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Rendaku, Phrasing, and Cohesion

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Abstract
Although *rendaku* is sometimes described as a signal of tight cohesion in a compound, it is not a consistent signal; a compound with tight cohesion does not necessarily have *rendaku*. Compound accent, on the other hand, is a consistent signal of tight cohesion, and this paper proposes that *rendaku* does not occur in the absence of compound accent. The argument involves "dephrasal accent," which is intermediate between compound accent and phrasal accent. When a combination of two elements has compound accent, it is pronounced as a single accent phrase, and in most cases its accent pattern depends on the second element. When a combination has phrasal accent, it allows each element to be pronounced as a separate accent phrase within a single major phrase, with each element preserving the accent pattern it has as an independent word. In many cases, phrasal accent allows optional dephrasing of the second element, that is, pronouncing the entire combination as a single accent phrase with the accent pattern of the first element preserved. In dephrasal accent, the accent pattern of the first element is preserved, but the combination must be pronounced as a single accent phrase; a pronunciation with two accent phrases within a single major phrase is not possible. It appears that *rendaku* immediately following the boundary between elements is blocked not only by phrasal accent but also by dephrasal accent, although compound accent and dephrasal accent cannot always be distinguished with certainty.*

Keywords: *rendaku*, cohesion, compound accent, dephrasal accent, accentually non-unified compound

1. *Rendaku*

The Japanese morphophonemic alternations known collectively as *rendaku* 連濁 are familiar to phonologists all over the world. *Rendaku* is often characterized as a "voicing" process, but it lost its phonetic grounding long ago and cannot be described as pairing obstruents that differ only in the presence versus absence of voicing (Vance 2016: 3, 2018: 193–197). A tedious but accurate way of describing *rendaku* is to say that many "elements" that occur non-initially in complex words alternate between a form beginning with a voiceless consonant and a form beginning with a voiced consonant. The elements that alternate are usually but not always monomorphemic, and most but not all of the complex words involved are compounds. The great majority of complex words can be analyzed into two constituents, and these constituents are the relevant elements,

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even when one or both constituents can be analyzed further. In a two-element complex word, when an alternating element is the first element (E1), it must begin with a voiceless consonant, but when it is the second element (E2), it may begin with the voiced partner of that consonant.[1] The examples in (1) show the element-initial phonemes that alternate.

(1) a. /f/~/b/ [ɸ]~[b]
/fu·soku/ 不足 'insufficiency'; /ne+bu(ꜜ)·soku/ 寝不足 'lack of sleep'[2]
b. /h/~/b/ [h],[ç]~[b]
/hači ꜜ/ 蜂 'bee'; /micu ꜜ+bači/ 蜜蜂 'honeybee'
c. /s/~/z/ [s]~[(d)z]
/seri+ai/ 競り合い 'competition'; /ko+ze ꜜri+ai/ 小競り合い 'skirmish'
d. /c/~/z/ [ts]~[(d)z]
/cuke ꜜ–ru/ 付ける 'to attach'; /na+zuke ꜜ–ru/ 名付ける 'to name'
e. /t/~/d/ [t]~[d]
/taka ꜜ–i/ 高い 'high'; /na+daka ꜜ–i/ 名高い 'famous'
f. /š/~/ǰ/ [ɕ]~[dʑ]
/šare/ 洒落 'pun'; /da+ǰare/ 駄洒落 'bad pun'
g. /č/~/ǰ/ [tɕ]~[dʑ]
/čikara ꜜ/ 力 'power'; /soko+ǰi(ꜜ)kara/ 底力 'latent power'
h. /k/~/g/(/ŋ/) [k]~[g]([ŋ])[3]
/kani/ 蟹 'crab'; /kabuto ꜜ+gani/ (/kabuto ꜜ+ŋani/) 兜蟹 'horseshoe crab'

An alternating E2 that begins with a voiced consonant and a complex word that contains it are said to "have" or "show" *rendaku*.

As is typical of morphophonemic alternations that originated in phonological changes that occurred long ago, the *rendaku* alternations are irregular (Vance 2015: 433–436). Many elements that begin with a voiceless consonant word-initially do not alternate, and among those that do alternate, some always or almost always show *rendaku* as an E2, whereas others only rarely do (Irwin 2016: 101–105).

2. /suki/~/zuki/ and /kirai/~/girai/

The elements /suki ꜜ/ 好き 'fond of' and /kirai/ 嫌い 'averse to' both alternate, and they behave

[1] Initial voiced obstruents in examples like /zama ꜜ/ 'sorry state' (cf. /sama ꜜ/ 様 'state, condition') exploit a phonesthetic association between voiced obstruents and mostly negative attributes ("big," "coarse," "heavy," "ponderous," "vulgar," etc.) and are not instances of *rendaku* (Vance 2017: §4.3; see Suzuki 1962: 23–24, Endō 1977: 222–228, Komatsu 1981: 87–88, Hamano 1998: 83–85).

[2] Throughout this paper, a dot rather than a plus marks the boundary between the two elements of a Sino-Japanese binom (*kango-niji-jukugo* 漢語二字熟語). A downward-pointing arrow marks the location of an accent nucleus, that is, an abrupt drop in pitch. The location of this pitch change is the distinctive feature of accented words in Tokyo Japanese. If there is no arrow in the phonemic transcription of a word, that word is unaccented. An arrow in parentheses means that the item is variable, occurring both accented and unaccented. Thus, /ne+bu(ꜜ)·soku/ is equivalent to /ne + bu·soku/~/ne + bu ꜜ·soku/.

[3] For the shrinking minority of Tokyo speakers who have syllable-initial [ŋ], [ŋ] is the *rendaku* partner of [k]. In his presidential address to the Phonetic Society of Japan, Uwano (2010) argued persuasively that for speakers who do have [ŋ], [ŋ] and [g] realize two separate phonemes. I ignore this complication in the remainder of this paper.

nearly but not quite consistently. Of the relevant complex words in common enough use to be listed as headwords in the most recent NHK pronunciation dictionary (NHK Hōsō Bunka Kenkyūjo 2016), 12 of the 13 ending with the former have /zuki/, and 8 of the 9 ending with the latter have /girai/. The examples in (2) are typical.

