■ PROCESSING OF GENDER NEUTRAL NOUNS (EPICENA): TESTING THE COGNITIVE RELEVANCE OF SYNTACTIC AND SEMANTIC AGREEMENT OF SERBIAN EPICENE NOUNS ENDING IN -*ICA* IN DIFFERENT SYNTACTIC ENVIRONMENTS USING ACCEPTABILITY JUDGEMENT MEASURES

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Cilj ove psiholingvističke studije je proučavanje procesuiranja kongruencije roda epicena (imenica nedefinisanog roda) u srpskom jeziku. Epicene u srpskom jeziku podržavaju dve paradigme slaganja (kongruencije), semantičku i sintaksičku. Naime, imenica epicena kao što je *tvrdica* sa sebi pridruženim atributom se može slagati semantički, tj. po muškom rodu (*naporni tvrdica*$_{m.rod}$), ili sintaksički (gramatički), tj. po ženskom rodu (*naporna tvrdica*$_{ž.rod}$). Takođe, radni glagolski pridev kao deo složenog glagolskog vremena perfekta će u srpskom jeziku dozvoliti obe kongruentske paradigme u slučaju slaganja sa epicenama (Tvrdica je nerado kupio$_{m.rod}$ / kupila$_{ž.rod}$ kartu za gradski autobus.). U okviru ovog rada, koristeći Likertovu skalu kao metod istraživanja, proučavaju se razlike u preferencama između dve gorepomenute paradigme kongruencije. Kako bi se eliminisao uticaj sintaksične udaljenosti na izbor između ovih dveju paradigmi, maternjim govornicima su prikazani stimulusi koji uključuju slaganje imenice sa pridruženim atributom (unutarsintagmatsko slaganje), imenice sa radnim glagolskim pridevom (izvansintagmatsko slaganje), i imeničkim predikativom (izvansintagmatsko slaganje). Krajnji cilj rada je, naime, procena prednosti koju maternji govornici pripisuju semantičkom ili sintaksičkom obrascu kongruencije u različitim sintaksičkim okruženjima, kao i potvrđivanje ili opovrgavanje validnosti Korbetove hijerarhije kongruencije (Corbett 2006b) kod epicena. Analiza podataka je ukazuje da, iako je većina ispitanika prednost davala sintaksičkoj paradigmi slaganja u svim prezentovanim sintaksičkim okruženjima, u izboru između ova dva tipa kongruencije postoji izvesna sistematičnost, čime se donekle implicira validnost hijerarhije kongruencije.

Ključne reči: procesuiranje roda, hijerarhija kongruencije, epicena, kongruencija, zadatak odabira roda, vreme reakcije.

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1. INTRODUCTION

The word gender has a well-established technical sense in linguistic discussions (McConnell-Ginet 1988). Gender is considered an inherent feature of nouns, based on arbitrary formal features, the meaning and form of the noun (e.g., Corbett 2006a; Hanulíková/Carreiras 2015). Gender processing is confirmed to integrate available linguistic cues (Vigliocco/Franck 1999; Vigliocco/Hartsuiker 2002; Popov 2020). Moreover, gender is considered to entail practical implications for agreement relations (McConnell-Ginet 1988). Research in the field of gender processing examines how the human brain stores and retrieves gender information, and how gender information affects agreement processes, both in production and comprehension. Psycholinguistic research has focused on discovering the mechanisms that the language processor uses to comprehend gender processing (Hagoort/Brown, 1999) and gender agreement processing (Molinaro *et al.* 2011). This research led to the development of theories and methods describing gender processing (Vigliocco/Hartsuiker 2002). However, instead of focusing on gender processing of more researched *common nouns*, we will focus on the gender processing in gender neutral (*epicene*) nouns. Moreover, we will adopt a perspective that highlights the difference between the two agreements gender neutral nouns allow for, namely syntactic and semantic agreement in different syntactic conditions with the aim of disambiguating the effect of syntactic distance on the choice between the two aforementioned agreement types.

2. THEORETICAL BACKGROUND

2.1. GENDER

According to Molinaro and colleagues (2011) gender presents a very complex pattern across languages. Gender is defined as one of the main agreement categories (Molinaro *et al.* 2011), meaning that noun gender is a property reflected in the morphosyntactic behaviour of other words (Hockett 1958). Molinaro and colleagues (2011) state that it is often impossible to tell the gender of a noun only by the noun's morphological composition or semantics, claiming that gender values can be both grammatically and semantically interpretable. Gender values are semantically interpretable only when they refer to animate entities and humans, whereas semantic interpretation of gender values is rendered impossible in case the noun denotes inanimate referents.

2.2. GRAMMATICAL AND SEMANTIC GENDER

Gender is further classified into the following subcategories: grammatical, conceptual (semantic) and biosocial gender. Grammatical or syntactic gender is an inherent property of nouns which establishes morphologically marked agreement relations between different syntactic elements (Bußmann/Hellinger 2003). Grammatical gender is always carried by inanimate nouns, as well as animate nouns without transparent gender morphology (Piazza *et al.* 2022).

However, although grammatical gender value cannot be inferred from semantic properties of the noun or from contextual information (Corbett, 1991; 2006), certain nouns entail predictable gender features based on their semantic content, mirroring

the biosocial gender of the noun's referent (Vigliocco *et al.* 2005; Popov 2017). In fact, Corbett (1991) argues that the gender of a noun can be derived from other properties of the noun or the noun referent (Hagoort/Brown 1999).

The gender that mirrors the noun's semantic properties is referred to as 'semantic' gender in literature (Vigliocco/Franck, 1999; Piazza *et al.* 2022). According to Vigliocco and Franck (1999) the semantics of the noun entailing semantic gender can aid overall gender decoding. This raises the issue whether the processing of grammatical gender is driven purely by syntactic form or is influenced by conceptual factors (Hagoort/Brown 1999). In terms of phonology, certain phonological endings explicitly indicate information about the referent's biological gender, which means they have overt gender. (Bobb/Mani 2013; Piazza *et al.* 2022) Other nouns have an opaque ending, whereby the ending is not indicative of grammatical or semantic gender (Piazza *et al.* 2022). Some researchers also consider grammatical, semantic and biosocial gender to be conceptually connected (Konish 1993; Irmen/Kurovskaja 2010; Ackerman 2019).

2.3. NOUN GENDER

According to Corbett (1991), the nouns are divided into two groups, rational and non-rational. Rational nouns denote living beings, whereby the grammatical gender corresponds to the biosocial sex. Nouns with neutral gender agreement are non-rational, and they denote all living beings without a specified biological sex, or objects whose gender cannot be explained by the existence of a biosocial sex (Pišković 2011).

Semantic gender can only be a feature of rational nouns, whereas referential gender can be entailed in both rational and non-rational nouns denoting animate entities. Nouns with referential gender do not require a semantic gender, as their biological sex is either irrelevant or inconspicuous (Pišković 2011). Košprdić (2016) concludes that only nouns with semantic gender can have a grammatical gender corresponding to their biosocial features. Moreover, if the feature value of the grammatical and semantic gender is not the same, these nouns are considered to only have a referential, and not semantic gender. Radić (2010) points further at such discrepancies, saying that a grammatically masculine noun can denote a semantically feminine entity (e.g. *devojčurak* 'girlie') and vice versa (e.g. *neženja* 'bachelor') (Radić 2010). Epicene nouns are believed to mostly enter syntactic agreement relations, with an additional ability to also employ semantic agreement (Piper, 2005).

