Better plurals than genuine plurals: syncretism and grammaticality illusions in number agreement

Natalia Slioussar
School of Linguistics, HSE, Moscow, and St.Petersburg State University
slioussar@gmail.com

A widely discussed example of grammaticality illusion comes from number agreement attraction. Since attraction effects can be found both in comprehension and in production and most models aim to offer a unified account for them, this paper will also consider both. In production, errors like (1a) are much more frequent than errors like (1b), while in comprehension, reading time, EEG and acceptability judgment data show that readers tend to react to former errors less and to rate sentences containing them as grammatical more often than in the case of latter errors (e.g. Bock, Miller 1991; Eberhard et al. 2005; Franck et al. 2002; Pearlmutter et al. 1999; Tanner et al. 2014; Wagers et al. 2009).

(1) a. Attraction error: *The key to the cabinets were rusty* (*key* = head noun, *cabinets* = attractor).

  b. Error without attraction: *The key to the cabinet were rusty.*

Among other things, it was noted that (i) only plural attractors cause a significant effect. (ii) In languages with morphological case, attraction is much stronger when the form of the attractor coincides with nominative plural, like in the German example (2a) as opposed to (2b) (Hartsuiker & al. 2003).

(2) a. *die Stellungnahme gegen die Demonstrationen* 'the position against the$_{\text{ACC.PL(=NOM.PL)}}$ demonstrations'

  b. *die Stellungnahme zu den Demonstrationen* 'the position on the$_{\text{DAT.PL(≠NOM.PL)}}$ demonstrations'

We show that singulars can cause attraction too – if they look like Nom.Pl forms. Gen.Sg forms of some Russian nouns coincide with Nom.Pl (and Acc.Pl) forms: e.g. *večerinki* from *večerinka* 'party'. We compared them to genuine plurals in production and comprehension.

  Experiment 1 was run on a PC using *Presentation* software. Participants were 32 native speakers of Russian. In every trial, participants saw a predicate, like (3a), then a subject, like (3b-c), and were asked to produce a complete sentence. Half of the predicates did not agree with the subjects in number, and participants were asked to modify such predicates. Eight protocols included 80 target items with Acc or Gen attractors in one of the 8 conditions (Sg/Pl head, attractor and predicate) and 120 fillers.

(3) a. *byla krasivoj / byli krasivymi* 'was beautiful$_{\text{SG}}$ / were beautiful$_{\text{PL}}$'[1]

  b. *doroga/dorogi čerez pole/polja* 'road$_{\text{NOM.SG / PL}}$ across field$_{\text{ACC.SG(≠NOM.PL) / ACC.PL(=NOM.PL)}}$'

  c. *komnata/komnaty dlja večerinki/večerinok* 'room$_{\text{NOM.SG / PL}}$ for party$_{\text{GEN.SG(=NOM.PL) / GEN.PL(≠NOM.PL)}}$'

Agreement errors occurred only with Sg heads and three attractor types: 49 errors (22.3% responses in this condition) with Acc.Pl, 13 errors (5.9%) with Gen.Sg, and 2 errors (0.9%) with Gen.Pl. A mixed-effects logistic regression model shows that the main effects of case and number and their interaction are significant ($p < 0.01$). Thus, looking like a Nom.Pl was more important than carrying a Pl feature.

  Experiment 2 was run on a PC using *Presentation* software. 32 (different) Russian speakers participated in it. I took sentences from Experiment 1 ('N1 P N2 was/were Adj/Part') and added four words to them (PPs modifying the predicate). There were eight protocols with 80 target sentences (half ungrammatical) and 150 fillers (grammatical). I used self-paced reading method, one third of sentences were followed by forced choice comprehension questions. Average RTs are presented in Fig. 1 and 2.

  RM ANOVAs were used to analyse RTs (for all reported significant differences, $p<0.05$ for F1 and F2). There were significant differences between conditions in regions 1-3, 5 and 7 (the latter only in the Gen group). The differences in regions 1-3 were caused by slower processing of Pl head and dependent nouns (this effect is discussed in detail by Wagers & al. (2009)). The differences in region 5 were due to agreement attraction. As Fig. 1 and 2 show, Acc.Pl and Gen.Sg attractors triggered largest effects, while the effects from other attractors are barely noticeable. The difference in region 7 reflects the slow-down in

---

[1] We opted for such predicates because we wanted them to be as short as possible and not to contain any more nouns and could not come up with single-verb predicates for all stimuli.

