Investigating Overt Subjects in Topic Continuity: An Online Study on the Effects of Language Dominance and Length of L2 Residence in Late L1 Attrition

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1. Introduction

This study investigates the use of null (NS) and overt pronominal subjects (OS) in topic-continuity (TC) contexts in 20 late L1-attriters of Bulgarian, speaking German as their L2.

Bulgarian is a consistent null-subject language, in which the alternation of OS and NS is dependent on grammatical and discourse conditions (Genevska-Hanke 2019). NS are typically used in topic-continuity contexts (TC), while OS are associated with topic-shift or focus (Sorace 2005), despite microvariation as to the scope of overt pronouns among consistent null-subject languages (Di Domenico & Baroncini 2018). These conditions are well-studied in different populations and found to be vulnerable in bilinguals, even in the absence of cross-linguistic difference (Di Domenico & Baroncini 2018). In German (a semi-null- subject and topic-drop language, see Hamann 1996, Roberts & Holmberg 2010), OS are used in both contexts.

Previous research has shown that speakers of consistent null-subject languages (CNSL) with attrition, induced by non-null subject languages overproduce OS in TC (Sorace & Filiaci 2006). However, this pattern is temporary and dependent on re-exposure (Chamorro, Sorace & Sturt 2016, Genevska-Hanke 2017). Accordingly, in late L1 attrition L1 knowledge seems intact but processing affected and language dominance (LD) is expected to impact the realization of OS/NS in attriters (Köpke & Genevska-Hanke 2018). With regard to the influence of length of residence (LoR), conflicting results exist, see Köpke (2018). Testing Bulgarian-dominant and German-dominant bilinguals with varying LoR and LD index aims to uncover which of the two factors, LoR or LD, is a better predictor with regard to the overproduction of OS in TC.

This paper is structured as follows: Sections 2 provides an overview of the theoretical background. Section 3 introduces the study, section 4 introduces its results. A discussion and an outlook follow in section 5.

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2. Theoretical background
2.1. Assumptions on the alternation of overt and null subjects

The alternation of OS and NS in CNSL like Italian, Spanish, Greek and Bulgarian is dependent on both grammatical and discourse conditions. The licensing of NS is a matter of parameter setting via the presence or absence of features or values of features of functional categories (Borer 1984, Chomsky 1995). Different settings or different feature combinations give rise to cross-linguistic variation. More recently, the notion of parameters has been redefined as macro- and microparameters in order to account for micro-scale parametric variation (Baker 2008, Kayne 2013). This core grammatical knowledge is acquired early so that children are sensitive to the fact that their language allows both structures, one with an OS and one with an NS in the main and subordinate clauses, given as (a) and (b) in example (1) from Bulgarian.[1]

(1a) *pro* znam   če   idva   Bulgarian
     (I)   know.prs.1sg that (he) come.prs.3sg

(1b) Az znam   če   toj idva
      I   know.prs.1sg that he come.prs.3sg
     'I know that he comes.'

However, the realization of the two subjects in (1) as overt or null further depends on discourse, in particular on the notions of information structure "topic" and "focus". In other words, in null subject languages of this kind, null subjects are highly preferred in the case of TC, while topic shift and focus contexts require an OS. The Italian example (2) from Roberts & Holmberg (2010) illustrates the difference between a topic shift (a) and a TC (b) context. In contrast, the corresponding structure with an OS as the only option in languages like English and German is ambiguous between the two distinct interpretations.

(2a) Il professore$_i$ ha parlato dopo che lui*$_{i/j}$ e arrivato.   Italian
     the professor has spoken after he is arrived

(2b) Il professore$_i$ ha parlato dopo che *pro*$_{i/*j}$ e arrivato.
     the professor has spoken after is arrived
     'The professor started speaking after he arrived.'

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[1] Note that Bulgarian verbs are morphologically unmarked for present tense, and that 3rd person singular present verbs lack any morphological marking (Bojadžiev, Kuzarov & Penčev 1999). Note that the glosses of the Bulgarian examples nevertheless contain this kind of information in order to improve readability.

