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Proceedings of the Twenty-Sixth Annual Meeting of the Berkeley Linguistics Society: General Session and Parasession on Aspect (2000), pp. 101-112

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The Annual Proceedings of the Berkeley Linguistics Society is published online via [eLanguage](#), the Linguistic Society of America's digital publishing platform.

Re-examining Default-to-opposite Stress¹

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0. Introduction

Default-to-opposite stress has attracted ample attention in the phonological literature (e.g., Prince 1983; Halle and Vergnaud 1987; Hayes 1995; Walker 1996; Zoll 1997; Bakovic 1998, etc.). In default-to-opposite stress systems, the stress-attracting edge in a domain, typically the word, differs as a function of the weight of syllables found in the domain. Default-to-opposite stress systems thus assume one of two forms. Many languages with default-to-opposite stress place stress on the rightmost heavy syllable, otherwise on the leftmost syllable in words with only light syllables. Another group of default-to-opposite stress systems stress the leftmost heavy syllable, otherwise the rightmost syllable in words with only light syllables. In the former case, the default side is the left side, since it is the left side of the word which attracts stress in the absence of heavy syllables. In the latter case, the default side is the right side, since it is the right side which attracts stress if there are no heavy syllables.

Krueger's (1961) account of Chuvash stress describes a default-to-left stress pattern, in which stress falls on the rightmost heavy syllable (=Full vowels), otherwise the initial syllable, as in (1).

- (1) Chuvash stress (forms from Krueger 1961)
Rightmost heavy (=Full vowels): sarla'ka 'widely', la'ja 'horse'
Otherwise, leftmost: 'əs'ləpər 'we shall work', 'tə'təmər² 'we got up'

Kwakw'ala (Boas 1947; Bach 1975; Wilson 1986) is typically described as a language with a default-to-right stress system, in which the leftmost heavy syllable (=CVV, CVR [R=sonorant]) attracts stress, otherwise the final syllable, as in (2).

- (2) Kwakw'ala stress (forms from Bach 1975)
Leftmost heavy (=CVV, CVR): 'x^wa:x^wək^w'əna 'canoe (pl.)', t'ə'li:dzu
'large board on which fish are cut', 'təlq^wa 'soft', mə'xən^wxənd 'to strike'
Otherwise, rightmost: tsəxə'la 'to be sick', gas'xa 'to carry on fingers'

¹ Thanks to the audience at the 26th meeting of the Berkeley Linguistics Society for helpful comments and suggestions. Any misconceptions or inaccuracies are my own responsibility.

² The quality of the vowel transcribed here as rounded schwa is contextually determined (see Krueger 1961:71).

This paper re-examines languages analyzed in the theoretical literature as possessing default-to-opposite stress. The principle result is that many, if not all, languages analyzed in the theoretical literature as having default-to-opposite stress are subject to re-analysis in different terms. Many default-to-opposite stress systems turn out to have secondary stresses on heavy syllables not carrying primary stress, a result already noted in the literature for some but not other languages with default-to-opposite stress. In other languages evidence suggests that the stress associated with an edge syllable in words consisting of only light syllables is better analyzed as intonational prominence rather than stress. The general picture which emerges is one of doubt concerning the existence of default-to-opposite stress.

2. A typology of default-to-opposite stress

As a starting point in the investigation of default-to-opposite stress, a list of languages described in the theoretical literature as having default-to-opposite stress was compiled. Sources consulted included Kenstowicz 1994, Hayes 1995, and Walker 1996. A total of eleven languages with default-to-opposite stress were found. In nine of these languages, the default side for stress in words consisting of only light syllables is the left side. In these languages, stress is pulled toward the right edge in words with at least one heavy syllable, and toward the left edge in words lacking heavy syllables.³ In two languages, the default side is the right side meaning that stress falls on the leftmost heavy syllable, otherwise the final syllable. A list of languages with default-to-opposite stress appears in (2) grouped according to which side is the default side for stress. Primary sources on stress for the cited languages appear in parentheses.