the sentences with Gen.Sg attractors. I hypothesize that the readers might come back to these errors and revise them, unlike in the Acc.Pl case, and plan to test this hypothesis in a subsequent speeded grammaticality judgment study (if it is on the right track, attraction effects with Gen.Sg nouns might be greatly diminished).
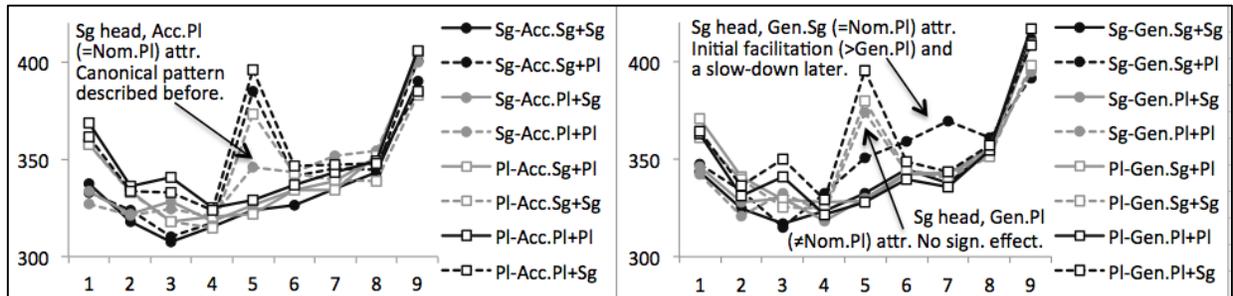

Fig. 1 and 2. Average RTs per region (in ms) in the Acc and Gen groups. Regions: $N1_1$ $Prep_2$ $N2_3$ was/were$_4$ Adj/Part$_5$ + four-word PPs. Template for condition names: 'head-attractor+predicate'.

Conclusions:

- There are two major approaches to agreement attraction: representational (errors arise due to illicit feature percolation from the attractor or similar mechanisms (e.g. Franck & al. 2002; Eberhard & al. 2005)) and retrieval-based (errors arise when subject DPs are accessed to determine/recheck the number on the verb, and a wrong noun can be retrieved (e.g. Solomon & Pearlmutter 2004; Wagers & al. 2009)). My data are problematic for both because both depend on the presence of a Pl feature: this is what should percolate or is supposed to be retrieved.

- In the reading experiment, I saw no ungrammaticality illusions (delays in grammatical sentences due to interference from the attractor, which are often used to tease apart the two approaches to agreement attraction, see e.g. (Wagers & al. 2009) for discussion). For this reason and because my data are hard to reconcile with the representational account, I will argue that the error arises at the retrieval stage, but my data shed new light on the nature of the representation that is retrieved. Apparently, rather than retrieving features, we retrieve a word form.

- This study offers new insights on grammatical ambiguity processing. Unlike in the majority of cases discussed before, in this study, at the stage when we see or produce an ambiguous form we are certain about its case (defined by the preposition). Still, alternative feature sets associated with it get activated to the extent they can influence agreement.

- Previous comprehension studies never reported evidence that number agreement attraction errors might be revised. My results suggest that this might be the case when the attractor coincides with Nom.Pl, but does not contain a genuine Pl feature. Further experiments are planned to check this hypothesis. Its confirmation may indicate that retrieval happens in two stages. At the first stage, we retrieve various forms and are fooled if one of them has a Nom.Pl feature set associated with it. However, if there are actually no Pl features in the subject DP, we discover the mistake at the second stage, while if there is a Pl feature, we do not.

- Attraction with Gen.Sg forms (especially the fact that it exists in production) is harder to explain in non-lexicalist frameworks saying that syntax operates with sublexical units and word forms are inserted at the last stage.

References. Bock, J.K., & Miller, C.A. (1991). *Cogn Psychol* 23: 45–93. • Eberhard, K.M., & al. (2005). *Psych Rev* 112: 531-559. • Franck, J., & al. (2002). *Lang Cogn Proc* 17: 371-404. • Hartsuiker, R., & al. (2003). *Mem Cognition, 31*, 1316–1326. • Pearlmutter, N.J., & al. (1999). Agreement processes in sentence comprehension. *J Mem Lang* 41: 427–456. • Solomon, E.S., & Pearlmutter, N.J. (2004). *Cogn Psychol* 49: 1-46. • Tanner, D., & al. (2014). *J Mem Lang* 76: 195–215. • Wagers, M.W., & al. (2009). *J Mem Lang* 61: 206–223.