Title: The count/mass distinction in classifier languages: Insights from ERPs on the processing of Korean number morphology

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Background Whether the so-called generalized classifier languages (GCLs) such as Korean have the count/mass distinction in their grammars as well as how the distinction is manifested has been a matter of debate. Some linguists [1-2] argue that in GCLs the conceptual distinction between objects and substances is not encoded syntactically, while other researchers [3] claim these languages make a syntactic count/mass distinction which is reflected in the classifier system. Korean is a good test case because it has both a classifier system and the plural marker *-tul* that can be combined with count nouns but cannot be combined with mass nouns. Recent psycholinguistic studies found mixed results; some studies found a syntactic distinction [4] while other studies reported semantic effects only [5]. Using ERPs, the current study aims to examine whether Korean has a grammatical count/mass distinction and to determine if it is reflected in the classifier system or in the plural marking system.

Methods This study comprised two experiments conducted in a single session across 2 blocks. In each block (E1 followed by E2), native speakers of Korean (N=39) read and judged the grammaticality of 384 sentences, including 128 critical trials, all presented using rapid serial visual presentation (RSVP). In E1, critical trials contained the construction numeral + classifier + noun, as shown in (1-a), where the classifiers and nouns were varied in terms of count/mass. For example, *cang* is a count classifier used for entities such as sheets of paper and pieces of clothing, whereas *can* is a mass classifier referring to containers (cups) holding liquids. In E2, critical trials contained the construction noun+tul, as shown in (1-b), where -tul and the nouns were varied in terms of count/mass. A count noun (*plate*) can be correctly combined with -tul, whereas a mass noun (*water*) combined with -tul is considered ungrammatical. The bare noun counterparts, which are always grammatical in Korean, were also compared. Continuous EEG was recorded, and ERPs, time-locked to the onset of the critical noun, were extracted.

Prediction If the classifier system and the plural marking system is constrained syntactically by the count/mass distinction, we expect to observe an increased P600 in the classifier-mismatched condition vs. the classifier-matched condition in E1 and in the mass noun+tul condition vs. other conditions in E2. If we obtain a P600 effect only in E1, this would support the hypothesis that Korean makes the syntactic count/mass distinction, and it is reflected in the classifier system, not in the plural marking system.

Results In E1, the accuracy rates for grammaticality judgement were consistently high across conditions. However, in E2, the accuracy rates were low in the *-tul*+mass noun condition (27.5%), suggesting that participants tended to accept -tul+noun constructions as correct in both count and mass nouns. The ERP data were analyzed using mixed effects models with classifier type (count vs. mass), grammaticality (grammatical vs. ungrammatical). In E1, the model revealed a significant main effect of grammaticality, suggesting a bigger P600 in the classifier-mismatched compared to the matched condition. There was no significant interaction between grammaticality and classifier type, suggesting a significant P600 effect in both count and mass nouns. In E2, the model revealed no significant effects or interaction, eliciting no P600 effect.

Conclusion Our data support claims that the syntactic count/mass distinction exists and is manifested in the classifier system in Korean. This differs from Kanero et al (2015), who did not find evidence for it in the syntactic processing of classifiers in Japanese. The question of why Korean and Japanese, which are quite similar in their classifier systems, differ needs further investigation. The plural marker -tul did not show clear patterns of sensitivity to the prescriptive grammaticality of its use, indicating that -tul-marking may not be fully grammaticized. We suspect that as more speakers use -tul as a grammaticized marker of plurality, its use may increasingly be constrained by the count/mass distinction.

(1) Example Stimuli in E1-E2.

a) E1: Count: matched vs. mismatched condition
Swuyeni-nun onul han cang-uy / can-uy thisyechu-lul phal-ass-ta.
Suyeon-Top today one **count.cl**-Gen / **mass.cl**-Gen **T-shirt**-Acc sell-Pst-Decl.
'Suyeon sold a T-shirt today.'