(2) Languages with default-to-opposite stress

Default-to-left

Khalkha Mongolian (Street 1963;
Bosson 1964; Poppe 1970;
Walker 1996)
Buriat (Poppe 1960; Walker 1996)
Classical Arabic (McCarthy 1979;
Angoujard 1990)
Chuvash (Krueger 1961;
Dobrovolsky 1999)
Kuuku-Ya'u (Thompson 1976;
1988)
Eastern Mari (Itkonen 1955;
Ristinen 1960; Sebeok &
Ingemann 1961)
Northwest Mari (Ivanov &
Tuzharov 1970)
Huasteco (Larsen & Pike 1949)
Selkup (Kuznetsova et al. 1980)

Default-to-right

Komi Jaz'va (Itkonen 1955; Lytkin
1961; Hausenberg 1998)
Kwakw'ala (Boas 1947; Bach
1975; Wilson 1986)

³ Note that Classical Arabic, Northwest Mari, Khalkha and Buriat have a non-finality clause operative in all words of at least two syllables, whereby final stress is either prohibited, as in Northwest Mari (see section 2.2.2), restricted to superheavy syllables (=CVCC, CVV(C)), as in Classical Arabic (see section 2.3.1), or limited to secondary stress and primary stress, only in the case the only heavy syllable is final, as in Khalkha Mongolian and Buriat (see section 2.1.2).

A rather striking feature of Table 1 is the predominance of the left side as the default side, an asymmetry to which we will return in section 3. Another feature of most of the default-to-opposite stress languages in Table 1 is their relatively underdocumented status, which leads Halle and Vergnaud (1987:52) to suggest that subsequent investigation may lead to revisions in at least some of their stress descriptions. Since Halle and Vergnaud's work, further work on certain default-to-opposite stress systems has been published. Given this more recent work, it seems worthwhile to re-examine default-to-opposite stress. To carry out this re-examination, primary sources on the languages in Table 1 were consulted. Interestingly, evaluation of these materials reveals complexities in certain of the default-to-opposite stress systems, some of which have been heretofore undiscussed in the theoretical literature. These complicating factors may be broadly divided into two classes. First, certain languages in Table 1 place secondary stress on heavy syllables not receiving primary stress, a result actually predicted by several metrical stress theories (e.g., Prince 1983; Hayes 1995; Bakovic 1998). These cases are discussed in section 2.1. Second, in other languages, the default stress pattern would appear to be better analyzed as intonational prominence rather than stress; such cases are detailed in section 2.2. Finally, there is a small set of languages discussed in section 2.3 for which stress data is either incomplete or conflicted and neither clearly fits the default-to-opposite pattern nor is clearly amenable to re-analysis in terms similar to those relevant for other default-to-opposite stress systems.

2.1. Secondary stress on heavy syllables

Four languages in the survey were found to have secondary stress on heavy syllables not receiving primary stress. These include Komi Jaz'va, Khalkha Mongolian, Buriat, and Kuuku-Ya'u. Komi Jaz'va is considered in section 2.1.1, Khalkha Mongolian and closely related Buriat are discussed in section 2.1.2, and Kuuku Ya'u is examined in section 2.1.3. A fifth language, Selkup, possibly has secondary stress on heavy syllables without primary stress, although the data is inconclusive (section 2.1.4).

2.1.1. Komi Jaz'va

Itkonen (1955) describes a default-to-opposite stress system in the Jaz'va dialect of Komi (Uralic) whereby the leftmost heavy syllable (=etymological non-high non-vowels⁴) attracts stress in words containing at least one heavy syllable, and the rightmost heavy syllable attracts stress in words consisting only of light syllables. Recent work by Hausenberg (1998), however, suggests that all heavy stem syllables are stressed, though no claims are made about the location of primary stress. Hausenberg's account allows for a different characterization of the Komi Jaz'va stress system which is not directly default-to-opposite. We may say that stress falls on heavy syllables in words containing at least one heavy syllable, otherwise on the final syllable in words lacking heavy syllables, and that the leftmost stress is the primary one. Alternatively, we might state that primary stress falls on the leftmost heavy syllable, otherwise on the rightmost syllable in words lacking heavy syllables, and that secondary stress falls on heavy syllables not carrying primary stress. Regardless of the prose formulation of the Komi Jaz'va stress rule, it is crucially only primary stress which is default-to-opposite.

⁴ Subsequent processes have turned certain historically non-high vowels into high vowels synchronically; these new high vowels behave as heavy for stress.

2.1.2. Khalkha Mongolian and Buriat

Bosson (1964) and Poppe (1970) describe a potential default-to-stress pattern in Khalkha Mongolian, an Altaic language. According to their descriptions, stress falls on the rightmost non-final heavy syllable (heavy=long vowels and diphthongs), unless the only heavy syllable is final, in which case it attracts stress.⁵ In words with only light syllables stress falls on the initial syllable.