(2) a. /sake+zuki(ꜜ)/ 酒好き ‘love of drink; heavy drinker’
b. /ke+giꜜrai/ 毛嫌い ‘instinctive aversion’

The patterns in (2) are so productive that some dictionaries list bound /zuki/ and /girai/ as headwords.

There are, however, two glaring exceptions, as shown in (3).

(3) a. /daꜜi+suki/ 大好き ‘very fond’
b. /daꜜi+kirai/ 大嫌い ‘very averse’

The examples in (3) both have the same E1, which occurs as an independent word in phrases such as /daꜜi no¦ya·kyuH+faꜜN/ 大の野球ファン ‘big baseball fan’, where ¦ marks a division between accent phrases within a single major phrase, a major phrase being the domain of downstep (Pierrehumbert and Beckman 1988: 16, Kubozono 1993: 118–124, Venditti 2005: 175–177). Some E1s are *rendaku* inhibitors (Irwin 2012), but /daꜜi/ does not seem to be one of them, although the only example with *rendaku* listed in one well-known pronunciation dictionary (Kindaichi and Akinaga 2014) is /dai+gaꜜi·ša/ 大会社 ‘large company’ (cf. /kai·ša/ ‘company’). This example is not listed in the 2016 NHK dictionary and seems to be obsolete.

3. Compound accent and right-dominance

What is striking about the two exceptional examples in (3) is their accentuation. They both appear to preserve the accent of their common E1, and this is not the expected pattern in a compound unless it is coordinate (Kindaichi and Akinaga 2014[appendix]: 28), especially if E2 is three moras or longer (Tanaka and Kubozono 1999: 70–73). Coordinate compounds are taken up below in §5.

In present-day Tokyo Japanese, compounds with regular (i.e., predictable) accent are “right-dominant” in the sense that the right-side element (E2) determines the accent of the compound (Huang 2020: 46–47). In some cases, the compound simply preserves the accent pattern that E2 carries as an independent word, as in /ki+maꜜkura/ 木枕 ‘wooden pillow’ (cf. /kiꜜ/ ‘wood’, /maꜜkura/ ‘pillow’). In most cases, however, a right-dominant compound does not preserve the accent pattern of E2. For example, although /abura/ 油 ‘oil’ is unaccented as a word on its own, compounds containing it as E2 are regularly accented on the antepenultimate syllable, as in /go·ma+aꜜbura/ 胡麻油 ‘sesame oil’ (cf. /go·ma/ ‘sesame’) and /tane+aꜜbura/ 種油 ‘rapeseed oil’ (cf. /taꜜne/ ‘seed’). Matsumori (2016: 141–145) provides a concise summary of the patterns and exceptions in noun+noun compounds in present-day Tokyo Japanese, and there is an extensive literature on the accentuation of such compounds (Hirayama 1960: 907–912, McCawley 1968: 157–172, 1977: 271–272, Tsujimura and Davis 1987, Satō 1989: 234–252, Kubozono, Itō, and Mester 1997, and many others).

It sometimes happens that a right-dominant pattern and preservation of the accent on E1 yield the same result. For example, compounds ending in /ryoH/ 料 ‘fee’ are accented on the last syllable of E1, as in /uN·soꜜH+ryoH/ 運送料 ‘shipping fee’ (cf. /uN·soH/) and

/ju·gyo↓H+ryoH/ 授業料 'tuition fee' (cf. /ju↓·gyoH/). Consequently, in /te+su↓H+ryoH/ 手数料 'handling fee' (cf. /te+su↓H/), the accent on the compound coincides with the accent that appears on E1 as an independent word. It is clear from the overall pattern that this coincidence should not be regarded as preservation of the accent on E1, but as we will see below in §8, it not always so easy to make such a decision.

All 8 of the compounds in the NHK dictionary that end /girai/ are accented as expected on the first syllable of that element (although /eri+gi(↓)rai/ 選り嫌い 'being choosy' is unaccented for some speakers). The two exceptions in (3) raise the possibility that they might be accentually non-unified compounds, that is, compounds that are (or can be) pronounced as two accent phrases within a single major phrase (Kubozono 1993: 9–72). The example in (4) is a typical accentually non-unified compound.

(4) /ko↓Q·ka¦koH·aN+i·i↓N+kai/ 国家公安委員会 'national public safety commission'

The portion on each side of the phrase boundary in (4) retains the accent that it would have as an independent word (cf. /ko↓Q·ka/ 'nation', /koH·aN+i·i↓N+kai/ 'public safety commission').

4. Cohesion

Rendaku is often described as a marker of strong cohesion, so it is not surprising that there are no instances of *rendaku* immediately following the accent phrase boundary in an accentually non-unified compound. In most cases, *rendaku* would be inhibited for some other reason as well, so it is actually not easy to find relevant examples, but those in (5) seem to show the relevance of accentual non-unification.

(5) a. /iki+guruši↓–i/ 息苦しい 'hard to breathe'
b. /čo↓H¦kuruši↓–i/ 超苦しい 'super arduous'

The second element in both examples in (5) is the adjective /kuruši↓–i/ 苦しい 'arduous'. Like Latinate *super* in English, Sino-Japanese /čo↓H/ 超 'super' has evolved from a bound element (as in /čoH+no↓H·ryoku/ 超能力 'supernatural ability', with compound accent; cf. /no↓H·ryoku/ 'ability'). In present-day Japanese, /čo↓H/ can be used an independent word that functions either adnominally or adverbially. Consequently, it is not obvious whether accentually non-unified (5b) should be analyzed as a compound or as a syntactic construction.

Returning now to the examples in (3), the question is, can they be pronounced as two accent phrases (i.e., as accentually non-unified)? The answer is no, leaving aside phenomena such as corrective focus, which can turn any pronounceable portion of a word into its own major phrase. Unlike /čo↓H/ and several other monomorphemic Sino-Japanese elements, /da↓i/ does not behave as what Martin (1975: 750–751) calls a pseudo adnoun, even when it is semantically an intensifier, as in /dai+ko↓H·bucu/ 大好物 'especially favored food' (which has compound accent).

