When singular morphology meets notional plurality: another puzzle for agreement

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Subject-verb agreement reveals interesting phenomena of interference or attraction in both production and comprehension, as documented by several studies in many languages (since Bock & Miller, 1991). Agreement variability has been documented also for coordinated phrases (Keung & Staub, 2018; Foppolo & Staub, 2020). Different explanations have been advocated to explain speakers' errors or listeners' preferences in subject/verb agreement. One processing explanation is the Marking and Morphing model (Bock et al, 2001), according to which semantic features are assumed to impact the agreement process in production prior to morphosyntax. Extending this account, the *self-organized sentence processing* model (Smith et al. 2018) explains the variability in agreement in production and comprehension as the result of a dynamic interplay between semantics and syntax. **Our study.** To explore the dynamic interplay of semantics and morphosyntax, we tested conjunctive subjects containing notionally plural, but morphologically singular/plural quantifiers in Italian followed by either a singular or a plural verb. We present two experiments. **Experiment 1** (N=42) was an acceptability judgement task (on a 7-point Likert scale) on sentences containing a conjunction of quantified nouns in a latin-square design consisting of 2 (quantifier) x 2 (verb number) conditions, 24 items each (Table 1): the quantifiers were notionally plural in all conditions but they were morphologically singular (*ogni*/*qualche*) in conditions A-B and morphologically plural (*tutti*/*alcuni*) in conditions C-D; they were followed by either singular (A-C) or plural (B-D) verbs. Condition C was expected to be the most natural and acceptable, while D was expected to be unacceptable. The critical conditions were A and B, in which the quantifiers' morphology was singular. **Hypotheses.** If notional plurality takes precedence over morphological agreement, we predict higher judgments for A and C sentences, in which the verb is plural, compared to B and D sentences, in which the verb is singular. If morphosyntax overrides notional plurality, we predict an asymmetry between A-B sentences (in which the quantifiers are morphologically singular) compared to C-D sentences (in which the quantifiers are morphologically plural) when these are followed by a singular or plural verb. **Results.** Results showed that C and D received the highest and lowest ratings, respectively (Figure 1). We set contrasts to compare the conditions in a CLMM with the package "ordinal" in R (Christensen, 2019): while in A-B sentences: (i) the mean ratings of B, in which notionally plural/morphologically singular quantifiers were followed by a singular verb, were significantly higher than the ratings of D; (ii) the mean ratings of A, in which notionally plural/morphologically singular quantifiers were followed by a plural verb, were significantly lower than the mean ratings of C (Table 2). **Experiment 2** tested the same sentences in a self-paced reading task in a different group of participants (N=82). Singular/plural agreement always appeared on the auxiliary of the verb followed by a past participle. **Results.** Longer RTs were recorded in D (Figure 2). The interaction between subject morphology and verb agreement significantly predicted RTs ($t=-3.1$, $p=0.002$). We then ran a linear mixed-effect model on log-transformed RTs on the auxiliary and the past participle that immediately followed, including Condition type as the dv and subject and items as random intercepts. Results confirmed the findings of Experiment 1, showing that RTs on condition D were significantly longer than those in condition B ($t=4.3$, $p<.0001$). RTs in condition C were faster than RTs in condition A ($t=-2.2$, $p=0.03$) and, remarkably, RTs in Condition A and in Condition B were not significantly different ($t=1.8$, $p=0.08$). **Conclusions.** (i) neither singular nor plural verbs are considered optimal in the case of conjoined morphologically singular quantifiers; (ii) no disruption is revealed when a singular verb follows notionally plural subjects if this is morphologically singular. These findings show that notional plurality does not take precedence over morphosyntax in subject-verb agreement, suggesting a more dynamic interplay between semantics and morphosyntax in agreement phenomena.

Table 1. Conditions involved in the study. The English translation of the sentences is: For security reasons, all mechanic(s) and some engineer(s) has/have inspected the airplane prior departure."

Condition	Example	Quantifiers' morphology	Verb number
A	*Per sicurezza, ogni meccanico e qualche ingegnere hanno ispezionato l'aereo prima della partenza.*	sing	plur
B	*Per sicurezza, ogni meccanico e qualche ingegnere ha ispezionato l'aereo prima della partenza.*	sing	sing
C	*Per sicurezza, tutti i meccanici e alcuni ingegneri hanno ispezionato l'aereo prima della partenza.*	plur	plur
D	*Per sicurezza, tutti i meccanici e alcuni ingegneri ha ispezionato l'aereo prima della partenza.*	plur	sing

Table 2. Output of the Cumulative Link Mixed Model (CLMM) of experiment 1 with the acceptability ratings as dependent variable, sentence type as predictor and subjects and sentences as random intercepts. Contrasts were set as follows: contrast <-cbind(c(-0.5,0,+0.5,0), c(0,-0.5,0,+0.5), c(-0.5,+0.5,0,0)). We checked for a possible influence of the word-length of the auxiliary (ha/hanno) adding word-length as covariate in the model and it did not affect the results.

	Estimate	Std. Error	z value	P value
A compared to C	4.7	0.1	45.9	<.0001
B compared to D	-4.8	0.1	-45.8	<.0001
A compared to B	-5.8	0.1	-48.8	<.0001

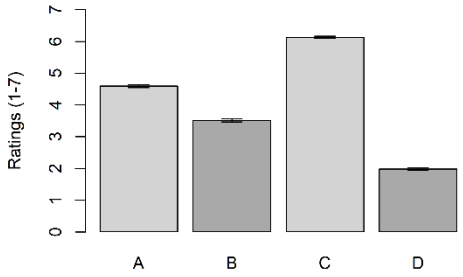

Figure 1. Bar plot showing the mean values of the acceptability rating (Experiment 1)

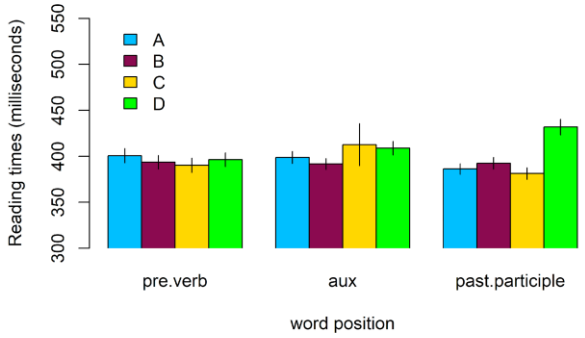

Figure 2. Reading times on pre-verb, auxiliar, and past participle in Experiment 2.

Selected References

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