Works by Street (1963) and Walker (1996) suggest a slight modification of this analysis. Walker's account is as follows. As in Bosson's and Poppe's analyses, primary stress falls on the rightmost non-final heavy syllable and on the final syllable if it is the only heavy syllable. In words containing only light syllables, the only stress is on the initial syllable, again as in earlier analyses. Walker's account (and Street's also) differs in positing secondary stress on heavy syllables not carrying primary stress, as well as on the initial syllable, though she expresses some uncertainty about the initial secondary stresses. Words illustrating Khalkha stress in Walker's account appear in (3)

- (3) Khalkha stress (forms from Walker 1996)

Multiple heavy syllables (at least one is non-final): 'a;ru:l 'dry cheese curds', 'uitgar,tæ 'sad', 'do'lo:du,ga:r 'seventh', xøn,di:ry:len 'to separate (modal)', u,la:n'barta,ra:s 'Ulaanbaatar (ablative)

Only heavy syllable is final: 'da'lae 'sea', 'ga'lu: 'goose'

All light syllables: 'axa 'brother', 'unfisan 'having read'

Just as in Komi Jaz'va, the presence of secondary stress on heavy syllables not carrying primary stress turns Khalkha stress into a limited default-to-opposite stress system only for primary stress. In addition, if one assumes that the secondary stresses on initial light syllables are genuine, this means that the initial syllable always carries either primary or secondary stress, another aspect of Khalkha stress which deviates from a true default-to-opposite stress pattern. Buriat (Poppe 1960; Walker 1996), an Altaic language closely related to Khalkha, is reported by Walker to have an essentially identical stress pattern to that of Khalkha.

2.1.3. Kuuku-Ya'u

Kuuku-Ya'u is an Australian language described by Thompson (1976, 1988) as having a stress system very similar to that of Khalkha with certain minor differences. Primary stress falls on the rightmost heavy syllable (even if final, unlike in Khalkha), where heavy is equivalent to a syllable containing a long vowel. In words lacking heavy syllables, primary stress falls on the initial syllable. The location of secondary stress is sensitive to various complexities not all of which are instantiated in the forms cited by Thompson. The crucial aspect of secondary stress for present purposes is the presence of secondary stress on heavy syllables lacking primary stress. The Kuuku-Ya'u stress system thus shares with Khalkha and Komi Jaz'va its confinement of default-to-opposite stress to primary stress.

⁵ Bosson and Poppe actually say that a penultimate heavy syllable is stressed and, in all of their examples with multiple heavy syllables, the penult is heavy. As Walker (1996) points out, this wording of the stress rule is ambiguous between rightmost non-final heavy or second-to-last of the heavy syllables. Walker (1996) shows that the former characterization, rightmost non-final heavy, is correct.

2.1.4. Selkup

Of the languages discussed thus far, the Selkup data appears to be the most inconclusive. Kuznetsova et al. (1980) present a default-to-opposite analysis of Selkup stress, according to which the rightmost heavy syllable (=long vowels) is stressed, otherwise the initial syllable in words lacking heavy syllables, subject to certain morphological complications. However, they also suggest that the location of stress is variable, and there are instances of words with multiple stresses, for which it is often unclear which stress is primary. In particular, their data for which multiple stresses are marked (pg. 37) suggests a propensity for stressing all heavy syllables, although further investigation would be necessary to assert this claim with confidence. Thus, while the data available to me certainly do not disprove the hypothesis that Selkup stress is truly default-to-opposite, there appears to be enough counterevidence to cast some uncertainty on this claim.

2.2. Default stress as intonational prominence

There were four languages in the survey for which there is evidence that the default stress pattern in words consisting of only light syllables is intonational prominence rather than stress. These include Chuvash, Northwest Mari, Eastern Mari, and Huasteco. Chuvash is perhaps the most compelling case of default stress re-analyzed as intonational prominence, owing to a recent phonetic study by Dobrovolsky (1999). Chuvash is thus discussed first in section 2.2.1. Northwest Mari, Eastern Mari, and Huasteco are then considered in sections 2.2.2, 2.2.3, and 2.2.4, respectively.

