

## Syllable count judgments: relating gestural composition and syllable weight

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This study aims at relating the gestural composition of coda laterals with native speakers' syllable count judgements (SCJ). I hypothesise that SCJ are dependent on the gestural composition of speech segments. To test this hypothesis I analyse speakers' intuitions about words with tense vowel/diphthong nuclei followed by a lateral. Previous studies [2,6,7] have shown that, in English, this particular class of words termed sesquisyllables [2] exhibits variation in speakers' SCJ (*1syll < feel; mail < 2syll*). I argue that the reason for speakers' variable intuitions about this particular class of words resides in the gestural composition of the liquids. I examine sesquisyllables in British English (*steel, stool*) and German (*Stiel, Stuhl*). The comparison is relevant because both languages have vowel length distinction, but differ in the type of lateral found in codas: British English has dark /l/ in codas whereas German has clear /l/. I propose that SCJ can be predicted based on the gestures involved in the production of the two varieties of /l/, and the syllabic weight attributed to them (in terms of the moraic representation of the gestures).

English monosyllabic words are bimoraic. Sesquisyllables on the other hand are considered to be superheavy or trimoraic [1,2]. I argue that the extra mora is attributed to the vocalic gesture of a lateral in coda position. It has been established that /l/ involves two distinct articulatory gestures: that of an apical consonant involving the tongue tip (TT) and a vocalic gesture involving the tongue dorsum (TD). Clear /l/ (onset) involves TD raising and fronting, while dark /l/ (coda) is articulated with TD retraction towards the uvular region [4]. The coordination of the two gestures is also different: for dark /l/ TD retraction occurs before TT raising; for clear /l/ the gestures are concomitant [5]. I argue, based on [3], that in the case of clear /l/ there is no specific target for the tongue dorsum and that the TD gesture is simply a byproduct of the apical gesture. Hence, unlike dark /l/, clear /l/ does not have an active vocalic gesture. If this is true, I predict that German speakers will give fewer variable SCJ for words with long V/diphthong + laterals than British speakers.

**Task:** An online syllable count judgment task was created. Subjects were shown a word and had three answer options: 1, 1.5 or 2 syllables. Following [6] the instructions justified a possible 1.5 syllables answer.

**Participants** were 34 British English and 22 German speakers.

**Test stimuli** consisted of pairs with tense V/diphthong in an open syllable (English '*fee*', German '*sah*') followed by a coda lateral (English '*feel*', German '*Saal*'). Controls consisted of a lax vowel + liquid/nasal (English '*fill*', '*bin*', German '*still*', '*Sinn*'), tense vowel/diphthong + nasal (English '*zoom*', German '*Wahn*') and unambiguous disyllabic words (English '*public*', German '*Nusskern*').

**Predictions:** Coda consonants with an active vocalic gesture will be attributed an extra weight unit. 1.5 syllables count judgments will be attributed to words with long vowels followed by a consonant with an active vocalic gesture. Examples of this prediction are given in Table 1:

	long V + lateral	short V+ lateral	long V + nasal	short V + nasal	long V + stop	short V + stop
English	<i>steel</i> 1.5σ	<i>still</i> 1σ	<i>zoom</i> 1σ	<i>bin</i> 1σ	<i>peak</i> 1σ	<i>bit</i> 1σ
German	<i>Stiel</i> 1σ	<i>still</i> 1σ	<i>Wahn</i> 1σ	<i>Sinn</i> 1σ	<i>Sieg</i> 1σ	<i>Sitz</i> 1σ

Table 1: Predictions of SCJ based on gestural composition in British English and German

**Results** show that in both languages 1.5 SCJ are attributed exclusively to words with long vowel nuclei followed by a lateral. Both British and German native speakers give variable SCJ to target words: 29% of British speakers and 13% of German speakers attribute 1.5 SCJ to long vowel + lateral words. A by-speaker analysis shows that speakers are consistent in their attribution of variable SCJ to target words. Results also show that German speakers tend to attribute more 1.5 SCJ to /u/ followed by /l/ than to /i/ followed by /l/ (more 1.5 SCJ for 'Stuhl' than for 'Stiel'). The opposite is found for British English (more 1.5 SCJ for 'steel' than for 'stool'). If we take into account that clear /l/ resembles the articulation of /i/ while dark /l/ resembles that of /u/ [5], this result is not surprising. There are two points to be made. First, we expect an increased gestural overlap between similar consecutive articulatory gestures (German 'Stiel', English 'stool'). If there is gestural overlap, one might argue that only one weight unit is associated with both gestures. Second, different consecutive gestures (German 'Stuhl', English 'steel') trigger coarticulation, rendering the English dark /l/ clearer (the TD retraction is reduced) and the German clear /l/ darker, thus explaining the unpredicted 1.5 SCJ in German.

Based on the results we can say that native speakers use the same mechanisms when making SCJ in both German and British English. They attribute weight units to active vocalic gestures of segments in nucleus and coda position. The variability in speakers' SCJ comes from variability in the production of coda laterals.

**Discussion:** Both articulatory and acoustic studies of laterals have shown that there is great inter-speaker variability, across and within languages, when it comes to the production of laterals. We cannot, then, make accurate predictions about SCJ based on the hypothesised gestural composition of laterals. The hypothesis will be tested in an articulatory study paired with a SCJ task, in order to further test whether syllabic weight is attributed to a vocalic gesture within a consonantal segment.

## References

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