articulation, and |L|, |H| and |ʔ| for manner of articulation (Charette, Göksel 1998; Backley 2011).

When associated to a nuclear position, the elements are interpreted as vowels. The element |A| is realized as an open vowel such as [a], |I| is realized as a front vowel such as [i] and |U| is realized as a vowel produced with lip compression or lip rounding, such as [u]. Elements may also be combined and create complex expressions, with the resulting expression retaining the broad qualities of each element. A vocalic expression composed of the open element |A| and the palatal element |I| would be |AI|, interpreted phonetically as [e], [ɛ] or [æ]. See the set of simple elements and their combinations below.

3. Example element combinations for vowels

|A| = [a] |I| = [i] |U| = [u]
|AI| = [e] |AU| = [o] |IU| = [y]
|AIU| = [ø]

Further combinations are possible when one considers headedness, which fortifies or amplifies a certain element in a segment or defines a natural class. Here, a head is represented as being underlined in the right-hand position of an elemental representation. One example is the difference between [æ] and [e] in Finnish, with the former represented as |I$\underline{\text{A}}$| and the latter represented as |I$\underline{\text{A}}$| (Kaye 2001). The exact definition of headedness is debated, but for the discussion at hand I adopt the assumption that a head defines the natural class of segments in a language.[4]

Elements are interpreted as consonants when associated to an onset or coda.[5] The element |A| typically correlates to alveolar consonants, |I| to palatal consonants and |U| to labial consonants, with velar place being unmarked. The other elements |L|, |H| and |ʔ| produce manner effects, with |L| or the low tone element for voicing and nasality (Nasukawa 1998, 2005; Ploch 1999), |H| or the high tone element for frication and aspiration (Cyran 2010) and |ʔ| or the glottal element for obstruency (Kaye, Lowenstamm, Vergnaud 1985; Har-

4 See Kaye, Lowenstamm, Vergnaud 1985; Charette, Göksel 1998; Backley 2011, 2017 and Breit 2017 for in-depth discussion.

5 The coda is not recognized as a constituent in Government Phonology or CV phonology – it is either a rhymal complement or final onset within Government Phonology (Kaye, Lowenstamm, Vergnaud 1990) or a consonant followed by an empty nuclear position both internally and medially (Lowenstamm 1996). The latter view is taken to be correct for Japanese in work by Yoshida (1999) and Nasukawa (2005).

ris 1994). The voiced alveolar consonant would thus be represented as |A?L|, with the elements encoding alveolar place, obstruency and voicing respectively.[6] These elements may also be found in vocalic inventories where they encode manner contrasts (Backley 2011), with |L| found in nasal vowels.

## 3.2 Element Theory Consonant Representations in Japanese

Japanese has a rather simple consonant inventory, which I present below drawing from the TJ consonant inventory given in Youngberg (2017). Previous research on the Element Theory representation of Japanese for vowels and consonants has been presented by Yoshida (1996), Yoshida (1999), and Nasukawa (1998, 2005). Segments found only as the result of surface assimilation are given in italics. I focus only on selected consonants below as some alternations are not evidenced in the relevant Yamato words, e.g. there are no verb stems terminating in /p/ or /f/. Palatalized consonants are discussed in the aforementioned sources, but note that only allophones which will be discussed directly in this chapter are presented in (4a-e).

4. The representation of Japanese consonants

| a. Tap and glides | | b. Nasals | |
|---|---|---|---|
| r | \|A\| | ɴ | \|L\| |
| j | \|I\| | m | \|U?L\| |
| w | \|U\| | n | \|A?L\| |
| c. Plosives | | d. Fricatives | |
| t | \|A?\| | h | \|H\| |
| d | \|AL?\| | s | \|AH\| |
| p | \|U?\| | z | \|ALH\| |
| b | \|UL?\| | ɕ | \|AIH\| |
| k | \|?\| | ʑ | \|AILH\| |
| g | \|L?\| | | |
| e. Affricates | | | |
| dʑ | \|IAL?\| | | |
| tɕ | \|IA?\| | | |

