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An examination of the comprehension of invariable and variable Dutch plurals by native Dutch readers

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Abstract

This thesis investigated whether reading comprehension is affected by morphological overabundance, i.e., multiple forms fulfilling the same morphological functions. Specifically, this research investigated whether there was a difference in the comprehension of invariable and variable Dutch noun plurals by native Dutch readers. This was done using a self-paced reading task in which native Dutch readers clicked through sentences containing either variable or invariable plurals. An analysis of the results suggests that significant differences were present between the invariable and variable plural reaction times at the target word, lag1 (the first word after the plural), and lag2 (the second word after the plural). Specifically, RTs of the variable plurals were longer than RTs of the correct invariable at all measurement points in the sentence. There are two potential explanations for these results: The first is that some participants may view a morphologically abundant form as incorrect while others view it as correct, and the second is that the morphologically abundant form is considered acceptable, but the processing is impacted by the interference of the alternate form. Overall, this study offers further insights into the processing mechanisms of morphologically complex words.

Contents

1. Introduction

In the Dutch language, most plural nouns are generally formed either by adding the suffix *-en* or the suffix *-s* to the stem. An example of the former would be the Dutch singular form of the noun *boek (book),* and the plural form, *boeken (books),* and an example of the latter would be the Dutch singular form of the noun *zetel (seat),* and the plural form, *zetels (seats)* (Keuleers et al., 2007). For most words, only one plural form is correct; however, in Dutch, some plurals can take both the *-s* and *-en* ending without a change in the definition of the plural word. These plurals are known as variable plurals.

Though there has been prior research both about and involving these variable plurals (Baayen et al., 2002; Keuleers et al., 2007; Zee et al., 2021;), this is the first study that employs a self-paced reading task and reaction times to determine if there is a difference in how variable and invariable plurals are perceived by native Dutch readers. This thesis intends to delve deeper into this gap of knowledge in order to understand not only how significant these differences are, but to better understand the reasoning behind why such differences may exist at all.

1.1 Literature Overview

As mentioned in the introduction, Dutch plurals are usually formed with the attachment of the suffix *-en* or the suffix *-s* to the stem. These plural endings, both considered productive forms, are assigned to nouns based on several factors and phonological restrictions (Baayen, 2002). Broadly, *-en* is used for nouns with a stressed final syllable, and *-s* is used for nouns with an unstressed final syllable, though many exceptions exist. A word ending in *-s* already, such as basis (base), would take on the -en ending and become *basissen* (bases), regardless of the stress pattern. Furthermore, loanwords such as *tram* (tram) generally take on the *-s* ending to become *trams* (trams). Additionally, words ending in a stressed final vowel may take on the *-s* ending to avoid a vowel sequence. An example of this is *pa's*, meaning *dads* in English. There are also nouns that can take on a different meaning depending on the plural suffix; for example, where *hemelen* refers to heavens, the word *hemels* refers to canopies. The same applies for *tafelen*, or tablets, and *tafels*, referring to tables (Donaldson, 2008).

Despite these rules to determine which plural ending is more appropriate for the singular forms, there are still cases of plurals in Dutch that can take both endings. These aforementioned variable plurals are plurals for which either the *-en* or the *-s* suffix can be used without the definition being altered between the two forms; an example is the word *aardappel* (*potato* in English), which can take both *aardappels* (*potatoes*) and *aardappelen* (*potatoes*) as plural forms. Their counterparts, invariable plurals, are plurals for which only one ending is accepted within the constraints of the language.

Variable plural endings are an example of morphological overabundance (Thornton, 2019). This phenomenon occurs when multiple forms fill the same cell in a morphological paradigm. In the case of English, this is exemplified by the use of multiple forms to indicate past tense (*dreamed* and *dreamt*, for example). In her study, Thornton suggests several factors could be the cause for multiple forms to exist, the main one being the case of overgeneralization. This occurs when speakers use a regular derivation or inflection such as the plural suffix *-es* (e.g. *corpuses*), regardless of already existing irregular forms (e.g. *corpora*). When these overgeneralized forms become more and more frequent over time, they become more accepted.