2.4. NOUN GENDER IN SERBIAN

Serbian is a highly inflected language employing to an extent a free word order (Piper, 2005). Serbian nouns are marked for case, grammatical number and grammatical gender. They agree with adjectives, some pronouns and some verb forms in gender, number and case. Each case is marked by an inflectional suffix and the order of these suffixes determines the declension class of Serbian nouns (Baayen/Schreuder 2011). According to Arsenijević (2021), declension classes do not seem to offer a suitable explanation for many instances of unexpected gender agreement patterns (e.g. *tata* 'dad', *vojvoda* 'duke'). Henceforth, a noun can show an agreement pattern that fails to match the natural gender of the referent or its designated declension class (Arsenijević 2021).

2.5. AGREEMENT

As previously mentioned, nouns are marked for three essential grammatical features, otherwise known as phi-features: number, gender, and person (Adger/Harbour 2008). They are the building blocks of an operation called syntactic agreement (Pesetsky/ Torrego 2007), but before agreement happens the phi-features on the noun have to be valued (Popov/Bastiaanse 2018). After they have been valued, the lexical items can enter the syntactic derivation (e.g., Chomsky 2001; Pesetsky/Torrego 2007; Bošković 2011; Popov 2017).

Agreement is a formal and/or semantic accommodation of grammatical forms of morphosyntactic units of language. The function of agreement as a morphosyntactic operation in Serbian is to express the syntactic and semantic dependencies that would have existed in language even without rules for agreement regulation (Piper *et al.* 2005). Agreement establishes a relationship between two sentential elements asymmetrically by transferring feature values from one sentential element, named the goal, to another element, the probe (Pesetsky/Torrego 2007).

Agreement can be complete and incomplete. Complete agreement means that all dependent syntactic elements agree with the goal in terms of grammatical form and meaning, whereas incomplete agreement pertains to either syntactic or semantic agreement (Piper *et al.* 2005; Košprdić 2016).

2.6. GENDER AGREEMENT

Gender agreement is a universal syntactic process whereby a relationship is established between elements at the syntactic level (Hagoort/Brown 1999). Gender and gender agreement used to be considered a formal feature engaging in a strictly syntactic relationship (Hagoort/Brown 1999). Additionally, gender is a fixed property of the noun and gender values of dependent agreeing elements are interpreted from the value of the trigger noun (Ritter 1988). Online processing of gender agreement is demonstrated to be not a content-driven, but a syntax-driven process (Hagoort/Brown 1999). The type of agreement which is triggered by a noun on declinable modifiers and predicates is thought to be decided by the grammatical gender (Arsenijević 2021). Syntactic and semantic agreement in Slavic languages causes problems even for native speakers, as inconsistencies in relation to person, number and gender resolution are quite common (Puškar 2018).

2.8. GENDER AGREEMENT IN EPICENE NOUNS

The nouns with both semantic and syntactic gender entering hybrid agreement patterns are called hybrid nouns (Puškar 2018). Epicene nouns are a subgroup of hybrid nouns, considered to have a purely referential gender as they denote both biologically male and female entities without change in form (Corbett 2006). Epicene nouns, although they are morphophonologically feminine, are considered not to have an inherent gender as their gender is considered to be determined by contextual factors and allow for both syntactic and semantic agreement (Košprdić 2016). Moreover, their grammatical gender is not informative about the biosocial gender features, as epicene nouns do not differentiate between the biosocial gender of the human beings they denote (Vigliocco *et al.* 2005; Janse 2023). Semantically, they denote a person who engages in a specific

type of social behaviour or entails a certain negative character trait (Košprdić 2016), such as *pijanica* 'drunkard', *pričalica* 'chatterbox' (Puškar 2018).

The agreement in epicene nouns is believed to be established on the basis of the morphosyntactic gender values of the noun and not on its semantic properties, meaning that gender agreement in epicene nouns is established regardless of semantic noun properties (Ogneva 2020). Ogneva (2020) postulates that epicene nouns allow variability in agreement if additional information about the biosocial gender of the referent is present, which subsequently results in syntactic or semantic agreement marked on the probe. This is not in line with Košprdić (2016), who came to different conclusions investigating Serbian, concluding that providing an unequivocally male referent does not influence the agreement pattern. Babić (1973) believes that a mismatch in noun declension and the referent's biological sex leads to a noun entering different types of agreement, whereby gender neutral (epicene) nouns will always follow the agreement type imposed by their noun declension (Babić 1973; Košprdić 2016).

In Serbian, epicenes elicit two types of agreement. The biological sex of the referent they denote depends on the type of agreement they elicit (Puškar 2018). The following examples illustrate the agreement in Serbian epicene nouns: (1a) syntactic/grammatical agreement or (1b) semantic/logical agreement is found when the referent is biologically male, and (1c) overlapping syntactic/grammatical agreement when the referent is biologically female (Puškar 2018). These are the terms that will also be used in the present study, although the awareness of the referential nature of epicene noun gender still exists.

(1a) *Tvrdica*   *je*   *nerado*   *platila*   *račune za vodu i struju.*
    scrooge-FEM   has   reluctantly   paid-FEM   utility bills.
    "The scrooge has reluctantly paid <u>his</u> utility bills."

(1b) *Tvrdica*   *je*   *nerado*   *platio*   *račune za vodu i struju.*
    scrooge-FEM   has   reluctantly   paid-MASC   utility bills.
    "The scrooge has reluctantly paid <u>his</u> utility bills."

(1c) *Tvrdica*   *je*   *nerado*   *platila*   *račune za vodu i struju.*
    scrooge-FEM   has   reluctantly   paid-FEM   utility bills.
    "The scrooge has reluctantly paid <u>her</u> utility bills."

2.9. GENDER AND SYNTACTIC DISTANCE

Examining dependencies involving agreement has the potential to enable better understanding of the multifaceted ways agreement features are recruited during language processing. There are two major currents attempting to explain how a parser establishes dependencies and which factors play a role in the resolution of those dependencies. Other researchers have shown that the ability to form or resolve a dependency weakens with the increase in distance between dependent elements (Just/Carpenter 1992; Gibson 1998, 2000; Lewis *et al.* 2006). Gibson (1998, 2000) postulates that the integration of gender and number feature values becomes more costly with

the increase in distance between a goal and the probe (the terms *head* and *syntactic dependent* are used, respectively).

Previous research, such as the study conducted by Bañón and colleagues (2012) suggests that the distance between the agreeing elements influences the processing of agreement. The researchers differentiate between the contribution of structural distance (number of intervening syntactic phrases) and linear distance (number of intervening words) to the processing of agreement. The researchers modulated gender agreement by creating within-phrase (local) and across-phrase (non-local) gender violations. Within-phrase violations contained a gender violation on the agreeing adjective, and across-phrase violations a gender violation on an agreeing verb. Bañón and colleagues (2012) kept the linear distance and syntactic category constant for both levels of structural distance. Bañón and colleagues (2012) failed to observe amplitude differences in number and gender violations, suggesting similar processing of gender and number, implying that it is the syntactic distance that influences the overall establishment of agreement. The findings are consistent with sentence processing models emphasising the importance of the hierarchical structure on processing of syntactic dependencies (Bañón *et al.* 2012).

