ASSESSING NUMBER IDENTIFICATION IN WORDS

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Introduction

Previous research using a lexical decision task shows that the processing speed of singular singular-dominant (SSD) words is faster than that of plural singular-dominant (PSD) words. Meanwhile, plural-dominant (PD) words, regardless of their form, yield equivalent reaction times (RT; New et al., 2004).

In a more recent study using a number decision task (NDT), Carson (2015) found that words in their plural form yielded the fastest RTs, regardless of their dominance. In addition, Carson also found participants displayed different response patterns.

To better understand these patterns, we replicated the NDT, while adding both singular and plural filler words (e.g., bonus, dice), as well as a post-experimental questionnaire to gain insight onto how the participants came to their decision.

Hypotheses

1. Accuracy will be higher for nouns presented in their dominant form
2. SSD nouns will have faster RTs than PSD nouns, while RTs for PD nouns will not differ based on their form
3. Accuracy for plural filler nouns will influence RTs for dominant nouns

Methods

Participants: 98 English-speaking University of Ottawa students (88 female, 10 male) with a mean age of 18.74 (SD: 2.29)
Equipment: E-Prime Professional 2.1, as well as an E-Prime response box
Stimuli: 138 words, 46 per condition
Design: 3 Dominance (SD, PD, fillers) x
2 Form (singular, plural) x
2 List (version A, B)

Procedure

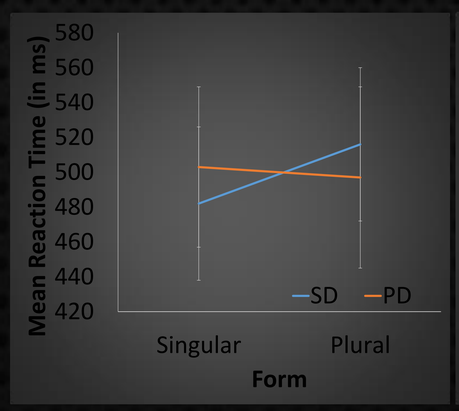
Participants were instructed to decide which pronoun fit the on-screen word by pressing one of two buttons, labelled "this" or "these". They were told that their speed and accuracy were being assessed.

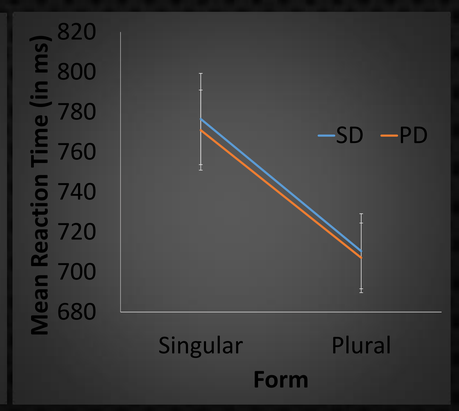
Results

A mixed method ANOVA showed that the form of the word influenced response accuracy for dominant items, F (1, 96) = 7.67, p = 0.007, η_p^2 = 0.74 (singular M = 99% vs. plural M = 98%). The other independent variables, dominance and list, did not, p > 0.331.

A second mixed methods ANOVA showed similar results for RTs.. Only form yielded significant results, F (1, 96) = 27.97, p < 0.000, η_p^2 = 0.226 (singular M = 774 ms vs. plural M = 709 ms). The other variables having no impact on RTs p > 0.693.

Independent samples t-tests were used to compare participants whose accuracy for plural filler items was above chance (< 50%) to those whose accuracy was below chance (> 50%). Results showed that plural filler accuracy had an influence on the RTs for SPD items. All results yielded a moderate effect size, regardless of their statistical significance.





Conclusion

We failed in our attempt to replicate similar results from the original lexical task from New et al. In addition, we had hoped that adding filler words would change participants' response strategies, yet this did not actually happen. Despite this, our final hypothesis that accuracy for plural filler nouns would influence RTs for dominant nouns was at least partially supported, shown by the t-test analysis. With these findings, we are more confident than ever in saying that people are very efficient at determining the form of a word, given the extremely high accuracy coupled with the high RTs.

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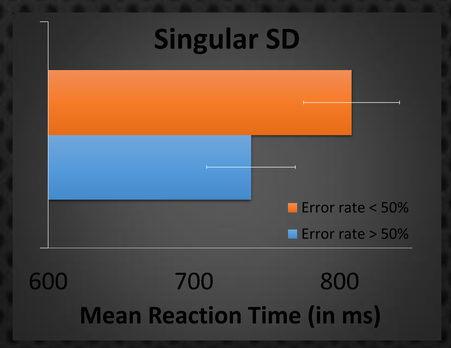
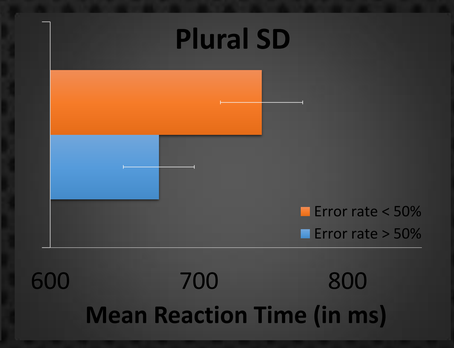
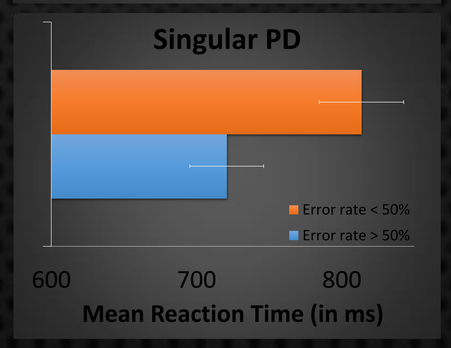
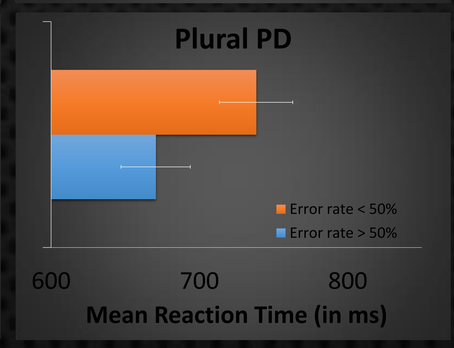
New, B., Brysbaert, M., Segui, J., Ferrand, L., & Rastle, K. (2004). The processing of singular and plural nouns in French and English. *Journal of Memory and Language, 51*, 568-585.









Condition	T	df	Sig. (2-tailed)	Effect Size (d)
Singular SD	-1.518	96	0.132	0.3097
Plural SD	-1.856	96	0.067	0.3797
Singular PD	-2.364	96	0.020	0.4834
Plural PD	-1.967	96	0.052	0.4010