5. An intermediate category?

In order to attribute the absence of *rendaku* in examples like (3) to weak cohesion, compounds with "dephrasal accent" must be treated as intermediate between those that are accentually non-unified and those that have "compound accent." The idea of an intermediate category is due to Kubozono, Itō and Mester (1997). Dephrasing means retention of the first accent in a combination and deletion of any subsequent accents. The clearest examples contain two lexically accented

constituents. Short syntactic constructions like those in (6) fit this description, and they can be produced as single accent phrases in which the first accent becomes the accent of the phrase.[4] However, many such constructions can also be pronounced as two accent phrases within a single major phrase, as long as the two underlying accents are not on adjacent moras (Kubozono 1993: 107–108). The second accent in a two-accent-phrase realization is, of course, downstepped. (Focus on the second accent phrase results in a new major phrase, with pitch reset rather than downstep.)

(6) a. /e↓ki/+/ma↓de/ → /e↓ki made/~/e↓ki¦ma↓de/ 駅まで ‘as far as the station’
b. /me↓ ga/+/de↓–ru/ → /me↓ ga de–ru/~/me↓ ga¦de↓–ru/ 芽が出る ‘buds appear’

In many constructions, an accentually non-unified pronunciation is obligatory, but any example that either allows or requires an accentually non-unified pronunciation will be described here as having “phrasal accent.” In contrast, the term “dephrasal accent” will be used to describe cases in which the non-unified pronunciation is not possible.[5]

Many coordinate compounds have dephrasal accent (as hinted above in §3). The examples in (7)–(9) illustrate.

(7) /yama↓/ 山 ‘mountain’
a. /u↓mi/ ‘sea’ /u↓mi+yama/ 海山 ‘the sea and the mountains’ (coordinate)
b. /ka↓ta/ ‘shoulder’ /kata+yama/ 肩山 ‘top of the shoulder’ (non-coordinate)
(8) /cuki↓/ 月 ‘moon; month’
a. /toši↓/ ‘year’ /toši↓+cuki/ 年月 ‘years and months’ (coordinate)
b. /yaku↓/ ‘bad luck’ /yaku+zuki(↓)/ 厄月 ‘unlucky month’ (non-coordinate)
(9) /hana/ 鼻 ‘nose’
a. /me↓/ ‘eye’ /me↓+hana/ 目鼻 ‘eyes and nose’ (coordinate)
b. /kagi↓/ ‘hook’ /kagi+bana/ 鉤鼻 ‘hooknose’ (non-coordinate)

The three coordinate compounds (7a, 8a, 9a) all have dephrasal accent, and the three non-coordinate compounds (7b, 8b, 9b) all have something else. I will use the term “compound accent” in this paper to denote an accent pattern on a compound that is neither phrasal nor dephrasal. A compound with compound accent must be pronounced as a single accent phrase and does not involve retention of the accent pattern that E1 carries as an independent word. Whether the accent pattern on the compound is regular or irregular does not matter for categorizing it as compound accent. As hinted above in §3, however, it can be hard to decide in some cases

[4] Faint traces of the second accent often remain in realizations that are typically described as single accent phrases (Kubozono 1993: 112–113), and Maekwawa (1997) is skeptical that the second accent ever disappears completely.

[5] Haruo Kubozono (p.c.) has suggested to me that dephrasal accent is just left-dominant compound accent (see §8 on left-dominance). The relevant examples are lexicalized compounds and therefore do not permit an alternative phrasal-accent pronunciation, and one could argue that there is no need for an intermediate category between phrasal and compound accent. Instead, it is left-dominance that prevents *rendaku*. My preference for the dephrasal-accent category is based on the feeling that the relevant vocabulary items resist *rendaku* for an intuitively natural reason, namely, that they are “atrophied” phrases. The label “left-dominant” does not capture this intuition. It is quite possible, of course, that native speakers simply do not have any such intuition.

whether an example has compound accent or dephrasal accent, and more such cases will come up below in §6 and §8.

Since the E2 in (7) begins with /y/, *rendaku* is not possible, but the non-coordinate compounds (8b) and (9b) both have *rendaku*. Nonetheless, it seems that the well-known resistance to *rendaku* in coordinate compounds cannot be just a secondary effect of dephrasal accent. The examples in (10) suggests that the tendency for coordinate compounds to resist *rendaku* is independent of accent.

(10) /hotoke(ˈ)/ 仏 'buddha'
a. /kaˈmi/ 'god' /kaˈmi¦hotoke/~/kami+hoˈtoke/ 神仏 'gods and buddhas'[6]
b. /išiˈ/ 'stone' /iši+boˈtoke/ 石仏 'stone buddha'

As (10b) shows, the element meaning 'buddha' alternates, and in fact, it always shows *rendaku* as an E2 except in the coordinate compound in (10a) (Irwin 2016: 104). (10a) does not have *rendaku* when it is accentually non-unified, of course, but it does not have *rendaku* even when it is pronounced with compound accent, which means that compound accent itself does not trigger *rendaku*. The hypothesis under consideration here is that compound accent might be a necessary condition for *rendaku*, but it certainly is not a sufficient condition.

Many verbal combinations consisting of a Sino-Japanese element followed by /su–ru/ 'to do' also seem to fit into the proposed intermediate category. When the Sino-Japanese element is a binom, as in /kuˈ·roH + su–ru/ 苦労する 'to suffer', the combination has dephrasal accent (cf. /kuˈ·roH/ 'suffering'). Unless the verbal element is focused for some reason, the combination is not pronounced as two accent phrases, despite the fact that it seems to be a straightforward case of particle ellipsis (cf. /kuˈ·roH o su–ru/, which has accusative /o/ and can be pronounced as two accent phrases: /kuˈ·roH o¦su–ru/). Binom+/su–ru/ combinations never have *rendaku*. When the element preceding /su–ru/ is a single Sino-Japanese morpheme, the combination typically has compound accent, and if it does, it may show *rendaku*, as in (11a). If the combination has dephrasal accent, however, it does not have *rendaku*, as in (11b).

(11) a. /kaˈN/ 感 'feeling'
/kaN+zu–ru/ 感ずる 'to feel'

b. /soˈN/ 損 'loss'
/soˈN+su–ru/ 損する 'to sustain a loss'
cf. /soˈN o¦su–ru/~/soˈN o su–ru/

The 2016 NHK dictionary also lists /soN+zu(ˈ)–ru/ 損ずる 'to damage', although Martin (1975: 872) describes this word as already obsolescent nearly 50 years ago. It has compound accent, which makes *rendaku* possible.