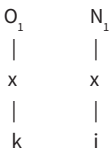
6 A reviewer correctly suggests that obstruents and sonorants are divided by the presence or lack of |?|. However, nasals and laterals have been argued to contain or lack |?| depending on the language, with a consonant such as [n] containing |?| in English (Harris 1994) and lacking |?| in Bemba (Kula 2002). I also note that the interpretation of sonorants may also depend on their association to a consonantal or vocalic position, as in an onset nasal and a syllabic nasal in New York English [n]*o* and *butt*[n̩]. I use |?| in the nasal representations here for consonants found in onsets, but in non-head position.

All expressions above contain a head to capture each natural class. The tap and the glide are represented as simple place elements, while nasals contain headed |L̲|. Stops and affricates are unified in having headed |ʔ̲| to capture the natural class of obstruents and these segments differ only in affricates having complex place specifications. Fricatives, finally, have headed |H̲| to capture the class as having a hallmark of frication. A few assumptions are made in the above representations. First, the velar place lacks an elemental specification, as in Yoshida (1996) and Yoshida (1999). Second, voiced consonants are represented using |L|, with voiceless stops containing no marked laryngeal element. I contrast the use of |L| for voicing while headed |L̲| captures nasality to capture the natural class of nasals following Kula (2002) and Breit (2013a), *pace* Nasukawa (2005). Finally, consonants with complex place (e.g. alveo-palatals) contain both palatal |I| and alveolar |A|. KJ also exhibits the alveo-palatal segment [ʑ], which I represent as |AIL̲H̲| with alveolar, palatal, voicing and frication elements respectively. In TJ, there is no distinction between [ʑ] and [dʑ].

## 4 Capturing Weakening

I propose that syllable weakening in KJ is rather easily captured as the suppression of a high vowel, with |I| or |U| being disassociated from a nucleus. The loss of a full vowel in the nuclear position then leads to an inability of the preceding onset to license and phonetically realize its segment fully. I assume a non-branching nucleus and onset representation for Japanese, following Yoshida (1999) and Nasukawa (2005). Crucially, a coda is understood to be a contentful onset followed by an empty nucleus. Various views of Japanese syllable structure are discussed at length in recent work by Vance (1987, 2008), Yoshida (1999), Nasukawa (2005), Labrune (2012) and Youngberg (2017). A full onset-nucleus pair in a word such as [ki] 'tree' is represented below in (5) using Government Phonology representations (Kaye, Lowenstamm, Vergnaud 1990).

5. Representation of [ki] 'tree'

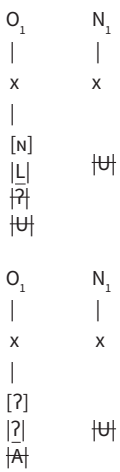



Syllable weakening deviates from this fully formed structure. The first step in weakening is the suppression of the final high vowel, which leads to a surface empty skeletal position. This empty position is then a weak licenser of the preceding onset and its segment.

This proposal combines two different proposals in the literature, the first where devoicing in TJ has been previously analysed as suppression of the |I| or |U| element by Yoshida (1996) and Yoshida (1999), while the second is that lenition is triggered by an empty position (Kaye, Harris 1990; Harris 1992, 1994). The idea is that a full nucleus can license the preceding onset and the interpretation of its elemental content (Kaye, Lowenstamm, Vergnaud 1990), while an empty nucleus or the nucleus in the weak position of a foot does not have the same potential to license its onset and its segmental content. The typology of vowel types and their effect on segments and syllable structure is expanded on in Cyran (2010) for languages such as Polish, Malayalam and Dutch.

