Register modulates grammaticality asymmetry in Turkish agreement attraction

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Recent research shows that people make systematic errors in establishing a number agreement relation between a verb and its agreement controller, when a syntactically unrelated NP (the attractor) interferes. As a result, speakers may produce sentences like '*The key to the cabinets are rusty,' or misclassify them as acceptable (Wagers et al., 2009; Pearlmutter et al., 1999; Bock & Miller, 1991). According to representational accounts, the presence of an attractor affects the number encoding of the agreement controller (Eberhard et al., 2005). These effects, called agreement attraction effects, have been observed in a range of languages, including Turkish (Türk & Logačev, 2024; Ulusoy, 2023; Lago et al., 2019). Retrieval accounts assume the attractor may be erroneously retrieved instead of the agreement controller (Engelmann et al., 2019; Wagers et al., 2009). One piece of evidence taken to support retrieval accounts is an observed grammaticality asymmetry, such that agreement attraction in comprehension occurs in ungrammatical sentences only. For retrieval accounts, a misretrieval only occur when there is no full match of features for the cues employed by the verb. If agreement attraction was due to representational mechanisms, we would expect a decreased acceptability in grammatical sentences like 'The key to the cabinets is rusty.' Recently, manipulating participants' response bias by instructions and the ratio of grammatical fillers showed that this grammaticality asymmetry is due to participants a priori bias to say *yes* (Türk & Logačev, 2023; Hammerly et al., 2019). In this work, we present a novel experimental manipulation in which we systematically decreased overall acceptability in grammatical sentences through register manipulation and show acceptability differences in grammatical sentences as a function of attractor number, as predicted by representational accounts.

Agreement Attraction in Turkish. In a speeded-acceptability task, Lago et al. (2019) and Türk and Logačev (2024) presented sentences like (1), in which the singular head noun of the subject NP ('*vokalisti*') always required singular agreement on the verb ('*zıpladı*'). In addition to verb agreement, they manipulated the grammatical number of the genitive-bearing possessor NP serving as an attractor. In the ungrammatical versions of (1), when the verb exhibited plural agreement, they observed an increase in acceptability when the attractor was plural ('*şarkıcıların*') compared to when it was singular ('*şarkıcının*').

(1) [[Şarkıcı-lar/Ø-(n)ın] vokalist-i] sahne-de sürekli zıpla-dı-lar/Ø.
singer-PL/SG-GEN back.up.singer.SG-POSS stage-LOC constantly jump-PST-PL/SG
'The singers' backup vocalist jumped on the stage non-stop.'

***-lAr* is licensed via register.** However, the plural suffix on the verb does not necessarily mean number marking in Turkish, nor is it always licensed by the subject's number. Turkish third-person plural marking is also licensed if the sentence is uttered in a formal register. In (2), the number of the subject is singular. However, the plural marking on the verb is licensed by the presence of the honorific word *'efendim'* (*sir*).

(2) Okul-un müdire-si gel-di-ler, efendim.
School-GEN principal.F-POSS come-PST-PL sir
'Sir, the school's principal have arrived.'

In the current work (N=174), we test whether the effects found in Turkish is mainly driven by the register effects in native Turkish speaker using a speeded acceptability judgment. Given that the relation between the agreement controller and the attractor in all previous experimental items were either one where the controller noun providing a service to the attractor (*soldier's barber*) or there was a superiority relation between the controller and the attractor (*the policeman's commander*), we argue that participants may sometimes interpret the plural suffix *-lar* as a register marker and find sentences acceptable even though the sentence is ungrammatical in a neutral or informal register. We found **(I)** that while there was an overall decreased acceptability in informal registers, the attraction effects persisted in informal registers. We also found **(II)** that informal register whose overall acceptability is lower did not show previously attested grammaticality asymmetry, thus replicating the recent findings that support representational accounts (Türk & Logačev, 2023; Hammerly et al., 2019).

Our experiment was conducted online using IbexFarm (Drummond, 2013). It included 80 fillers and 40 experimental items based on previous studies (Türk & Logačev, 2024; Lago et al., 2019) with eight conditions: attractor number (*singular* vs. *plural*), the verb number (*singular* vs. *plural*), and the register (*formal* vs. *informal*). The subject head was always singular. Whereas the formal register was induced with a post-verbal interjection such as '*efendim*' (sir) the informal register conditions ended with an interjection like '*lan*' (yo). One set of experimental conditions can be found in (3). The conditions are shown with curly braces. Participants were asked to judge sentences after reading them word-by-word.