It is not always the case that the irregular form becomes more common than the standard form (such as the English word *burned* being more common than irregular form *burnt*), but the existence of both leads to more variation in the language. Thornton suggests that communication necessitates some variety; the ability to choose between several forms, even if they denote similar meanings, can provide flexibility for a speaker and allow them to more clearly convey their intentions (Thornton, 2019). This may suggest why overgeneralization (and, consequently, overabundance), occurs in a language.

The main goal of this study is to understand whether or not variable plurals are processed differently from invariable plurals. While prior research (Zee et al. 2021) has shown that alternative plural variants of a noun may influence each other's production, it is unclear whether plural variability also affects comprehension. In this study, comprehension was operationalized using reaction times in a self-paced reading task. A longer reading reaction time would indicate that a participant experienced processing delays, confusion, or surprise when encountering certain words, whereas a shorter reading time would indicate the opposite. Reading reaction times as a tool to measure comprehension have been used in prior research (Connelly et al. 2001; Evitts et al., 2016; Tozcu & Coady, 2010) and are useful for examining how acceptable the participants determine the variable and invariable plurals to be.

Two forms of invariable plural were used in the experiment – correct invariable plurals and incorrect invariable plurals. Incorrect invariable plurals were used as reference to examine delayed processing; an example of this occurring in previous literature was in a study done by Ernestus and Baayen (2004) where it was determined that participants reacted more slowly to incorrect or nonstandard forms. In the case of this study, it is expected that the reading reaction times will be longer for the variable plurals than the correct invariable plurals. When participants read a variable plural, the alternate plural form may also be activated and cause a delay in the comprehension process. This delay will result in longer reading times for the variable plurals as opposed to the correct invariable plurals. However, based on both the evidence that participants experience a delay in processing of incorrect inflection and variable plurals not being incorrect forms, it can be expected that there will be a longer delay in processing for the incorrect invariable plurals than for the variable plurals.

2. Methodology

2.1 Participants

For the current study, 25 participants were gathered via the 'snowball' method to participate in a self-paced reading task; participants who had done the experiment were asked to reach out to others they knew who might be able to take the experiment. These participants were demographically different from one another; some were students at Radboud University, while others were members of the greater public. The participants' ages also varied; they largely ranged in their twenties, but there were outlier participants in their 60s. Of these 25 participants, the results from 22 of the participants were actually used; three participants did not complete the survey, and thus were removed from the analysis.

One stipulation for all the participants was that they had to be native Dutch speakers and have Dutch as their first or one of their first languages. The experiment itself was entirely in Dutch. The participants were not paid for their participation.

2.2 Materials

This survey took place on ROLEG, the Radboud Online Linguistic Experiment Generator; this tool was created by researchers in the Centre for Language Studies (CLS). ROLEG was used to create a self-paced reading test that could be administered to participants via a public link. No other materials were necessary for the participant to use, other than a computer with working internet connection and a keyboard with a mouse in order to click through the survey questions.

The stimuli consisted of a total of 81 sentences, and each participant received one of six lists. Every list had the same number of sentences. The lists were grouped as "List 1 and 2," "List 3 and 4," and "List 5 and 6." Each list in a pair had the same order of sentences. The only difference between the lists was that the plural forms of the target stimuli were different. These 14 sentences had a target plural that could end with either *-en* or *-s*. An example of this is the sentence *De financieel directeurs/directeuren werden gearresteerd na het schandaal*. In List 1, the participant saw the sentence with the *directeurs* variant, and in List 2, the participant saw the sentence with the *directeuren* variant. Lists 3 and 4 and Lists 5 and 6 were formatted similarly with different randomized sentence orders. The variable plurals chosen for the experiment were gathered from a pilot experiment in which participants rated them to be somewhat equally split between the *-en* and *-s* endings compared to other variable plurals. Each list contained seven sentences with a variable plural ending in -s and seven sentences with a variable plural ending in -en.