2.2.1. Chuvash

Work by Krueger (1961) presents a default-to-opposite analysis of Chuvash stress (see Dobrovolsky for further references on Chuvash stress). Recall from section 1 that Krueger's analysis posits stress on the rightmost heavy syllable, where heavy is equivalent to a syllable containing a non-central vowel, otherwise on the initial syllable in words with only light syllables.

Recent work by Dobrovolsky (1999) investigating the phonetic correlates of stress in Chuvash, however, suggests a different interpretation of Chuvash stress. For all syllables found in a corpus consisting of disyllabic words uttered in isolation, Dobrovolsky measured the peak intensity, the average intensity, the duration, the fundamental frequency, and the intensity integral, which is intensity integrated over time (see Beckman 1986 for discussion of this measure). His word list included the four logically possible combinations of heavy and light syllables for a disyllabic word: $\acute{\sigma} \acute{\sigma}$, $\acute{\sigma} \sigma$, $\sigma \acute{\sigma}$, $\sigma \sigma$ which are predicted to have the following stress patterns, respectively, according to Krueger's default-to-opposite account: $\acute{\sigma} \acute{\sigma}$, $\acute{\sigma} \sigma$, $\sigma \acute{\sigma}$, $\sigma \sigma$

Dobrovolsky found that, while at least certain intensity measures differentiated stressed from unstressed syllables in most word shapes, he found that light syllables were *not* typically characterized by greater peak, average, and total intensity, nor by increased duration, even when occurring in positions predicted to carry stress (i.e. the first syllable in $\acute{\sigma} \acute{\sigma}$). Rather, Dobrovolsky found that the first syllable usually contained the fundamental frequency peak in the word followed by a fall in fundamental frequency throughout the rest of the word. This fundamental frequency peak and then fall was a consistent property of the initial syllable, even for initial syllables predicted to be unstressed. As Dobrovolsky suggests, the picture which

thus emerges is one in which certain prominence correlates do not pattern together. At least one of the intensity and/or durational correlates of stress are associated with stressed *heavy* syllables, whereas a fundamental frequency peak is consistently associated with the initial syllable independent of syllable weight. Dobrovolsky interprets this mismatch as a divergence between intonational and stress prominence. Heavy syllables have the potential to be stressed, as indicated by increased duration and/or intensity, whereas the initial syllable is prominent by virtue of its intonational properties.

Adopting Dobrovolsky's analysis leads to a re-interpretation of Chuvash stress in which words consisting of only light syllables, the "default" case, lack stress, while all words have intonational prominence on the initial syllable even if they have a stressed syllable later in the word. This combination of intonational prominence and stressless words necessitates a phonological analysis (not provided here due to space limitations) incorporating both stress-based and intonational prominence.

It is also worth pointing out that there is an important intonational issue which Dobrovolsky's study leaves unresolved. It is unclear whether the fundamental frequency peak and subsequent fall found in Dobrovolsky's study is a word-level property or is a feature of a larger intonational unit, such as the phrase or the utterance. If the latter scenario is true, then we would not expect generally to find a fundamental frequency peak in words in non-initial position of this larger intonational unit. Unfortunately, we are currently not in a position to address the nature of intonation domains in Chuvash.

However, given the fact that intonational properties cross-linguistically tend to be associated with prosodic units larger than the word, it is quite plausible that the fundamental frequency peak in Dobrovolsky's data is not a feature of all words. In fact, the phenomenon under consideration, namely the early fundamental frequency peak, is likely to belong a domain larger than the word. Cross-linguistically, fundamental frequency tends to be highest at or near the beginning of large intonational units, such as utterances, and then gradually decline (cf. Maddieson 1997 for an overview of the declination literature). The early fundamental frequency peak and subsequent fundamental frequency decline in Chuvash conform to this pervasive pattern, under the assumption that these intonational features are a property of a domain larger than the word.

More generally, the Chuvash data raises the question of whether other default-to-opposite stress systems in which the default side is the left side are also amenable to an intonationally-based analysis of default stress. Crucially, the only languages for which this analysis is plausible are those in which the default side is the left side, since fundamental frequency values overwhelmingly tend to be highest cross-linguistically at or near the left edge of domains and then decline as one moves rightward. It thus seems unlikely that stress on the final syllable could be linked increased fundamental frequency, barring an exceptional intonational system in which fundamental frequency values are highest at the end of domains.

Before seriously extending the Chuvash analysis to other languages with default-to-left stress, there is a paradox which must be addressed. While intonation is characteristically a property of domains larger than the word, stress is typically assumed to be a feature of the word. It is thus not immediately clear how the intonationally-driven analysis extends to all words.