(3) Milyoner-{ler/Ø}-in terzi-si tamamen gereksizce kov-ul-du-{lar/Ø}, {lan/efendim}.
millionaire-{PL/SG}-GEN tailor-POSS completely no.reason fire-PASS-PST-{PL/SG} {yo/sir}
'The {millionaires'/millionaire's} tailor {were/was} fired for no reason at all, {yo/sir}.'

Our results (Fig1 & Fig2) show that participants overall accepted formal sentences *(M=.63, SE=.14)* more often than the informal sentences *(M=.49, SE=.17)*, which was verified by our maximal Bayesian GLM model fitted to experimental sentences, assuming a bernoulli distribution *($\hat{\beta}$=.91, CI=[.64,1.18], P(>0)>.99)*. Plural number on the attractor also increased the overall acceptability *($\hat{\beta}$=.30, CI=[.13,.49], P(>0)>.99)*. However, this effect was mainly driven by the effect of plural attractor in conditions with a plural verb. Participants, regardless of register, accepted sentences with plural verb and a plural attractor *(M=.34,SE=.10)* more often than those with singular attractor *(M=.25, SE=.09)*. This interaction was also verified by our model *($\hat{\beta}$=.59, CI=[.27,.91], P(>0)>.99)*, showing that agreement attraction in Turkish was not due to formal interpretations of the plural morpheme. Finally, we see that plural attractor number decreased number of 'yes' (acceptable) responses when the verb is singular, but only in informal conditions. Participants erroneously thought sentences were ungrammatical more often when there is a plural attractor *(M=.77, SE=.01)* compared to a singular attractor *(M=.81, SE=.01)*. In our Bayesian GLM, we found a strong evidence for a negative three-way interaction between the attractor number, the verb number, and the register *($\hat{\beta}$=-.45, CI=[-1.03,.17], P(>0)=.07)*, which clearly entails the presence of plural attractor is an indicator of decreased acceptability in grammatical sentences, in other words *ungrammaticality illusion*.

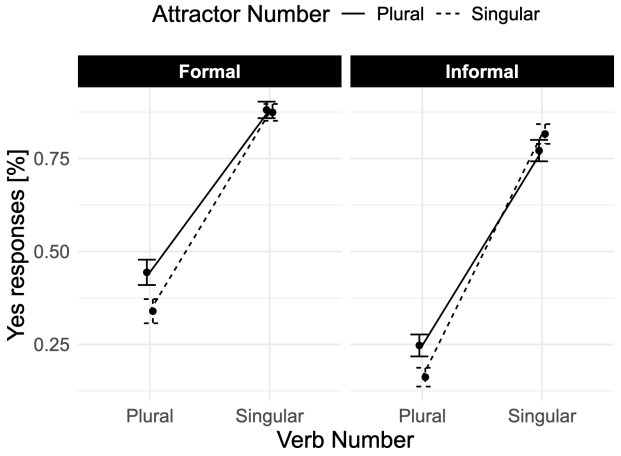

Fig1. Percentage of 'yes' (acceptable) responses in our exp. Error bars signal CIs (Morey, 2008).

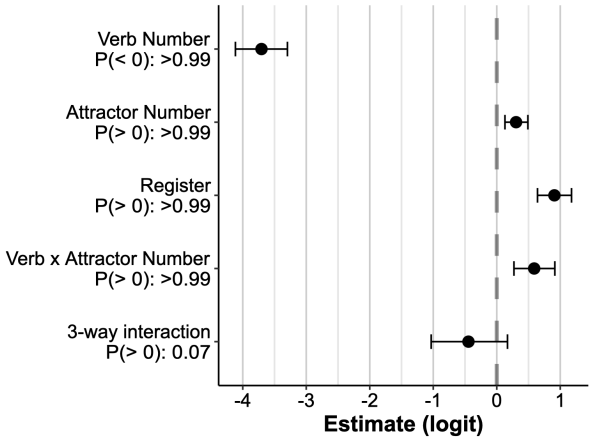

Fig2. Estimates and 95% CIs of a Bayesian GLM with random intercept and slopes (Gelman & Hill, 2007).

Taken together, our experiment show that the agreement attraction effects in Turkish were not due to a possible re-analysis of plural marker as an honorific. Moreover, our results provide additional evidence for attraction effects in grammatical sentences. This symmetrical behavior in grammatical and ungrammatical sentences support the idea that the driving force behind attraction effects are erroneous number representation, instead of cue-retrieval mechanisms based on the feature of the verb. Thus, the grammaticality asymmetry is due to task-related factors, such as bias, rather than process-related factors as previously claimed by cue-based retrieval models.