Morphological ambiguity in gender agreement attration[1]

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Many experimental studies of grammar focus on mistakes caused by agreement attraction. These studies are based on the data from experiments on production or comprehension (reading). It was demonstrated that attraction errors, like (1a), trigger more incorrect answers in grammaticality judgment experiments and provoke less pronounced effects in reading time and EEG studies than other agreement errors, like (1b).

(1) a. *The key to the cabinets were rusty*
   b. *The key to the cabinet were rusty*

In this paper we focus on the role of syncretism in agreement attraction. The study by Hartsuiker et al. (2003) on German showed that the sentences with syncretic (ambiguous between accusative and nominative) forms of attractors cause more mistakes than those, where attractors' forms are unambiguous. Similar regularities were found in other languages. Almost all these studies were conducted on language production. Only one study (Slioussar 2018) analyzed the role of syncretism in comprehension working with number agreement attraction on Russian.

However, some questions about syncretism are not explored yet. In particular, Badecker and Kuminiak (2007) in their study on Slovak showed that not only attractor's, but also the head's syncretism affect the quantity of attraction errors in production. In our study we are the first to explore this question in a comprehension experiment.

55 native speakers of Russian aged 18–44 took part in our experiment. We constructed 32 sets of stimuli like (2a-d) and (3a-d). Every stimulus contained 8 words (segments). The head was always inanimate feminine noun in nominative singular. The dependent noun was

also inanimate, either 2nd declension masculine or 3rd feminine word (always in a syncretic form). The predicate could appear in feminine (grammatical) or masculine (ungrammatical) form. Attraction could be expected in sentences like (2d) and (3d) where the ungrammatical gender of the predicate matches the gender of the dependent noun. To find out whether head syncretism affects attraction, we made half of the stimuli with 1st declension (not syncretic) heads, and the other half with 3rd declension (syncretic) heads.

(2) a. NS-ff *Ocenka za četvert' byla vysokoj u priležnogo učenika.*

grade$_{\text{F.NOM.SG}}$ for term$_{\text{F.ACC=NOM.SG}}$ was$_{\text{F.SG}}$ high$_{\text{F.SG}}$ at diligent student

b. NS-fm **Ocenka za četvert' byl vysokim u priležnogo učenika.*

grade$_{\text{F.NOM.SG}}$ for term$_{\text{F.ACC=NOM.SG}}$ was$_{\text{M.SG}}$ high$_{\text{M.SG}}$ …

c. NS-mf *Ocenka za semestr byla vysokoj u priležnogo učenika.*

grade$_{\text{F.NOM.SG}}$ for semester$_{\text{M.ACC=NOM.SG}}$ was$_{\text{F.SG}}$ high$_{\text{F.SG}}$ …

d. NS-mm **Ocenka za semestr byl vysokim u priležnogo učenika.*

grade$_{\text{F.NOM.SG}}$ for semester$_{\text{M.ACC=NOM.SG}}$ was$_{\text{M.SG}}$ high$_{\text{M.SG}}$ …

'The diligent student got an excellent mark for the term / semester.'

(3) a. S-ff *Reč' pro moral' byla skučnoj s pervyx slov.*

speech$_{\text{F.NOM=ACC.SG}}$ on moral$_{\text{F.ACC=NOM.SG}}$ was$_{\text{F.SG}}$ boring$_{\text{F.SG}}$ from first words

b. S-fm **Reč' pro moral' byl skučnym s pervyh slov.*

speech$_{\text{F.NOM=ACC.SG}}$ on moral$_{\text{F.ACC=NOM.SG}}$ was$_{\text{M.SG}}$ boring$_{\text{M.SG}}$ …

c. S-mf *Reč' pro etiket byla skučnoj s pervyh slov.*

speech$_{\text{F.NOM=ACC.SG}}$ on etiquette$_{\text{M.ACC=NOM.SG}}$ was$_{\text{F.SG}}$ boring$_{\text{F.SG}}$ …

d. S-mm **Reč' pro etiket byl skučnym s pervyh slov.*

$$\text{speech}_{\text{F.NOM=ACC.SG}} \text{ on etiquette}_{\text{M.ACC=NOM.SG}} \text{ was}_{\text{M.SG}} \text{ boring}_{\text{M.SG}} \dots$$

'The speech about moral / etiquette was boring from the very first words.'

Sentences in different conditions were distributed across four experimental lists. In addition to 16 grammatical and 16 ungrammatical target sentences, every list contained 68 grammatical fillers.

We used word-by-word self-paced reading methodology. The average word-by-word reading times (in ms) in syncretic and non-syncretic head conditions are shown on the graphs 1 and 2. We modeled the data with a mixed-effects logistic regression. The random variables were participants and stimuli.

Firstly, we analyzed stimuli with different types of heads separately (factors: dependent noun gender and predicate gender=grammaticality). NS-group showed only the significance of grammaticality factor in the 5th and 6th segments. In S-group, the interaction of the two factors was significant in the 5th segment, which points to attraction.
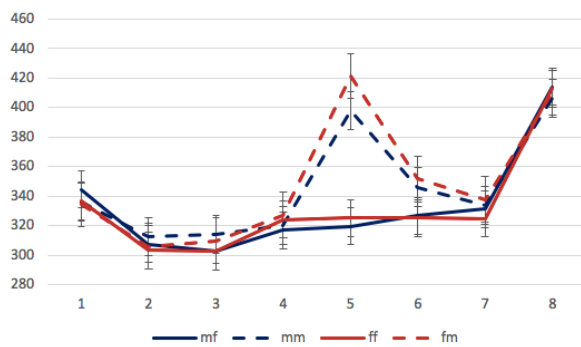
Graph. 1. Average word-by-word RTs (in ms.) in the 1 declension head conditions (NS).
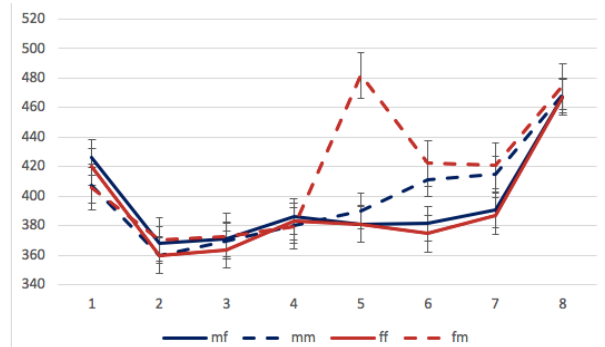
Graph. 2. Average word-by-word RTs (in ms.) in the 3 declension head conditions (S)

Thus, our experiment showed that the ambiguity of the head noun form affects attraction. This conclusion was obtained in a reading experiment for the first time.

In general, there are two types of approaches to explain attraction. Some researches postulate an error in the syntactic structure: when we construct the subject phrase, we determine its gender incorrectly because of the dependent noun interference (e.g. Eberhard et al., 2005; Franck et al., 2002; Nicol et al., 1997; Staub, 2009, 2010). The others postulate an access error: at the moment when the predicate needs to find the agreement controller

(Badecker, Kuminiak, 2007; Dillon et al., 2013; Wagers et al., 2009). The effects of syncretism are better explained within the second type of approaches. In addition, our conclusions emphasize the role of head nouns in the process of attraction. There were only a few studies about this factor (Badecker, Kuminiak 2007; Slioussar, Malko 2016) because the majority of researchers focus only on the features of the potential attractor.

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