Agreement attraction in Serbian: decomposing markedness

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Abstract

Asymmetric number attraction effects have been typically explained via a privative markedness account: plural nouns are more marked than singular ones and thus stronger attractors. However, this account doesn't explain results from tripartite systems, in which a third number value is available, like paucal. Here we tested whether attraction effects can be driven by specific markedness sub-components, such as frequency/naturalness of use, using Serbian, in which participles can agree with masculine subjects in singular, plural and *paucal.* We first conducted a naturalness judgment task, finding the following naturalness/frequency pattern: singular,plural<paucal. In a subsequent forced-choice task, we presented participants with preambles containing a singular, a plural or a paucal headnoun (*the castle$_{[Sg]}$/two castles$_{[Pauc]}$/the castles$_{[Pl]}$*) modified by singular/plural/paucal attractors (*with the window$_{[Sg]}$/with two windows$_{[Pauc]}$/with the windows$_{[Pl]}$*). Three options were provided to complete the sentence (*resembles$_{[Sg]}$/resemble$_{[Pauc]}$/resemble$_{[Pl]}$ gothic architecture*).Both accuracy and reaction times (RTs) were collected. Accuracy data reflected the naturalness/frequency pattern, with paucal being the strongest attractor, and plural and singular attracting equally. However, reaction times showed a difference between singular and plural, suggesting co-influence of both frequency/naturalness and morphological markedness. We emphasize the necessity of re-defining markedness and testing attraction through different markedness sub-components (i.e. frequency/naturalness) to explain attraction cross-linguistically.

Keywords: number attraction, markedness, Serbian, subject-verb agreement

Number Attraction Asymmetry

The cognitive mechanisms enabling sentence production are error-prone: both empirical and theoretical accounts have been developed to explain the mechanisms behind the production and correction of errors in speech (e.g. Levelt, 1983). One of the sentential relations whose fallibility has been repeatedly proven is subject-verb agreement. That is, subject-verb number agreement can go wrong in the presence of an "intervening" noun, i.e. a noun carrying a number value that mismatches with the number value of the agreement controller. For example, in the sentence **The key to the cabinets are lost,* plural agreement on the verb (instead of the grammatical, singular agreement) occurs due to the presence of the plural noun, *cabinets*. This faulty agreement mostly does not happen in the opposite direction, therefore **The keys to the cabinet is lost* rarely occurs. In other words, in these contexts, plural seems to act as an *attractor*, while singular is almost always the feature susceptible to attraction (henceforth referred to as *attractee*). This asymmetry between the attracting power of singular and plural has been reported for many languages with two number values, namely singular and plural (see Staub, 2009 for English; Hartsuiker, Schriefers, Bock, & Kikstra, 2003 for German and Dutch; Vigliocco, Butterworth, & Garrett, 1996a for Spanish; Tucker, Idrissi, & Almeida, 2015 for Arabic). Nevertheless, some languages, populations and structural configurations seem to show attraction symmetry (see Vigliocco, Butterworth, & Semenza, 1995 for Italian; Franck, Vigliocco, & Nicol, 2002 for French; Franck, Cronel-Ohayon, Chillier, Frauenfelder, Hamann, Rizzi, & Zesiger, 2004 for children; Hartsuiker, Antón-Méndez, & van Zee, 2001 for object

attraction in Dutch; Häussler, 2009 for object attraction in German; Eberhard, 1997 for singular attraction with the determiner *one*).

Attraction asymmetry in psycholinguistics has been usually explained through a privative feature approach, where one feature (plural) is characterized by explicit marking, and the other (singular) lacks it, and has been mostly subsumed under the name of *markedness* (Bock & Eberhard, 1993; Eberhard, 1997). Markedness, explained in such a way, could account for the attraction asymmetry in two-value systems, where the marked value (plural) is more likely to be the attractor, but also less likely to be the attractee.

Nevertheless, linguistic theory addresses markedness as a complex concept that can make reference to several different components: morphological factors such as the difference between zero-marking and overt marking, frequency of use, cross-linguistic frequency, etc. (Greenberg, 1966; Haspelmath, 2006). Critically, however, the role of these different components has been mostly neglected in the attraction literature. Thus, when attraction is investigated in a three-value system, the privative unmarked/marked account seems to be challenged. This study makes use of a language with a more complex number system, Serbian[1], to observe whether and how different factors giving rise to attraction effects can be differentiated.

Attraction in Three-value Languages

Attraction effects in more complex number systems have received less attention in the psycholinguistic literature. The few studies that have tested tripartite systems have mainly focused on gender. Badecker & Kuminiak (2007) investigated attraction effects in Slovak, a

language that distinguishes between masculine, feminine and neuter gender. By comparing the three features in a pairwise fashion (masculine-neuter, masculine-feminine, neuter-feminine), the authors found that masculine acts as an attractor when paired with neuter, and as an attractee when paired with feminine. Furthermore, feminine and masculine seem not to differ in their attractiveness relative to neuter. Therefore, rather than defining markedness in privative terms and providing a static gender markedness hierarchy, the authors conclude that the markedness status of a gender value should be defined in relative terms, as described within Optimality Theory (OT). According to OT, language structure consists of violable constraints, and the forms not satisfying more highly ranked constraints are less well-formed and more marked (Bresnan, 2001). Importantly, no form would be marked or unmarked inherently, but in comparison to another form (Kager, 1999).

Languages with three number values have been also investigated, such as Slovene, which distinguishes between singular, plural and dual, a number value that denotes exactly two entities. Harrison (2009) observed response accuracy in sentences in which a mismatching local noun occurred both within a prepositional phrase and within a relative clause modifying the subject noun. Similarly to Badecker & Kuminiak (2007), she compared the three values pairwise. In contrast to the prevailing result in two-way number systems, her results show that besides plural and dual, singular also can act as a strong attractor. Additionally, this study suggests that the attraction strength of a value is relative and depends on the value to which it is being compared, in line with Badecker & Kuminiak (2007). Specifically, singular was found to be a (marginally) stronger attractor than plural. Also, plural attracted dual less than dual attracted plural. We can therefore infer that dual

and singular attract equally and more strongly than plural, giving rise to the pattern: *plural< singular,dual*. Critically, this pattern cannot be easily explained by a privative feature account.

Aligning Experimental Data and Theoretical Proposals

While psycholinguistic studies on two-value systems refer to markedness in terms of a privative feature configuration (Bock & Eberhard, 1993; Franck et al., 2002), an alternative account was offered by Badecker & Kuminiak (2007), who suggest adopting OT to account for three-value systems. Nevertheless, theoretical work by Greenberg (1966) and Haspelmath (2006) has advanced a decomposed view of markedness, emphasizing on the different facets that underlie this complex concept. According to Haspelmath (2006), the difference between the unmarked, i.e. something default and lacking morphological marking (see Greenberg, 1966 for the condition of zero expression), and the marked, i.e. something that carries an additional feature or an additional coding, is just one of the meanings that can be ascribed to markedness. Other facets of markedness relate to the unnaturalness of certain morphological forms, their bigger processing cost, as well as the language-internal and cross-linguistic frequency. Crucially, following Greenberg (1966), Haspelmath (2006) claims that most of the markedness criteria could be explained through the frequency of use (language-internal frequency)[2]. Nonetheless, the criterion of zero expression seems to be what attraction studies mostly refer to when talking about

markedness. In two-value systems, this criterion easily obscures most of the other criteria, as the binary (privative) patterns of attraction and markedness usually coincide.

Serbian number system

To express number, noun phrases in Serbian can take the singular or the plural form. Additionally, another form is used to denote the existence of two, three or four entities – the so-called "paucal" form (Example 1), whose status as a third number value has been widely debated. On one hand, Corbett (1983) claims that the term *paucal* should be avoided in Serbian, as the noun in paucal itself cannot refer to a small number of entities without the numerals 2/3/4 preceding it. Therefore, Corbett (2000) suggests that this *count form* should be analyzed as genitive singular. On the other hand, Zlatić (1997), Browne (1993), Franks (1994), and Belić (2008) do call this form *paucal* or *234 form*, a case invariant form governed by the numeral 2/3/4, and describe it as a remnant of an old dual or paucal (see also Materials).

The status of the participle agreeing with this form has also been debated. Šarić (2014) argues that the participles (and verbs) agree with the numerals and take their neuter plural form. Contrary to this, Zlatić (1997) and Browne (1993) also claim that the participles agree with the numerals, but that they take their paucal/234 form.

As this study investigates the effects initiated by the differences in marking, we will use the term *paucal* to refer to the marking on the NPs containing numerals 2/3/4 and the agreeing predicate.

(1)

a. *Dečak-Ø je dotrča-o do kuć-e.*

boy-NOM.SG.M be-PRS.3SG run-PTCP.PST.3SG.M to home-GEN.SG

'The boy ran to the house.'

b. *2 /3/4 lepa dečak-a su dotrča-la do kuć-e.*[3]

2/3/4 beautiful-NOM.PAUC.M boy-NOM.PAUC.M be-PRS.3PL run-PTCP.PST.3PAUC.M to home-GEN.SG

'Two/three/four boys ran to the house.'

c. *Dečac-i su dotrča-li do kuć-e.*

boy-NOM.PL.M be-PRS.3PL run-PTCP.PST.3PL.M to home-GEN.SG

'The boys ran to the house.'

The Current Study

Rather than studying attraction through markedness as a simple, one-dimensional concept, the goal of the present study is to look into the role of specific markedness sub-components during the processing of agreement relations. Specifically, our aim is to contrast two specific markedness components: the absence or presence of the zero expression criterion, which has been usually adopted in privative views of markedness in the attraction literature (e.g. Bock & Eberhard, 1993; Eberhard, 1997), and the frequency/naturalness of use, a criterion claimed to subsume most of the markedness phenomena (Haspelmath, 2006). Importantly, while investigating a two-value system would not help to distinguish between these two factors, because frequency/naturalness and

zero expression patterns coincide in most of the languages (singular being both morphologically unmarked and more frequent, see Greenberg, 1966), this is not so in tripartite systems, in which the presence of three number values provides the processing system with more "degrees of freedom" and, arguably, with different frequency and zero-expression patterns. Critically, no study on attraction in a tripartite number system so far has investigated decomposed markedness effects on attraction. The current study will use subject-predicate agreement in Serbian as a testing ground.

The number attraction phenomenon has been chiefly investigated with production paradigms, mainly reporting accuracy data (Badecker & Kuminiak, 2007; Franck et al., 2002). The proportion of agreement errors provides a reliable measure of the outcome of the process involved in the establishment of an agreement relation. Therefore, similarly to the previous literature, and especially to the studies on tripartite systems (Badecker & Kuminiak, 2007; Harrison, 2009), we will collect accuracy data. However, reaction times (RTs) should be also measured in order to obtain a more comprehensive picture of the attraction phenomenon (cf. Staub, 2009). Specifically, RTs can be informative about the cognitive cost associated with agreement establishment, a process that involves extracting information from a (complex) NP and properly inflecting the corresponding predicate. Therefore, besides accuracy, we will also collect RTs, to assess whether singular, plural and paucal differentially affect the cognitive cost and the outcome of subject-predicate agreement computation.

We will first conduct a naturalness judgment task (Experiment 1) to obtain the pattern of frequency/naturalness of use of Serbian singular, plural and paucal forms in complex NPs

(i.e. head nouns followed by local nouns). Naturalness judgment tasks have been used in psycholinguistic research to compensate for the lack of frequency information drawn from corpus data (Mancini, Molinaro, Rizzi, & Carreiras, 2011; Perez, Molinaro, Mancini, Barraza & Carreiras, 2012; Molinaro, Vespignani, Canal, Fonda, & Cacciari, 2008; Molinaro, Carreiras, & Duñabeitia, 2012), and we adopt it here as an adequate measure of frequency. Furthermore, in Experiment 2, we test whether attraction effects can be found in a language with a more complex number system such as Serbian, and whether these attraction effects can be explained in terms of zero expression or by the frequency/naturalness of use.