The discourse conditions of the alternation of OS and NS are acquired later than the grammatical ones (see Tsimpli 2014 for timing in acquisition).

In addition, differences among CNSL as to cross-linguistic microvariation have been attested more recently so that Italian and Greek are more strict in the licensing of OS in TC, while Spanish and Bulgarian are more liberal (Di Domenico & Baroncini 2018, Genevska-Hanke 2019). In these languages, OS are therefore more likely to occur in contexts of TC than in Italian or Greek.

These differences are possibly attributable to differences in the scope of the pronouns in the different languages. Cardinaletti & Starke (1994) propose a typology of pronominal elements, differentiating between strong, weak and clitic pronouns that build up structurally different pronominal paradigms (weak and clitic pronouns being deficient). The three kinds of pronominal elements give rise to semantic, phonological and syntactic differences. Importantly, weak overt subjects and null subjects share the same set of features and can thus freely alternate in the same structural context.

2.2. Previous research on overt and null subjects

In a vast body of research on L2-speakers' use of OS and NS, one of the languages involved is typically a null subject language of the Italian kind, while the other is not. L2 speakers of CNSL often differ significantly from native speakers in terms of subject use. Two of the early studies are the studies of White (1985) and Tsimpli & Roussou (1991). For instance, the Spanish L1-English L2 speakers tested by White (1985) used up to 40% of null subjects in English. More recently, one of the patterns discussed is the overuse of OS, and the question has been raised of whether this pattern can be attributed to defective knowledge or processing (e.g. Sorace 2005, Tsimpli & Sorace 2006, Dominguez & Arche 2008, Prentza & Tsimpli 2013). For instance, Sorace (2005) tested English L1-Italian L2 speakers, who overproduced OS in their L2. The L1 Greek-L2 English speakers in Prenza & Tsimpli's study used ungrammatical NS and preferred OS in coordination structures in English. Genevska-Hanke (2019) found that her group of L1 Bulgarian-L2 German speakers tested used ungrammatical OS in German.

The pattern of overproduction of OS has also been found in speakers of two null subject languages (e.g. Sorace, Serratrice, Filiaci & Baldo 2009, Margaza & Bel 2006) and in speakers with late L1 attrition (e.g. Sorace 2005, Belletti, Bennati & Sorace 2007, Chamorro et al. 2016, Genevska-Hanke 2017). Sorace et al. (2009) tested Italian-English and Italian-Spanish bilingual children, finding the pattern of overuse in Italian in both bilingual groups. Margaza & Bel (2006) tested the use of OS and NS in written production of two groups of adult L2 speakers of Spanish with L1 Greek. The results revealed that the advanced group used fewer OS than the monolingual controls, while the intermediate group overused OS only in matrix clauses. It should be noted that Greek and Spanish differ in the scope of the overt pronoun or in other words in the extent to which OS are implemented. Greek and Italian were shown to pattern the same

by Di Domenico & Baroncini (2018) who tested Greek and Italian monolinguals as well as two groups of Greek-Italian bilinguals, simultaneous bilinguals and near-native L2 speakers. The pattern of overproduction of OS was attested only for the near-native speakers of Greek. Interestingly, comparing Greek-dominant and Italian-dominant bilinguals revealed that the Greek-dominant ones used significantly more NS.

Although this pattern of overproduction has been repeatedly attested for speakers with late L1 attrition, more recently, it has been acknowledged that these effects are only temporary and disappear after relatively short re-exposure to massive L1 input in the home country (Chamorro et al. 2016 for Spanish-English, Genevska-Hanke 2017 for Bulgarian-German). Köpke & Genevska-Hanke (2018) present results from a longitudinal study of an L1 Bulgarian-L2 German speaker, relating different patterns of performance on subject use over time to LD. Re-exposure to massive L1 input is a change in activation patterns for the two languages of a bilingual and thus a dominance shift since the dominant language is the language more available in language processing and the one related to automaticity (Grosjean 1998, Paradis 2004). Importantly, speakers with late L1 attrition who are typically 1st generation immigrants have a stable L1 system, associated with exposure to the L1 in the country of origin during the first 12 years of life.