There were also 28 sentences which contained invariable plurals. These were plurals such as *verhaal* and *pizza*. As with the variable plurals above, participants that received List 1 would see the sentence *De pizza's waren gemaakt met verse ingrediënten*, and the participants that received List 2 would see the sentence *De pizzaen waren gemaakt met verse ingrediënten*. This same pattern was present in the rest of the lists as well. Participants received 14 sentences with the "correct" versions of the invariable plurals (such as *pizza's* and *modellen*) and received 14 sentences with the "incorrect" versions of the invariable plurals (such as *leugenen* and *daks*). 14 of the invariable plurals were plurals for which the correct form ended in *-s*, and 14 of the invariable plurals were plurals for which the correct form ended in *-en*.

The remaining 39 sentences were filler sentences. An example of these sentences is *De stieren richtten hun horens op de matador*, which translates *to The bulls turned their horns on the matador*. These sentences were the same for all participants, regardless of which list was presented to them.

The sentences were all formatted the same way: the target stimuli would occur toward the beginning of the sentences, within the second or third word. Participants were expected to see at least one or two words before being presented with the target word so they could adjust to the sentence. Having several words after the target word allowed for the participants to have a potentially delayed response in reaction time to the target word; this effect would be seen in the reaction time for words that supersede the target word instead of the target word itself.

2.3 Procedure

All participants were shown a consent form prior to beginning the experiment that provided them with the necessary information to contact the administrators of the experiment. It also let them know that they could leave the experiment at any point and that their data would be anonymized. If the participant did not consent, they would be taken back to the original ROLEG introduction page.

After beginning the experiment, participants completed 81 self-paced reading trials in which they were presented with hyphens representing each word in the sentence. Each participant received one list, and ROLEG cycled through each list in numerical order for each new participant. As the participant clicked through the sentences one at a time, each hyphen would disappear and reveal a word, and once they had read through the full sentence, they could click to move onto the next sentence. Reaction times were gathered by ROLEG for each word in the sentence to show how much time participants took to read them. Participants moved through this part of the experiment on their own time and could take as long as they needed to read through the sentences.

During the experiment, participants were asked questions about some of the sentences, in order to make sure they were paying attention to the sentences they were reading and not just clicking through to finish the experiment.

The second part of the experiment was a rating task. The participants were presented with a scale for each one of the 14 variable plurals and six invariable plurals. The scale had the variable plural with the *-s* ending on the left hand side and the variable plural with the *-en* ending on the right hand side. The participants were presented with the question *Hoe vaak komen deze twee meervouden ten opzichte van elkaar voor? (How often do these two plural [endings] appear, relative to each other?).* The slider started in the middle, and participants could pull it toward the -s ending, the -en ending, or keep it in the middle to represent how frequently they determined certain endings occurred. Six invariable plurals were included as a measure of consistency to make sure participants would rate them with the correct ending. They completed this rating task for all fourteen of the variable plurals from the first part of the experiment.

The third task required them to indicate how familiar they were with each of the 14 variable plurals in their singular forms. They were presented with the question *Hoe goed ken je dit woord: compagnie? (How well do you know this word: company?),* for example, and would have to select one of the following options*: Dit woord bestaat niet (This word does not exist), Dit woord ken ik niet (I don't know this word), Dit woord ken ik, maar ik weet niet wat het betekent (I know this word, but I don't know what it means),* and *Dit woord ken ik, en ik weet wat het*

betekent (I know this word, and I know what it means). The participants would have to select one of the options to move to the next question.

Once the participants had finished rating and indicating their familiarity with the variable plurals, they moved on to a short demographic survey. The survey asked how old they were in years, whether Dutch was their first or one of their first languages (participants who answered no for this question were removed from the data collection), which other languages they spoke, and which dialect of Dutch they spoke apart from Standard Dutch (if any). After this, they were thanked for their participation. The total experiment took participants roughly ten to fifteen minutes, depending on their reading speed.