Citation forms ending with /zu–ru/ are cited in the paragraph just above, but they have an archaic or formal feel and have largely been replaced in the spoken language by forms ending in /ǰi–ru/, as in /kaN+ǰi–ru/ 感じる 'to feel' and /soN+ǰi(ˈ)–ru/ (Martin 1975: 289, Vance and Asai 2016: 125–126). Needless to say, /ǰi–ru/ is not the *rendaku* counterpart of /su–ru/, and the inflec-

[6] These are the two alternative pronunciations given in the most recent NHK pronunciation dictionary (NHK Hōsō Bunka Kenkyūjo 2016), but an earlier NHK dictionary (NHK Hōsō Bunka Kenkyūjo 1998) and another well-known pronunciation dictionary (Kindaichi and Akinaga 2014) both give dephrasal /kaˈmi+hotoke/ instead of phrasal /kaˈmi¦hotoke/ as the first option. As Haruo Kubozono (p.c.) has pointed out to me, accentual unification becomes less likely when a coordinate or reduplicated compound is longer than four moras.

tional forms that speakers actually use suggest that the synchronic connection between /ǰi–ru/ and /su–ru/ is tenuous (Vance and Asai 2016: 126).

Interestingly, /soN+ǰi(ˈ)–ru/ appears as E2 in {/ši/}+{/soN+ǰiˈ–ru/} 為損じる/仕損じる 'to bungle'. E1 is etymologically the combining form of /su–ru/ 'to do', which can be written with the *kanji* ⟨為⟩ or ⟨仕⟩ but is usually written entirely in *hiragana*. It is possible that some native speakers have reanalyzed this compound as {/ši·soN/}+{/ǰiˈ–ru/}, and since ⟨仕⟩ has the *on'yomi* /ši/, /ši·soN/ written ⟨仕損⟩ looks like a Sino-Japanese binom, although it is unattested as an independent word. Formal /zu–ru/ does not appear after any true binom, as noted above, and neither does colloquial /ǰi–ru/. For present purposes, of course, it does not matter how a speaker analyzes /ši+soN+ǰiˈ–ru/. Even on the assumption that it is an instance of *rendaku*, it has compound accent and therefore does not violate the generalization proposed here.

In contrast to coordinate compounds, non-mimetic reduplicated words strongly favor *rendaku* (Martin 1952: 49, Vance 2015: 417). Of particular interest here are words consisting of a reduplicated verb stem, like those in (12).

(12) a. /kasane+gaˈsane/ 重ね重ね 'repeatedly' (cf. /kasane–ru/ 'to repeat')
b. /hore+boˈre/ 惚れ惚れ 'fondly' (cf. /hore–ru/ 'to become enamored')

There is, however, a type of verb-stem reduplication that systematically resists *rendaku* (Vance 2015: 418). A reduplicated verb stem can express the meaning 'while (repeatedly) doing' the action of the verb, as in (13a) below.

(13) a. /kaˈki+kaki/ 書き書き 'while writing' (cf. /kaˈk–u/ 'to write')
b. /kuzuši+gaki/ 崩し書き 'abbreviated writing' (cf. /kuzuˈs–u/ 'to simplify')

As (13b) shows, the E2 involved does alternate, but reduplicated examples like (13a) have dephrasal accent rather than compound accent (Martin 1975: 408–409). Thus, examples like (13a) are consistent with the hypothesis that compound accent is a necessary condition for *rendaku*.

6. Coordinate compounds with *rendaku*

The generalization proposed above is that *rendaku* is possible in a compound only if that compound has compound accent (as defined in §5). The consistent absence of *rendaku* immediately following the phrase boundary in an accentually non-unified compound (see §4) follows from this generalization, and it is intuitively natural to regard non-unification as a signal of weak cohesion. There are, however, accentually unified compounds that nonetheless do not have compound accent, as shown in §5, and it seems reasonable to characterize them as having an intermediate degree of cohesion. Consistent absence of *rendaku* in these intermediate examples would follow from the same generalization. The remainder of this paper is devoted to a search for counterexamples to the hypothesis that compound accent is a necessary condition for *rendaku*. This section treats coordinate compounds, and §7 takes up compounds with phrasal E1s. Finally, §8 considers the notion of left-dominance and presents a small number of examples that are difficult to reconcile with the hypothesis.

Coordinate compounds invite scrutiny because there are some well-known examples that have *rendaku*. As explained above in §5, coordinate compounds tend to resist *rendaku* and also tend to have dephrasal accent, and if any of the exceptional compounds that show *rendaku* also

have dephrasal accent, they would be clear counterexamples to the generalization. The examples in (14), however, do not have dephrasal accent.

(14) a. /mie+ga$^{(↓)}$kure/~/mie+ka$^{(↓)}$kure/ 見え隠れ ‘appearing and disappearing’
cf. /mie$^{↓}$–ru/ ‘to be visible’; /kakure$^{↓}$–ru/ ‘to become concealed’
b. /ita+gayu$^{↓}$–i/ 痛痒い ‘painful and itchy’
cf. /ita$^{↓}$–i/ ‘painful’; /kayu$^{↓}$–i/ ‘itchy’

It is implausible to think that (14a) is compounded not from the two verb stems but from the derived nouns /mie$^{↓}$/ ‘appearances, display’ and /kakure$^{↓}$/ ‘being unknown’, but even if it were, /mie+ga$^{(↓)}$kure/ still does not have dephrasal accent. The traditional accent pattern for A+A=A compounds (i.e., adjective+adjective compound adjectives) is unaccented, but there is a tendency for relatively long A+A=A compounds to be accented, and younger speakers prefer the accented pattern in all A+A=A compounds (Kindaichi and Akinaga 2014[appendix]: 68–69). There is no independent noun based on the root of /ita$^{↓}$–i/, but on the assumption that the root has an underlying accent that disappears in (14b), the accent of (14b) cannot be construed as dephrasal.

On the other hand, the examples in (15) are ambiguous.