The neuroimaging results of Bañón and colleagues (2012) confirmed that the hierarchical nature of sentence structure affects the processing of agreement, and henceforth supported the models of sentence processing predicting that the online processing of linguistic dependencies is influenced by structural distances.

This sends us on a different path, and one cannot help but wonder if similar (or comparable) effects can be obtained in a psycholinguistic study of gender agreement processing. As epicene nouns are the only noun group that entails both semantic and syntactic agreement paradigm in singular form, whereby a gender violation is if not impossible, then very difficult to achieve, they seem like a perfect candidate for the endeavour. Namely, the present study aims to investigate if there are differences in gender agreement processing in different syntactic and structural environments that are not measured using a gender violation paradigm. In sum, the present study investigates the effects of structural distance and syntactic category on the processing of gender agreement of epicene nouns in Serbian.

2.10. AGREEMENT HIERARCHY

As previously mentioned, the noun (goal) functions as the agreement controller (Wechsler 2010). In case that a goal entails both syntactic and semantic gender features, the choice between syntactic and semantic agreement on the probe is believed to be made systematically. Corbett (1979) postulates that not only is the choice systematic, but it is dependent on the type of the agreeing constituent (target).

Namely, syntactic and semantic agreements enter a hierarchy otherwise known as the Agreement Hierarchy (Corbett 1979), which postulates a hierarchy of agreement positions (depending on agreeing constituents). The hierarchy aims to make predictions as to the possibility and relative frequency of semantic as compared to syntactic agreement. According to Corbett (1979), in case the adjective shows grammatical gender agreement, the verb can still show either grammatical or semantic agreement. On the other hand, if the adjective agrees with semantic gender, it is impossible to go back to

grammatical agreement, and the verb can only show natural gender agreement (Puškar 2018). This also means that the possibility of semantic agreement increases with the syntactic distance (Corbett 1979).

The Agreement Hierarchy is a theoretical model aiming to explain the seemingly unpredictable relationship between grammatical and semantic agreement distribution, postulated by Corbett (1979). In sum, it postulates that the possibility of syntactic agreement decreases monotonically moving from left to right on the constituent type scale (Corbett 1979). Subsequently, gender agreement including a certain constituent type on the left of the scale poses constraints for the type of gender agreement located on the right side of the scale. In practice, this means that the semantic gender agreement is obligatory on the predicate (across-phrase) once it has been established on the nominal modifier (within-phrase).

3. METHODOLOGY

3.1. AIMS

The present study aims to investigate gender agreement of epicene nouns across three different conditions (within-phrase and across-phrase) to investigate if predefined gender agreement (syntactic or semantic) will influence the choice of referent.

Based on these findings and the fact that gender processing is usually considered to be a syntactic process rather than semantic, we expect a higher ratio of grammatical agreement options overall. We can also predict that opting for grammatical agreement will be easier in the within-phrase condition, due to the lower syntactic distance between the agreeing elements, thus reinforcing the notion that gender agreement is processed syntactically. The fact that epicenes allow for both gender agreements (without introducing a gender agreement violation that will render a sentence unacceptable), should result in a relatively even ratio between gender responses (Vigliocco *et al.* 2005). However, due to the syntactic influence of the syntactic distance, the ratio of grammatical vs. semantic agreement during the selection process might differ across conditions.

Based on dictionary classification of epicene noun gender and the results obtained by Košprdić (2016) two predictions were created. The present experiment tests this prediction using an Internet-based acceptability judgement task. The use of this technique is primarily motivated by practical considerations due to the ease of access to a wider and more diverse set of participants.

It was already mentioned that nouns have two separate groups of features: grammatical features entailing formal properties, and semantic features, denoting semantic and referential information. The limitations of previous studies of Agreement Hierarchy in Serbian are reflected in the fact that only hybrid nouns (e.g. *tata* "dad", vladika "bishop") were researched. These nouns follow the feminine declension paradigm, but enter hybrid agreement relations (Corbett 1991, 2011). Additionally, although the dual gender agreement properties of epicene nouns were formalised, and formal accounts of their gender representation and agreement pattern were stated (Wechsler/Zlatić 2000, 2003), the reasons why they allow for two agreement patterns have not been formally explained. Moreover, literature on the validity of the Agreement Hierarchy on epicene noun gender agreement seems to be scarce for the time being.

3.2. PARTICIPANTS

A randomly selected sample of 110 native speakers of Serbian (93 female, 16 male, 1 other, mean age 26.3, age range 19–53, were contacted for voluntary participation using snowball and convenience sampling and simple random sampling via social media posts. Prior to data collection, ethical approval was obtained from the Research Ethical Review Committee (CETO) of the Faculty of Arts of the University of Groningen. All participants were expected to disclose their native language, highest achieved education level, as well as information about other foreign or second languages they speak. All participants listed Serbian as their native language. All participants reported to be of legal age to provide informed consent before participation (at least 18 years old) and were informed about the aims of the study upon completion.

The initial attrition was 68 (62%) participants. This includes participants that did decide to not participate in the experiment at all after being contacted, declined to provide consent during the survey, or ended up not completing the full survey.

3.3. MATERIALS

A total number of 13 gender neutral epicene noun items were chosen for the experiment from Serbian dictionaries (Košprdić 2016). The nouns were integrated into an initial set of 156 experimental sentence items and 48 sentence filler items created for the main experiment (78 experimental items and 24 filler items per participant group). All items are presented in Appendix A and B.

Each item described a unique situation. The items consisted of a well-formed stimulus sentence with a blank space, and two options for a potential response to sentence completion. However, no context was provided that would provide potential semantic congruence. The response options were presented in both agreements, masculine (M) and feminine (F), as one of the three following sentence constituents: attribute (ATTR), past participle (PART) or noun predicative (PRED). The target sentence entailed either a masculine or a feminine agreement. The constituent types posed one independent variable, and the two potential agreement options were examined as their subconditions, resulting in six subconditions overall: attribute semantic agreement (M-ATTR), attribute syntactic agreement (F-ATTR), past participle semantic agreement (M-PART), past participle syntactic agreement (F-PART), predicative semantic agreement (M-PRED) and predicative syntactic agreement (F-PRED). The two factors, constituent type and agreement, were crossed within-item factors, thus resulting in six versions of each item.

An example of an epicene noun item across all conditions and subconditions is presented below (3a-5b). Each noun item was presented across three conditions, with the subconditions being chosen by the participant during the online experiment, so that the final list of test items contained all (potential) versions of a given item.

(3a) Syntactic agreement and active past participle (within-phrase) condition (F-PART):
Tvrdica   je   nerado   kupila   kartu za gradski autobus.
scrooge-FEM has reluctantly   bought-FEM   the ticket for the city bus
"The scrooge reluctantly bought the ticket for the city bus."

(3b) Semantic agreement and active past participle (within-phrase) condition (M-PART):
    Tvrdica   je nerado   kupio   kartu za gradski autobus.
    scrooge-FEM has reluctantly   bought-MASC   the ticket for the city bus
    "The scrooge reluctantly bought the ticket for the city bus."

(4a) Syntactic agreement and passive past participle (across-phrase) condition (F-PRED):
    Tvrdica   iz komšiluka   je   dosadna   i uvek traži kusur.
    scrooge-FEM from the neighbourhood is being bothersome-FEM asking for change
    "The scrooge from the neighbourhood is being bothersome asking for change."

