

## What reaction times can reveal behind acceptability judgments

Eunkyung Yi (Ewha Womans University) and Sang-Hee Park (Duksung Women's University)

Acceptability judgment experiment is one of the most common methods used to investigate one's syntactic knowledge. Based on speakers' judgments on a sentence (e.g., on a gradient scale), syntacticians decide which syntactic rule is relatively more (or less) operative in the grammar of a particular language. While what counts as important in syntactic studies is the *product* of judgments, or judgment scores, we focus in this study on cognitive measures such as reaction times in the *process* of judgments. Specifically, we investigated what reaction times can implicate in acceptability judgment where judgment scores ultimately do not make much difference.

We conducted an auditory acceptability judgment experiment with 2x2 conditions, i.e., two syntactic variants of the Korean ditransitive construction (1) and two semantic verb types (2). Participants were asked to judge acceptability of each stimulus on a seven-point Likert scale and their reaction time (i.e., end of an auditory stimulus ~ judgment selection) was recorded in milliseconds.

- |                        |  |
|------------------------|--|
| (1) Syntactic variants | a. Canonical ( <i>John-NOM Mary-DAT book-ACC gave</i> )  |
|                        | b. Double-Acc ( <i>John-NOM Mary-ACC book-ACC gave</i> ) |
| (2) Verb types         | a. Caused-possession verbs (CP, e.g., <i>give</i> )      |
|                        | b. Caused-motion verbs (CM, e.g., <i>send</i> )          |

Previous research showed Korean speakers tend to judge the Double-Acc structure (1b) to be highly unacceptable as opposed to the Canonical one (1a). Theorists endorse both as grammatical, though. In this context, Lee (2018) reported a small verb type effect in a written judgment experiment. Namely, CP verbs slightly improve the Double-Acc structure. In addition, the Canonical structure is perceptually even better with CP verbs than with CM verbs, since the dative case marker is more often used to mark a recipient than a goal (Yun & Hong, 2014). In this context, we expect subjects to produce a gradient acceptability across conditions as indicated in (3) and more specifically, based on Nagata (1990) and McElree (1993), we expect them to be faster in judging the best and worst combinations at either end than judging the less obvious ones in the middle. Namely, we predict that CM verbs make judgment on the Canonical structure relatively slower while making judgment on the Double-Acc structure faster, which is the opposite for CP verbs.

- (3) Canonical+CP > Canonical+CM >> Double-Acc+CP > Double-Acc+CM

We analyzed the data using mixed-effects regression models with structure, verb type and their interaction as predictors. In the first model, where judgment scores set as outcome, we found the main effect of structure ( $b=-4.73$ ,  $p<.001$ ) but found no effects of verb type and the interaction. In the second, where reaction time was the outcome, we found no main effects but found a marginally significant interaction between structure and verb type ( $b=1244.85$ ,  $p=.086$ ). An examination of the interaction showed, as predicted, CP and CM verbs made judgments relatively slower on the Double-Acc and on the Canonical structure, respectively (Figure 1). We further examined whether highly (un)acceptable and less-so judgments are correlated with reaction times and found a significant correlation within the Canonical structure ( $r=-0.27$ ,  $p<.01$ ) as well as within the Double-Acc structure ( $r=.35$ ,  $p<.001$ ), i.e., faster for the highly (un)acceptable, confirming Nagata's (1990) results (Figure 2). This study shows, the small verb type effects on judgment scores observed in the written mode may disappear in the auditory judgment experiment, but the effects can survive in subjects' reaction times. The present study suggests that reaction time can be a meaningful remnant of such small effects left behind the process of acceptability judgment.

### Example stimuli in Korean

- a. apeci-ka atul-eykey wuncen-ul kaluchy-ess-ta (Canonical)  
 father-NOM son-DAT driving-ACC teach-PAST-DECL
- b. apeci-ka atul-ul wuncen-ul kaluchy-ess-ta (Double-Accusative)  
 father-NOM son-ACC driving-ACC teach-PAST-DECL  
 'A father taught his son how to drive.'