Experiment 1: Naturalness Judgment Task

If singular, plural and paucal NPs are used equally frequently and are thus equally natural to native Serbian speakers, their combinations in complex NPs should receive equivalent scores and the presence of an intervening local noun bearing singular, plural or paucal inflection should not cause any significant decrease in the naturalness of the NPs. Alternatively, phrases containing paucal nouns (both as head and local noun or in either one of these positions) could cause lower naturalness scores compared to singular and plural exemplars. This pattern could be triggered by a more limited distribution of paucal NPs (i.e. they can refer only to two, three or four entities), which is also in line with its lower cross-linguistic frequency.

Methods

Participants

The test was administered to thirty six native speakers of Serbian (females: 25, age range: 16-54, mean: 25.58, SD: 9.59).

Materials

The materials consisted of ninety experimental items, involving a preamble and the corresponding predicate as a sentence completion. The preambles contained an initial adverbial, a head noun and a modifying prepositional phrase (PP). As shown in Table 1, head nouns were preceded by an adjective, while modifying PPs always involved the preposition *sa* (´with´), an adjective or the numeral ´two´ (only in paucal conditions), and a noun in instrumental case. Both head and local noun were inanimate masculine. The head nouns appeared in singular, paucal or plural, and the local nouns appeared in singular, paucal or plural. The preamble length ranged from six to ten words (mean length=7.8, SD=0.81). Additionally, the NPs (head noun + PP) were tested on imaginability with 18 Serbian speakers. They were asked to rate the imaginability on a 1-5 scale (1=not imaginable, 5=very imaginable). The overall rating was 3.38 (SD=1.32), with all the conditions receiving a rather high rating (Singular+Singular: mean=3.57, SD=1.31; Singular+Paucal: mean=3.51, SD=1.34; Singular+Plural: mean=3.59, SD=1.34; Paucal+Singular: mean=3.23, SD=1.29; Paucal+Paucal: mean=3.32, SD=1.24; Paucal+Plural: mean=3.28, SD=1.34; Plural+Singular: mean=3.43, SD=1.27; Plural+Paucal: mean=3.03, SD=1.31; Plural+Plural: mean=3.43, SD=1.37).

Different case morphology characterizes the inanimate masculine nouns in their singular, plural and paucal forms. Specifically, singulars have zero inflection in nominative and accusative, syncretic forms in dative and locative, and different inflections in genitive, vocative and instrumental (*-om/-em* in instrumental). In plural, nominative and vocative are syncretic (*-Ø*), as well as dative, instrumental and locative (*–ima*). However, the numeral 2 and the noun it modifies (i.e. paucal phrases) are not marked for case, but appear in their non-declined form[4]. Therefore, the syncretism between the local noun in nominative and the head noun in instrumental is present for paucal, but not singular and plural nouns.

The nine combinations of head and local nouns were followed by correctly inflected predicates. Predicates were always in the past tense, as paucal marking in Serbian is seen only on the participle. The predicates contained an auxiliary verb followed by a past participle (Table 1). Predicate length ranged from three to five words (mean length=3.68, SD=0.57).

The ninety items were distributed into nine lists using a Latin Square design, with each list containing ten sentences per condition, so that each subject could see only one version of each item. Also, ninety filler sentences were added. They were structurally diverse, including subjects of all the three genders and numbers, sentences with several adverbials, subjects modified by genitive, coordinated subjects, proper names etc.

[Insert Table 1 about here]

Procedure

The task was administered using a web-based application (Lime Survey tool, version 2.0). The participants were recruited online and they were asked to read the sentences, presented one by one, and rate their naturalness by clicking on a number on a 1–5 scale (1=not natural; 5=very natural).

Data Analysis

To evaluate the relative naturalness of singular, plural and paucal local nouns in combination with singular, plural and paucal values on head nouns, and to be able to relate the frequency/naturalness results to the attraction findings, data were subset into three pairs (singular-paucal , plural-paucal and singular-plural pair) and linear mixed-effects models were fitted to each pair. This resulted in three subsets of four conditions (Table 2).

[Insert Table 2 about here]

All the analyses were performed using the R Statistical software program (Team, R.C., 2014; version 3.0.2), and the package lme4 (Bates, 2013). We report the intercept, the estimate, standard error and *t* value for each analysis. As the *lmer* output does not provide the *p* values for the effects, the results are taken to be significant when the *t* value is greater than 2. Marginally significant or non-significant results are reported only when relevant for the discussion. Table 3 displays mean naturalness scores for each pair.

The factors included as fixed effects were Head Noun (two levels for each subset – singular and paucal, plural and paucal, or plural and singular) and Matching Status of the

local with the head noun (two levels: Match, e.g. Singular+Singular and Mismatch e.g. Singular+Paucal), as well as the interaction between the two. Following Barr et al. (2013), we created a series of models and tested random slopes for inclusion/exclusion against a by-subject and by-item random intercept model. We selected the maximally converging model common to the three pairs. In cases of convergence failure, a model was simplified (Barr et al., 2013). Comparisons between experimental conditions within each pair were performed by changing the reference level of the intercept.

Results

Although all the experimental conditions received a high naturalness score (mean rating score: 3.90 out of 5, *SD*=1.16), significant differences emerged among conditions. A maximally convergent model including the interaction between the two fixed factors, by-subject random slopes and by-subject/item random intercepts was fitted to the data of each pair.

[Insert Table 3 about here]

Singular–Paucal Pair

The Paucal Match condition was used as reference level to evaluate potential differences in naturalness/frequency between Paucal Match and Paucal Mismatch, to test for Head Noun X Matching Status interaction and to test for the differences between two Match

conditions. Singular Match was used as the reference level to evaluate potential differences in naturalness/frequency between Singular Match and Singular Mismatch.

Overall, the Singular Match condition was rated as equally natural as the Singular Mismatch condition (Intercept: 4.06, Estimate: 0.02, *SE*: 0.06, *t* value: 0.34), while Paucal Match yielded a lower score compared to Paucal Mismatch stimuli (Intercept: 3.49, Estimate: 0.31, *SE*: 0.06, *t* value: 4.86). This resulted in a Head Noun by Matching interaction [Intercept (Paucal Match): 3.49, Estimate: -0.29, *SE*: 0.09, *t* value: -3.32]. Also, the Paucal Match condition was rated as less natural than the Singular Match condition (Intercept: 3.49, Estimate: 0.57, *SE*: 0.10, *t* value: 5.58).

Plural-Paucal Pair

The Paucal Match condition was used as reference level to evaluate potential differences in naturalness/frequency between Paucal Match and Paucal Mismatch, to test for Head Noun X Matching Status interaction and to test for the differences between two Match conditions. Plural Match was used as the reference level to evaluate potential differences in naturalness/frequency between Plural Match and Plural Mismatch.

While Plural Match stimuli were rated as more natural compared to Plural Mismatch ones (Intercept: 3.87, Estimate: 0.17, *SE*: 0.07, *t* value: 2.39), Paucal Match ones were judged as less natural than Paucal Mismatch (Intercept: 3.49, Estimate: 0.36, *SE*: 0.07, *t* value: 4.93), leading to a Head Noun X Matching interaction [Intercept (Paucal Match): 3.49, Estimate: -0.53, *SE*: 0.08, *t* value: -6.12]. Furthermore, the Paucal Match condition

elicited lower ratings than the Plural Match condition (Intercept: 3.49, Estimate: 0.55, *SE*: 0.07, *t* value: 7.66).

Singular–Plural Pair

The Plural Match condition was used as reference level to evaluate potential differences in naturalness/frequency between Plural Match and Plural Mismatch, to test for Head Noun X Matching Status interaction and to test for the differences between two Match conditions. Singular Match was used as the reference level to evaluate potential differences in naturalness/frequency between Singular Match and Singular Mismatch.

There was no significant difference between Singular Match and Singular Mismatch conditions (Intercept: 4.06; Estimate: -0.1; *SE*: 0.06; *t* value: -1.7), or between Plural Match and Plural Mismatch condition (Intercept: 4.04, Estimate: -0.1, *SE*: 0.06, *t* value: -1.66). Similarly, no Head Noun x Matching interaction emerged [Intercept (Plural Match): 4.04, Estimate: -0.002, *SE*: 0.08, *t* value: -0.03).

Discussion

The results of the naturalness judgment task revealed some noteworthy differences among singular, plural and paucal. Firstly, Paucal Match received a lower rating relative to Singular Match and Plural Match, while in the plural-paucal pair, the conditions containing paucal local nouns (Plural Mismatch) were rated lower than the condition containing plural local nouns (Plural Match). Finally, the overall lowest rated condition was the one

containing paucal in both head and local noun position (Paucal Match). In sum, the results of Experiment 1 suggest that the paucal nouns, either as local or head noun, generally lower the naturalness of the whole construction. However, no difference was found between singular and plural NPs, yielding the following pattern: singular, plural< paucal.[5]

Experiment 2: Number Attraction in Serbian

Having evaluated the frequency/naturalness of singular, plural and paucal NPs, Experiment 2 sets out to study whether attraction effects occur in Serbian. Most of the studies so far have been conducted in languages with two number values (singular and plural), one of them typically acting as the attractor and the other one as the attractee. To our knowledge, the existing results on more complex number systems are reduced to a single unpublished study in Slovene (Harrison, 2009), whose results are at odds with most of the previous findings on bipartite number systems.

The second aim of the experiment is to investigate whether potential attraction effects reflect zero-expression based on privative accounts or frequency/naturalness markedness pattern.

Based on the privative zero expression criterion, Serbian distinguishes between the unmarked, singular, on one side, and the marked, non-singular (plural and paucal), on the other side. If the presence or absence of overt morphological marking influences the process of choosing a preamble completion, both plural and paucal should act as attractors to singular head nouns, whereas singular should not act as an attractor, neither for singular

not for plural head nouns. Furthermore, no difference in attraction strength should emerge between plural and paucal, giving rise to the following pattern of results: singular<plural, paucal.

Based on frequency/naturalness of use (as measured by our naturalness judgment task), Serbian distinguishes between more frequent/natural singular and plural, and less frequent/natural paucal. If, therefore, the pattern of attraction effects in accuracy reflects the frequency/naturalness of use, paucal should attract both singular and plural head nouns, but should not be attracted by them. Additionally, singular and plural should display equal attraction strength. Therefore, we could expect the following pattern: singular, plural<paucal.

Thirdly, by measuring both accuracy and RT data, we can evaluate whether the patterns resulting from these two dependent variables align, and thus see whether the cognitive cost associated with choosing a predicate (as measured by RTs) and the final outcome of this process (as revealed by accuracy) are equally sensitive to zero expression or frequency/naturalness. One possibility is that similar attraction patterns emerge, with both accuracy and RTs aligning with either frequency/naturalness or zero expression criterion. An alternative hypothesis is however possible, as accuracy and RTs can shed light on two different sides of predicate inflection choice. Specifically, regardless of the choice eventually made by the speaker, the time taken to respond may be influenced by a combination of morphology-related factors (such as the complexity of number extraction from the preambles and the three predicate options), and the frequency/naturalness of the form. Specifically, the analysis of morphological markers in plural and paucal preambles

and predicates, combined with the lower frequency/naturalness associated to paucal phrases and predicates (relative to both singular and plural) could slow down the response and produce asymmetry not only in the singular-paucal and the plural-paucal comparisons, but also in the singular-plural one. This could lead to a singular<plural<paucal pattern.

Methods

Participants

Thirty six native speakers of Serbian (females: 22, age range: 20-27, mean: 23.72, SD: 1.61) took part in this study, in exchange for a gift. Most of the participants were college students recruited from the University of Novi Sad.