(4b) Semantic agreement and passive past participle (across-phrase) condition (M-PRED):
    Tvrdica   iz komšiluka   je   dosadan   ..... i uvek traži kusur.
    scrooge-FEM from the neighbourhood is being bothersome-MASC asking for change
    "The scrooge from the neighbourhood is being bothersome asking for change."

(5a) Syntactic agreement and attribute (within-phrase) condition (F-ATTR):
    Dosadna   tvrdica   će   konačno   kupiti   autobusku kartu.
    tiresome-FEM scrooge-FEM will   finally   buy   bus ticket
    "The tiresome scrooge will finally buy a bus ticket"

(5b) Semantic agreement and attribute (within-phrase) condition (M-ATTR):
    Dosadni   tvrdica   će   konačno   kupiti   autobusku kartu.
    tiresome-MASC scrooge-FEM will   finally   buy   bus ticket
    "The tiresome scrooge will finally buy a bus ticket"

The noun items were selected based on their subtype (epicene ending in -ica), the natural gender (biological sex) of their potential referents, as well as their declension class (class III) according to Stevanović (1986). The noun items were of approximately the same length (7 to 10 characters). All noun items were animate. The target items (the agreeing attribute, past participle and predicative) were of varying length (5 to 13 characters) and frequency, as making adjustment reinforcing the semantics denoted by the epicene without creating a potential implicit genderization was prioritised. Target constituents consisted of an adjective (in either attributive or predicative function) or a verb participle (predicate function).

The structure of the sentence stimuli was mostly consistent across conditions: in attribute [Attribute–N–Adverb–V], in participle [N–Aux–Adverb–V] and in predicative condition [N–Aux–Adverb–V]. Sometimes the adverb was moved or omitted to ensure an unmarked, natural-sounding sentence of comparable length. Moreover, the sentence length was balanced. The epicene entailed the function of sentence subject, and was therefore presented in nominative singular form. The target verb in the participle condition was always provided in past tense, as subject-verb gender agreement is only apparent in compound tenses that contain the L-participle (Brown/Alt 2004). The target adjective in attribute and predicative condition were presented in their nominative singular form. The conjugated present tense verb in the sentence items with the within-phrase (attribute) condition was expected to prevent gender bias as overt gender markers in past tense provide a salient cue to the referential gender. Thus, all PART and

PRED experimental items, as well as two thirds of filler items, had past tense verbs. The target constituents in predicative and participle conditions were followed by either a noun phrase or a short dependent clause consisting of two or three words to reduce the impact of sentence wrap-up effects on the target region (Just/Carpenter 1980) and provide context.

In addition, an initial set of 24 filler sentence items was created. The filler items were similar to experimental items in that they entailed all three conditions (attribute, participle and predicative), amounting to 8 filler sentence items per condition. Importantly, unlike experimental items, the sentence subject was not an epicene noun, henceforth prompting a specific gendered response (incorrect response would yield agreement violation and ungrammatical target sentences). The filler items included nouns with feminine grammatical gender, but masculine biological sex and semantic agreement pattern (FN agreement violation).

In addition to filler sentence items, a set of 6 training sentence items was created to help the participants familiarise with the testing environment. All items in their original Serbian form are available in Appendix A (experimental sentence items) and Appendix B (filler sentence items).

3.4. PROCEDURE

The goal of the study, conducted via Google forms, was to confirm the (un) acceptability of the masculine and feminine agreement in the initial set of sentence stimuli. and examine the perception of the biological sex referred to by the noun + adjective / verb agreement in each of the sentences. Native speakers of Serbian provided acceptability judgments (from 1 – completely unacceptable to 6 – completely acceptable, that even number was chosen to keep the methodology in line with some previous research) and were asked to attribute either a male or female referent to each sentence stimuli. Participants were instructed to read each sentence carefully and judge whether it was acceptable, relying on their native speaker's intuition. They responded by selecting a numerical value with a corresponding description of acceptability. In addition, they were asked to attribute either a male, female or both gender to noun + adjective / verb agreement pairs in each sentence (one agreement per sentence stimuli). If the participants chose to attribute both genders, they were also prompted to choose one preferred gendered response.

In sum, each participant saw one of the lists with 78 experimental and 24 filler items. Each of the items contained one sentence acceptability judgement question and two gender attribution questions. The order of presentation was randomised for each participant to avoid repetition of similar test items and to obscure the intentions of the study.

4. RESULTS

4.1. ACCURACY

Forty-two native speakers of Serbian completed this experiment. Based on the filler items and unanswered experimental items, five participants (12%) were excluded from further analysis, as they did not reach the predefined 80% threshold of providing correct results for the filler items.

This resulted in the responses of 37 participants being further evaluated (27 female, 10 male, mean age 29.5, range 21–53). Additionally, taking a closer look at the filler sentence items revealed that two items had a relatively high acceptability score (> 4). However, the filler average score was 2.02, which means that filler items in general were judged as unacceptable on the Likert scale. Thus, items containing inadequate sentences were marked as candidates for exclusion (and were ultimately excluded). Due to the low number of responses, both groups were treated as one group for analysis.

4.2. ACCEPTABILITY AND ATTRIBUTION DATA

The purpose of the acceptability judgement portion of the task was to disambiguate the preferred agreement by analysing the acceptability of paired experimental sentence items across all conditions. The stimuli containing preferred gender agreement would be graded with high acceptability scores across all conditions, which turned out to be true, as all experimental sentence items scored an average value of at least 4.5 for all participants. Due to the low number of responses, stimuli were not analysed individually.

Data from the study were analysed in R 4.4.2 (R Core Team 2022). The results for the acceptability scores of all conditions (the grammatical conditions and the used gender context), and the ratio of masculine responses are shown in Table 1.

	Participle			Predicative			Attribute		
	masc.	fem.	Ov.	masc.	fem.	Ov.	masc.	fem.	Ov.
Mean score m	4.93	5.23	5.08	4.69	5.14	4.91	4.47	5.21	4.84
SD of m	0.79	0.67	0.74	0.90	0.68	0.82	0.95	0.65	0.89
Ratio masculine attribution	88.4	23.1	55.7	87.2	22.9	55.0	85.9	37.3	61.6
SD of ratio	25.9	23.1	19.3	26.2	21.6	18.9	27.8	27.9	23.5

Table 1. Mean score m of acceptability, its SD, ratio of masculine attribution and its SD for the acceptability experiment in all conditions, by genders and overall values for each condition.

The results show a higher acceptability for all grammatically feminine cases compared to their masculine counterparts.

The participants seemed to show a slight preference for denoting a biologically male entity as referent. When looking at the percent of gendered entity responses for the individual conditions, some male bias is also observable. For all masculine conditions, the association with a male entity is at 87%, while the feminine conditions have an association with a female entity of only 72%. In total, there were 1658 masculine responses provided by the participants, while there were only 1228 feminine responses. Comparing the individual conditions, it is also noteworthy to mention that for Participle

and Predicative conditions (both across-phrase) show a common value of around 55% male referents, while the Attributive condition (within-phrase) exposes a higher percentage of 61%.