I would suggest that there are two lines to take in resolving this apparent paradox. First, it seems plausible that many of the stress patterns reported in the descriptive literature are based on words uttered in isolation, a context in which the word is coextensive with the utterance. If this is in fact true, then the intonationally-

based analysis of default-to-left stress may be viable for many languages. Second, there are languages with a documented asymmetry between utterance-level and word-level stress which conforms to the predictions of the intonationally-based analysis of default-to-left stress. In these languages, the default pattern of initial stress is found in words uttered in isolation, where intonational prominence is plausibly present on the initial syllable, while words embedded in a phrasal context have different stress patterns, which are less likely to be attributed to intonational prominence. The better documented of these languages is Northwest Mari which is discussed in the section 2.2.2. Eastern Mari, which presents a less clear cut example of stress asymmetries between isolation words and those embedded in a phrasal context, is briefly examined in section 2.2.3. Huasteco, another language with intonationally-driven stress, albeit of a slightly different type, is discussed in section 2.2.4.

2.2.2. Northwest Mari

According to Ivanov and Tuzharov (1970), stress in Northwest Mari falls on the rightmost non-final heavy syllable, where heavy syllables are those with a full vowel. In words lacking heavy syllables, stress falls on the first or second syllable, depending on the quality of the first vowel. If the first vowel is a rounded non-full vowel [ü] or [ÿ], stress consistently falls on the second syllable; if the first vowel is an unrounded non-full vowel [i] or [ü], stress falls on either the first or the second syllable. This description of Northwest Mari stress, discussed in the theoretical literature by Kenstowicz (1994), clearly entails a default-to-opposite stress pattern in conjunction with stress repulsion from the absolute final and, in certain cases, the absolute initial syllables.

Interestingly, Ivanov and Tuzharov point out that this pattern is characteristic of words in isolation, but is not consistently a feature of words embedded in a larger context. For embedded words, there is some preference for penultimate stress. Thus, the default stress pattern near the left edge of isolation is only consistently a property of a phrasal domain larger than the word. This accords with the hypothesis that default-to-left stress is intonational prominence attributed to a fundamental frequency peak occurring early in the intonation domain. Assuming that the default stress is intonational prominence, what is interesting about the Northwest Mari case is the fact that the fundamental frequency peak falls generally on the second syllable rather than the first syllable, unlike in Chuvash. This pattern becomes less surprising when one considers that a slight rise in fundamental frequency is often observed in languages at the beginning of utterances before the subsequent declination commences. Given that the light vowels in Northwest Mari are central vowels which tend to be phonetically short in duration (see Gruzov 1960 for phonetic data from the literary Mari dialect, which makes the same weight distinction as Northwest Mari), the fundamental frequency peak presumably falls, durationally speaking, quite near the left edge.

2.2.3. Eastern Mari

Descriptions of Eastern Mari stress are less comprehensive than Ivanov and Tuzharov's account of Northwest Mari stress. Itkonen (1955) and Sebeok and Ingemann (1961) describe a default-to-opposite pattern in which the rightmost heavy syllable (where heavy syllables contain full vowels) is stressed, otherwise the

initial syllable is stressed.⁶ Ristinen (1960), however, questions the predictability of stress in Eastern Mari and suggests that the default-to-opposite pattern is characteristic of words uttered in isolation, but not those in a phrasal context. Ristinen (1960) does not offer a systematic alternative analysis of stress, but merely comments on the difficulties involved in transcribing stress. In summary, Eastern Mari does not appear to be a convincing case of default-to-opposite stress; instead, it would appear to be a potential candidate for reanalysis of default-to-left stress in terms of intonational prominence.

2.2.4. Huasteco

Yet another language in which stress appears to be based on intonational prominence is Huasteco (Larsen and Pike 1949). According to Larsen and Pike's account, stress falls on the rightmost heavy syllable (where heavy syllables contain long vowels), otherwise on the initial syllable. They also note, however, that the location of stress is closely pinned to the particular intonational contour associated with a given utterance. Stresses dock on syllables which carry intonational peaks, such that stress moves when the intonation changes. A consequence of the close dependence of stress on intonation is that not only the default stress pattern in words containing only light syllables, but also the stress found in words containing heavy syllables is intonationally-driven. Huasteco thus differs from Chuvash, Northwest Mari, and Eastern Mari. It should be noted that the Huasteco data raises issues about the proper analysis of the relationship between the intonation system and both syllable weight and stress. Nevertheless, the apparent directionality of the relationship between stress and intonation suggests that the Huasteco stress system may not fit the profile of a true default-to-opposite stress system.