2.4 Design

In this experiment, the independent variable indicated the condition to which the target word in each sentence belonged: incorrect invariable, correct invariable, variable, or filler. The reaction times of the participants as they clicked through each word of the sentence were the dependent variables in the experiment, because they were examined afterwards to determine how the participant interpreted the target word embedded in each sentence.

2.5 Apparatus

The experiment was done entirely on ROLEG, an online tool for administering linguistic experiments, and the participants' data was collected within ROLEG as well. It was analyzed using R Studio.

2.6 Analysis

The analysis was conducted entirely in R Studio. A mixed-effects regression was conducted on log-transformed reaction times with one fixed factor (target_type (incorrect invariable, correct invariable, variable)) and repeated measurements for the participants. Random intercepts were included for participants as well, as reaction times differed between participants. Three models were fitted using R as well, one for the reaction times for the target word in the sentence, one for the reaction times for the word immediately following the target word (lag1), and one for the reaction times for the second word after the target word (lag2).
Three participants were removed from the raw data files for not completing the experiment; therefore, 22 participants were used in total for the analysis.

3. Results

3.1 The effect of target_type on transformedrt_target

The first linear mixed model was fitted to predict log-transformed reaction times for the target word, i.e., the plural, (transformedrt_target) with the type (variable, correct invariable, incorrect invariable) of the target word (target_type). The model also included random intercepts for participants (1|participants). A box plot was constructed to display the differences between the conditions.

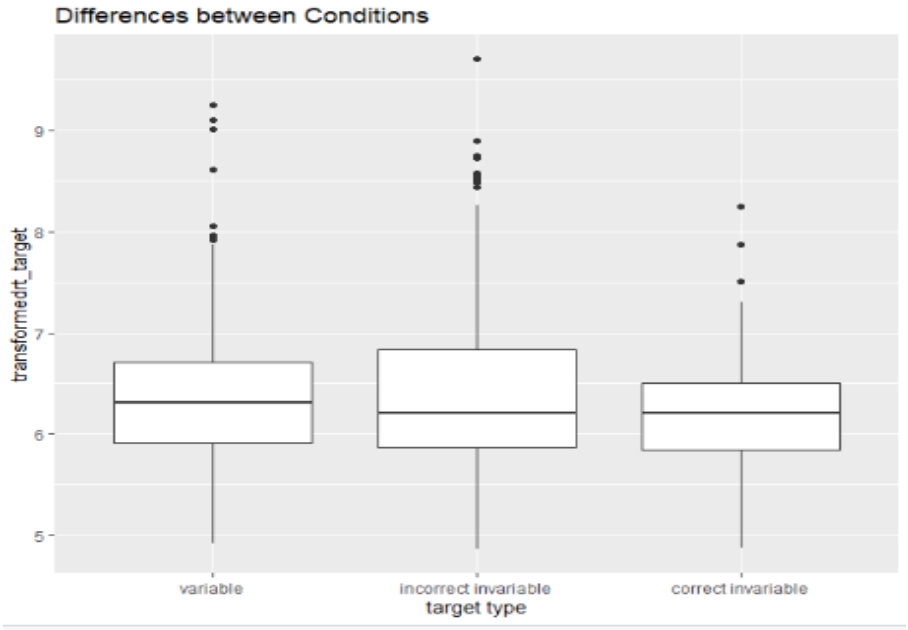

Figure 1: Differences between conditions for the transformed target word reaction times

The box plot in Figure 1 displays the distribution of log-transformed reaction times for the target word across the three target type conditions: variable, incorrect invariable, and correct invariable. The median values for the variable, incorrect variable, and correct variable were 6.3, 6.2, and 6.2 respectively.

The estimated coefficient for the intercept of the model, corresponding to the variable target type, was β = 6.37 (95% CI [6.16, 6.59], $t(941) = 58.67$, $p < .001$). The effect of the incorrect invariable target type was positive and non-significant (β = 0.02, 95% CI [-0.05, 0.09], $t(941) = 0.60$, $p = .552$), and the effect of the correct invariable target type was negative and statistically significant (β = -0.18, 95% CI [-0.25, -0.11], $t(941) = -4.83$, $p < .001$).