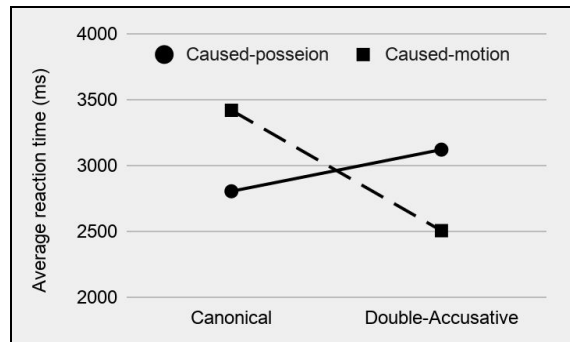


Figure 1. An illustration of the interaction between structures and verb-types

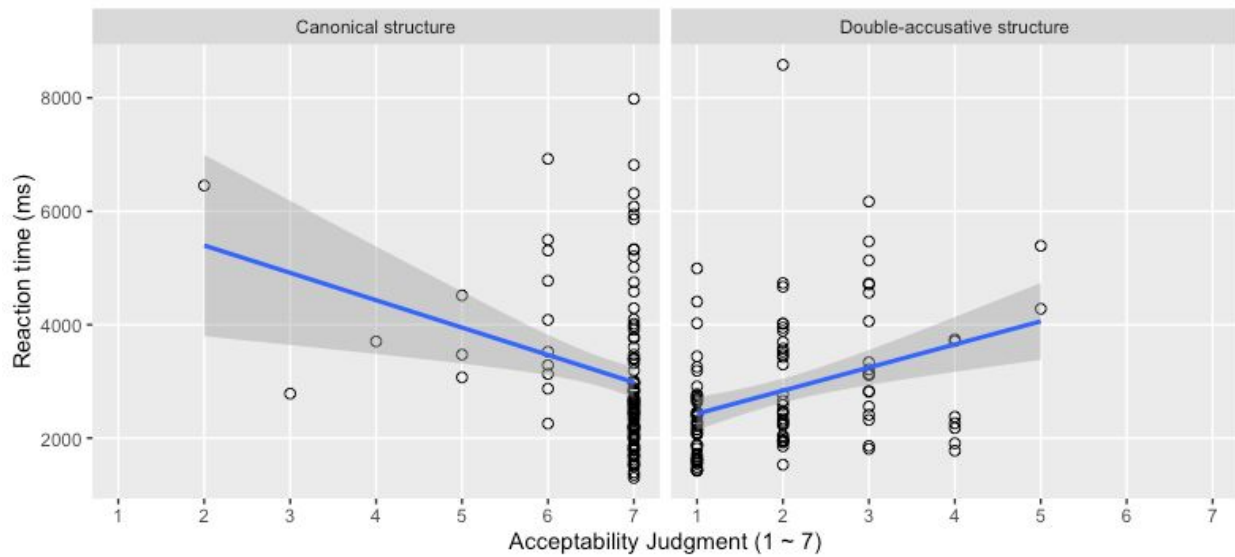


Figure 2. Relationship between acceptability ratings and reaction times

### References

- Keller, F. (2000). Gradience in grammar. Doctoral dissertation. University of Edinburgh.
- Lee, Hanjung (2018). *Linguistic Research* 35(3), 449-482.
- McElree, B. (1993). *Journal of Memory and Language* 32, 536-571.
- Nagata, H. (1990). *Perceptual and motor skills* 70, 987-994.
- Schütze, C. T. (2016). *The empirical base of linguistics: grammaticality judgments and linguistic methodology*. Berlin: Language Science Press.
- Yun & Hong, (2014). The effect of role predictability and word predictability on sentence comprehension. *Journal of Cognitive Science* 15, 349-390.