For each condition, the acceptability scores were analysed using a t-test comparing the masculine and feminine responses with each other. It was found that for all conditions, the masculine and feminine acceptability are statistically different from each other, which, combined with them having higher average values, shows that the feminine cases have a significantly higher acceptability than the masculine cases. The results are presented in Table 2.

	Participle	Predicative	Attribute
p	.005	.001	<.001
Is p significant?	Yes	Yes	Yes

Table 2. (Adjusted) P-values of paired Bonferroni t-tests for masculine and feminine acceptability responses of the acceptability experiment per condition.

Responses gained in the acceptability judgement were analysed using a repeated measures ANOVA test for the separate conditions and all (filtered) participants by taking the difference of the score between the masculine and feminine responses of each condition. There was a statistically significantly main effect of condition $F(2,72) = 14.487, p < .001, \eta^2 = .065$ This means that there are strong indications that the conditions are statistically different from each other.

Furthermore, the responses gained for the gender attribution were analysed using a repeated measures ANOVA test for the separate conditions and all (filtered) participants, taking the overall male responses per condition as the dependent variable. This is done to check if the attribution is higher or lower in specific conditions, and the overall values are used as a measure since each condition was presented equally often in masculine and feminine context in the experiment. 11 values from 4 participants (three having low masculine attribution for all conditions and one having a high masculine attribution for two conditions) were identified as outliers. There was a statistically significant main effect of condition $F(1.57,56.68) = 12.538, p < .001p \, \eta^2 = .022$ in the remaining data. This confirms that the condition has an effect on the attribution as well.

In addition, a pairwise t-test (Bonferroni) was performed on the difference of the scores and revealed that some of the pairwise values are also significantly different from each other between all available conditions *(p ≤ .05)*. In particular, the Participle and Attribute conditions were highly statistically independent from each other. In addition, the same was performed on the attribution and revealed that the same of the pairwise values are also significantly different from each other between all available conditions *(p ≤ .0 5)*. The full results are shown in Table 3.

	Participle - Predicative	Participle - Attribute	Predicative - Attribute
p(m)	.15	<.001	.011
Is p(m) significant?	No	Yes	Yes
p(ratio)	.549	.002	<.001
Is p(ratio) significant?	No	Yes	Yes

Table 3. (Adjusted) P-values of pairwise Bonferroni t-tests for difference of acceptability scores m and masculine attribution ratio of the acceptability experiment.

5. DISCUSSION

The aim of this paper was to address the issue of gender agreement in epicene nouns in Serbian. Based on the findings of syntactic distance effects on the processing of gender agreement in common nouns (Bañón *et al*. 2012), the goal of the present study was to extend these inquiries into the domain of gender processing in epicene nouns in regards to syntactic distance between the agreeing elements. With this aim in mind, an Internet-based study was conducted, namely a grammatical acceptability study. The study collected grammatical acceptability ratings and gender attribution for sentences that contained either within-phrase (noun-adjective) or across-phrase (subject-verb) gender agreement. Namely, both grammatical acceptability ratings and gender attribution in epicene nouns depended on the utilised gender agreement in said sentence (syntactic vs. semantic).

5.1. GRAMMATICAL ACCEPTABILITY

It was predicted that the syntactic agreement would be deemed more acceptable. The grammatical acceptability was measured with a Likert scale as per Langsford *et al*. (2018). The syntactic gender agreement was predicted to yield higher acceptability ratings than semantic agreement across all conditions.

The data showed the acceptability scores between gender agreement types were significantly different from each other. The syntactic agreement obtained consistently higher acceptability scores than semantic agreement in all conditions. Higher acceptability ratings for syntactic gender agreement confirmed the prediction, and the obtained results were consistent with the findings by Košprdić (2016). The results implied that epicene nouns are processed syntactically, similarly to common nouns (Hagoort/Brown 1999).

5.2. GENDER ATTRIBUTION

The gender attribution study was designed to investigate if predefined gender agreement (syntactic vs. semantic) will influence the choice of the referent. Firstly, the sentences containing semantic agreement type were predicted to prompt the reader to choose a male referent. Secondly, the sentences containing syntactic agreement were predicted to not show bias towards any of the possible genders, whereby the differences in preference is expected to be coincidental.

The results showed that the participants seemed to show a slight preference for denoting a biologically male referent across all sentences. This is in line with the grammar definitions of epicenes (Klajn 2005), and in line with the findings by Košprdić (2016), stating that syntactic gender processing in epicenes is independent from the referent's biosocial gender and semantic information.

5.3. FUTURE RESEARCH

The experimental design should be altered to include neutral gender agreement in epicene nouns, as such an agreement is ungrammatical in Serbian (Klajn 2005). Even though the present study showed unequivocal preference for the syntactic agreement pattern, a violation paradigm design could account for the shortcomings of the present study. Namely, such a design could utilise reaction time measures to more successfully confirm the preferred gender agreement in epicene nouns. Furthermore, the effect of syntactic distance on other types of agreement, such as number, could offer insights into the factors that determine agreement processes, particularly as Bañón and colleagues (2012) theorised that syntactic distance effects would occur nonetheless. Moreover, a gender attribution task with measured reaction times could be used to allow us to delve further into not only the native speaker's preference for a certain agreement paradigm, but also give us further insight into gender agreement processing in real time.

In summary, the present data confirmed the syntactic processing of gender in epicene nouns, as well as the syntactic distance effect on gender agreement processing. However, the nature of the syntactic distance effect and the reasons why it occurs in agreement dependencies are still up for debate.

6. FINAL REMARKS

The study set out to investigate the gender agreement processing of epicenes in Serbian. The experiment focused on the acceptability and gender attribution of epicenes.

Despite the fact that not all predictions in the present study were confirmed, the study seems to particularly emphasise the importance of the syntactic distance in gender agreement processing. Namely, the grammatical acceptability indicated differences between within-phrase and across-phrase conditions for both syntactic and semantic agreement. Moreover, the differences in perception as processing of within-phrase and across-phrase were maintained regardless of agreement. This is in line with the findings of Bañón and colleagues (2012), as gender agreement in epicene nouns is heavily influenced by the syntactic distance exactly as other types of agreement dependencies such as number, or gender agreement in common nouns.

It is notable that the responses in all tasks were never as extreme as the predictions based on theoretical notions of gender processing and hierarchy models seemed to suggest. Namely, both syntactic and semantic gender agreements were rarely attributed the lowest acceptability scores, even in case of strong preference of one agreement to the other. In conclusion, the variety in the obtained results, as well as the influence of syntactic distance on gender agreement, indicate that gender agreement processing in epicene nouns is dependent on other factors than syntactic, and that the belief of syntactic nature of gender processing is influenced by the syntactic distance between the goal and the probe.