Montrul (2004) tested subject expression in the elicited narratives of adult Spanish heritage speakers with Mexican-American background. She found that while the advanced heritage speakers patterned similar to the monolinguals in subject production, this was not the case for the intermediate heritage speakers who produced more overt than NS. With regard to the pragmatic appropriateness of the OS and NS, differences between the monolinguals and both the intermediate and the advanced groups were found. These differences were greater for the intermediate heritage speakers. Kaltsa et al. (2015) tested Greek-Swedish adult bilinguals, L1 attriters and heritage speakers, finding evidence for divergent use of OS in both bilingual groups compared to the monolinguals. For NS, responses were similar to those of the monolinguals, but reaction times were longer.

The research reviewed here has revealed the following insights. The alternation of OS and NS is a vulnerable phenomenon since infelicitous use of pronominal subjects is found in different populations. In late L1 attrition, bilinguals are sensitive to recent reexposure to the L1, in the absence of which they pattern with L2 speakers and crucially not with monolinguals (Chamorro et al. 2016, Genevska-Hanke 2017). Although microvariation among CNSL is found to impact performance, overproduction takes place even in the absence thereof (Di Domenico & Baroncini 2018 for Greek and Italian). Language dominance was also shown to play a role (Di Domenico & Baroncini 2018).

Cross-linguistic influence, general effects of bilingualism, processing and combinations thereof have been suggested as possible sources for the pattern of overuse of OS. Its presence in monolingual development sheds some doubt on an explanation in favor of general effects of bilingualism. The fact that

overproduction of OS has been found in bilinguals with two similar CNSLs disfavors cross-linguistic influence as an explanation. Still cross-linguistic influence in the case of languages that differ in subject expression is expected to magnify the effects. The results on late L1 attrition speak for the plausibility of processing effects in the sense of more or less dominant languages.

2.3. The languages of investigation – Bulgarian and German

Bulgarian is a CNSL (Genevska-Hanke 2019) according to the recent classification of Roberts & Holmberg (2010). Referential and expletive NS are not restricted to clausal position and used in 61%-73% of all cases.[2] In addition, Bulgarian is less restrictive than Italian with regard to the use of OS (see Genevska-Hanke 2019 for details). The use of OS in TC contexts has been attributed to featural overlap for null pronouns and overt weak pronouns in the sense of Cardinaletti & Starke (1994), which allows for their alternation.

Comparing Bulgarian and German is a demanding task since both languages allow NS, or in other words they are null subject languages of different kinds. German is a semi-null subject language because null expletive subjects are licensed (Roberts & Holmberg 2010). In addition, German allows for topic-drop in its spoken register (e.g. Hamann 1996, Haegeman 2013). Accordingly, a sentence like (3), another variant of (1), is derived differently but is grammatical in both languages.

(3) *pro* znam   če   idva   Bulgarian
    (I) know.prs.1sg that (he) come.prs.3sg
    'I know that he's coming.'

The following sentences are examples of topic-drop in German, (4)-(5), which is restricted to clause-initial position, hence the ungrammaticality of (6).

(4) [CP*pro* hab' [IP t Hans schon angerufen]]   German
      (I) have Hans already called
      'I have called Hans already.'

(5) [CPOP hab' [IP ich gestern   *pro* gekauft]]   German
          have   I   yesterday (it) bought
        'I have bought it yesterday.'

(6) Gestern   hab *(ich) das gekauft.   German
    yesterday have (I)   that bought
    'Yesterday, I have bought that.'

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[2] Note that the percentages vary as to whether the count includes pronominals only or also lexical DPs. In addition, instances of subject doubling were counted twice so that the rates of null subjects are lower.

As to expletive subjects, only null non-argumental expletives are licensed in German. In non-clause-initial position they are obligatorily null (8) and (9) and typically overt in clause-initial position, compare (7).

(7) *(Es) wurde getanzt. (non-argumental *es*)   German
    *(It) was   danced
     'People danced.'