Post-hoc pairwise comparisons using Tukey's adjustment were conducted to examine group differences in the transformed reaction times for the target word; these comparisons were done using the emmeans package in R. The model included target_type as a predictor variable. The results of the pairwise comparisons indicated significant differences between the variable reaction times ($M = 6.37$, $SE = 0.109$) and correct invariable reaction times ($M = 6.20$, $SE = 0.110$), ($t(22) = 4.83$, $p < .0001$). The variable reaction times were, on average, slower than the correct invariable reaction times. Additionally, significant differences were found between

incorrect invariable reaction times (*M* = 6.40, *SE* = 0.109), and correct invariable reaction times (t(22) = 5.26, *p* < .0001), with the incorrect invariable reaction times being, on average, slower than the correct invariable reaction times. The variable reaction times did not significantly differ from the incorrect invariable reaction times (*t*(22) = -0.595, *p* > .05).

In order to determine if the addition of the target_type variable improved the model, the model including target_type (transformedrt_target ~ target_type + (1 | participants) was compared to a model without the variable (transformedrt_target ~ 1 + (1 | participants). This comparison showed that the target_type variable improved model fit for transformedrt_target (χ^2 (2, N = 22) = 32.19, *p* < .001).

3.2 The effect of target_type on transformedrt_lag1

The second linear mixed model was fitted to predict log-transformed reaction times for the word after the plural (transformedrt_lag1) with the type (variable, correct invariable, incorrect invariable) of the target word (target_type).. The model also included random intercepts for participants.

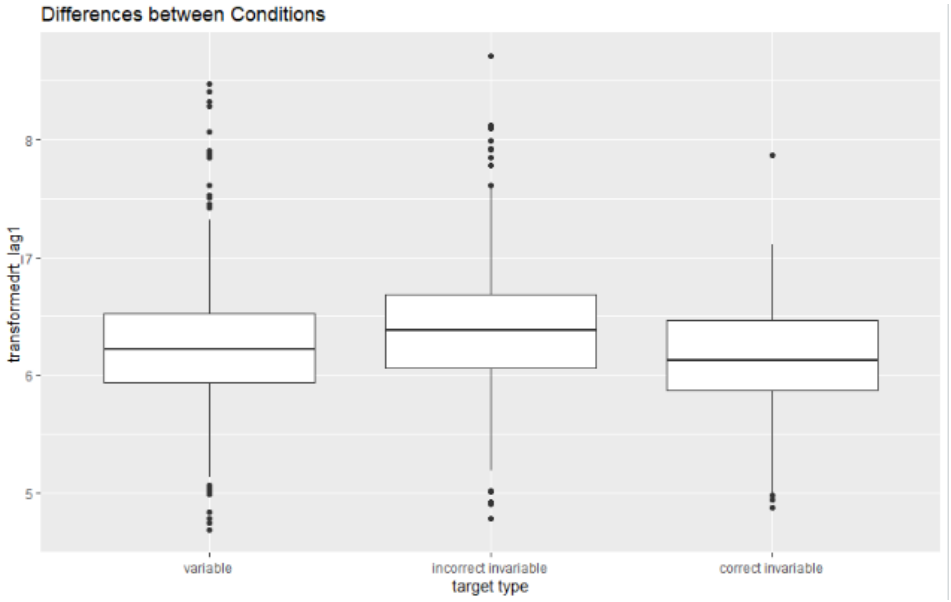

Figure 2: Differences between conditions for the transformed lag1 reaction time.

The box plot in Figure 2 displays the differences in mean log-transformed reaction times for lag1 (the word immediately following the target) across the three target types: variable, incorrect invariable, and correct invariable. The median values for the variable, incorrect variable, and correct variable were 6.3, 6.4, and 6.2 respectively.