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APPENDIX A
Experimental Items

No.	Condition		Sentence	Gender
1	PART	AP	Tvrdica je nerado kupio kartu za gradski autobus.	m
2	PART	AP	Tvrdica je nerado kupila kartu za gradski autobus.	f
3	PRED	AP	Tvrdica iz komšiluka je dosadan i uvek traži kusur.	m
4	PRED	AP	Tvrdica iz komšiluka je dosadna i uvek traži kusur.	f
5	ATTR	WP	Dosadni tvrdica će konačno kupiti autobusku kartu.	m
6	ATTR	WP	Dosadna tvrdica će konačno kupiti autobusku kartu.	f
7	PART	AP	Varalica je ipak uspeo da naplati nepostojeću štetu u stanu.	m
8	PART	AP	Varalica je ipak uspela da naplati nepostojeću štetu u stanu.	f
9	PRED	AP	Varalica je nažalost spreman na sve zarad novca.	m
10	PRED	AP	Varalica je nažalost spremna na sve zarad novca.	f
11	ATTR	WP	Lokalni varalica ide po gradu prodajući polovne satove.	m
12	ATTR	WP	Lokalna varalica ide po gradu prodajući polovne satove.	f
13	PART	AP	Zvanica nije znao šta da kupi mladencima za svadbu.	m
14	PART	AP	Zvanica nije znala šta da kupi mladencima za svadbu.	f
15	PRED	AP	Zvanica se čini tužan uprkos veseloj muzici na proslavi.	m
16	PRED	AP	Zvanica se čini tužna uprkos veseloj muzici na proslavi.	f
17	ATTR	WP	Nepoželjni zvanica juri da pozdravi mladence pred slikanje.	m
18	ATTR	WP	Nepoželjna zvanica juri da pozdravi mladence pred slikanje.	f
19	PART	AP	Izdajica se domogao vlasti odmah nakon velike recesije.	m
20	PART	AP	Izdajica se domogla vlasti odmah nakon velike recesije.	f
21	PRED	AP	Izdajica je smiren i promatra odvijanje konflikta u zemlji.	m
22	PRED	AP	Izdajica je smirena i promatra odvijanje konflikta u zemlji.	f
23	ATTR	WP	Ubijeni izdajica zauzima naslovnice svih novina u zemlji.	m
24	ATTR	WP	Ubijena izdajica zauzima naslovnice svih novina u zemlji.	f
25	PART	AP	Izelica se večeras prejeo slavskih kolača i ima glavobolju.	m
26	PART	AP	Izelica se večeras prejela slavskih kolača i ima glavobolju.	f
27	PRED	AP	Izelica je večito gladan kada krene sezona slava.	m

28	PRED	AP	Izelica je večito gladna kada krene sezona slava.	f
29	ATTR	WP	Matori izelica užurbano od dece sklanja čokolade.	m
30	ATTR	WP	Matora izelica užurbano od dece sklanja čokolade.	f
31	PART	AP	Kukavica je zurio u akvarijum sa anakondom u zoo-vrtu.	m
32	PART	AP	Kukavica je zurila u akvarijum sa anakondom u zoo-vrtu.	f
33	PRED	AP	Kukavica je jako uplašen i govori nam da smanjimo brzinu.	m
34	PRED	AP	Kukavica je jako uplašena i govori nam da smanjimo brzinu.	f
35	ATTR	WP	Obični kukavica ne sme da pomazi zmiju u zoo-vrtu.	m
36	ATTR	WP	Obična kukavica ne sme da pomazi zmiju u zoo-vrtu.	f
37	PART	AP	Pijanica je upravo izašao iz oronule kafane na uglu.	m
38	PART	AP	Pijanica je upravo izašla iz oronule kafane na uglu.	f
39	PRED	AP	Pijanica je iznerviran neučtivim ponašanjem konobara.	m
40	PRED	AP	Pijanica je iznervirana neučtivim ponašanjem konobara.	f
41	ATTR	WP	Okoreli pijanica se svake nedelje odaje alkoholu.	m
42	ATTR	WP	Okorela pijanica se svake nedelje odaje alkoholu.	f
43	PART	AP	Prznica se celo veče brecao na konobare u restoranu.	m
44	PART	AP	Prznica se celo veče brecala na konobare u restoranu.	f
45	PRED	AP	Prznica je celo veče besan zbog jedne obične greške.	m
46	PRED	AP	Prznica je celo veče besna zbog jedne obične greške.	f
47	ATTR	WP	Pravi prznica ne okleva da se svima brecne u lice.	m
48	ATTR	WP	Prava prznica ne okleva da se svima brecne u lice.	f
49	PART	AP	Pridošlica je privukao svu pažnju iznenadnim dolaskom.	m
50	PART	AP	Pridošlica je privukla svu pažnju iznenadnim dolaskom.	f
51	PRED	AP	Pridošlica je veoma zbunjen brojem gostiju na proslavi.	m
52	PRED	AP	Pridošlica je veoma zbunjena brojem gostiju na proslavi.	f
53	ATTR	WP	Raspevani pridošlica jedva čeka da zabava počne.	m
54	ATTR	WP	Raspevana pridošlica jedva čeka da zabava počne.	f
55	PART	AP	Propalica je došao na stadion sa namerom da napravi haos.	m
56	PART	AP	Propalica je došla na stadion sa namerom da napravi haos.	f
57	PRED	AP	Propalica je dobrodušan uprkos teškoj životnoj priči.	m

58	PRED	AP	Propalica je dobrodušna uprkos teškoj životnoj priči.	f
59	ATTR	WP	Lokalni propalica se uvek žali na cene prolaznicima.	m
60	ATTR	WP	Lokalna propalica se uvek žali na cene prolaznicima.	f
61	PART	AP	Svađalica je juče opet vikao na sve u redu ispred pošte.	m
62	PART	AP	Svađalica je juče opet vikala na sve u redu ispred pošte.	f
63	PRED	AP	Svađalica je prepadnut šefovim pretnjama o otkazu.	m
64	PRED	AP	Svađalica je prepadnuta šefovim pretnjama o otkazu.	f
65	ATTR	WP	Agresivni svađalica se uvek raspravlja ni oko čega.	m
66	ATTR	WP	Agresivna svađalica se uvek raspravlja ni oko čega.	f
67	PART	AP	Udvorica se među prvima učlanio u vladajuću stranku.	m
68	PART	AP	Udvorica se među prvima učlanila u vladajuću stranku.	f
69	PRED	AP	Udvorica je prezauzet razmišljanjem o rezultatima izbora.	m
70	PRED	AP	Udvorica je prezauzeta razmišljanjem o rezultatima izbora.	f
71	ATTR	WP	Lakomisleni udvorica razmišlja o stranačkom zaposlenju.	m
72	ATTR	WP	Lakomislena udvorica razmišlja o stranačkom zaposlenju.	f
73	PART	AP	Ulizica je stalno pokušavao privući pažnju nastavnicima.	m
74	PART	AP	Ulizica je stalno pokušavala privući pažnju nastavnicima.	f
75	PRED	AP	Ulizica je zadovoljan povodom visoke ocene na testu.	m
76	PRED	AP	Ulizica je zadovoljna povodom visoke ocene na testu.	f
77	ATTR	WP	Predusretljivi ulizica donosi ministru pripremljen govor.	m
78	ATTR	WP	Predusretljiva ulizica donosi ministru pripremljen govor.	f

Table A1. List of experimental items of group 1. Conditions are Participle (PART), Predicative (PRED) and Attribute (ATTR), which can be within-phrase (WP) or across-phrase (AP). Possible gender agreements are masculine (m) and feminine (f).