(8) Gestern   wurde (*es) getanzt. (non-argumental *es*)   German
    yesterday was   *(it) danced
     'People danced yesterday.'

(9) Ich weiß, dass (*es) getanzt wurde. (non-argumental *es*)   German
     I   know that *(it) danced was
     'I know that people danced.'

Overall, despite the fact that both referential and expletive subjects can be null in German, the extent to which this happens is much lower than in consistent null subject languages, because of the restrictions as to clausal-position and register. This, taken together with the fact that Bulgarian allows more pronominal subjects to be overt, leads to the conclusion that the cross-linguistic distance between German and Bulgarian is smaller than the one between English and Italian, at least in terms of actual rates of subject realization.

2.4. Some notes on L1 attrition

L1 attrition is usually viewed as a decline in proficiency of the L1 attributed to its reduced use for a prolonged time under the influence of a (dominant) L2 and the role of various factors has been explored (Köpke 2007). Factors like length of residence (LoR) and frequency of use that have been traditionally associated with attrition have been reconsidered due to the fact that empirical research has shown that although LoR generally plays a role, there seems to be no direct linear relationship between LoR and attrition and that frequency of use has little or no effect (Köpke 2018). As above indicated, re-exposure, which is related to LD, has been recently identified as a factor for late L1 attrition (Chamorro et al. 2016, Genevska-Hanke 2017). Stability in L1 is reached after 12 years of exposure to this language as the only language and in the country, in which it is spoken so that speakers with first exposure to L2 after puberty are referred to as late L1 attriters (Schmid & Köpke 2013).

3. The study – participants, method, predictions

20 bilinguals and 10 monolinguals (BGM/NR) participated. The bilinguals were late attriters with LoR of 5-20 years in Germany (group split between short and long residence, was 10 years, SR vs. LR, 10 speakers each), Bulgarian-

dominant (BGD) and German-dominant (GED), 10 speakers each, where LD was calculated experientially as an index (LDI, see figure 3 for the distribution of values) on the basis of patterns of language use (questionnaire data, PaBiQ, Tuller 2015).[3] All speakers are native speakers of Bulgarian (mean age 38), exposed to L2 after puberty and with a stable L1.

The self-paced reading task used here consisted of 42 items of similar length (24-26 syllables) but different number of phrases, presented in a semi-randomized manner (20 test and control items, 16 fillers and 6 familiarization items). None were (strongly) ungrammatical due to the fact that the phenomenon of investigation is rather subject to preferences than to grammaticality. In addition, timed acceptability judgments were taken. The sentences were presented non-cumulatively and phrase-by-phrase, reaction times were measured after each syntactic phrase. Three measuring points were taken per test item - at the antecedent DP as the first, at the pronoun carrying the same reference in TC (PRON, or at the verb in the case of null pronouns) as the second, and at the phrase thereafter (PRON + 1) as the third measuring point.

The test items included 10 sentences with an overt pronoun in topic continuity like (10), the inappropriate/less preferred option for this context and 10 sentences with a null pronoun like (11), the appropriate/preferred choice.

(10) Tim e hodil čak do Yaponiya, a **toj** e izharčil mnogo malko za pătuvaneto.

    Tim is gone far to Japan,   but he is spent too   little   for trip-the

    'Tim has gone as far as Japan, spending extremely little for the trip.'

(11) Mara ne e stignala daleč, a vechje e ***pro*** dala vsičkite si pari na vjatara.

    Mara not is got   far, but already is   given all   her money to wind-the

    'Mara hasn't got far, but has already spent all her money for nothing.'

All pronouns in the test sentences were 3rd person pronouns.

The participants were instructed to read as fast as possible for the acceptability of the sentences as natural in colloquial speech, and indicate their judgments by pressing a button for "yes" or for "no" after the end of each sentence. Detailed instructions appeared on the screen prior to the experiment, followed by a test trial of six sentences.