Materials

The materials used in Experiment 1 (Table 1) were used as preambles to be followed by three predicate options, i.e. a singular-inflected, a plural-inflected and a paucal-inflected verb. The materials were divided into nine lists using Latin square design.

Procedure

The experiment was conducted using PsychoPy (version 1.80.039 on a computer running a 32-bit Windows version). The participants were sitting in front of the computer, in a normally lighted, quiet room. We adapted the forced-choice task procedure presented in Staub (2009), so that each trial consisted of: a fixation cross presented on the center of

the screen (1s), a preamble presented word-by-word on the center of the screen (300ms each word, with a 150-ms interstimulus interval), which was always followed by three predicate options presented on the left lower, middle lower and right lower part of the screen (3.5s). Predicate position was balanced across the trials in such a way that each number value appeared an equal number of times at each position (left, middle and right), and each number value was adjacent to the other two values an equal number of times. Also, the correct answer occurred at every position equally. Participants were instructed to read each preamble and after that to choose one of the three predicate options that would correctly complete the sentence, by pressing the appropriate keys on the keyboard. If the participant did not answer while the three options were on the screen (3.5 s), the next trial would begin automatically. A short practice session consisting of 2 stimuli was run to familiarize participants with the task. The experiment lasted approximately 40 minutes.

Data Analysis

Similarly to the analysis of Experiment 1, and in order to be able to compare our study to previous studies on number attraction in two-value number systems, we conducted three separate analyses that compared singular and paucal, plural and paucal, and plural and singular pairs of number values (see also Harrison, 2009).

Following previous studies on attraction (e.g. Bock, & Miller, 1991; Staub, 2009), we evaluated attraction effects by comparing the errors in the matching conditions with the errors in the mismatching conditions (e.g. to assess plural attraction in the singular-plural pair, we compared the number of plural errors (attraction errors) in the Singular Mismatch

condition (Singular+Plural) with the number of plural errors (random errors) in Singular Match (Singular+Singular). This allowed us to distinguish attraction errors from random errors, and to relativize attraction errors to the errors of the same type made in the baseline condition. The data was therefore subset into three pairs, as shown in Table 2.

In all the three pairs, RT analyses were carried out using the response latencies for the same trials as those used in the accuracy analysis. The onset for measuring RTs was the presentation of the screen with the three sentence completion options. One item was removed from the analysis due to a design error. Linear mixed-effect models were fitted to data using the same procedure, model selection criteria and fixed factors as in the analysis of Experiment 1 (accuracy data were analyzed with logistic linear mixed-effect models).

Mean accuracy and RTs for the comparisons between pairs of number values are reported in Table 4 below.

[Insert Table 4 about here]

Results

In total, there were 516 errors, 233 (45.16%) of which were due to attraction, 135 (26.16%) were random errors, and 148 (28.68%) were other errors.

For each pair, accuracy analysis was carried out by fitting a maximally converging model that included the interaction between the two fixed factors as well as the by-item and by-subject random intercepts. As for RTs, a maximally converging model across the three

pairs involving the two fixed factors, by-subject/item random factors and by-subject random slopes was used.

Singular-Paucal Attraction

The Paucal Match condition was used as the reference level to test singular attraction after paucal head nouns, to compare singular and paucal attraction (Head Noun x Matching interaction) and to test for potential differences between the two Match conditions, while Singular Match was the reference level used to test paucal attraction after singular head nouns.

Accuracy. While no difference was found between Paucal Match and Paucal Mismatch (Intercept: 3.74, Estimate: -0.26, *SE*: 0.42, *z* value: -0.61, corresponding to 0.6% difference), Singular Match showed significantly higher accuracy than Singular Mismatch (Intercept: 5.43, Estimate: -2.34, *SE*: 0.63, *z* value: - 3.72, corresponding to 3.9% difference). A significant Head Noun X Matching interaction emerged, driven by the higher Mismatch effect for Singular compared to Paucal head noun conditions [Intercept (Paucal Match): 3.74, Estimate: -2.08, *SE*: 0.75, *z* value: -2.75, corresponding to 2% difference], as Figure 1 shows. Moreover, Paucal Match elicited less accurate answers than Singular Match (Intercept: 3.74, Estimate: 1.69, *SE*: 0.66, *z* value: 2.55, corresponding to 1.8% difference).

Response times. While the time taken to complete Paucal Match and Paucal Mismatch conditions did not differ (Intercept: 2.12s, Estimate: -0.01, *SE*: 0.04, *t* value: -

0.26), Singular Match conditions required shorter RTs than Singular Mismatch conditions (Intercept: 1.52s, Estimate: 0.16, *SE*: 0.04, *t* value: 4.16). Moreover, the Paucal Match elicited longer RTs than the Singular Match condition (Intercept: 2.12s, Estimate: -0.59, *SE*: 0.06, *t* value: -9.76). Also, a Head Noun X Matching interaction emerged due to the greater mismatch effect found for Plural compared to Paucal head noun conditions [Intercept (Paucal Match): 2.12, Estimate: 0.17, *SE*: 0.06, *t* value: 2.99], as shown in Figure 1.

[Insert Figure 1 about here]

Plural-Paucal Attraction

The Paucal Match condition was used as the reference level to test plural attraction after paucal head nouns, to compare plural and paucal attraction (Head Noun x Matching interaction) and to test for potential differences between the two Match conditions, while Plural Match was the reference level used to test paucal attraction after plural head nouns.

Accuracy. As shown in Figure 2, no difference was found between Paucal Match and Paucal Mismatch (Intercept: 1.56, Estimate: -0.08, *SE*: 0.19, *z* value: -0.42, corresponding to 1.2% difference), but Plural Match conditions were answered more correctly relative to Plural Mismatch (Intercept: 1.50, Estimate: -0.97, *SE*: 0.24, *z* value: 4.11, corresponding to a 10% difference). This yielded a significant Head noun x Matching status interaction [Intercept (Paucal Match): 1.56, Estimate: -0.89, *SE*: 0.30, *z* value: -2.88, corresponding to 0.8% difference]. Moreover, Paucal Match was answered less correctly than Plural Match (Intercept: 1.56, Estimate: 0.91, *SE*: 0.24, *t* value: 3.84, corresponding to 9.5% difference).

Response times. While the time required to complete Paucal Match and Paucal Mismatch sentences did not differ (Intercept: 2.14, Estimate: -0.04, *SE*: 0.04, *t* value: -0.90), responses to Plural Match conditions were faster than to Plural Mismatch ones (Intercept: 1.95, Estimate: 0.12, *SE*: 0.04, *t* value: 2.65) (see Figure 2). Paucal Match conditions took longer to answer than Plural Match conditions (Intercept: 2.14, Estimate: -0.19, *SE*: 0.04, *t* value: -4.19). Also, a Head Noun X Matching interaction emerged, driven by the greater Mismatch effect for Plural compared to Paucal head noun stimuli [Intercept (Paucal Match): 2.14, Estimate: -0.16, *SE*: 0.06, *t* value: -2.61].

[Insert Figure 2 about here]

Singular-plural attraction

The Plural Match condition was used as the reference level to test singular attraction after plural head nouns, to compare plural and singular attraction (Head Noun x Matching interaction) and to test for potential differences between the two Match conditions, while Singular Match was the reference level used to test plural attraction after singular head nouns.

Accuracy. Plural Match was more accurate than Plural Mismatch (Intercept: 3.60, Estimate: -0.94, *SE*: 0.26, *z* value: -3.58, corresponding to 3.8% difference), and Singular Match was more accurate than Singular Mismatch (Intercept: 4.20, Estimate: -0.94, *SE*: 0.26, *z* value: -3.58, corresponding to 2.2% difference). Also, as shown in Figure 3, responses to Plural Match conditions were less accurate than to Singular Match ones

(Intercept: 3.60, Estimate: 0.59, *SE*: 0.25, *z* value: 2.36, corresponding to 1.2% difference). No Head Noun X Matching interaction emerged. [6]

Response times. No difference was found between Plural Match and Plural Mismatch conditions (Intercept: 1.94, Estimate: 0.06, *SE*: 0.04, *t* value: 1.53), but the Singular Match conditions were answered more quickly compared to the Singular Mismatch conditions (Intercept: 1.54, Estimate: 0.11, *SE*: 0.04, *t* value: 2.98). Furthermore, Plural Match took longer to answer than Singular Match (Intercept: 1.93, Estimate: -0.39, *SE*: 0.05, *t* value: -7.73), but no significant Head Noun X Matching interaction emerged [Intercept (Plural Match): 1.93, Estimate: 0.05, *SE*: 0.5, *z* value: 0.96] (see Figure 3).

[Insert Figure 3 about here]

Discussion

The aim of Experiment 2 was to test whether attraction effects can be found in Serbian and whether they follow a privative account and zero expression criterion, or a pattern reflecting the naturalness/frequency of use. Our data show that attraction in Serbian does occur. However, the nature of the attraction effect is not always asymmetric, in line with previous studies on three-way number and gender systems (Badecker & Kuminiak, 2007; Harrison, 2009). Furthermore, we obtained different patterns of results for the accuracy and RT data.

Our accuracy data show that both paucal, plural and singular can be attractors. More specifically, paucal can cause attraction both with singular and plural, but is not vulnerable

to attraction errors when followed by either a singular or plural local noun. Plural and singular, however, can both cause attraction and be vulnerable to attraction errors to the same extent. We could say therefore that the attraction effect in accuracy data is asymmetric between singular and paucal and between plural and paucal, but symmetric between singular and plural. The overall pattern of results for the accuracy data thus follows the pattern obtained for the naturalness judgment data: singular, plural<paucal. This suggests a tight link between the frequency/naturalness of use and attraction effects.

One might argue that the stronger attraction effects for paucal compared to singular and plural arise from the presence of an overt numeral (*dva*, ´two´, Table 1) used in paucal conditions. The use of overt numerals has been found to reinforce attraction effects (Eberhard, 1997), arguably because of the additional number cue. However, in our experiment, both singular and plural phrases contained an additional number cue on the adjective preceding them, as adjectives in Serbian agree with nouns in number, gender and case. While the cue provided by adjectival number inflection may not be as strong as the one provided by an overt numeral, it nevertheless contributes to balancing the amount of cues available across conditions, and thus to lowering the possibility of confounded attraction effects.

Another potential confound for the interpretation of paucal attraction might come from syncretism between the local and head noun in paucal conditions. Specifically, it has been shown that case inflection on the attractor can help differentiate it from the subject (e.g. Badecker & Kuminiak, 2007), thus decreasing the probability of attraction errors. Based on this, one would expect no sizeable attraction effects by plural and singular local nouns in

our experiment, and a (confounded) attraction effect for case-syncretic conditions, like paucal ones. Critically, however, our data show sizeable attraction effects both in conditions that show syncretic and non-syncretic case.

In line with our expectations, an asymmetric mismatch effect emerged also between singular and plural in RTs. Specifically, plural local nouns after singular head nouns elicited longer RTs compared to singular local nouns following plural head nouns. This asymmetry might be ascribed to the presence of an extra morpheme on plural nouns (compare singular *dečak-Ø*, ´a boy´, with plural *dečac-i*, ´the boys´), which could trigger greater processing costs (Wagers, Lau, & Phillips, 2009), while the asymmetry in the plural-paucal pair (which would not be expected if only the zero expression condition was taken into account) could be the result of the differential frequency/naturalness of use between these two forms. Therefore, our RT results may combine two predicted patterns of results: one related to the zero expression criterion (singular<plural, paucal) and the other to frequency/naturalness (singular, plural<paucal), generating the singular<plural<paucal pattern.