The estimated coefficient for the intercept, corresponding to the variable target type, was β = 6.25 (95% CI [6.09, 6.41], *t*(941) = 76.15, *p* < 0.001). The effect of the incorrect invariable target type was positive and statistically significant (β = 0.15, 95% CI [0.08, 0.21], *t*(941) = 4.62, *p* < 0.01), and the effect of the correct invariable target type was negative and statistically significant (β = -0.11, 95% CI [-0.18, -0.04], *t*(941) = -3.24, *p* < .001).

Post-hoc pairwise comparisons using Tukey's adjustment were conducted to examine group differences in the transformed reaction times for lag1. The model included target_type as a predictor variable. The results of the pairwise comparisons indicated significant differences between the variable reaction times (M = 6.25, SE = 0.082) and incorrect invariable reaction times (M = 6.40, SE = 0.082), ($t(22) = -4.62$, $p < .0001$). The incorrect invariable reaction times were, on average, slower than the variable reaction times. There were also significant differences found between variable reaction times and correct invariable reaction times (M = 6.14, SE = 0.0832), ($t(22) = 3.24$, $p < .05$), with the variable reaction times being, on average, slower than the correct invariable reaction times. Finally, the incorrect variable reaction times and correct invariable reaction times for lag1 were also significantly different from one another ($t(22) = 7.409$, $p < .0001$).

In order to determine if the addition of the target_type variable improved the model, the model including target_type (transformedrt_lag1 ~ target_type + (1 | participants) was compared to a model without the variable (transformedrt_lag1 ~ 1 + (1 | participants). The target_type variable improved model fit for transformedrt_lag1 (χ^2 (2, N = 22) = 54.77, $p < .001$).

3.3 The effect of target_type on transformedrt_lag2

The third linear mixed model was fitted to predict log-transformed reaction times for the second word after the plural (transformedrt_lag2) with target_type. The model also included random intercepts for participants.

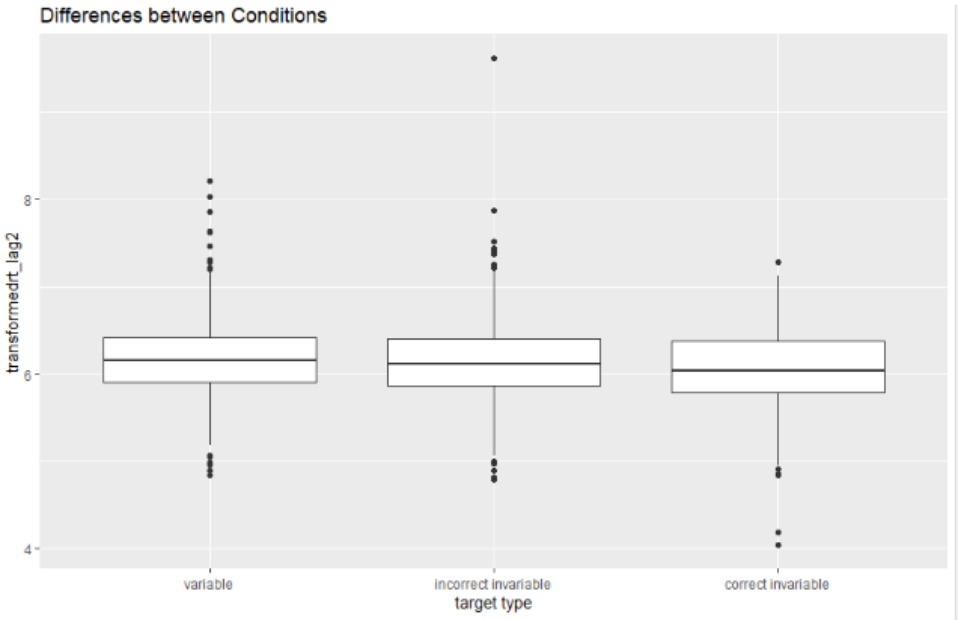

Figure 3: Differences between conditions for the transformed lag2 reaction times.