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[3] PaBiQ (Questionnaire for Parents of Bilingual Children, Tuller 2015) allows the calculation of a language dominance index (LDI): 60% of the points are given for patterns of current exposure and use, 32% for exposure within the first four years and 8% for length of exposure (+ 5 to – or 5 equals balanced bilingualism, > +5 L2-dominant, < – 5 L1-dominant, 50 points max per language). We extended the maximal value per language by 12 points in order to account for differences between children and adults.

Based on results from previous studies, the expectation was that OS in TC will be attested for attrited speakers. For such speakers OS in TC should not impede processing in terms of longer reaction times, which were predicted for monolinguals and non-attrited bilinguals. Based on results from the reexposure studies and related processing assumptions, attrition was only expected in cases, in which Bulgarian was non-dominant, so that an impact of LDI was predicted. LoR was also expected to play a role but only in cases, in which Bulgarian is non-dominant. In addition, all participants were expected to accept some overt subjects in TC, which can be attributed to the fact that Bulgarian is more liberal than Italian as to cross-linguistic microvariation. Finally, an impact of the L2 as a semi-null subject language was predicted, since German subjects are necessarily overt in the TC contexts tested.

4. Results

We performed regression analyses and linear mixed effects analyses of the obtained data for the three measuring points in question, for the acceptability judgments we used ANOVA. Reaction times longer than 2000 milliseconds were excluded from consideration as extreme values. The data was log-transformed to ensure normality of distribution for RT data but the figures display the original RT values in milliseconds for convenience.

With regard to the preferences for OS and NS in the two contexts tested, the rates of "yes" and "no" responses were considered.[4] Figures 1 and 2 illustrate the mean acceptability rates in percentages per group split to LDI or LoR for the OS and NS test items.
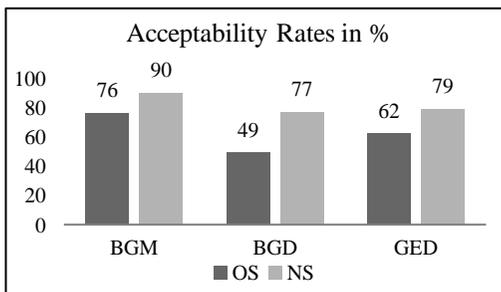
Figure 1. Acceptability rates of OS and NS in TC split to LDI

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[4] Two items were excluded due to possible alternative interpretations at sentence level.
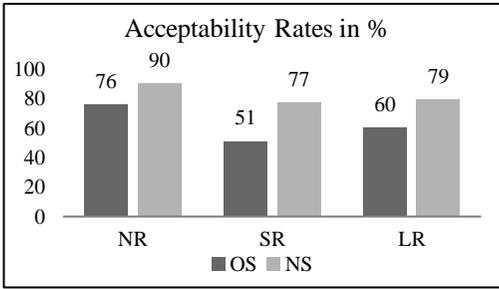
Figure 2. Acceptability rates of OS and NS in TC split to LoR

The rates show that NS items were generally accepted to a higher degree than the OS items and that monolinguals accept more OS and NS than the two bilinguals groups do. As to NS, no group differences were attested. However, regression analyses calculated with the sentence response times revealed an impact of LDI ($F_{(1,18)} = 4.16$, $p = .05$), as illustrated by figure 3 but crucially no impact for LoR ($F_{(1,18)} = 0.40$, $p > .05$).
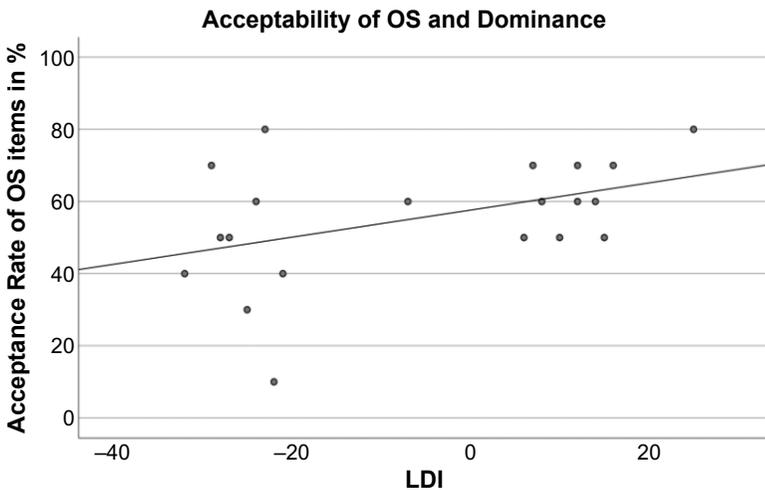
Figure 3. Sentence response times as to LDI – OS totals