A question arises as to why RTs are influenced by more factors than accuracy. As mentioned above, RTs reflect the cost of the operations involved in subject-verb agreement establishment, while accuracy shows the final outcome of the process. A plausible interpretation is that RTs and accuracy are differentially sensitive to markedness subcomponents. Specifically, RTs could be more susceptible to attraction arising from different factors (morphology-related and frequency-related) due to the nature of the processes it reflects (operations such as noun accessing, morphological number extraction

etc.) and the involvement of working memory in subject-predicate agreement computation (Badecker & Lewis, 2007). [7]

Another interesting insight into our results might be obtained through OT, in line with Badecker & Kuminiak (2007)[8]. As OT describes the forms as relatively marked to one another (Kager, 1999), our pattern of results for RTs would suggest that paucal is marked relative to singular and relative to plural, and that plural is marked relative to singular (but not relative to paucal). This would emerge out of the following ranking of constraints: *Paucal< *Plural< *Singular, where the forms ranked more highly are more marked and their expression is more disfavored. The obtained accuracy pattern, however, would imply no difference between singular and plural. Within OT, singular and plural would thus be unranked with respect to one another (McCarthy, 2011), as the constraints that penalize their expression are equally ranked and their expression is equally disfavored. Nevertheless, the difference in patterns for RT and accuracy results cannot be straightforwardly accommodated under an OT approach.

General Discussion

Different Factors, Different Languages, Different Measures

The pattern of results for the accuracy data obtained in Experiment 2 (singular, plural<paucal) suggests that frequency/naturalness of use influences attraction effects. Moreover, this pattern of results rules out the hypothesis that attraction effects in Serbian

result only from markedness in terms of zero expression criterion, in which case the expected pattern of results would be: singular<plural, paucal.

Also, the finding that singular can act as an attractor in accuracy data is interesting both theoretically and empirically. Namely, most of the studies on two-value systems find that singular is prone to attraction but that it rarely acts as an attractor (see the section Number Attraction Asymmetry for exceptions). Our finding of singular attraction, though, goes in line with the results obtained by Harrison (2009) on Slovene. Similarly to Harrison (2009), we used masculine singular nouns in nominative case, which have no marking, echoing the English number system. However, zero marking on singular masculine nouns in Serbian occurs only in nominative case, and it thus represents "an exception rather than the rule" (Harrison, 2009). In this study, the finding that the zero-marked singular can be an attractor provides additional evidence that the existence/absence of the overt marker is not explanatory enough to account for the attraction effects across languages.

However, this is not to say that morphological markedness does not contribute to attraction at all: it can combine with frequency/naturalness and give rise to a composite pattern such as the one reported for RT data. Therefore, both the presence/absence of zero expression and frequency/naturalness of use should be considered among the factors driving attraction effects.

We suggest that the alignment between theoretical accounts of markedness and the effects emerging in psycholinguistic research across languages can be improved by adopting a decomposed view of markedness, along the lines of what was proposed in linguistic theory (Greenberg, 1966; Hapselmath, 2006). Specifically, the attraction effects

differences across studies might result from the different factors being weighed differently across languages. While the presence or absence of a morphological marker might be triggering attraction effects in some languages (English or Spanish), the frequency/naturalness of the form might be more prominent in others. Arguably, the wider range of forms available in tripartite systems causes more factors to come into play during number attraction. In other words, the relative weight of the different factors driving attraction might be subject to cross-linguistic differences. Therefore, more than one criterion should be taken into account when accounting for attraction patterns. Our study shows that one of the ways to do this is to test forms on their naturalness/frequency of use.

Finally, we showed that accuracy and RTs can be differentially sensitive to the factors underlying attraction. Therefore, more measures should be taken into account when studying attraction effects across languages.

Paucal Or Not?

Our findings are also informative on the debate about the nature of the *paucal* form in Serbian. Specifically, while some theoretical approaches characterize this form as singular genitive (Corbett, 1983; 2000), others emphasize that the numeral 2/3/4 imposes its number feature on other sentential elements, which is either described as plural (Šarić, 2014) or the special number value – *paucal* or *234 form* (Browne, 1993; Franks, 1994; Zlatić, 1997).

If paucal nouns are actually singular nouns in genitive case, we would expect them to pattern with singular. However, data show that paucal and singular follow different attraction patterns. Also, the number of random paucal errors in Singular Match condition and the number of random singular errors in Paucal Match is rather low (3 and 12,

respectively, out of 135 total random errors), suggesting that singular and paucal are not being intermixed.

However, if paucals are plural neuter nouns (Šarić, 2014), we would expect them to behave like plurals. On the one hand, random plural errors in Paucal Match condition, and random paucal errors in Plural Match conditions are quite high (65 and 31, respectively, out of 135 total random errors), suggesting that speakers may use these two forms interchangeably. The fact that semantic plural agreement with paucal subject is accepted by some speakers (Wechsler & Zlatic, 2003, see also Note 3) may have contributed to the generation of plural random errors after paucal. This points to the involvement of notional factors during subject-predicate computation with paucal head nouns, and is in line with the attraction literature that emphasizes the involvement of semantic factors in attraction (e.g. Vigliocco et al., 1995; Vigliocco, Hartsuiker, Jarema & Kolk, 1996b; Humphreys & Bock, 2005). On the other hand, the fact that paucal is still a stronger attractor than plural seems to disconfirm the hypothesis that the two forms are two sides of the same underlying representation. Crucially, further investigation is necessary to shed light onto the nature of paucal inflection.

Conclusions

In sum, we have adopted a decomposed view of markedness and have tested attraction effects measuring both accuracy and RTs. Our results suggest that the parser is sensitive to morphological marking, but also to the naturalness/frequency of use of forms, when

computing subject-predicate agreement. Moreover, as our frequency/naturalness ratings refer to the entire NP, and frequency/naturalness was found to influence attraction, we can conclude that the properties of the entire NP influence attraction effects and thus subject-predicate computation.[9] Notional factors seem to influence agreement particularly strongly with paucal subjects. In sum, although further research using a sentence production paradigm may be necessary to confirm these results, the current data depict agreement as a composite operation which takes into account different types and sources of information.

Additionally, our study points to the necessity of expanding the definition of markedness, the range of the languages tested, but also the methodology of research, in order to achieve a more comprehensive picture of the attraction phenomenon.

Acknowledgments

The authors are grateful to Ainhoa Bastarrika for her help with the experiment creation, Isidora Gatarić, Maja Marković and Tanja Milićev for their help in the experiment administration, as well as Doug Davidson for the helpful comments on the analysis. Nevertheless, all the mistakes in the paper are ours. This research was partially funded by the P1_2014_1_38 (B.R and S.M) and PRE_2015_1_0320 (B.R.) grants from the Basque Government, the PSI2012-32350 and PSI2015-65694-P grants from the Spanish Government (N.M.), the Gipuzkoa Fellowship Program (S.M.) and by the grant Centro de Excelencia Severo Ochoa SEV-2015-0490.

References

Badecker, W., & Kuminiak, F. (2007). Morphology, agreement and working memory retrieval in sentence production: Evidence from gender and case in Slovak. *Journal of Memory and Language, 56(1),* 65-85.

Badecker, W., & Lewis, R. (2007). A new theory and computational model of working memory in sentence production: Agreement errors as failures of cue-based retrieval. In 20th annual CUNY sentence processing conference. San Diego, La Jolla, CA: University of California.

Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of memory and language, 68(3),* 255-278.

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2013). Linear mixed-effect models using Eigen and S4. R package version: 1.0-5. <http://cran.rproject.org/package=lme4>.

Belić, B. (2008). Minor paucal in Serbian. In G. Zybatow, L. Szucsich, U. Junghanns & R. Meyer (Eds.), *Formal Description of Slavic Languages: The Fifth Conference, Leipzig 2003* (pp. 258-269). Frankfurt am Main: Peter Lang.

Bock, K., & Eberhard, K. M. (1993). Meaning, sound and syntax in English number agreement. Language and Cognitive Processes, 8(1), 57-99.

Bock, K., & Miller, C. A. (1991). Broken agreement. *Cognitive psychology, 23(1),* 45-93.

Bresnan, J. (2001). Explaining morphosyntactic competition. Handbook of contemporary syntactic theory, 11-44.

Browne, W. (1993). 7 Serbo-Croat. The Slavonic Languages, 306-87.

Corbett, G. G. (1983). *Hierarchies, Targets and Controllers: Agreement patterns in Slavic.*

Corbett, G. G. (2000). *Number*. Cambridge: Cambridge University Press.

Eberhard, K. M. (1997). The marked effect of number on subject–verb agreement. *Journal of Memory and Language, 36(2),* 147-164.

Franck, J., Cronel-Ohayon, S., Chillier, L., Frauenfelder, U. H., Hamann, C., Rizzi, L., & Zesiger, P. (2004). Normal and pathological development of subject–verb agreement in speech production: A study on French children. *Journal of Neurolinguistics, 17(2),* 147-180.

Franck, J., Vigliocco, G., & Nicol, J. (2002). Subject-verb agreement errors in French and English: The role of syntactic hierarchy. *Language and Cognitive Processes, 17(4),* 371-404.

Franks, S. (1994). Parametric properties of numeral phrases in Slavic. *Natural Language & Linguistic Theory, 12(4),* 597-674.

Greenberg, J. H. (1966). *Language universals: With special reference to feature hierarchies*. Berlin: Mouton de Gruyter.

Harrison, A. J. (2009). *Production of subject-verb agreement in Slovene and English* (Doctoral dissertation). The University of Edinburgh

Hartsuiker, R. J., I. Antón-Méndez, and M. van Zee (2001). Object attraction in subject-verb agreement construction. *Journal of Memory and Language, 45*, 546‑572.

Hartsuiker, R. J., Schriefers, H. J., Bock, K., & Kikstra, G. M. (2003). Morphophonological influences on the construction of subject-verb agreement. *Memory & Cognition, 31(8),* 1316-1326.

Haspelmath, M. (2006). Against markedness (and what to replace it with). *Journal of linguistics, 42(01),* 25-70.

Häussler, J. (2009). The emergence of attraction errors during sentence comprehension (Doctoral dissertation).

Humphreys, K. R., & Bock, K. (2005). Notional number agreement in English. *Psychonomic Bulletin & Review, 12(4),* 689-695.

Kager, R., Qiuwu (马秋武)· Ma, & Jialing (王嘉龄)· Wang. (1999). *Optimality theory* (Vol. 2). Cambridge: Cambridge University Press.

Klajn, I. (2005). *Gramatika srpskog jezika.* Beograd: Zavod za udžbenike i nastavna sredstva.

Levelt, W. J. (1983). Monitoring and self-repair in speech. *Cognition, 14(1),* 41-104.

London: Croom Helm

Mancini, S., Molinaro, N., Rizzi, L., & Carreiras, M. (2011). When persons disagree: an ERP study of Unagreement in Spanish. *Psychophysiology, 48(10),* 1361-1371.

McCarthy, J. J. (2011). *Doing optimality theory: Applying theory to data.* John Wiley & Sons.

Molinaro, N., Carreiras, C., & Duñabeitia, J.A. (2012). Semantic combinatorial processing of non-anomalous expressions. *Neuroimage,* 59(4), 3488-3501

Molinaro, N., Vespignani, F., Canal, P., Fonda, S., & Cacciari, C. (2008). Cloze-probability does not only affect N400 amplitude: The case of complex prepositions. *Psychophysiology*, 45(6), 1008-1012

Perez, A., Molinaro, N., Mancini, S., Barraza, P., & Carreiras, M. (2012). Oscillatory dynamics related to the Unagreement pattern in Spanish. *Neuropsychologia, 50(11),* 2584-2597.

Šarić, A. (2014). *Numeral induced agreement mismatches in Serbo-Croatian* (Unpublished master dissertation). Utrecht University.

Staub, A. (2009). On the interpretation of the number attraction effect: Response time evidence. *Journal of Memory and Language, 60(2),* 308-327.