The third box plot displays the differences in mean log-transformed reaction times for lag2 (the second word immediately following the target) across three conditions (Figure 3). The median values for the variable, incorrect variable, and correct variable were 6.2, 6.1, and 6.05 respectively.

The estimated coefficient for the intercept, corresponding to the variable target type, was β = 6.17 (95% CI [6.02, 6.32], $t(941) = 80.95$, $p < 0.001$). The effect of the incorrect invariable target type was negative and statistically non-significant (β = -0.01, 95% CI [-0.07, 0.04], $t(941) = -0.44$, $p = 0.659$), and the effect of the correct invariable target type was negative and statistically significant (β = -0.12, 95% CI [-0.18, -0.06], $t(941) = -4.01$, $p < .001$).

Post-hoc pairwise comparisons using Tukey's adjustment were conducted to examine group differences in the transformed reaction times for the second word after the plural. The model included target_type as a predictor variable. The results of the pairwise comparisons indicated significant differences between the variable reaction times ($M = 6.17$, $SE = 0.076$) and correct invariable reaction times ($M = 6.05$, $SE = 0.077$), ($t(22) = 4.01$, $p < .05$). The variable reaction times were, on average, slower than the correct invariable reaction times. Additionally, significant differences were found between incorrect invariable reaction times ($M = 6.16$, $SE = 0.077$) and correct invariable reaction times ($t(22) = 3.51$, $p < .05$), with the incorrect invariable reaction times being, on average, slower than the correct invariable reaction times. The variable reaction times did not significantly differ from the incorrect invariable reaction times ($t(22) = 0.441$, $p > .05$).

In order to determine if the addition of the target_type variable improved the model, the model including target_type (transformedrt_lag2 ~ target_type + (1 | participants) was compared to a model without the variable (transformedrt_lag2 ~ 1 + (1 | participants). The target_type variable improved model fit for transformedrt_lag2 (χ^2 (2, $N = 22$) = 18.21, $p < .001$).

4. Discussion

4.1 Differences between comprehension of correct invariables, incorrect invariables, and variable plurals for the target word

The aim of the present study was to examine whether there is a difference between the comprehension of invariable and variable plurals, and this was done by analyzing the reaction times of participants as they read sentences containing these plurals. The reaction times at three key points were the focus of the analysis and discussion: the target word, lag1 (the word immediately following the target word), and lag2 (the second word following the target word). The first section will focus on the reaction times of the participants when they read the target word, which could be either a variable, correct invariable, incorrect invariable, or filler word. The filler words were not relevant to the analysis and were therefore excluded.

Based on the post-hoc pairwise comparisons administered in the analysis, significant differences were found between the participants' reaction times when they encountered the variables, correct invariables, and incorrect invariables. For the target word, significant differences were found between the reaction times for the variable and correct invariable reaction times, with the reaction times for the variables being longer than those of the correct invariable reaction times. This was to be expected, as the correct invariable was the word type expected to have the shortest reaction. Additionally, participants were more likely to be surprised by a variable plural if they had a preference for the variant that was not presented. There were also significant differences between the reaction times for the incorrect invariable target and the reaction times of the correct invariable target. This was also to be expected, as at this stage, the participants would likely take a longer time to process a word with an ending that never occurred as opposed to a word with an ending they were used to encountering. The lack of a significant difference between the reaction times for the variable target word and the incorrect invariable target word suggests that participants may have taken similar amounts of time to process these two target types at this point in the sentence.

4.2 Differences between comprehension of correct invariables, incorrect invariables, and variable plurals for lag1.

The first word immediately following the target word is referred to as lag1. A portion of the participants were expected to experience processing delays at lag1 as a spillover effect from encountering a target word they may not have been expecting.