Mass: matched vs. mismatched condition
Changwu-nun ecey han can-uy / cang-uy kholla-lul ssot-ass-ta.
Changwoo-Top yesterday one **mass.cl**-Gen / **count.cl**-Gen **soda**-Acc spill-Pst-Decl.
'Changwoo spilled a cup of soda yesterday.'

b) E2: Count: with vs. without plural marker *-tul*
Sengyuni-nun chancang-eyse **cepsil(-tul)-ul** nayelhay-ss-ta.
Sengyuni-Top cabinet-Loc **plate(-PL)-Acc** arrange-Pst-Decl.
'Sungyoon arranged plates in the cabinet.'

Mass: with vs. without plural marker *-tul*
Hyencwuni-nun hwacangsil-eyse **mwul(-tul)-ul** nayli-ess-ta.
Hyencwuni-Top in the restroom **water-PL-Acc** flush-Pst-Decl.
'Hyunwoo flushed the waters in the restroom.'

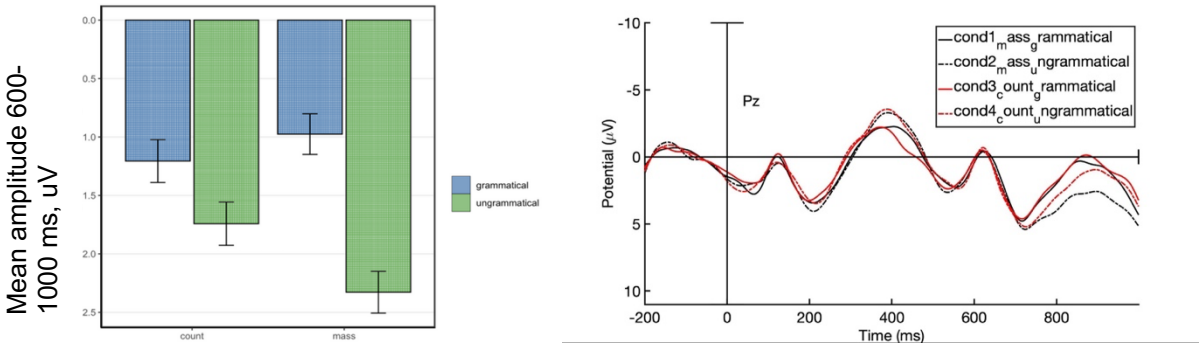

Figure 2. E1 Results (classifier mismatches): **P600** (Measures were taken over central-parietal scalp regions)

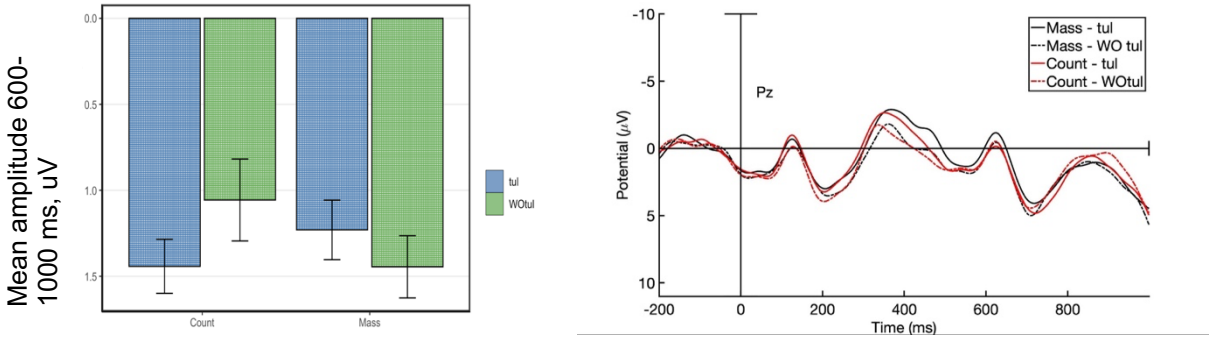

Figure 3. E2 Results (-tul constructions): **P600** (Measures were taken over central-parietal scalp regions)

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