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Opponent's report on *Grammatical number processing: Psycholinguistic evidence from Polish* by mgr Piotr Gulgowski

General Evaluation

In his doctoral thesis, Piotr Gulgowski (PG) addresses the grammatical number in natural languages. The thesis is based on six psycholinguistic experiments conducted with native speakers of Polish. PG seeks to account for semantic, lexical, and morphological properties of linguistics expressions from the psycholinguistic perspective. The semantic properties of grammatical number and its formal treatment were in the center of linguistic research in the last 40 years, giving rise to various influential frameworks usually summarized under the umbrella term, theories of plurality. There are many issues already settled in the theories of plurality. Still, at least the same number of topics remains unresolved and open (such as proper treatment of cumulativity, the division of labor between semantic and pragmatic theories of modified numerals among others). PG looks at some of the open issues from the processing, psycholinguistic perspective, and he manages to bring some intriguing observations concerning the conceptual representation of the grammatical number. His main experimental findings are based on numerical Stroop inferences, SNARC effects, and numerical size congruity effects. The plurality problems he addresses via the mentioned experimental methods have a wide range. He begins with form-meaning mismatches (like the plural interpretation of grammatically singular collective nouns and mass nouns). Then he looks at the impact of morphological markedness on the processing of grammatical number. And his last experiments address compositional issues such as the interaction of negation with the grammatical number or the processing of singular nouns in the scope of collective and distributive quantifiers. The thesis is firmly rooted in the experimental data, which is very welcome both for the psycholinguistic and theoretical part of linguists as we still lack proper theories both of the linguistic competence and processing of plurality in the natural languages. Moreover, the dissertation offers much more than an only interpretation of experimental results, but it gives them reasonable linguistic interpretation too. Sometimes, it would be possible to come with another theoretical explanation of the experimental results (as PG acknowledges himself), but generally, the dissertation delivers a very solid mixture of experimental and theoretical linguistics. In sum, I recommend the dissertation for the defence.

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Detailed evaluation

Chapter one "Overview" presents some typological linguistic lore concerning grammatical number in natural languages, number agreement, but also specific facts concerning grammatical number in Polish. Chapter one also gives an overview of the grammatical number processing research techniques and the research topics and methodology used in the dissertation.

Chapter two "Number mismatch" reports the results of two experiments where the cognitive number interpretation of Polish collective nouns was probed by the SNARC effect and size congruity effect. The chapter is well structured and presents all the details of the experimental design but also of its statistical interpretation in a clear and well readable manner (the same holds for the following chapters of the dissertation). The main linguistic question of this chapter concerns the conceptual representation of collective nouns: whether it is closer to the conceptualization of the plural count nouns or whether it resembles more the conceptual profile of the singular count nouns (which would agree with the grammatical number of the collective nouns). This issue is one of the most debated problems in theories of plurality: even if the collective nouns bear the morphological singular features, they (at least partially) show the behavior of plurality denoting expressions since they can be antecedents to the plural anaphora or can serve as arguments of collective predicates unlike the atomic denoting singular count nouns. PG's approach is not of the theoretical linguist, though, but he pursues the problem from the processing perspective. He tries to find out whether the early conceptualization of collective nouns is singular or plural. And even if the experimental results are mixed (SNARC effects were found in experiment 1, not experiment 2, there were no size congruity effects found in neither experiment), his positive results from the SNARC effect in experiment 1 agree with the theoretical stance generally agreed on now (Barker 1992; Schwarzschild 1996; Landman 2000): collective nouns are treated as primary atomic in their denotation, their plurality behavior is described as a type (or sortal) shifting process.

The SNARC effect observed in the experiment 1 is neat but there can be many reasons why size congruity effects and the SNARC effects in experiment 2 didn't yield the same results: i) one additional factor can be that the experiments weren't controlled for different sub-types of collectives, as is clear from the Appendix (the division of collectives is a standard assumption in current approaches to collectives – Henderson 2017; Pearson 2011: since topologically sensitive collectives like *herd* or *bouquet* yield different linguistic properties than the standard membership type of collectives as *group* or *class*); ii) the reaction times differences of the experiments conditions were rather subtle and maybe it would help to model them via linear mixed models instead of the still standard ANOVA approach (taking into account the random effects of both subjects and items in the mixed linear models would maybe reveal more clearly what's in the data than the either by subject or by item ANOVA modelling).

In **chapter three** "Morphological markedness" PG reports the result of experiment 3 where the Stroop effect was used as an experimental probe of the morphological markedness influence on the grammatical number conceptualization. Since some Polish singular noun paradigms are morphologically unmarked, the idea of the experiment was to test whether the status of morphological markedness can influence at least the early singular/plural conceptualization. The results of the experiment confirm the hypothesis and replicate the previous experimental results of Stroop effects observed in Hebrew.

