Exploiting orthography-free phonological evidence in orthography-rich language

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In the most recent literature on syllables, Gnanadesikan (2010) claims that a writing system, though neglected in modern linguistics, is by its nature a theory of processing, and thus written evidence of syllables constitutes evidence for their linguistic reality. This raises an issue of what counts as linguistic evidence. I contend that purely phonological evidence, free of orthographic and prescriptive influences, is vital and ideal, but is difficult to come by in ordinary linguistics settings. I demonstrate that ideal evidence in phonology can yet be obtained from and only from atypical members of the linguistic community.

Written evidence can be vital only under the assurance that orthography serves as a window to linguistic reality and not vice versa. This assurance, however, is difficult to hold in linguistic communities where literacy inculcation is part of the culture and starts as early as 2, 3 years of age. This should be the case since in such early ages the first language (L1) acquisition is ongoing in the child's brain, and in the process of L1 acquisition orthographic knowledge can merge in his/her natural linguistic knowledge. Strictly speaking, then, pure evidence in phonology, which is free of orthographic and prescriptive influences, is not retrievable from members of such orthography-rich communities, among which Japanese is one representative. There are, however, atypical occasions where such ideal evidence can be exploited.

To the above extent, I report on a remarkable ability in backward *ludling* (Latin *ludus* 'game' + *lingua* 'language') demonstrated by the subject KT, a Japanese male born with Williams syndrome (WS). WS is a rare genetic disorder caused by microdeletion of 26 - 28 genes from chromosome #7 (7q.11.23). Along with various physical and cognitive impairments, WS exhibits superior auditory working memory (AWM). With his superior AWM, KT instantly renders words (both real and unreal) backward as soon as he hears them. His response time averages 300ms, measured by praat. A handful of examples are given below.

(1)a. [burajiru] → [rujirabu] b. [tebukuro] → [rokubute] c. [saNma] → [maNsa.]
(2)a. [teepu] → [puute] b. [doobut^{s}u] → [t^{s}ubuudo] c. [tebag$_{y}$ooza] → [zaag$_{y}$obate]
(3)a. [happa] → [pahha] b. [gakkou] → [ugokka] c. [yappari] → [ripaaya]

In (1c) a syllabic nasal [N] is treated as a separate unit: [sa.N.ma]→[ma.N.sa], rather than as a coda consonant forming a rhyme with the preceding V to form a closed syllable: *[saN.ma]→[ma.saN]. This shows that the operating unit on the *ludling* is a mora, rather than a syllable, and that the positions of their associated moraic units appear in a mirror image between the input and the output. Apart from further significance of the data to the investigation of the structure of syllables, relevant to the present issue is (2c), where the second part of the long vowel is pronounced as [o], but spelled as [u] as in [te.ba.g$_{y}$o.u.za]. If his performance is influenced by the Japanese Kana syllabary, the output should be [za.u.g$_{y}$o.ba.te], which is not borne out. Moreover, in (3b) and (3c), his performance deviates from orthographic reality of the supposed outputs: [ga.k.ko.u]→*[u.ko.g.ga] and [ya.p.pa.ri]→*[ri.pa.y.ya]. In (3b) he exchanged the [voice]-feature value between [k] and [g] to avoid the language specific constraint *voiced obstruent geminates. In (3c) he lengthened the preceding [a], rather than geminating the following [y], most likely to avoid gemination of the half vowel [y]. Orthography in any case is not reflected in KT's performance.

Working memory as developed in Baddeley & Hitch (1974) consists of the central executive system and two slave systems: phonological loop and visuo-spatial sketch pad. Phonological loop consists of subvocal rehearsal component and phonological short-term store which is assumed to be stored with distinctive features of phonological items. Subvocal rehearsal is necessary for linguistic inputs to be stored in the phonological short-term storage (Baddeley 1997), but not for auditory linguistic stimuli, which go directly into the phonological short-term store. This means that the moment the auditory stimuli are perceived, their recording takes place automatically. This leaves the possibility that performance in working memory associated with auditory stimuli is free of orthography, to which KT's *ludling* is entitled.

The subject KT is practically illiterate. His backward *ludling* does not match written evidence. His response time averages 300ms. The backward *ludling* is not common at all in the Japanese culture; no one around him has ever been able to play it. These facts together ensure that KT's performance is free of orthographic and prescriptive influences, which offers most vital and ideal evidence in linguistic theory.