Team, R. C. (2014). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria, 2012.

Tucker, M. A., Idrissi, A., & Almeida, D. (2015). Representing number in the real-time processing of agreement: self-paced reading evidence from Arabic. *Frontiers in psychology,* 6.

Vigliocco, G., B. Butterworth, and C. Semenza (1995). Constructing subject-verb agreement in speech: the role of semantic and morphological factors. *Journal of Memory and Language, 34*, 186‑215.

Vigliocco, G., Butterworth, B., & Garrett, M. F. (1996a). Subject-verb agreement in Spanish and English: Differences in the role of conceptual constraints. *Cognition, 61(3),* 261-298.

Vigliocco, G., Hartsuiker, R.J., Jarema, G., & Kolk, H.H.J. (1996b). One or more labels on the bottles? Notional concord in Dutch and French. *Language and Cognitive Processes, 11(4),* 407-442.

Wagers, M. W., Lau, E. F., & Phillips, C. (2009). Agreement attraction in comprehension: Representations and processes. *Journal of Memory and Language, 61(2),* 206-237.

Wechsler, S., & Zlatić, L. (2003). The many faces of agreement. Stanford: Center for the Study of Language and Information.

Zlatić, L. (1997). *The structure of the Serbian noun phrase* (Unpublished doctoral dissertation). University of Texas, Austin.

Notes

[1]We here refer to the language discussed as “Serbian”, although the preferred term in the literature is “Serbo-Croatian”. We have chosen “Serbian” in order to ensure that the phenomena discussed in the paper apply to the dialect in question.

[2]An anonymous reviewer suggested adopting the term “saliency” here. However, as we are trying to decompose the notion of “markedness” that has been used as an umbrella term for many concepts, we are afraid that using the term “saliency” would bring us to the same problem, making the relation of our paper with the previous studies harder.

[3] Other possible agreement options have been suggested. According to Franks (1994), in:

Dva dečak-a *su* *došla /* *? je došlo /*

? su došli

two boy-NOM.PAUC.M be-PRS.3PL arrive-PTCP.PRS.3PAUC.M /? be-PRS.3SG arrive-PTCP.PRS.3SG.N / ?be-PRS.3PL arrive-PTCP.PRS.3PL.M

‘Two boys arrived’,

the speakers report fuzzy judgements for the two last options, but the first pattern clearly represents syntactic agreement. For the numeral five, for example, this syntactic agreement would be impossible. There is a possibility that the other two options are subject to dialectal variability, as masculine plural form seems rather unnatural.

[4] Although, prescriptively, instrumental case is required after the numeral 2/3/4 (Klajn, 2005), these forms are descriptively rather archaic and rarely used in spoken Serbian today (see Šarić, 2014). Moreover, the non-declined paucal PPs used in this study received high naturalness judgment scores with participants of different ages (age range: 16-54).

[5]As suggested by an anonymous reviewer, we looked at the effects of the three values in the headnoun position (irrespective of local nouns) , in order to have a more general assessment of singular, plural and paucal naturalness as such. The analysis revealed the same pattern as the one we present here (singular, plural < paucal).

[6] Because of convergence failure when changing the reference level, we adopted a simpler model involving the sum treatment, rather than interaction between the two fixed factors. The random effects structure remained the same as in other pairs. For this reason, we do not report the interaction statistics in singular-plural pair. Importantly, the converging model including interaction didn't show significant effects [Intercept (Plural Match): 3.45, Estimate: -0.61, *SE*: 0.55, *z* value: -1.12, corresponding to 1% difference].

[7] An anonymous reviewer suggested that the presence of the same auxiliary for plural and paucal might make them less distinguishable and thus increase the RTs. If this were the case, we should expect similar RTs for paucal and plural conditions. Nevertheless, our results show that this was not the case.

[8] We thank an anonymous reviewer for suggesting this interpretation.

[9] We are grateful to an anonymous reviewer for this observation.

Table 1

An example of experimental item in Experiments 1 and 2, with the preamble in all six conditions, and the predicate in all three forms

(Sg=singular, Pauc=paucal, Pl=plural)

PREAMBLE			PREDICATE	
Head noun number	Local noun number	example	predicate number	example
Sg	Sg	*Prema legendi, stari dnevnik sa zlatnim inicijalom* According to the legend, an old diary[Sg] with a golden initial[Sg]	Sg	*je krio mnogo tajni.* was[Sg] keeping many secrets
	Pauc	*Prema legendi, stari dnevnik sa dva inicijala* According to the legend, an old diary[Sg] with two initials[Pauc]		
	Pl	*Prema legendi, stari dnevnik sa zlatim inicijalima* According to the legend, an old diary[Sg] with the golden initials[Pl]		
Pauc	Sg	*Prema legendi, dva dnevnika sa zlatnim inicijalom* According to the legend, two diaries[Pauc] with a golden initial[Sg]	Pauc	*su krila mnogo tajni.* were[Pauc] keeping many secrets
	Pauc	*Prema legendi, dva dnevnika sa dva inicijala* According to the legend, two diaries[Pauc] with two initials[Pauc]		
	Pl	*Prema legendi, dva dnevnika sa zlatnim inicijalima* According to the legend, two diaries[Pauc] with the golden initials[Pl]		
Pl	Sg	*Prema legendi, stari dnevnici sa zlatnim inicijalom* According to the legend, the old diaries[Pl] with a golden initial[Sg]	Pl	*su krili mnogo tajni.* were[Pl] keeping many secrets
	Pauc	*Prema legendi, stari dnevnici sa dva inicijala* According to the legend, the old diaries[Pl] with two initials[Pauc]		
	Pl	*Prema legendi, stari dnevnici sa zlatnim inicijalima* According to the legend, the old diaries[Pl] with the golden initials[Pl]		

Table 2

Condition subsets for Experiment 1 and 2 analyses (Sg=singular; Pl=plural; Pauc=paucal)

Pair	Head noun + local noun selected
Sg-Pauc	Singular Match (Singular+Singular)
	Singular Mismatch (Singular+Paucal)
	Paucal Match (Paucal+Paucal)
	Paucal Mismatch (Paucal+Singular)
Sg-Pl	Singular Match (Singular+Singular)
	Singular Mismatch (Singular+Plural)
	Plural Match (Plural+Plural)
	Plural Mismatch (Plural+Singular)
Pl-Pl	Plural Match (Plural+Plural)
	Plural Mismatch (Plural+Paucal)
	Paucal Match (Paucal+Paucal)
	Paucal Mismatch (Paucal+Plural)

Table 3

Mean naturalness ratings and SEs for the three pairs in Experiment 1 (Sg=singular; Pl=plural; Pauc=paucal)

pair	condition	Mean rating	SE
Sg-Pauc	Sg Match	4.06	0.1
	Sg Mismatch	4.08	0.1
	Pauc Match	3.49	0.1
	Pauc Mismatch	3.81	0.1
Pl-Pauc	Pl Match	4.04	0.1
	Pl Mismatch	3.87	0.1
	Pauc Match	3.49	0.1
	Pauc Mismatch	3.85	0.1
Sg-Pl	Sg Match	4.06	0.1
	Sg Mismatch	3.96	0.1
	Pl Match	4.04	0.1
	Pl Mismatch	3.95	0.1

Table 4

Mean accuracy and RTs for singular-paucal, plural-paucal and singular-plural pair (Sg=Singular; Pl=Plural; Pauc=Paucal)

pair	condition	Mean accuracy	Mean RTs
Sg-Pauc	Sg Match	99%	1.52
	Sg Mismatch	92%	1.69
	Pauc Match	96%	2.08
	Pauc Mismatch	95%	2.10
Pl-Pauc	Pl Match	91%	1.95
	Pl Mismatch	79%	2.06
	Pauc Match	80%	2.11
	Pauc Mismatch	79%	2.08
Sg-Pl	Sg Match	98%	1.54
	Sg Mismatch	93%	1.65
	Pl Match	95%	1.92
	Pl Mismatch	91%	1.99

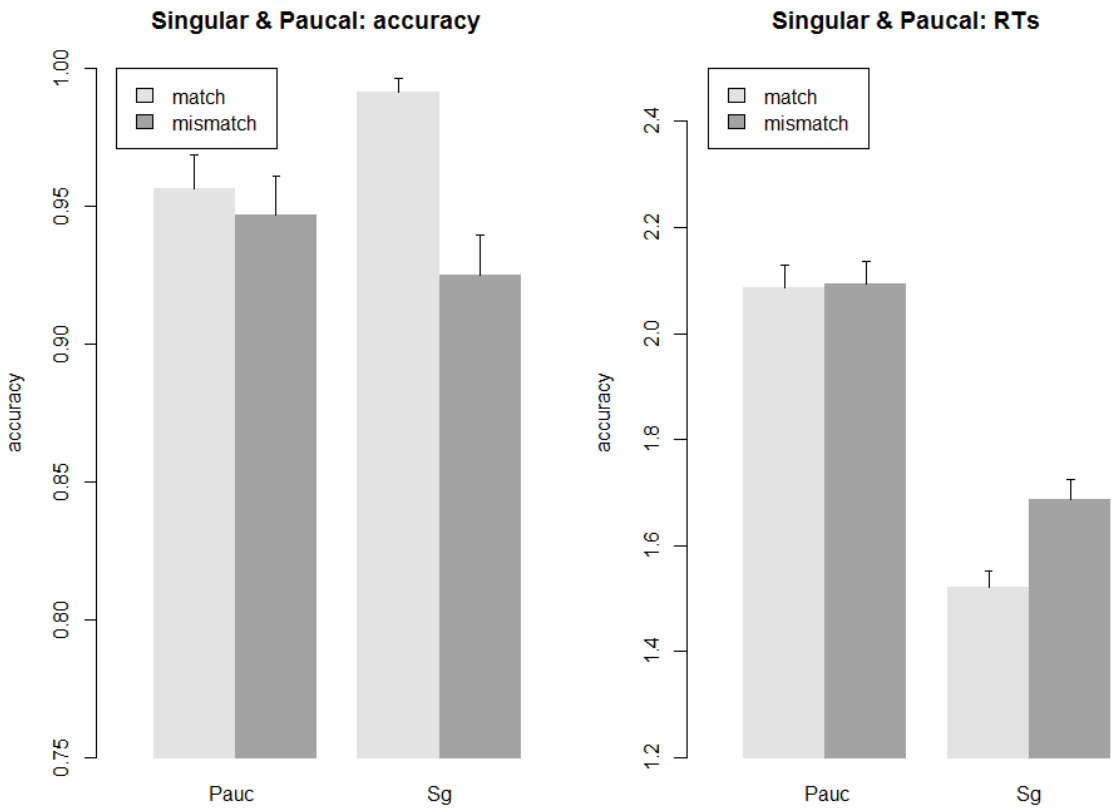

Figure 1. Accuracy and RTs for the singular-paucal pair (Pauc=paucal head noun; Sg=singular head noun; Match=number-matching local noun; Mismatch=number-mismatching local noun)