Based on the post-hoc pairwise comparisons administered in the analysis, significant differences in participants' reaction times at lag1 were found between the experimental conditions. These significant differences were found between the reaction times for the variable and incorrect invariable reaction times, with the reaction times for lag1 after the incorrect invariable target being larger than the reaction times for lag1 after the variable target. Based on the survey done in the pilot study for this experiment, it was expected that participants would have differing opinions on the "correctness" of the presented variable plural. By comparison, the incorrect invariable was expected to cause processing delays for all participants, so the longer reaction times for the incorrect invariables were expected. There were also significant differences between the reaction times for lag1 after the variable target word and the reaction times for lag1 after the correct invariable target word. This was also to be expected. Though

certain variable endings may not have caused a processing delay for participants, there was still a likelihood that participants might have been expecting the *-en* ending or an *-s* ending and instead received the opposite, causing a delay in reaction times at lag1 due to spillover. Finally, there were significant differences between the reaction times for lag1 after the incorrect invariable target and the reaction times for lag1 after the correct invariable target, with the reaction times being on average longer for the incorrect invariable. Participants were expected to have larger delays in processing the incorrect invariable than the correct invariable, so this followed in line with those predictions.

4.3 Differences between comprehension of correct invariables, incorrect invariables, and variable plurals for lag2.

The second word following the target word is referred to as lag2. Participants were also expected to experience processing delays at lag2 as a spillover effect in a similar way to lag1.

Based on the post-hoc pairwise comparisons administered in the analysis, significant differences were found between the participants' reaction times at lag2. These significant differences were found between the reaction times for lag2 after the variable target word and correct invariable target word, with the reaction times for the variable target being on average longer. This was expected, as participants would have more delayed processing for the variable than the correct invariable. There were also significant differences between the reaction times for lag2 after the incorrect invariable and the reaction times for lag2 after the correct invariable, with the reaction times for the incorrect invariable being, on average, longer. This was also to be expected, because participants were more likely to experience processing delays for the incorrect invariable than the correct invariable. Finally, the lack of significant differences between the reaction times for lag2 after the variable target word and the reaction times for lag2 after the incorrect invariable target word suggests that encountering both types of target word led to similar processing delays and therefore similar reaction times.

5. Conclusion

Overall, most of the expected differences were found, especially those between the correct and incorrect invariable plurals. The differences in reaction time between these two categories was significant at the target, lag1, and lag2. The same can be said for the variable and correct invariable plurals as well; these were also significantly different at each point in the sentence, presumably because participants were more likely to quickly process the correct invariable plurals than the potentially surprising or unexpected variable plurals. Given these findings we can conclude that variable plurals are clearly processed differently from correct invariable plurals. Another result to make note of is the significant difference in reaction times between the variable plurals and both correct and incorrect invariable plurals at lag1. The results of the lag1 analysis show that on average variable plurals were processed faster than incorrect invariable plurals. This suggests that, on average, participants seem to have less trouble processing variable plurals than outright mistakes.

If further research was to be done, it would be a natural step to further examine whether this average difference is the result of some people treating a plural variant as incorrect and others treating it as correct or the result of different processing of variable plurals on the level of individual readers. Furthermore, the causes behind why participants may have expected certain variable endings were not as deeply explored. Examining the causes behind why participants leaned toward one ending or another may have offered more in terms of understanding why they handled the variable plurals the way they did. Some participants may have been influenced by dialectical differences, media, or other languages. It would be useful to include these statistics in further experiments, to better examine why participants reacted the way they did.

More generally, the results suggest that morphologically overabundant forms on average may be processed differently from words without alternative forms. Two mechanisms may be identified as the cause of this difference. Firstly, some language users may perceive a morphologically abundant form as an error, whereas others perceive it as correct. Secondly, language users may perceive multiple morphologically abundant forms as acceptable, but processing of the presented form is slowed due to interference of the alternative form. Both mechanisms would explain the results of the present study, and future research may point out which mechanism is correct. Regardless of the exact mechanism, this study has shown that it is worthwhile expanding the study of overabundance to comprehension, as it provides insights into the processing mechanisms involved in the comprehension of morphologically complex words.

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