(15) a. /mono$^{↓}$+goto/ 物事 ‘things, matters’
cf. /mono$^{↓}$/ ‘(concrete) thing’; /koto$^{↓}$/ ‘(abstract) thing’
b. /ama+zuQpa$^{(↓)}$–i/ 甘酸っぱい ‘sweet and sour’
cf. /ama–i/ ‘sweet’; /suQpa$^{↓}$–i/ ‘sour’

Most compounds with /koto/~/goto/ ‘thing’ as E2 are unaccented, and if this pattern were consistent, (15a) would be an unambiguous instance of dephrasal accent. There are, however, a few examples such as /šo·sa$^{(↓)}$+goto/ 所作事 ‘kabuki dance’ (cf. /šo$^{↓}$·sa/~/šo·sa$^{↓}$/ ‘movement’), /yoso$^{(↓)}$+goto/ 余所事 ‘none of one’s business’ (cf. /yoso$^{↓}$/~/yo$^{↓}$so/ ‘other’), and /deki$^{↓}$+goto/ 出来事 ‘occurrence’ (cf. /deki$^{↓}$–ru/ ‘to come into existence’; /deki/ ‘outcome’) that are non-coordinate and are accented on the last syllable preceding E2, at least as one possibility. Consequently, the accent in (15a) is arguably compound accent. As for (15b), unlike /ita$^{↓}$–i/, the E1 in (14b), the adjective /ama–i/ is unaccented. On the assumption that the root is underlyingly unaccented as an E1, the unaccented alternative /ama+zuQpa–i/ for (15b) is clearly not dephrasal, since the first accent in the combination (i.e., the accent on /suQpa$^{↓}$–i/) is not preserved. The accented alternative /ama+zuQpa$^{↓}$–i/ could be construed as preserving this first accent, but this accent location is the only possibility for an accented adjective and thus could just as plausibly be construed as compound accent.

There are a few complex compounds that contain a coordinate element that shows *rendaku*, (Vance 2015: 426) but these have compound accent, as shown in (16).

(16) /aši+de+ma$^{↓}$toi/~/aši+te+ma$^{↓}$toi/ 足手纏い ‘impediment’
cf. /aši$^{↓}$/ ‘foot’, /te$^{↓}$/ ‘hand’, /mato$^{↓}$–u/ ‘to be wrapped’

The constituent structure of (16) is /aši+de/+/ma$^{↓}$toi/(~/aši+te/+/ma$^{↓}$toi/). The coordinate E1 does not exist as an independent word, but if it did and had dephrasal accent, the *rendaku* pronunciation would be */aši$^{↓}$+de/, with the accent of /aši$^{↓}$/ preserved. This hypothetical form obviously violates the generalization proposed in this paper. In the *rendaku* pronunciation of (16), however, this coordinate element is contained in a longer compound that has compound accent:

/aši+de+ma↓toi/, not */aši↓+de+matoi/. Consequently, the *rendaku* in (16) clearly does not immediately follow a boundary between elements within a combination that has phrasal or dephrasal accent.

The example in (17) was coined as a translation (or, more accurately, an explanation) of *automated teller machine*, but it is not used in ordinary conversation and is not listed in accent dictionaries.

(17) /geN·ki↓N¦ji·doH+azuke+bara↓i+ki/~/geN·kiN+ji·doH+azuke+bara↓i+ki/
現金自動預け払い機
cf. /geN·ki↓N/ 'cash', /ji·doH/ 'automatic operation', /azuke↓–ru/ 'to deposit', /hara↓–u/ 'to pay', /ki↓/ 'machine'

The constituent structure of (17) is {{/geN·kiN/+{/ji·doH/+{/azuke+barai/}}}+/ki/} (leaving accent unmarked). The accentually unified pronunciation (on the right) has compound accent, with the accent pattern of the whole determined by its E2, /ki↓/. As E2 in a compound, this element regularly induces accent on the last syllable of E1, as in /kaN·so↓H+ki/ 乾燥機 'dryer' (cf. /kaN·soH/ 'drying') and /jeQto↓+ki/ ジェット機 'jet plane' (cf. /je↓Qto/ 'jet'). Like many multi-element compounds, (17) also allows an accentually non-unified pronunciation, but the phonological boundary between the two accent phrases does not coincide with the primary semantic constituent boundary (i.e., the boundary between E1 and E2).[7] Unlike the examples in (6) in §5, the non-unified pronunciation of (17) is not an ordinary case of phrasal accent because the accentually unified alternative does not preserve the accent of E1, but what is important for present purposes is the coordinate portion /azuke+barai/. There is no independent word of this form, but if it did exist and had the dephrasal accent that we saw in examples (7)–(9) in §5, it would presumably be */azuke↓+barai/, with the accent of /azuke↓/ 'entrusting' preserved and the accent of /hara↓i/ 'payment' suppressed. Regardless of whether or not (17) as a whole is accentually unified, the *rendaku* (i.e., the /b/) clearly does not immediately follow a boundary between the two elements of a combination that carries phrasal or dephrasal accent.

7. Compounds with phrasal E1s

In the example in (18), E1 is a syntactic phrase.

(18) /haya–i+mono+gači(↓)/ 早い者勝ち 'advantage to the early person'
cf. /haya↓–i/ 'early', /mono↓/ 'person', /kači↓/ 'win'

The adjective /haya↓–i/ and the noun /mono↓/ can form a combination like those in (6) above in §5, with phrasal accent, thus allowing an accentually non-unified pronunciation as an option: /haya↓–i mono/~/haya↓–i¦mono↓/. The accent pattern on this phrase, however, is irrelevant in (18), which has compound accent. It is not possible to pronounce (18) with phrasal accent (*/haya↓–i+mono¦gači(↓)/) or with dephrasal accent (*/haya↓–i+mono+gači/).

The example in (19) is similar.

[7] Kubozono (1993: 19–20) discusses compounds that show this kind of mismatch between semantic constituency and phrasing. The examples he treats are not as complex as (17), but they are semantically {{AB} C} and phonologically /A¦BC/. (17) can be analyzed this way (A=/geN·kiN/, B=/ji·doH+azuke+barai/, C=/ki/; accent unmarked).

(19) /ar–u+toki+ba↓rai/ 有る時払い ‘paying when one has the money’
cf. /a↓r–u/ ‘to have’, /toki↓/ ‘time’, /hara↓i/ ‘payment’

The verb /a↓r–u/ modifies the noun /toki↓/ in the syntactic phrase /a↓r–u toki/~/a↓r–u¦toki↓/ ‘when one has’, but the accent pattern on this phrase vanishes in (19). Like (18), (19) has compound accent, which means that neither phrasal accent (*/a↓r–u+toki¦bara↓i/) nor dephrasal accent (*/a↓r–u+toki+barai/) is possible.