Looking at the reaction times at the level of phrases (RTs), it can be observed that the BGM and the BGD groups get considerably slower at the VP (mean difference of 114 ms in the case of BGM and 106 ms in the case of BGD. This is different for the GED group, where the difference between the second and the third measuring point is much smaller (mean difference of 35 ms). Figures 4 and 5 illustrate these distributions. Since the phrases of all measuring points except for the pronoun are of comparable length (mean 3 syllables), the differences detected at measuring point 3 cannot be attributed to varying phrase length.
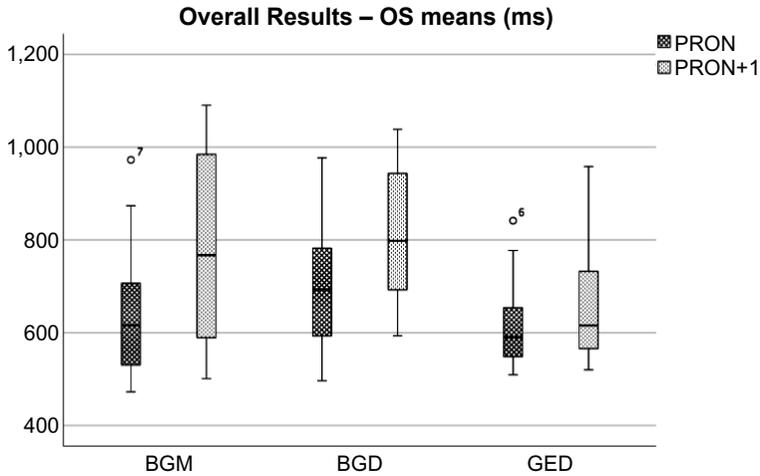
Figure 4. RTs at measuring points PRON and PRON + 1 as to LDI – OS totals
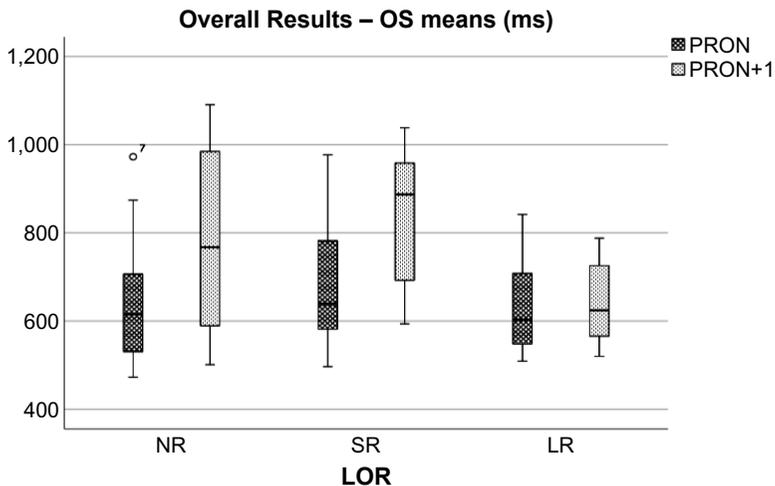
Figure 5. RTs at measuring points PRON and PRON + 1 as to LoR – OS totals

In contrast, the results for the NS items show no such differences for any of the groups. Accordingly, the two groups BGM and BGD performed differently according to condition. Crucially, a look at the rates of the GED group in both conditions (OS and NS) shows that this group performs similarly across conditions (mean difference of 35 ms for OS and 45 ms for NS).