No.	Condition		Sentence	Gen-der
1	PART	AP	Tvrdica je nerado platio račune za struju i vodu.	m
2	PART	AP	Tvrdica je nerado platila račune za struju i vodu.	f
3	PRED	AP	Tvrdica iz ulaza je naporan kad prodaje staro gvožđe.	m
4	PRED	AP	Tvrdica iz ulaza je naporna kad prodaje staro gvožđe.	f

5	ATTR	WP	Naporni tvrdica će konačno prestati da pita za cenu.	m
6	ATTR	WP	Naporna tvrdica će konačno prestati da pita za cenu.	f
7	PART	AP	Varalica je pokušao da nam iznudi još više novca.	m
8	PART	AP	Varalica je pokušala da nam iznudi još više novca.	f
9	PRED	AP	Varalica je uživo nepokolebljivo uporan pri trgovini.	m
10	PRED	AP	Varalica je uživo nepokolebljivo uporna pri trgovini.	f
11	ATTR	WP	Gradski varalica po kućama prodaje jeftine šampone.	m
12	ATTR	WP	Gradska varalica po kućama prodaje jeftine šampone.	f
13	PART	AP	Zvanica se dugo pitao o mestu proslave Nove godine.	m
14	PART	AP	Zvanica se dugo pitala o mestu proslave Nove godine.	f
15	PRED	AP	Zvanica je zaista opčinjen vatrometom sa prošlog dočeka.	m
16	PRED	AP	Zvanica je zaista opčinjena vatrometom sa prošlog dočeka.	f
17	ATTR	WP	Veseli zvanica uz čašu vina uživa u starogradskoj muzici.	m
18	ATTR	WP	Vesela zvanica uz čašu vina uživa u starogradskoj muzici.	f
19	PART	AP	Izdajica je prvom prilikom prešao pravo u protivnički tabor.	m
20	PART	AP	Izdajica je prvom prilikom prešla pravo u protivnički tabor.	f
21	PRED	AP	Izdajica je nervozan zbog okršaja sa opozicijom u emisiji.	m
22	PRED	AP	Izdajica je nervozna zbog okršaja sa opozicijom u emisiji.	f
23	ATTR	WP	Osuđeni izdajica će ipak provesti tri godine u zatvoru.	m
24	ATTR	WP	Osuđena izdajica će ipak provesti tri godine u zatvoru.	f
25	PART	AP	Izelica je sakrio dva velika kolača u džep svog kaputa.	m
26	PART	AP	Izelica je sakrila dva velika kolača u džep svog kaputa.	f
27	PRED	AP	Izelica nije svestan da je predstojeća slava posna.	m
28	PRED	AP	Izelica nije svesna da je predstojeća slava posna.	f
29	ATTR	WP	Sebični izelica sa drugog kraja stola odmerava sarme.	m
30	ATTR	WP	Sebična izelica sa drugog kraja stola odmerava sarme.	f
31	PART	AP	Kukavica je umislio da nam se ajkula približava u pličaku.	m
32	PART	AP	Kukavica je umislila da nam se ajkula približava u pličaku.	f
33	PRED	AP	Kukavica je premoren od grčevitog plivanja ka obali mora.	m
34	PRED	AP	Kukavica je premorena od grčevitog plivanja ka obali mora.	f
35	ATTR	WP	Prestrašeni kukavica se nažalost boji i da uđe u vodu.	m

36	ATTR	WP	Prestrašena kukavica se nažalost boji i da uđe u vodu.	f
37	PART	AP	Pijanica se jako obradovao novoj flaši vina za Božić.	m
38	PART	AP	Pijanica se jako obradovala novoj flaši vina za Božić.	f
39	PRED	AP	Pijanica je razočaran ukusom bezalkoholnog piva.	m
40	PRED	AP	Pijanica je razočarana ukusom bezalkoholnog piva.	f
41	ATTR	WP	Ostareli pijanica pije već sedmu veliku čašu špricera.	m
42	ATTR	WP	Ostarela pijanica pije već sedmu veliku čašu špricera.	f
43	PART	AP	Prznica se okretao oko sebe tražeći nekog za svađu.	m
44	PART	AP	Prznica se okretala oko sebe tražeći nekog za svađu.	f
45	PRED	AP	Prznica je ljut na pretpostavljene zbog refiskalizacije.	m
46	PRED	AP	Prznica je ljuta na pretpostavljene zbog refiskalizacije.	f
47	ATTR	WP	Dežurni prznica ne dopušta da sastanak protekne mirno.	m
48	ATTR	WP	Dežurna prznica ne dopušta da sastanak protekne mirno.	f
49	PART	AP	Pridošlica se odmah ubacio u najzabavnije društvo.	m
50	PART	AP	Pridošlica se odmah ubacila u najzabavnije društvo.	f
51	PRED	AP	Pridošlica je odmah po dolasku izveden na plesni podijum.	m
52	PRED	AP	Pridošlica je odmah po dolasku izvedena na plesni podijum.	f
53	ATTR	WP	Veseli pridošlica se odmah pridružuje božićnoj zabavi.	m
54	ATTR	WP	Vesela pridošlica se odmah pridružuje božićnoj zabavi.	f
55	PART	AP	Propalica se pokajao zbog niza loših životnih odluka.	m
56	PART	AP	Propalica se pokajala zbog niza loših životnih odluka.	f
57	PRED	AP	Propalica je uvek prljav zbog loših životnih uslova.	m
58	PRED	AP	Propalica je uvek prljava zbog loših životnih uslova.	f
59	ATTR	WP	Ulični propalica čeka na sažaljenje i novac prolaznika.	m
60	ATTR	WP	Ulična propalica čeka na sažaljenje i novac prolaznika.	f
61	PART	AP	Svađalica je juče opleo po svim članovima upravnog odbora.	m
62	PART	AP	Svađalica je juče oplela po svim članovima upravnog odbora.	f
63	PRED	AP	Svađalica je veoma sklon provociranju upravnika odbora.	m
64	PRED	AP	Svađalica je veoma sklona provociranju upravnika odbora.	f
65	ATTR	WP	Nadmeni svađalica srećom danas ne dolazi na sastanak.	m
66	ATTR	WP	Nadmena svađalica srećom danas ne dolazi na sastanak.	f

67	PART	AP	Udvorica je celo veče laskao predsednikovoj supruzi.	m
68	PART	AP	Udvorica je celo veče laskala predsednikovoj supruzi.	f
69	PRED	AP	Udvorica je razočaran postignutim rezultatima stranke.	m
70	PRED	AP	Udvorica je razočarana postignutim rezultatima stranke.	f
71	ATTR	WP	Poznati udvorica piše članak o vladinim funkcionerima.	m
72	ATTR	WP	Poznata udvorica piše članak o vladinim funkcionerima.	f
73	PART	AP	Ulizica nije uspeo da se dočepa priznanja uprkos svemu.	m
74	PART	AP	Ulizica nije uspela da se dočepa priznanja uprkos svemu.	f
75	PRED	AP	Ulizica je veoma nezadovoljan postignutim rezultatima.	m
76	PRED	AP	Ulizica je veoma nezadovoljna postignutim rezultatima.	f
77	ATTR	WP	Domišljati ulizica već zna ko je upravnik odeljenja.	m
78	ATTR	WP	Domišljata ulizica već zna ko je upravnik odeljenja.	f

Table A2. List of experimental items of group 2. Conditions are Participle (PART), Predicative (PRED) and Attribute (ATTR), which can be within-phrase (WP) or across-phrase (AP). Possible gender agreements are masculine (m) and feminine (f).