Thus, the *rendaku* in (18) and (19) is consistent with the generalization proposed in this paper, since it does not immediately follow a boundary between elements within a combination that has phrasal or dephrasal accent.

8. Left-dominance

A combination that preserves the accent of E1 is often called “left-dominant,” and many left-dominant compounds are at least arguably left-headed (Huang 2020: 45–46). The coordinate examples cited above in §5 (7a, 8a, 9a, 10a) are left-dominant in this sense, of course, but the label “dephrasal” implies nothing about headedness. It would be nice if we could identify dephrasal accent unequivocally by comparing the accent pattern on a combination with the accent patterns carried by E1 and E2 as independent words. As we saw above in §6, however, the accent patterns on some combinations are ambiguous.

As explained above in §3, most compounds in modern Tokyo Japanese are right-dominant, but not in the strict sense that they necessarily preserve the accent pattern that E2 carries as an independent word. They are right-dominant in the looser sense that the right-side element (E2) determines the outcome. Compounds in many Ryukyuan languages and Japanese dialects are left-dominant in this looser sense, that is, E1 determines the outcome but a compound does not necessarily just preserve the accent pattern that E1 carries as an independent word. Left-dominance seems to be historically older (Matsumori 2016: 156), and there appear to be some vestiges of left-dominance in modern Tokyo Japanese in compounds consisting of two short (i.e., one-mora or two-mora) elements (Kindaichi and Akinaga 2014 [appendix]: 14–16; Matsumori 2016: 147–151).

Modern Tokyo examples like those in (20) (Matsumori 2016: 148–149) can be taken as noun+noun compounds that are left-dominant in the looser sense.

(20) a. /kizu/ ‘wound’+/kuči/ ‘mouth’ → /kizu+guči/ 傷口 ‘wound opening’
b. /muši/ ‘bug’+/ha↓/ ‘tooth’ → /muši+ba/ 虫歯 ‘decayed tooth’
c. /i↓to/ ‘thread’+/kuči/ ‘mouth’→ /ito↓+guči/ 糸口 ‘thread end’
d. /o↓ku/ ‘interior’+/ha↓/ ‘tooth’ → /o↓ku+ba/ 奥歯 ‘back tooth’

The examples in (20a) and (20b) suggest that when unaccented /kizu/ or /muši/ combines with short (one-mora or two-mora) E2, the resulting compound is unaccented, and the examples in (20c) and (20d) suggest that when accented /i↓to/ or /o↓ku/ combines with the same kind of E2, the resulting compound is accented. Since all the compounds in (20) have *rendaku*, the important question here is whether their accent patterns are dephrasal. The pattern in (20c) clearly is not, since the accent of /i↓to/ is not preserved in /ito↓+guči/. The unaccented pattern in (20b) is also not dephrasal, since the accent of /ha↓/ is not preserved in /muši+ba/. The other two examples, however, cannot be so easily dismissed.

In short syntactic phrases like those in (6) in §5, when the second constituent is unaccented, the combination can be pronounced as a single major phrase containing a single accent phrase, as in (21).

(21) /nagare↓-ru/+/mizu/ → /nagare↓-ru mizu/ 流れる水 'flowing water'

Examples like (21) can also be pronounced as two accent phrases within the single major phrase (Kindaichi and Akinaga 2014[appendix]: 114–115), but since there is no second accent to exhibit downstep, the second accent phrase shows what can be described as initial lowering followed by a downstepped rise. Using traditional mora-by-mora pitch representations (Haraguchi 1977, McCawley 1977), the two-accent-phrase pronunciation of (21) is /nagare↓-ru¦mizu/ LHHL¦LM (where M = mid pitch). Understandably, it is not easy to distinguish single-major-phrase productions from two-major-phrase productions in such cases.

When it comes to typical compounds, which do not allow a two-accent-phrase realization, unaccented examples like (20a) /kizu+guči/ 傷口 'wound opening' leave some room for doubt as to whether the pattern should be treated as dephrasal. On the one hand, both E1 /kizu/ 'wound' and E2 /kuči/ 'mouth' are unaccented as words on their own, and since there is no first accent to preserve, the unaccented combination certainly could be construed as dephrasal. On the other hand, the overall pattern in short compounds like those in (20a) and (20b) is that the unaccented E1 yields unaccented compounds, not compounds that preserve the accent of E2. Thus, /kizu+mono/ 傷物 'damaged item' does not preserve the accent of /mono↓/ 'thing', and /hako+bune/ 箱舟 'ark' does not preserve the accent of /fu↓ne/ 'boat', just as /muši+ba/ 虫歯 'decayed tooth' in (20b) does not preserve the accent of /ha↓/ 'tooth'. In contrast, coordinate /uči+so↓to/ 内外 'inside and outside', which also has an unaccented E1 (/uči/ 'inside') and an accented E2 (/so↓to/ 'outside'), does preserve the accent of its E2, in line with the tendency for coordinate compounds to have dephrasal accent, as discussed above in §5.

Given the different overall patterns for coordinate and non-coordinate short compounds with unaccented E1s, it is possible to argue that coordinate examples like /eda+ha/ 枝葉 'branches and leaves' (cf. /eda/ 'branch', /ha/ 'leaf') have dephrasal accent, whereas non-coordinate examples like /eda+ge/ 枝毛 'split ends' (cf. /eda/ 'branch', /ke/ 'hair') have compound accent. In general, in a two-element short compound A+B, if A, B, and A+B are all unaccented, dephrasal accent and compound accent are indistinguishable, and this ambiguity means that *rendaku* in a compound like (20a) /kizu+guči/ 傷口 'wound opening' does not have to be taken as counterevidence to the hypothesis that dephrasal accent blocks *rendaku*. The same logic applied to the examples with *rendaku* cited in (15) in §6.

All of the left-dominant four-mora examples that Matsumori (2016: 149) cites have E2s that are unaccented as independent words, like /kuči/ 'mouth' in (20a) /kizu+guči/ 傷口 'wound opening' (cf. /kizu/ 'wound') and in (20c) /ito↓+guči/ 糸口 'thread end' (cf. /i↓to/ 'thread'). The overall trend in these examples is for A+B to be accented on the syllable immediately preceding the boundary between A and B when A is accented as an independent word. Additional examples are shown below in (22).