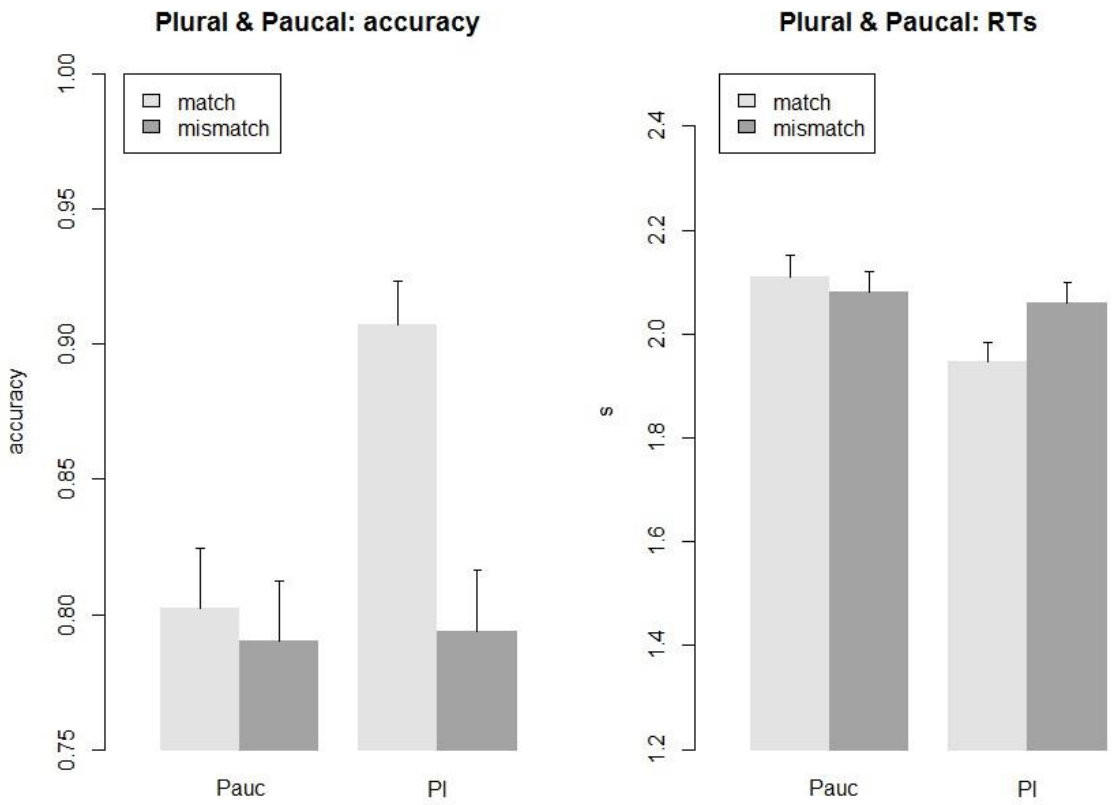

Figure 2. Accuracy and RTs for the plural-paucal pair (Pauc=paucal head noun; Pl=plural head noun; Match=number-matching local noun; Mismatch=number-mismatching local noun)

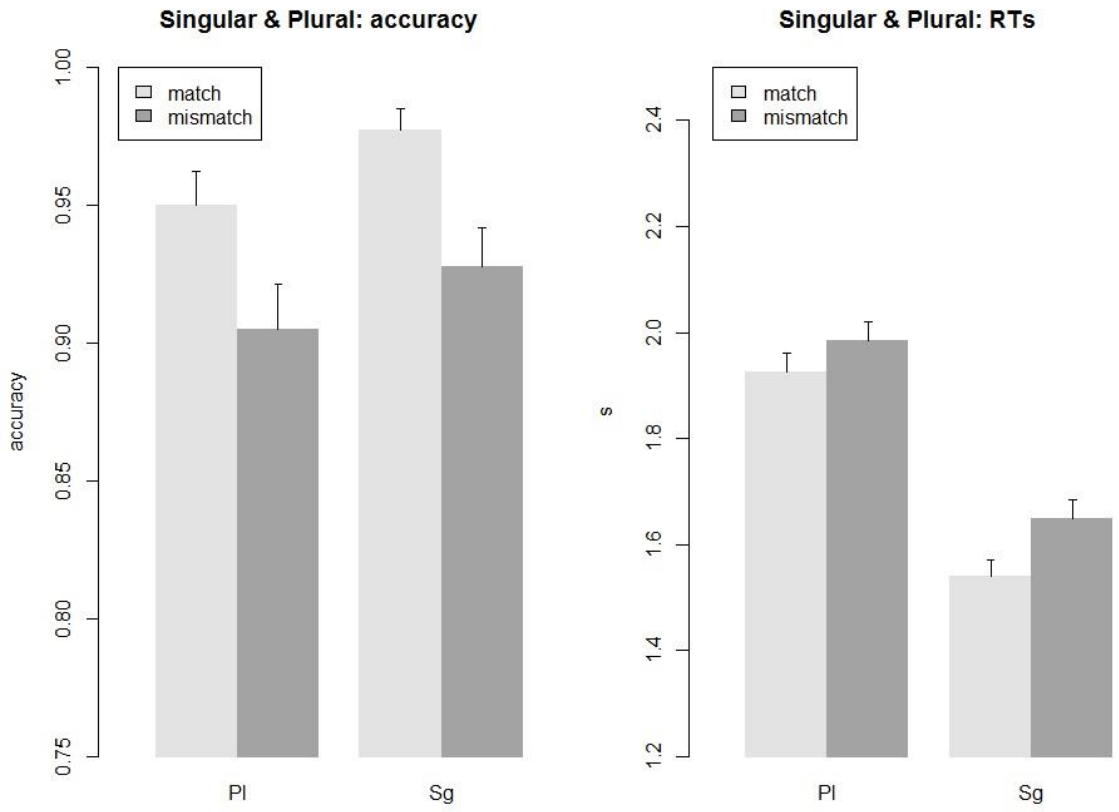

Figure 3. Accuracy and RTs for the singular-plural pair (Pl=plural head noun; Sg=singular head noun; Match=number-matching local noun; Mismatch=number-mismatching local noun)

Appendix 1

Materials used in Experiments 1 and 2.

1 Nasuprot očekivanjima, onaj esej/dva eseja/oni eseji sa zanimljivim podnaslovom/dva podnaslova/zanimljivim podnaslovima je pobedio/su pobedila/su pobedili na takmičenju.

'Contrary to expectations, that essay/two essays/those essays with an interesting subtitle/two subtitles/interesting subtitles won the competition.'

2 Kada smo skrenuli, osunčani proplanak/dva proplanka/osunčani proplanci sa zelenim javorom/dva javora/zelenim javorima je nestao/su nestala/su nestali iz vida.

'When we turned, the sunny plain/two plains/the sunny plains with a green maple tree/two maple trees/green maple trees disappeared from the sight.'

3 Za razliku od kredenca, stari kovčeg/dva kovčega/stari kovčezi sa velikim katancem/dva katanca/velikim katancima je delovao/su delovala/su delovali očuvano.

'Unlike the cupboards, the old chest/two chests/old chests with a big lock/two lock/big locks seemed preserved.'

4 Prilikom spremanja, porcelanski tanjir/dva tanjira/porcelanski tanjiri sa crvenim ornamentom/dva ornamenta/crvenim ornamentima je pao/su pala/su pali na pločice.

'During cleaning, the porcelain plate/two porcelain plates/porcelain plates with an ornament/two ornaments/ornaments fell down on the floor.'

5 Mada je nameštaj naš, beli tepih/dva tepiha/beli tepisi sa sivim krugom/dva kruga/sivim krugovima je pripadao/su pripadala/su pripadali mojoj baki.

'Although the furniture is ours, the white carpet/two carpets/the carpets with a grey circle/two circles/grey circles belonged to my grandmother.'

6 Zahvaljujući dobrom dizajnu, novi model/dva modela/novi modeli sa poboljšanim upravljačem/dva upravljača/poboljšanim upravljačima je donosio/su donosila/su donosili veliku zaradu.

'Thanks to good design, the new model/two models/the new models with an updated controller/two controllers/updated controllers brought a lot of money.'

7 Čim je granulo sunce, beli ljiljan/dva ljiljana/beli ljiljani sa zelenim listom/dva lista/zelenim listovima je procvetao/su procvetala/su procvetali u bašti.

'Upon sunrise, a white lilly/two lillies/the white lillies with a green leaf/two leaves/green leaves blossomed in the garden.'

8 Uprkos istorijskoj važnosti, drevni mač/dva mača/drevni mačevi sa sitnim natpisom/dva natpisa/sitnim natpisima je propadao/su propadala/su propadali na tavanu.

'Despite its historical significance, an ancient sword/two swords/ancient swords with a small inscription/two inscriptions/small inscriptions was falling into decay at the attic.'

9 Nakon par pokušaja, plavi mantil/dva mantila/plavi mantili sa unutrašnjim džepom/dva džepa/unutrašnjim džepovima je stao/su stala/su stali u kutiju.

'After few attempts, a blue coat/two coats/blue coats with an inner pocket/two pockets/inner pockets fitted in the box.'

10 Kao i orhideje, šareni buket/dva buketa/šareni buketi sa predivnim narcisom/dva narcisa/predivnim narcisima je mirisao/su mirisala/su mirisali divno.

'As orchids, the colorful bouquet/two bouquets/colorful bouquets with a gorgeous daffodil/two daffodils/gorgeous daffodils smelled great.'

11 Među mnogim radovima, modernistički crtež/dva crteža/modernistički crteži sa neobičnim oblakom/dva oblaka/neobičnim oblacima je osvojio/su osvojila/su osvojili nagradu.

'Among many works, the modernist drawing/two drawings/modernist drawings with an unusual cloud/two clouds/unusual clouds won(received) a prize.'

12 Izuzev par ogrebotina, antikvarni ormar/dva ormara/antikvarni ormari sa gvozdenim ključem/dva ključa/gvozdenim ključevima je odoleo/su odolela/su odoleli vremenu.

'Besides few scratches, the antique cabinet/two cabinets/antique cabinets with an iron key/two keys/iron keys stood the test of time.'

13 Tokom puta, vijugavi drum/dva druma/vijugavi drumovi sa opasnim nagibom/dva nagiba/opasnim nagibima je izazivao/su izazivala/su izazivali vrtoglavicu.

'During the road, the sinuous road/two roads/the sinuous roads with a dangerous slope/two slopes/dangerous slopes were causing vertigo.'

14 Kada smo stigli, veliki kofer/dva kofera/veliki koferi sa pokidanim točkićem/dva točkića/pokidanim točkićima je stajao/su stajala/su stajali nasred sobe.

'When we arrived, the big suitcase/two suitcases/the big suitcases with a broken wheel/two wheels/broken wheels were left in the middle of the room.'

15 Na poslednjem testu, briljantan zadatak/dva zadatka/briljantni zadaci sa tačnim odgovorom/dva odgovora/tačnim odgovorima je odskakao/su odskakala/su odskakali od ostalih.

'On the last exam, the brilliant assignment/two assignments/the brilliant assignments with a correct answer/two answers/correct answers stood out.'

16 Dok smo postavljali sto, mamin kolač/dva kolača/mamini kolači sa slatkim filom/dva fila/slatkim filovima je rastao/su rasla/su rasli u rerni.

'While setting the table, mom's cake/two cakes/mom's cakes with a sweet filling/two fillings/sweet fillings grew in the oven.'

17 Tog jutra, glasan telefon/dva telefona/glasni telefoni sa dosadnim tonom/dva tona/dosadnim tonovima je zujao/su zujala/su zujali pola sata.

'That morning, the loud phone/two phones/the loud phones with a boring tone/two tones/boring tones rang for half an hour.'

18 Dok smo pričali, ukusni biftek/dva bifteka/ukusni bifteci sa kremastim sosom/dva sosa/kremastim sosovima je cvrčao/su cvrčala/su cvrčali u tiganju.

'During chatting, the tasty steak/two steaks/the tasty steaks with a creamy sauce/two saces/creamy sauces sizzled in the pan.'

19 Bez obzira na žanr, taj hit/dva hita/ti hitovi sa zaraznim refrenom/dva refrena/zaraznim refrenima je zvučao/su zvučala/su zvučali dobro.

'Regardless of the genre, that hit/two hits/those hits with a catchy chorus/two choruses/catchy choruses sounded good.'

20 U trenutku nepažnje, platneni neseser/dva nesesera/platneni neseseri sa crvenim karminom/dva karmina/crvenim karminima je ispao/su ispala/su ispali iz torbe.

