Acoustic detail in English pluralia-tantum and regular-plural nouns

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In the English language, non-affixal (e.g., *lapse*) and affixal (e.g., *laps*) word-final [s, z] are used. Affixal [s, z], in turn, indicates plurality (e.g., *the cars*), genitive case (e.g., *the car's*), both plurality and genitive case (e.g., *the cars'*), is a cliticized form (e.g., *it's*), or part of the third-person singular form (e.g., *she uses*). These types of [s, z] seem to be uttered in the same way and one should not expect phonetic/acoustic contrasts between, say, *cars* and *car's*. However, scholars have surprisingly found evidence that the different types of English [s, z] show durational variation (see, e.g., Plag, Homann, & Kunter, 2017; Schwarzlose & Bradlow, 2001; Seyfarth, Garellek, Gillingham, Ackerman, & Malouf, 2018). We go further by presenting data on a so far unexplored type, namely the word-final segment of pluralia-tantum nouns.

We conducted a reading experiment with Praat (Boersma & Weenink, 2019) and tested whether the word-final segment of English pluralia-tantum nouns (= PTN) (e.g., *goggles*) and regular-plural nouns (= RPN) (e.g., *toggles*) can be distinguished in duration. Three hypotheses were to be tested:

H0: There is no difference between the two.
H1a: The final segment is longer in RPN.
H1b: The final segment is longer in PTN.

Each has some plausibility. H0 would reflect the fact that both control plural agreement. A potential difference, as expressed in H1a and H1b, might derive from the complexity of RPN such as *toggles* (stem + suffix), which contrasts with the simplex nature of the respective singular (*toggle*). In PTN, in turn, no simplex singular counterpart exists. A second potential explanation for an acoustic distinction between the two is their segmentability (see, e.g., Hay, 2007). It increases, for instance, if the stem's frequency (e.g., *toggle*) is higher than the frequency of the complex item (e.g., *toggles*). This scenario is typical for RPN. Without a singular counterpart, PTN are more frequent than their (actually non-existent) stems. The segmentability difference might translate into a durational contrast.

An example of our test sentences is given in (1), and all 18 test items are given in Table 1. We used nine test pairs with one PTN and a comparable RPN each. Potentially confounding variables were controlled for across the two conditions. The 18 test items ended in [z], were inanimate, and were placed in subject position. In each pair, identical sentences were used, the only difference being the target noun, which was either the PTN or the RPN. The PTN and the equivalent RPN had the same number of syllables, the same stress pattern, the same rhyme in the ultimate syllable, and at least two identical segments before the target segment [z]. Moreover, the frequencies of the two were not different (Mean RPN = 4.2 per million words (pmw); SD RPN = 4.7 pmw; Mean PTN = 4.2 pmw; SD PTN = 5.4 pmw; independent t test: t = 0.02, p = .988). The frequencies were gathered from the ukWaC corpus[1], a two-billion-words corpus containing materials from UK-based web pages. Also, the sequence "target noun + following word" had a frequency of 0 pmw in the ukWaC for all 18 test items. Each subject was tested on both items of a pair to exclude the influence of inter-subject variability. 36 filler sentences increased the distance between the two members of each pair. The two conditions were counterbalanced in the experiment. Analysis of the data of 40 native speakers of British English and nine item pairs revealed no significant difference between the two conditions (for the descriptive statistics, see Table 2). We will reflect upon this finding against the background of the morpho-syntactic properties of PTN and RPN.

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[1] http://corpus.leeds.ac.uk/itweb/htdocs/Query.html#

(1) a. *The toggles appear to be broken and they're useless.*
  b. *The goggles appear to be broken and they're useless.*

Table 1. Nine test pairs.

RPN	PTN
beers	*shears*
browsers	*trousers*
yearnings	*earnings*
fires	*pliers*
freezers	*tweezers*
toggles	*goggles*
gongs	*tongs*
screens	*jeans*
pods	*odds*

Table 2. Descriptive statistics of word-final [z] of RPN and PTN. Subscript "1" = Subject analysis. Subject "2" = Item analysis. N = Number of observations. SD = Standard deviation. In milliseconds (ms).

	RPN	PTN
N_1	40	40
(N_2)	(9)	(9)
$Mean_1$	66.75	66.22
$(Mean_2)$	(66.57)	(65.89)
SD_1	9.11	8.78
(SD_2)	(7.88)	(7.31)
$Median_1$	65.88	65.44
$(Median_2)$	(64.62)	(64.54)
$Minimum_1$	50.44	44.44
$(Minimum_2)$	(53.63)	(54.91)
$Maximum_1$	84.13	84.38
$(Maximum_2)$	(79.63)	(76.57)

References

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