(22) a. /niši/ 'west'+/kaze/ 'wind' → /niši+kaze/ 西風 'west wind'
b. /šio↓/ 'tide'+/kaze/ 'wind' → /šio↓+kaze/ 潮風 'sea breeze'
c. /ha↓ru/ 'spring'+/kaze/ 'wind' → /haru↓+kaze/ 春風 'spring breeze'

d. /mizu/ ‘water’+/muši/ ‘bug’ → /mizu+muši/ 水虫 ‘athlete’s foot’
e. /imo↓/ ‘potato’+/muši/ ‘bug’ → /imo↓+muši/ 芋虫 ‘green caterpillar’
f. /ma↓cu/ ‘pine’+/muši/ ‘bug’ → /macu↓+muši/ 松虫 ‘pine cricket’

Consequently, the apparent preservation of the accent of E1 in examples like (22b) and (22e) is arguably just a coincidence. In right-dominant compounds, accent on the syllable immediately preceding or immediately following the boundary between E1 and E2 is a common outcome (Matsumori 2016: 138), and so is “default” accent, that is, accent on the syllable containing the antepenultimate mora (Matsumori 2016: 147).[8] Notice that the syllable immediately preceding the boundary and the default syllable coincide in the accented examples just above (22b, c, e, f).

The left-dominant three-mora examples that Matsumori (2016: 149) cites all have a two-mora E1 followed by a one-mora E2. In some cases, E2 is accented as an independent word (/ha↓/ 歯 ‘tooth’, /hi↓/ 火 ‘fire’), but in other cases, E2 is unaccented /ke/ 毛 ‘hair’. The other E2 that appears in Matsumori’s examples is /ya↓/ 屋 ‘store, shop’, and I assume here that present-day speakers identify this E2 synchronically with /ya↓/ 家 ‘house’, which can occur as an independent word. Even if they do not, there is nothing strange about treating this E2 as a bound root and categorizing the words that contain it as compounds. The overall trend in these three-mora examples is for A+B to be accented when A is accented as an independent word. The accent on A+B may be on the first syllable (the default location), as shown in (23).

(23) a. /eda/ ‘branch’+/ke/ ‘hair’ → /eda+ge/ 枝毛 ‘split ends’
b. /ma↓yu/ ‘eyebrow’+/ke/ ‘hair’→ /ma↓yu+ge/ 眉毛 ‘eyebrow hair’
c. /kuči/ ‘mouth’+/hi↓/ ‘fire’ → /kuči+bi/ 口火 ‘fuse’
d. /hana↓/ ‘flower’+/hi↓/ ‘fire’ → /ha↓na+bi/ 花火 ‘fireworks’
e. /muši/ ‘bug’+/ha↓/ ‘tooth’ → /muši+ba/ 虫歯 ‘decayed tooth’ (20b)
f. /ma↓e/ ‘front’+/ha↓/ ‘tooth’ → /ma↓e+ba/ 前歯 ‘front tooth’

It seems at least as likely, however, for an accent on A+B to be on the syllable immediately preceding the boundary, as in (24). This is true of all the accented examples that Matsumori (2016: 149) cites with the E2 /ya↓/ ‘shop’.

(24) a. /na↓ka/ ‘middle’+/hi/ ‘day’→ /naka↓+bi/ 中日 ‘middle day’
b. /hata↓/ ‘flag’+/hi/ ‘day’ → /hata↓+bi/~/ha↓ta+bi/ 旗日 ‘flag-display day’
c. /ka↓do/ ‘gate’+/hi↓/ ‘fire’ → /kado↓+bi/ 門火 ‘gate-front fire’
d. /wa↓ra/ ‘straw’+/hi↓/ ‘fire’ → /wara↓+bi/ 藁火 ‘straw fire’
e. /ta↓bi/ ‘split-toe sock’+/ya↓/ ‘shop’→ /tabi↓+ya/ 足袋屋 ‘split-toe sock shop’

[8] The examples cited in this section contain only native noun elements, and very few compounds that fit this description have a long-syllable E1. The expectation is that if such an E1 is accented, a compound containing it will be accented on that long syllable, as in /ši↓H+take/ 椎茸 ‘shiitake mushroom’ (cf. /ši↓H/ 椎 ‘chinquapin’, /take/ 茸 ‘mushroom’). The long syllable /ši↓H/ is both the syllable immediately preceding the boundary and the syllable containing the antepenultimate mora /H/. When it comes to hybrid examples, those like /ho↓N+dana/ 本棚 ‘bookshelf’ (cf. Sino-Japanese /ho↓N/ ‘book’, native /tana/ ‘shelf’) fit this pattern, but those like /paN+ku↓zu/ パン屑 ‘breadcrumb’ (cf. foreign /pa↓N/ ‘bread’, native /ku↓zu/ ‘crumb’) do not. Since I have not investigated the behavior of non-native elements in short compounds, I will have nothing further to say about them here. Matsumori (2016: 149) also cites examples with deverbal E1s, as in /ire+ba/ 入れ歯 ‘denture’ (cf. /ire–ru/ ‘to put in’).

f. /hana↓/ ‘flower’+/ya↓/ ‘shop’ → /hana↓+ya/ 花屋 ‘flower shop’

In a constraint-based approach, the preference for default accent (located on the syllable containing the antepenultimate mora) and the preference for boundary-marking accent (located at the boundary between E1 and E2) can be viewed as violable and potentially conflicting. In four-mora short compounds, as noted above, the prevailing pattern for accented examples satisfies both constraints (○○↓+○○). In three-mora short compounds with a two-mora E1, however, the default location (○↓○+○) and the boundary-marking location (○○↓+○) are different, and it is not clear that either is the prevailing pattern. In any case, as in the four-mora examples (22b) and (22e), the apparent preservation of the accent of E1 in (23b, f) and in (24b, f) is arguably just coincidence and thus does not force us to say that these examples have dephrasal accent.

In closing this section, one caveat is in order. It is important not to exaggerate the regularity of the overall trends in short compounds shown above in (22), (23), and (24) . Especially when E1 is accented as an independent word, counterexamples like those below in (25) are not difficult to find.