2.3. Other default-to-opposite stress patterns

Thus far, we have examined nine candidate languages for default-to-opposite stress whose stress systems are plausibly re-analyzed as involving secondary stress on non-primary stressed heavy syllables or as possessing intonational prominence rather than stress in words lacking heavy syllables. This leaves two languages in the survey of default-to-opposite stress which do not appear to be straightforward candidates for re-analysis. The first of these languages is Classical Arabic, whose stress system is the subject of considerable debate, while the second language is Kwakw'ala whose stress description remains inconclusive in certain crucial respects. Classical Arabic is discussed in section 2.3.1, while Kwakw'ala is the subject of section 2.3.2.

2.3.1. Classical Arabic

Classical Arabic is perhaps the most familiar case of default-to-opposite stress from the theoretical literature, largely owing to the work of John McCarthy (1979). McCarthy reports a default-to-stress pattern for Classical Arabic, according to which stress falls on the rightmost heavy syllable, otherwise on the initial syllable. Both CVV and CVC are heavy in non-final syllables, whereas only CVV(C) and CVCC are heavy in final syllables.

While the stress facts for words containing at least one heavy syllable are generally agreed upon, the situation for words containing only light syllables is considerably less clear-cut. According to certain accounts, e.g., Abdo (1969),

⁶ Sebeok and Ingemann (1961) actually say that the default-to-opposite stress pattern is in free variation with another pattern, whereby words have final stress regardless of syllable weight.

primary stress is claimed to fall on the antepenult in words without heavy syllables, whereas, according to the account adopted by McCarthy, stress fell on the initial syllable in such words. According to Angoujard (1990), Wright (1859) proposes a hybrid account, whereby the first syllable is stressed in words containing all lights, *and in words in which the only heavy syllable falls before the antepenult*. In addition, there is the question of whether non-primary stressed heavy syllables receive secondary stress or not, a largely unresolved issue which commonly arises in discussion of modern Arabic varieties and is therefore likely to be relevant for Classical Arabic as well. Angoujard (1990), who provides a summary of the Classical Arabic stress controversy (pp. 282-4), leans toward Abdo's (1969) account, stating that his description finds support from the actual pronunciation of classical Arabic by speakers of certain modern dialects. Nevertheless, he admits that prospects of finding definitive data on Classical Arabic data are not particularly promising given the lack of native speakers of classical Arabic and the lack of compelling evidence in descriptions written by classical Arabic grammarians. Given the uncertainty surrounding the stress data, it appears that we should withhold judgment on whether Classical Arabic is truly an example of a default-to-opposite stress system with neither secondary stress nor intonationally-based prominence.

2.3.2. Kwakw'ala

The final language to consider is Kwakw'ala, a Wakashan language whose stress system has been described by Boas (1947), Bach (1975), and Wilson (1986). Kwakw'ala is frequently inferred to have a default-to-opposite stress system, based on the description given by Bach which draws heavily from Boas' earlier work. This description suggests that stress falls on the leftmost heavy syllable (heavy=CVV, CVR), otherwise on the final syllable.

Although the default-to-opposite pattern is certainly compatible with the observations of Boas (1947), Boas' description is open to other interpretations. Boas reports that stems with initial CV, CVO have *accent on second or a later syllable* (Boas, pg. 218). This leaves open the possibility that words with more than two syllables may have stress on the second syllable, which would be non-final. Such a stress pattern, which actually occurs frequently in Boas' data, contradicts the default-to-opposite pattern. The basis for the default-to-opposite description is presumably grounded in Boas' observation that CəCəCa stems have final stress in terminal position. This stress pattern, however, holds of one particular type of stem in one particular context, terminal position, which presumably corresponds to final position of some domain larger than the word. Boas does not offer explicit discussion of stress patterns for stems other than CəCəCa and does not talk about stress in non-terminal positions. Without this information, it is difficult to speak confidently of Kwakw'ala as a language with default-to-opposite stress.