Let us consider the case of stops and nasals, focusing on non-past and Negative forms of the stems /jom-/ 'read' and /tat-/ 'stand'. These stems are realized as [joɴ] 'read-NP' and [taʔ] in the non-past, which I assume terminates underlyingly in the non-past suffix /-u/. I assume the verb ends in a suffix in the underlying grammar as all speakers speak both the Tōkyō Japanese-based common language[7] and Kagoshima Japanese, with the verbal paradigms and morphology being similar. The final syllables are shown in (6) where a floating element represents a delinked and uninterpreted element and a strikethrough represents an unrealized element. The final vowel /u/ is delinked and not realized.

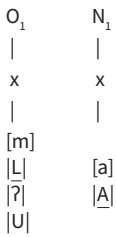
6. Lenition in final /mu/ and /tu/, realized as [ɴ] and [ʔ]

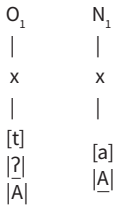



7 This is a simplication of *kyōtsūgo* 共通語 or 'common language' and the concept of standard Japanese, but will suffice for the current discussion.

The full stem-final consonant is found preceding other suffixes containing a non-high vowel followed by another syllable as in the Negative forms suffixed with /-aɴ/, giving [jomaɴ] 'read-NEG' and [tata] 'stand-NEG'. The structures of the stem-final consonants followed by the full realized vowel [a] are given in (7), with a vowel linked to the nucleus and all elements interpreted.

7. Full realization of /ma/ and /ta/




What happens in weakening is represented in (6): the final vowel is not realized as the element |I| or |U| is disassociated from the nucleus. The final nucleus is thus empty and unable to license the preceding onset fully. The resultant onset does not have the strength to interpret its entire elemental expression. Following Kaye and Harris (1990), I propose that KJ weakening leaves only the head element and all other place or manner elements are suppressed; as such, only the elements |L| or |ʔ| surface. It is clear, however that the elements are not deleted, rather only suppressed when one considers the Negative forms of consonant final stems. The vowel in /aɴ/ 'NEG' licenses the stem-final consonant, with the Non-Past [joɴ] corresponding to [jomaɴ] 'read-NEG'. The conditions for weakening cannot be met here; the initial vowel in the negative suffix cannot be deleted as it does not fit the conditions for apocope – it is not a high vowel and it is not in final position. The onset is then fully licensed and all elements are realized acoustically. This analysis is also applicable to account for weakening found in Yamato nouns such as TJ [kami] 'paper' realized as KJ [kaɴ], albeit here the process of weakening is no longer productive and the final consonant can be considered lexicalized.

## 5 Further Directions

This chapter is a simple proposal to capture syllable weakening in Kagoshima Japanese using insights from Element Theory and Government Phonology, but a number of broader issues remain to be investigated fully. The first is the existence of empty positions in this framework and its impact on our understanding of the mora in Japanese generally; a definition of the well-formed and deficient mora and the involvement of full or empty positions is dealt with in Youngberg (2017) and a forthcoming article. Second, it is unclear how best to represent segments when one considers lenition of fricatives and the rhotics, where the representations adopted *a priori* from Tōkyō Japanese imply that all fricatives should be realized as [h] and /r/ should be realized simply as [r] if head elements remain; the elemental representations used must be adjusted through careful consideration of the full phonology of Kagoshima Japanese. Although my speakers did not exhibit the relevant lenition of fricatives and the rhotic, it is a pattern which must still be accounted for. An additional issue is why mid and low vowels do not disappear and trigger weakening. While diachronically we can claim that this process is linked to high vowel devoicing which is common throughout Japan, synchronically another solution must be found. I tentatively propose that this is linked to the idea that the element |A| is structure and which is unable to be altered, explored for Tokyo and Owari Japanese vocalic interaction in Youngberg (2017). Finally, further investigations must consider the role of word-medial weakening and the creation of consonant clusters and voiced geminates word medially, which were not systematically investigated in April 2019. These words must be the result of diachronic change, as weakening does not currently affect the word-medial context productively. The analysis presented would still be valid if this were the case, albeit with the modification that high vowels could be deleted more generally and not only in word final position. Further fieldwork and research will explore these issues in more detail.

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