(25) a. /ha↓ri/ ‘needle’+/kane/ ‘metal’ → /hari+gane/ 針金 ‘wire’
*/hari↓+gane/

b. /kucu↓/ ‘shoe’+/soko/ ‘bottom’ → /kucu+zoko/ 靴底 ‘sole’
*/kucu↓+zoko/

c. /kome↓/ ‘rice’+/cu↓bu/ ‘grain’→ /kome+cu↓bu/ 米粒 ‘rice grain’
*/kome↓+cubu/

d. /hana↓/ ‘flower’+/so↓no/ ‘garden’ → /hana+zono/ 花園 ‘flower garden’
*/hana↓+zono/

e. /ma↓cu/ ‘pine’+/yani↓/ ‘resin’ → /macu+yani/ 松脂 ‘pine resin’
*/macu↓+yani/

f. /so↓ba/ ‘buckwheat’+/kara↓/ ‘husk’ → /soba+gara/ 蕎麦殻 ‘buckwheat chaff’
*/soba↓+gara/

g. /a↓ši/ ‘reed’+/ke/ ‘hair’ → /aši+ge/ 葦毛 ‘dappled (horse)hair’
*/a↓ši+ge/ */aši↓+ge/

h. /iwa↓/ ‘rock’+/to/ ‘door’ → /iwa+to/ 岩戸 ‘rock covering a cave entrance’
*/i↓wa+to/ */iwa↓+to/

i. /ha↓to/ ‘pigeon’+/me↓/ ‘eye’ → /hato+me/ 鳩目 ‘eyelet’
*/ha↓to+me/ */hato↓+me/

j. /hana↓/ ‘flower’+/wa↓/ ‘ring’ → /hana+wa/ 花輪 ‘flower wreath’
*/ha↓na+wa/ */hana↓+wa/

9. Conclusion

Since no unambiguous instances of *rendaku* in a compound with dephrasal accent have been found, the claim that compound accent is a necessary condition for *rendaku* remains an unrefuted hypothesis. If this hypothesis is in fact correct, we can say that the relatively weak cohesion in a compound with dephrasal accent makes *rendaku* impossible.

The presence of *rendaku* is a reliable indicator of strong cohesion, but the absence of *rendaku* means nothing by itself. In examples like (3a) /da↓i+suki/ 大好き ‘very fond’ and (3b) /da↓i+kirai/ 大嫌い ‘very averse’, the absence of *rendaku* is just a side-effect of the weak cohesion

signaled by dephrasal accent. In examples like (5b) /čo˙H¦kuruši˙–i/ 超苦しい ‘super arduous’, the absence of *rendaku* is a side-effect of the even weaker cohesion signaled by accentual non-unification. Compound accent signals strong cohesion, but a combination with compound accent can lack *rendaku* for any of a number of different reasons. The relevant element may be immune to *rendaku*, either because of a constraint such as Lyman’s Law (which prohibits *rendaku* in an element that contains a medial voiced obstruent, as in /ao+sagi/ 青鷺 ‘blue heron’; Vance 2015: 402–408) or just idiosyncratically (as in /yubi+saki(˙)/ 指先 ‘fingertip’). Even more obviously, *rendaku* may be impossible because the relevant element does not begin with a voiceless obstruent word-initially (as in /yoko+nami/ 横波 ‘side wave’).

When an element’s *rendaku* behavior is inconsistent, as in the case of /hi/ 日 ‘sun’, there is an understandable temptation to claim that an example like /niši+bi/ 西日 ‘westering sun’ has tighter cohesion than an example like /asa+hi/ 朝日 ‘morning sun’. It is totally implausible, however, to imagine that there is some measure of degree of cohesion that could make the presence versus of absence of *rendaku* predictable in such cases.

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連濁，句および結合度

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要旨

連濁は複合語の結合度の印であるとしばしば主張されている。つまり，日本語の複合語の後部要素が連濁すれば，その複合語の結合度が高いという相関関係が唱えられている。しかし，結合度の高い複合語が必ずしも連濁するとは限らない。一方では，アクセント型が典型的な複合語に現れる型（以下「複合的アクセント」）であれば，結合度が高いと確信できる。言い換えれば，複合的アクセントは連濁の必要条件ではあるが，十分条件ではない。

この見方の背景にあるのは，句境界削除（dephrasing）という概念である。複合的アクセントの場合は，2 要素からなる列が 1 つのアクセント句を形成する。アクセント核の有無と位置は後部要素によって決まる事例が圧倒的に多い（例えば，**ヤマ**┐＋**オトコ**┐→ **ヤマオ**┐**トコ**「山男」）。対照的に，句的アクセントの場合は，各要素が自立語としてのアクセント型を保ち，その組み合わせが 2 つのアクセント句になる（例えば，**エ**┐**キ**＋**マ**┐**デ** → **エ**┐**キ・マ**┐**デ**「駅まで」）。同じイントネーション句に含まれているので，後部のアクセント句にダウンステップが起こる。その 2 つのアクセント句の間にある境界を削除して組み合わせ全体を 1 つのアクセント句にしてもいい事例もある（例えば，**エ**┐**キマデ**）。このような境界削除の場合は，前部要素のアクセント型が優先して保たれる。2 つのアクセント句として発音される韻律上不統一複合語（prosodically non-unified compound）もあるが，単なる境界削除はほとんど許されない。1 つのアクセント句になると，たいてい複合的アクセントが現れる（例えば，**サ**┐**イム**＋**ヘンサイ** → **サ**┐**イム・ヘンサイ**～**サイムヘ**┐**ンサイ**）。

本稿で提案されるのは，「句境界削除アクセント」（dephrasal accent）というもう 1 つの可能性である。句境界削除アクセントの場合は，句的アクセントと同様に前部要素のアクセント型が保たれるが，句的アクセントと異なり 2 つのアクセント句として発音する選択肢はない（例えば，**ハ**┐**ル**＋**ア**┐**キ** → **ハ**┐**ルアキ**「春秋」）。要するに，句境界削除アクセントは複合的アクセントと句的アクセントの中間にある。組み合わせの後部要素は，句的アクセントの場合に連濁しないことは当然であるが，句境界削除アクセントの場合にも連濁しないようである。

キーワード：連濁，結合度，複合的アクセント，句境界削除アクセント，韻律上不統一複合語