Chapter four "Number mismatch meets markedness" summarizes experiment 4, which addressed again both the morphological markedness as a factor of early conceptualization of grammatical number but adds substantive material (collective nouns, pluralia tantum and mass nouns). The underlying hypothesis of experiment 4 was to test whether the grammatical number is the decisive factor of the early conceptualization of plurality/singularity. The experimental technique was again the Stroop effect, and the dependent variable was the reaction time as a function of the following fixed factors: countability profile (countable singular, pluralia tantum, mass nouns, collectives), morphology (marked vs. unmarked) and the visual number. Experiment 4 confirmed the results of experiment 1: the grammatical number is the decisive factor for the early conceptualization. But surprisingly (contra the experiment 3 results), the Stroop effect was produced only by morphologically unmarked nouns.

Chapter five "Compositional semantics (negation)" is built around experiment 5 where the so-called inclusive interpretation of plural was experimentally tested (again Stroop interference and reaction times as the dependent variable). The monotonicity of the environment is a well-known factor in the interpretation of plural number. The usual empirical generalization is: downward monotonic operators allow the inclusive interpretation of bare plurals. The issue is still a hot topic in the current formal semantics, and even if there are many supporting arguments for the inclusive theory of plural (the exclusive interpretation is then usually explained as a pragmatic strengthening), there are many good reasons to adhere to the traditional exclusive interpretation of plural number (see also influential exclusive theories as Krifka 1995; Farkas and Swart 2003, for experimental/theoretical study Grimm 2013). PG explains the results of the experiment (the plural bare NPs were in fact interpreted exclusively) as a timing effect: for him the initial number representation was exclusive (there are some supporting experimental arguments for this claims stemming from the studies of late interpretation/processing of negation), the inclusive interpretation appears later in the processing. This is, of course, possible interpretation, but the result of experiment 5 is compatible with the pure exclusive (or ambiguous) theories of plural too. It should be testable (via regular DE arguments or change of the environment: episodic vs. generic contexts) whether the Polish data support more the inclusive + late processing of negation camp or are, in fact, arguments in favor of the exclusive theory of plural.

In **chapter six** "Compositional semantics (quantifiers)". PG reports the results of an experiment trying to replicate a previous study (Patson and Warren, 2010) where the Stroop effect detected plurality conceptualization of singular nouns in the scope of a distributive quantifier (contra collective operators). The Polish experiment also included verbal distributive operators to test whether the plurality inference can be caused by the multiplication of events too. Although there was a numerical tendency in the results, the experiment failed to replicate the previous results both in the object quantification and the event quantification part (there seems to be a big variation in the data as the error bars suggest). It is not easy to understand the failure to replicate the pattern; PG offers some explanation according to him due to the morphological differences between English and Polish. Nevertheless, at least for the event part of the results, another plausible explanation would be to claim that the quantifier *kilkakrotnie* quantifies over times and not directly over events (maybe it would be better to use real pluractional verb instead of the time-related quantifier to test the event-multiplication).

The last chapter "General discussion and conclusions" summarizes the results of all the experiments and

connects them with the theoretical linguistic topics: conflicts between form and meaning, morphological markedness, and compositional semantics. PG discusses implications of his research for general theories of plurality but also points out at some limitation and dead ends of his experimental work (like the different results of experiment 1 and experiment 2 with respect to SNARC effects, a.o.). Here he also discusses the usability of different experimental methods, like the failure to replicate the size congruity effects with Polish, which may be interpreted as a lack of size information in the early language processing of plurality expressions.

This is a good doctoral thesis. Mr. Gulgowski succeeded in all the necessary steps of proper linguistic research: (i) he found unanswered problems in the chosen area; (ii) formulated hypotheses and assembled reasonable experiments to test the hypotheses; (iii) provided a well-argumented explanation of the experimental results and linked them back with the general linguistic questions concerning plurality in the natural language. I am sure that the experimental results discussed in the dissertation will be of interest both for psycholinguists and theoretical linguists working on plurality phenomena in natural languages. I was happy to read the dissertation. And to summarize: Piotr Gulgowski's dissertation meets all the requirements for the linguistic PhD theses and therefore I recommend the dissertation for the defence.

Yours sincerely,

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References

Barker, C. (1992, January). Group Terms in English: Representing Groups as Atoms. *Journal of Semantics 9*(1), 69–93. Publisher: Oxford Academic.

Farkas, D. F. & H. d. Swart (2003). *The semantics of incorporation: From argument structure to discourse transparency*. University of Chicago Press.

Grimm, S. (2013). Plurality is distinct from number-neutrality. In *Proceedings of the north east linguistic society*, Volume 41, pp. 247–258.

Henderson, R. (2017, February). Swarms: Spatiotemporal grouping across domains. *Natural Language & Linguistic Theory 35*(1), 161–203.

Krifka, M. (1995). Common nouns: A contrastive analysis of Chinese and English. *The generic book*, 398–411. Publisher: University of Chicago Press Chicago.

Landman, F. (2000). Events and Plurality: The Jerusalem lectures. Vol. 76. *Boston, MA: Kluwer Academic Pub. doi 10*, 978–94.

Patson, N. D. & T. Warren (2010). Evidence for distributivity effects in comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition 36*(3), 782. Publisher: American Psychological Association.

Pearson, H. (2011). A new semantics for group nouns. In *Proceedings of WCCFL*, Volume 28, pp. 160–168.

Schwarzschild, R. (1996). *Pluralities*, Volume 61. Springer Science & Business Media.