'In the moment of negligence, the linen vanity case/two vanity cases/the linen vanity cases with a red lipstick/two lipsticks/red lipstick fell out of the bag.'

21 Na kraj sela, onaj šumarak/dva šumarka/oni šumarci sa mladim bagremom/dva bagrema/mladim bagremima je goreo/su gorela/su goreli satima.

'At the end of village, that grove/two groves/those groves with a young acacia tree/two acacia trees/young acacia trees were burning for hours.'

22 I nakon krečenja, stari kućerak/dva kućerka/stari kućerci sa ogromnim podrumom/dva podruma/ogromnim podrumima je zaudarao/su zaudarala/su zaudarali na memlu.

'Even after the painting, the old house/two houses/the old houses with a huge cellar/two cellars/huge cellars stunk like mold.'

23 Iako nemamo mesta, tetkin automobil/dva automobila/tetkini automobili sa pokidanim branikom/dva branika/pokidanim branicima je zauzeo/su zauzela/su zauzeli celu garažu.

'Although we don't have enough space, my aunt's car/two cars/my aunt's cars with a broken bumper/two bumpers/broken bumpers occupied the entire garage.'

24 Uprkos lošem prijemu, taj roman/dva romana/ti romani sa uzbudljivim zapletom/dva zapleta/uzbudljivim zapletima je stekao/su stekla/su stekli svetsku slavu.

'In spite of the bad weather, that novel/two novels/those novels with an interesting plot/two plots/interesting plots gained world fame.'

25 Početkom 19. veka, kratak putopis/dva putopisa/kratki putopisi sa komičnim epilogom/dva epiloga/komičnim epilozima je uticao/su uticala/su uticali na književnost.

'At the beginning of 19th century, the short travel journal/two travel journals/short travel journals with a comic epilogue/two epilogues/comic epilogues influenced literature.'

26 U zlatari, prelepi broš/dva broša/prelepi broševi sa crvenim rubinom/dva rubina/crvenim rubinima je mamio/su mamila/su mamili uzdahe žena.

'In the jewelry store, the beatiful brooche/two brooches/the beautiful brooches with a red ruby/two rubies/red rubies lured the women.'

27 Kada smo izašli, zlatni lančić/dva lančića/ zlatni lančići sa simpatičnim priveskom/dva priveska/simpatičnim privescima je sijao/su sijala/su sijali na suncu.

'When we went out, the golden chain/two chains/the golden chains with a lovely pendant/two pendants/lovely pendants was shining on the sun.'

28 I pored reklame, skupi sladoled/dva sladoleda/skupi sladoledi sa jakim ukusom/dva ukusa/jakim ukusima je ostao/su ostala/su ostali bez kupaca.

'Despite advertizing, the expensive icecream/two icecreams/the expensive icecreams with a strong flavour/two flavours/strong flavours remained unsold.'

29 Sa starim koferom, debeli džemper/dva džempera/debeli džemperi sa šarenim dezenom/dva dezena/šarenim dezenima je zadavao/su zadavala/su zadavali probleme pri pakovanju.

'With the old suitcase, the think jumper/two jumpers/the thick jumpers with colorful pattern/two patterns/colorful patterns caused problems for packing.'

30 Pored klima uređaja, veliki ventilator/dva ventilatora/veliki ventilatori sa brzim programom/dva programa/brzim programima je hladio/su hladila/su hladili kuću.

'Besides air-conditioning, the big fan/two fans/the big fans with a fast option(speed)/two options (speeds)/fast options(speeds) was cooling the house.'

31 Prema kritičarima, sivi kip/dva kipa/sivi kipovi sa uzdignutim mačem/dva mača/uzdignutim mačevima je ilustrovao/su ilustrovala/su ilustrovali trijumf osvajača.

'According to the critics, the grey statue/two statues/the gray statues with raised sword/two swords/raised swords represented the triumph of the conqueror.'

32 Kao i ostali eksponati, umetnikov rad/dva rada/umetnikovi radovi sa visokim neboderom/dva nebodera/visokim neboderima je oslikavao/su oslikavala/su oslikavali moderno društvo.

'Like other showpieces, the author's artwork/two artworks/the author's artworks with a tall skyscraper/two skyscrapers/tall skyscrapers reflected the modern society.'

33 Kako muzikolozi kažu, taj balet/dva baleta/ti baleti sa produženim činom/dva čina/produženim činovima je podsećao/su podsećala/su podsećali na Čajkovskog.

'As the musicologists claim, that ballet/two ballets with an extended act/two acts/extended acts remided of Tchaikovsky.'

34 Na sajmu automobila, uglancani mercedes/dva mercedesa/uglancani mercedesi sa upadljivim brisačem/dva brisača/upadljivim brisačima je privukao/su privukla/su privukli mnogo pažnje.

'At the auto show, the polished mercedes automobiles/two mercedes automobiles/the polished mercedes automobiles with a showy windscreen wiper/two windscreen wipers/showy windscreen wipers attracted a lot of attention.'

35 Vrlo brzo, novi program/dva programa/novi programi sa šaljivim skečom/dva skeča/šaljivim skečevima je zadobio/su zadobila/su zadobili simpatije gledalaca.

'Very soon, the new show/two show/the new shows with a witty skit/two skits/witty skits won the affection of audience'

36 Pre rekonstrukcije, veliki dvorac/dva dvorca/veliki dvorci sa visokim prozorom/dva prozora/visokim prozorima je podražavao/su podražavali/su podražavali gotski stil.

'Before the reconstruction, the big castle/two castles/the big castles with a big window/two windows/big windows resembled gotchic style.'

37 U prodavnici tehnike, skupi televizor/dva televizora/skupi televizori sa ugrađenim zvučnikom/dva zvučnika/ugrađenim zvučnicima je davao/su davala/su davali utisak prave predstave.

'At the electronics store, the expensive television/two televisions/the expensive televisions with a built-in speaker/two speakers/built-in speakers gave the impression of a real show.'

38 Od svih proizvoda za čišćenje, žuti sunđer/dva sunđera/žuti sunđeri sa dodatnim slojem/dva sloja/dodatnim slojevima je brisao/su brisala/su brisali najbolje.

'From all the cleaning products, the yellow sponge/two sponges/the yellow sponges with an extra layer/two layers/extra layers cleaned better.'

39 Nakon promocije, novi preparat/dva preparata/novi preparati sa inovativnim sastojkom/dva sastojka/inovativnim sastojcima je pojeftinio/su pojeftinila/su pojeftinili u Srbiji.

'After the promotion, the new product/two products/the new products with an innovative ingredient/two ingredients/innovative ingredients became cheaper in Serbia.'

40 Tokom par meseci, zajednički projekat/dva projekta/zajednički projekti sa izmenjenim nacrtom/dva nacrta/izmenjenim nacrtima je čekao/su čekala/su čekali na odobrenje.

'During several months, the joint project/two projects/th ejoint projects with an amended scheme/two schemes/amended schemes waited for approval.'

41 Na prvi pogled, napušteni letnjikovac/dva letnjikovca/napušteni letnjikovci sa mračnim ulazom/dva ulaza/mračnim ulazima je izgledao/su izgledala/su izgledali zastrašujuće.

'At first glance, the abandoned country house/two country houses/the abandoned country houses with a dark entrance/two entrances/dark entrances looked scary.'

42 Pored muzičkog programa, ludi performans/dva performansa/ludi performansi sa jakim vatrometom/dva vatrometa/jakim vatrometima je zainteresovao/su zainteresovala/su zainteresovali posetioce.

'Besides musical program, the crazy performance/two performances/crazy performances with a powerful firework/two fireworks/powerful fireworks engaged the visitors.'

43 Kao i svake godine, obližnji grad/dva grada/obližnji gradovi sa sportskim terenom/dva terena/sportskim terenima je učestvovao/su učestvovala/su učestvovali u akciji.

'Same as every year, the nearby town/two towns/the nearby towns with a sports court/two (sports) courts/sports courts took part in the movement.'

44 Prošle sezone, večernji trening/dva treninga/večernji treninzi sa intenzivnim delom/dva dela/intenzivnim delovima je umarao/su umarala/su umarali sve igrače.

'Last season, the evening training/two trainings/the evening trainings with an intensive part/two parts/intensive parts fagged out all the players.'

45 Pre renoviranja, mali pab/dva paba/mali pabovi sa drvenim stolom/dva stola/drvenim stolovima je primao/su primala/su primali manje gostiju.

'Before the renovation, the little pub/two pubs/the little pubs with a wooden table/two tables/wooden tables accommodated less guests.'

46 Prema legendi, stari dnevnik/dva dnevnika/stari dnevnici sa zlatnim inicijalom/dva inicijala/zlatnim inicijalima je krio/su krila/su krili mnogo tajni.

'According to the legend, the old diary/two diaries/the old diaries with a golden initial/two initials/golden initials kept many secrets.'

47 Godinama, ružni grafit/dva grafita/ružni grafiti sa velikim zmajem/dva zmaja/velikim zmajevima je zastrašivao/su zastrašivala/su zastrašivali prolaznike.

'For years, the ugly mural/two murals/the ugly murals with a giant dragon/two dragons/giant dragons frightened away the passers-by.'

48 Postepeno, tužni film/dva filma/tužni filmovi sa neuspelim nastavkom/dva nastavka/neuspelim nastavcima je odlazio/su odlazila/su odlazili u zaborav.

'Gradually, the sad movie/two movies/the sad movies with an unsuccessful sequel/two sequels/unsuccessful sequels faded into oblivion.'

49 Prilikom prevoza robe, stari kamion/dva kamiona/stari kamioni sa manjim kvarom/dva kvara/manjim kvarovima je truckao/su truckala/su truckali neprestano.

'During the shipment, the old truck/two trucks/the old trucks with a minor malfunction/two malfunctions/minor malfunctions bounced constantly.'

50 Ispod njene marame, srebrni medaljon/dva medaljona/srebrni medaljoni sa malim dijamantom/dva dijamana/malim dijamantima je blještao/su blještala/su blještali vrlo jasno.

'Underneath her scarf, the silver medallion/two medallions/the silver medallions with a small diamond/two diamonds/small diamonds flared brightly.'

51 Prilikom pomeranja stola, veliki rokovnik/dva rokovnika/veliki rokovnici sa crvenim obeleživačem/dva obeleživača/crvenim obeleživačima je srušio/su srušila/su srušili vazu.

’During the desk movement, the big agenda/two agendas/the big agendas with a red bookmark/two bookmarks/red bookmarks knocked down the vase.'

52 Pored sve buke, okrugli časovnik/dva časovnika/okrugli časovnici sa iritantnim alarmom/dva alarma/iritantnim alarmima je zvonio/su zvonila/su zvonili neprestano.

’In addition to the noise, the rounded clock/two clock/the rounded clocks with an irritating alarm/two alarms/iritating alarms rang on and on.'

53 Prema nutricionistima, energetski napitak/dva napitka/energetski napici sa dodatim vitaminom/dva vitamina/dodatnim vitaminima je pokazao/su pokazala/su pokazali dobre rezultate.

’According to the nutricionists, the energy drink/two drinks/energy drinks with an additional vitamin/two vitamins/additional vitamins showed good results.'

54 Budući da sam kolekcionar, porcelanski servisi/dva servisa/porcelanski servisi sa oslikanim čajnikom/dva čajnika/oslikanim čajnicima je vredeo/su vredela/su vredeli svake pare.

’As I am a collector, the china set/two sets/china sets with a painted teapot/two teapots/painted teapots was/were worth every penny.'

55 Čak i zimi, veliki voćnjak/dva voćnjaka/veliki voćnjaci sa savremenim plastenikom/dva plastenika/savremenim plastenicima je zahtevao/su zahtevala/su zahtevali dosta rada.

’Even at winter, the big orchard/two orchards/the big orchards with a contemporary greenhouse/two greenhouses/contemporary greenhouses required a lot of work.'