APPENDIX B
Filler Items

No.	Condition		Sentence	Gender
79	PART	AP	Komšija se besno izdrala na nas zbog silne buke.	f
80	PART	AP	Stanodavac je početkom rata povećala cene nekretnina.	f
81	ATTR	WP	Nenaspavana komšija se tužno tetura do prodavnice.	f
82	ATTR	WP	Bezobzirna stanodavac ne prilagođava cenu zakupa tržištu.	f
83	PRED	AP	Vojskovođa je veoma sposobna za vođenje dugih ratova.	f
84	PRED	AP	Plašljivac je jako uplašena i govori nam da smanjimo brzinu.	f
85	PART	AP	Gost nije znala tačno šta da kupi mladencima za svadbu.	f
86	PART	AP	Proždrljivac se večeras prejela slavskih kolača i ima glavobolju.	f
87	ATTR	WP	Nepoželjna gost juri da pozdravi mladence pred slikanje.	f
88	ATTR	WP	Oduševljena saradnik odobrava dekoraciju za božičnu proslavu.	f
89	PRED	AP	Prosjak je dobrodušna uprkos teškoj životnoj priči.	f
90	PRED	AP	Tata je nasmejana nežno gledajući u novorođenu bebu.	f
91	PART	AP	Zavodnik se i večeras osmehivala svima na zabavi.	f
92	PART	AP	Izdajnik se domogla vlasti odmah nakon velike recesije.	f
93	ATTR	WP	Dosadna škrtac će konačno kupiti autobusku kartu.	f
94	ATTR	WP	Odgovorna mašinovođa nikada ne rizikuje svoje putnike.	f
95	PRED	AP	Poslovođa je uvek razočarana pritužbama zaposlenih u firmi.	f
96	PRED	AP	Gazda je nepromišljena pri objavljivanju oglasa za stan.	f
97	PART	AP	Kolega se jako obradovala dekoraciji za božićnu proslavu.	f
98	PART	AP	Ljutiša se celo veče brecala na konobare u restoranu.	f
99	ATTR	WP	Lokalna prevarant ide po gradu i prodaje polovne satove.	f
100	ATTR	WP	Dežurna zavodnik osmehom uvek ulepša veče gostima.	f
101	PRED	AP	Vojvoda je na svečanosti odlikovana svetlucavim medaljama.	f
102	PRED	AP	Starac je zadovoljna uspesima svih svojih unuka.	f

Table B1. List of filler items of group 1 and experiment 2. Conditions are Participle (PART), Predicative (PRED) and Attribute (ATTR), which can be within-phrase (WP) or across-phrase (AP). Possible gender agreements are masculine (m) and feminine (f).

No.	Condition		Sentence	Gender
79	PART	AP	Komšija je odmah istrčala na terasu goruće zgrade.	f
80	PART	AP	Preduzetnik je skoro pročitala priručnik o uspešnom poslovanju.	f
81	ATTR	WP	Nova komšija se već uveliko druži sa celom zgradom.	f
82	ATTR	WP	Loša preduzetnik nikada ne vodi računa o dobrobiti radnika.	f
83	PRED	AP	Vojskovođa je odvažna pri napadu, ne prezajući ni od čega.	f
84	PRED	AP	Plašljivac je premoren/a grčevito plivajući ka obali mora.	f
85	PART	AP	Gost se dugo pitala o mestu proslave Nove godine.	f
86	PART	AP	Proždrljivac je sakrila dva velika kolača u džep svog kaputa.	f
87	ATTR	WP	Vesela gost uz čašu vina uživa u starogradskoj muzici.	f
88	ATTR	WP	Iznervirana saradnik saopštava odluku o otkazivanju sastanka.	f
89	PRED	AP	Prosjak je uvek prljava zbog loših životnih uslova.	f
90	PRED	AP	Tata je iznervirana hrpom rasutog brašna u kuhinji.	f
91	PART	AP	Zavodnik je namerila da nam sutradan pomogne u garaži.	f
92	PART	AP	Izdajnik je prvom prilikom prešla pravo u protivnički tabor.	f
93	ATTR	WP	Naporna škrtac će konačno prestati da pita za cenu.	f
94	ATTR	WP	Usplahirena mašinovođa proverava stanje šina pred polazak.	f
95	PRED	AP	Poslovođa je uvek iskrena pri evaluiranju svojih zaposlenih.	f
96	PRED	AP	Gazda je revoltirana novim zakonom o sigurnom poslovanju.	f
97	PART	AP	Kolega se odmah izvinila zbog ometanja današnjeg sastanka.	f
98	PART	AP	Ljutiša se okretala oko sebe tražeći nekog za svađu.	f
99	ATTR	WP	Gradska prevarant po kućama prodaje jeftine šampone.	f
100	ATTR	WP	Nepopravljiva zavodnik ne odustaje od osvajanja.	f
101	PRED	AP	Vojvoda je na dodeli proglašena za najistaknutijeg borca.	f
102	PRED	AP	Starac je istrošena mnogim godinama vrednog rada.	f

Table B2. List of filler items of group 2. Conditions are Participle (PART), Predicative (PRED) and Attribute (ATTR), which can be within-phrase (WP) or across-phrase (AP). Possible gender agreements are masculine (m) and feminine (f).

SUMMARY

PROCESSING OF GENDER NEUTRAL NOUNS (EPICENA): TESTING THE COGNITIVE RELEVANCE OF SYNTACTIC AND SEMANTIC AGREEMENT OF SERBIAN EPICENE NOUNS ENDING IN -*ICA* IN DIFFERENT SYNTACTIC ENVIRONMENTS USING ACCEPTABILITY JUDGEMENT MEASURES

This experiment adds to the growing literature on gender agreement processing, and processing of gender neutral nouns, having collected data from speakers of a less-represented Indo-European language. Although Serbian shares many similarities with other morphologically rich languages that have been more thoroughly researched, the results of the present study emphasise the necessity for a more balanced and thorough investigation of small and rarely studied languages. As gender processing is becoming a more prevalent research topic in psycholinguistics, yielding a vast body of research and linguistic theories (Corbett 1979, 2006) attempting to account for miscellaneous and often conflicting research results (Bañón *et al.* 2012) the necessity for a more uniform research approach to rarely studied languages becomes paramount. Otherwise, forming a linguistic theory with the ability to account for a vast array of inconsistencies and discrepancies found in rarely studied languages becomes unattainable. In addition, this study is the first investigation into both within-phrase and across-phrase gender processing of epicene nouns in Serbian. The study of gender agreement processing, such as the study conducted by Popov (2020), had long focused only on either processing of common nouns, different subtypes of epicenes in either within-phrase position (Košprdić 2016), or the general influence of syntactic distance on gender processing (Bañón *et al.* 2012). Studies focusing on gender agreement processing of epicenes are, in my opinion, crucial, as they examine how humans process agreement of nouns that do not disposing of clearly defined, stable gender features, or in other words, where agreement depends on both the linguistic and non-linguistic (referential) context. The study of epicenes and gender processing of epicenes in different syntactic positions has yet to reach this more ecologically valid step. The present experiment provides the important first step in understanding how gender agreement processing of nouns with ambiguous gender might be facilitated by the syntactic proximity of the agreeing elements. Studying these questions brings us closer to understanding gender agreement processing and language comprehension more broadly.

KEYWORDS: gender processing, agreement hierarchy, epicene, agreement, gender selection task, reaction time.