3. Conclusions

In summary, examination of the cases of default-to-opposite stress cited in the theoretical literature fails to offer conclusive evidence for the existence of true default-to-opposite stress systems. Many apparent default-to-opposite stress systems distinguish between two levels of stress, a distinction which limits the scope of default-to-opposite stress to primary stress. Other apparent default-to-opposite stress systems are amenable to re-analysis in terms of intonational prominence rather than stress in words consisting of only light syllables. The intonationally-driven analysis of default-to-opposite stress is supported by documented

asymmetries between word-level stress, where intonational prominence is unlikely to play a role in stress judgments, and utterance-level stress, where intonational properties potentially provide the percept of stress in the absence of other syllables possessing acoustic cues to stress-based prominence.

The proposed re-analysis of default-to-opposite stress potentially offers an explanation for an asymmetry in the relative frequency of the default-to-left languages versus those with default-to-right stress. Recall from section 2 that nine languages in which the default side is the left side were documented in the survey, whereas only two in which the default side is the right side were found. In the case of default-to-left stress, there are two potential pitfalls involved in the transcription of stress. First, there is the intonational prominence potentially present on the first syllable of isolation words which can easily be transcribed as stress in the absence of other prominent syllables. Second, there are potentially secondary stresses present which may be perceptually much less salient than the primary stress. In the case of default-to-right stress, only the issue of transcribing potentially subtle secondary stresses is at issue. Intonational prominence is not at issue, since there is unlikely to be an intonation peak at the right edge of an utterance. Assuming that both the transcription of intonational prominence and the transcription of secondary stress are roughly equally delicate issues, then it is not surprising that there are more cases in the theoretical literature of default-to-left stress, where both factors are potentially relevant, than default-to-right stress, where only secondary stress on heavy syllables presents a potential confound. It should of course be noted that it is highly speculative to assume that intonational prominence and secondary stress are equally problematic for the transcriber of stress. I merely offer this suggestion as a possible explanation for the numerical asymmetry found in the theoretical literature on default-to-opposite stress.

There are questions raised by the proposed re-analysis of default-to-opposite stress. The factors claimed to underlie stress systems analyzed as default-to-opposite stress also have the potential to be present in stress systems in which the stress attracting edge in words containing at least one heavy syllable is the same as in words consisting of only light syllables, so called "default-to-same" systems. It is thus conceivable that many default-to-same stress systems should be re-analyzed either in terms of intonational prominence or secondary stress on heavy syllables. For that matter, intonational prominence may also underlie stress judgments in certain languages with fixed initial stress regardless of the weight of syllables in a word. Presumably, future research will lead to re-analysis of other types of stress systems. Indeed, transcription of secondary stress on heavy syllables is a problematic issue for many languages which do not have default-to-opposite stress, e.g. many Arabic varieties (see Angoujard 1990 for discussion), Hungarian (Kerek 1971). Furthermore, separation of intonational prominence and stress is a tricky issue in many languages never claimed to have default-to-opposite stress, e.g., Korean (see Koo 1986; Lee 1990; Jun 1993), French (see Jun & Fougeron 1995).

It is also conceivable that certain weight-sensitive stress systems could possess both intonational prominence on initial syllables and weight-sensitive secondary stress. In fact, two languages examined in this paper, Kuuku Ya'u and Khalkha Mongolian, are candidates for such an analysis, although the necessary intonational evidence from these languages is currently lacking. Only thorough prosodic analysis on the level of individual languages will lead to a comprehensive cross-linguistic taxonomy of stress and intonation systems.

The proposed re-analyses of default-to-opposite stress also has implications for the theoretical treatment of stress. These implications differ according to the type of

re-analysis adopted. For languages with secondary stress on heavy syllables not carrying primary stress, there is no longer a need for a separation of Align constraints into broad constraints requiring alignment of stressed syllables with edges and narrow constraints requiring alignment of stressed light syllables with edges (Zoll 1997). Instead of the narrow constraints referring specifically to stressed light syllables, Align constraints referring specifically to primary stress are required, as Walker (1996) and Bakovic (1998) show. Because these constraints are independently necessary regardless of one's treatment of default-to-opposite stress, an analysis in which all heavy syllables carry some level of stress leads to a reduction in the constraint inventory. For languages with intonational prominence in words lacking heavy syllable, separate Align constraints referring to intonational properties are necessary. These constraints are also independently needed to account for intonation in a wide variety of languages. In summary, the proposed re-analyses of default-to-opposite stress thus appears to have the desirable result of ultimately simplifying metrical stress theory.

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