56 Zbog izuzetne arhitekture, prelepi most/dva mosta/prelepi mostovi sa belim stubom/dva stuba/belim stubovima je zaslužio/su zaslužila/su zaslužili divljenje.

’Due to its extraordinary architecture, the gorgeous bridge/two bridges/the gorgeous bridges with a white pier/two piers/white piers deserved admiration.'

57 Pre restauracije, čelični spomenik/dva spomenika/čelični spomenici sa zelenim vencem/dva venca/zelenim vencima je nervirao/su nervirala/su nervirali građane.

’Before the renovation, the iron monument/two monuments/the iron monuments with a green garland/two garlands/green garlands iritated the citizens.'

58 Nasuprot dobrim forama, glupi fazon/dva fazona/glupi fazoni sa šašavim policajcem/dva policajca/šašavim policajcima je vređao/su vređala/su vređali mnoge.

’As opposed to good jests, the stupid joke/two jokes/the stupid jokes with a silly policeman/two policemen/silly policemen offended many people.'

59 Pre popravke, neravni drum/dva druma/neravni drumovi sa uskim kolosekom/dva koloseka/uskim kolosecima je zabrinjavao/su zabrinjavala/su zabrinjavali vozače.

’Before the repair, the bumpy roadway/two roadways/the bumpy roadways with a narrow lane/two lanes/narrow lanes troubled the drivers.'

60 Na Istoku, uvežbani ples/dva ples/uvežbani plesovi sa dubokim naklonom/dva naklona/dubokim naklonima je otvarao/su otvarala/su otvarali ceremonije.

’In the Far East, the coordinated choreography/two choreographies/the coordinated coreographies with a deep bow/two bows/deep bows opened the ceremonies.'

61 Pored postojećih regulativa, novi zakon/dva zakona/novi zakoni sa izmenjenim članom/dva člana/izmenjenim članovima je doprineo/su doprinela/su doprineli razvoju kulture.

’Besides the existing regulations, the new act/tow acts/the new acts with a corrected clause/two clauses/corrected caluses contributed to the cultural growth.'

62 Čak i pored kvarova, moderni radijator/dva radijatora/moderni radijatori sa malim podešivačem/dva podešivača/modernim podešivačima je grejao/su grejala/su grejali dobro.

’Even with the damages, the modern radiator/two radiators/teh modern radiators with a small ajuster/two adjusters/small adjusters warmed very well.'

63 I pored obećanja lekara, komplikovani zahvat/dva zahvata/komplikovani zahvati sa malim šavom/dva šava/malim šavovima je plašio/su plašila/su plašili dečakovu majku.

’Despite the doctor's promises, the complex procedure/two procedures/the complex procedures with a small stitch/two stitches/small stitches scared the boy's mother.'

64 Prošle nedelje, kratak imejl/dva imejla/kratki imejlovi sa opasnim virusom/dva virusa/opasnim virusima je kružio/su kružila/su kružili internetom.

’Last week, the short e-mail/two e-mails/the short e-mails with a dangerous virus/two viruses/dangerous viruses circulated through the internet.'

65 Na Badnje veče, veliki panj/dva panja/veliki panjevi sa osušenim bršljenom/dva bršljena/osušenim bršljenovima je pucketao/su pucketala/su pucketali na vatri.

’At Christmas eve, the big log/two logs/the big logs with a dried ivy/two ivies/dried ivies crackled in the fire.'

66 Na aukciji, misteriozni pejzaž/dva pejzaža/misteriozni pejzaži sa drvenim čamcem/dva čamca/drvenim čamcima je izluđivao/su izluđivala/su izluđivali posetioce.

’At the auction, the mysterious landscape painting/two landscape paintings/the mysterious landscape paintings with a wooden boat/two boats/wooden boats upset the participants.'

67 Pri dolasku, dugački put/dva puta/dugački putevi sa naglim usponom/dva uspona/naglim usponima je otežavao/su otežavala/su otežavali vožnju.

’Upon arrival, the long road/two roads/the long roads with an abrupt incline/two inclines/abrupt inclines hindered driving.'

68 Tokom dijete, lagan obrok/dva obroka/lagani obroci sa biljnim čajem/dva čaja/biljnim čajevima je zadovoljavao/su zadovoljavala/su zadovoljavali dnevne potrebe.

’Throughout the diet, the light meal/two meals/the light meal with a herbal tea/two teas/herbal teas fulfilled the daily needs.'

69 Posle požara, napušteni gradić/dva gradića/napušteni gradići sa popločanim trgom/dva trga/popločanim trgovima je smrdeo/su smrdela/su smrdeli na paljevinu.

’After the fire, the abandoned town/two towns/the abandoned towns with a tiled square/two squares/tiled squares smelled burnt.'

70 Dok smo prolazili kroz grad, crveni krov/dva krova/crveni krovovi sa visokim odžakom/dva odžaka/visokim odžacima je promicao/su promicala/su promicali pored nas.

’While we were moving through the city, the red roof/two roofs/the red roofs with a tall chimney/two chimneys/tall chimneys passed us by.'

71 Dok smo šetali, betonski pločnik/dva pločnika/betonski pločnici sa uskim trotoarom/dva trotoara/uskim trotoarima je isparavao/su isparavala/su isparavali posle kiše.

’While we were walking, the concrete walkway/two walkways/the concrete walkways with a narrow pavement/two pavements/narrow pavements evaporated after the rain.'

72 Na svu sreću, platneni kofer/dva kofera/platneni koferi sa skupim blejzerom/dva blejzera/skupim blejzerima je čekao/su čekala/su čekali na recepciji.

’Luckily, the linen suitcase/two suitcases/the linen suitcases with an expensive blazer/two blazers/expensive blazers was/were waiting for us at the reception.'

73 Pre selidbe, stari kauč/dva kauča/stari kaučevi sa udobnim naslonom/dva naslona/udobnim naslonima je trunuo/su trunula/su trunuli u podrumu.

’Before moving, the old sofa/two sofas/the old sofas with a cozy arm/two arms/cozy arms was/were rotting in the basement.'

74 Pre postavljanja semafora, visoki znak/dva znaka/visoki znaci sa žutim putokazom/dva putokaza/žutim putokazima je zbunjivao/su zbunjivala/su zbunjivali vozače.

'Before putting the traffic light, the tall traffic sign/two traffic signs/the tall traffic signs with a yellow guidepost/two guideposts/yellow guideposts confused the drivers.'

75 Koliko pamtim, široki bulevar/dva bulevara/šitoki bulevari sa retkim drvoredom/dva drvoreda/retkim drvoredima je vodio/su vodila/su vodili ka plaži.

'As far as I can remember, the broad boulevard/two boulevards/the broad boulevards with a sparse alley/two alleys/sparse alleys led to the beach.'

76 U našem bloku, ružni soliter/dva solitera/ružni soliteri sa sporim liftom/dva lifta/sporim liftovima je išao/su išla/su išli svima na živce.

'In our block, the ugly buliding/two buildings/the ugly buildings with a slow elevator/two elevators/slow elevators got on everyone's nerves.'

77 Nekada davno, brzi voz/dva voza/brzi vozovi sa ispisanim vagonom/dva vagona/ispisanim vagonima je prolazio/su prolazila/su prolazili ovuda.

'Long time ago, the fast train/two trains/the fast trains with a graffiti-covered railcar/two railcars/graffiti-covered railcars went through this area.'

78 Vekovima unazad, prelepi hram/dva hrama/prelepi hramovi sa oslikanim portalom/dva portala/oslikanim portalima je inspirisao/su inspirisala/su inspirisali umetnike.

'For centuries, the beautiful temple/two temples/the beutiful temples with a painted doorway/two doorways/painted doorways inspired the artists.'

79 U Indiji, iznenadni cunami/dva cunamija/iznenadni cunamiji sa razarajućim talasom/dva talasa/razarajućim talasima je naneo/su nanela/su naneli veliku štetu.

'In India, the unexpected tsunami/two tsunamis/the unexpected tsunamis with a destructive wave/two waves/destructive waves made a lot of damage.'

80 Uprkos kiši, ulični festival/dva festivala/ulični festivali sa zanimljivim koncertom/dva koncerta/zanimljivim koncertima je trajao/su trajala/su trajali nedelju dana.

'Despite the rain, the street festival/two festivals/the street festivals with an interesting concert/two concerts/interesting concerts lasted a week.'

81 Tokom godina, gradski muzej/dva muzeja/gradski muzeji sa originalnim rukopisom/dva rukopisa/originalnim rukopisima je zadržao/su zadržala/su zadržali ugled.

’Over the years, the city museum/two museums/the city museums with the original manuscript/two manuscripts/the original manuscripts kept their good reputation.'

82 Prošle nedelje, beli kabriolet/dva kabrioleta/beli kabrioleti sa pokvarenim farom/dva fara/pokvarenim farovima je uzrokovao/su uzrokovala/su uzrokovali sudar.

’Last week, the white convertible/two convertibles/the white convertibles with a malfunctioning headlight/two headlights/malfunctioning headlights caused an accident.’

83 Za vreme Rimljana, visoki zid/dva zida/visoki zidovi sa uzanim prolazom/dva prolaza/uzanim prolazima je čuvao/su čuvala/su čuvali od neprijatelja.

’In Roman times, the tall wall/two talls/the tall walls with a narrow passage/two passages/narrow passages protected from the enemies.'

84 Na raskrsnici, crveni traktor/dva traktora/crveni traktori sa metalnim plugom/dva pluga/metalnim plugovima je blokirao/su blokirala/su blokirali saobraćaj.

’At the crossroad, the red tractor/two tractors/the red tractors with a metal plough/two ploughs/metal ploughs blocked the traffic.’

85 Po mojoj proceni, onaj trotinet/dva trotineta/oni trotineti sa pokvarenim točkom/dva točka/pokvarenim točkovima je predstavljao/su predstavljala/su predstavljali opasnost za decu.

’In my opinion, that scooter/two scooters/those scooters with a damaged wheel/two wheels/damaged wheels imposed danger upon children.'

86 Posle suđenja, njegov testament/dva testamenta/njegovi testamenti sa lažnim potpisom/dva potpisa/lažnim potpisima je izgubio/su izgubila/su izgubili pravosnažnost.

’After the trial, his will/two wills/his wills with a fake signature/two signatures/fake signatures lost their validity.'

87 Zbog novog programa, novi udžbenik/dva udžbenika/novi udžbenici sa korisnim dodatkom/dva dodatka/korisnim dodacima je zamenio/su zamenila/su zamenili stare knjige.

’With the new program, the new textbook/two textbooks/the new textbooks with a useful appendix/two appendices/useful appendices replaced the old books.'

88 Kao i svi ukrasi, veliki svećnjak/dva svećnjaka/veliki svećnjaci sa zlatnim stalkom/sa dva stalka/sa zlatnim stalcima je skupljao/su skupljala/su skupljali prašinu na polici.

’Like any ornament, the big candleholder/two candleholders/the big candleholdres with a golden pedestal/two pedestals/golden pedestals collected the dust on a shelf.'

89 Na sinoćnom koncertu, simfonijski orkestar/dva orkestra/simfonijski orkestri sa dobrim saksofonom/dva saksofona/dobrim saksofonima je očarao/su očarala/su očarali goste.

’At the last night's concert, the symphony orchestra/two orchestras/symphony orchestras with a good saxophone/two saxophones/good saxophones enchanted the audience.'

90 Nakon dugo čekanja, kvalitetni mikrofon/dva mikrofona/kvalitetni mikrofoni sa jakim magnetom/dva magneta/jakim magnetim je stigao/su stigla/su stigli poštom.

’After long waiting, the quality microphone/two microphones/the quality microphones with a strong magnet/two magnets/strong magnets arrived in the mail.'