Linear mixed effects analyses were performed with the data. Items and subjects were included as random factors, with calculation of intercepts and

slopes. The p-values were obtained by using the likelihood ratio for the full model, pairwise comparisons were Bonferroni corrected.

There were no differences between the groups for measuring point 1, neither in the NS, nor in the OS condition (p > .05). This is interpreted as evidence that all groups (independently of grouping as to LD or LoR) perform alike after phrases that are neutral as to condition. However, for measuring points 2 and 3, a different picture arises. Overall, significant differences as to group were attested for the measuring point at the VP in both conditions (in the NS condition this was VP and in the OS condition – PRON+1). In each case, the monolinguals and Bulgarian-dominant speakers patterned alike and both groups differed from the German-dominant speakers. Similarly, monolinguals and speakers with SR patterned alike, while both groups differed from speakers with LR. It should be noted that there is an overlap between the GED and the LR group (bilinguals with high LDI and LoR), captured by the strong correlation between the LDI and LoR of the bilingual participants – $r(18) = .58$, p = .006. Linear regression analyses with LDI and LoR revealed that each of the two factors significantly affected OS rates at measuring point 3. For measuring point 3, in the OS condition, there were differences for both group types of bilinguals (as to LDI vs. LoR, p < .001 in each case). When LoR grows with 1 year, reaction time slowers down with 12 milliseconds and when LDI grows by 4 points, reaction time slowers down with 16 milliseconds.

Pairwise comparisons showed that while the BGM and the BGD groups performed similarly, they both differed from the GED group (BGM vs. GED, p = .015, BGD vs. GED, p = .001). In the case of LoR, the groups of monolinguals and bilinguals with SR did not differ, while the group with LR differed from both the groups of monolinguals and bilinguals with SR (NR vs. LR, p 0 .006, SR vs. LR, p = .000).

As to results of the regression analyses, the rates of 9 of the LR speakers are below the distribution mean of 732,8 ms but it is only after LoR of 10 years that rates reliably remain under this value. In other words, for speakers with an LoR below 10 years, the picture is rather mixed so that higher and lower values are both possible. With regard to LDI, as soon as the speakers are German-dominant, LDI > 5, the rates of 8 speakers are under the mean. LoR accounts for 60% of the low values, LDI accounts for 80% or even more (if the only nearly balanced speaker is included). Importantly, while monolinguals' rates covered the greatest distribution range (with 70% of rates above the distribution mean), for bilinguals the trend was toward lower rates with growing LD and LoR.

5. Discussion

Overall, the results show that OS in TC are accepted by all groups of speakers, albeit to a different extent. The acceptability judgment data is indicative of different preferences toward the use of OS in TC. Consideration of the acceptability rates shows that while monolinguals have the highest acceptability of OS items in TC, BGD bilinguals accept such items the least. These different preferences are indicative of the impact of bilingualism

(bilingual processing) and L2-influence. The pattern of the BGD group could be attributed to the need of these speakers to sufficiently differentiate between both their languages (their dominant L1 and the majority language, dominating their environment) on an everyday basis, which is in-line with the assumptions on Greek-Italian bilinguals by Di Domenico and Baroncini (2018). This could also explain the high acceptability of OS by the monolinguals, for whom there is no need to differentiate between two languages at all so that OS in TC do not pose a problem for language processing. Alternatively, it could be the case that monolinguals do better in imagining contexts to accommodate OS in TC. This is possibly further influenced by the fact that this kind of OS are not strongly ungrammatical but simply the less preferred option in the L1 of the speakers. The fact that OS in TC are generally accepted to a higher degree in Bulgarian in comparison to Italian makes this assumption even more plausible.

While the monolinguals' RTs covered the widest range of distribution in terms of high and low values (70% above the distribution mean for measuring point 3), for the bilinguals a trend toward lower values only was evident with growing LD and LoR. Thus an OS in TC was a processing impediment for most monolinguals, it never was one for the bilinguals with a high LDI or LoR.

The similar performance of GED bilinguals in both conditions of the test (low RTs for OS and NS in TC) can be interpreted as evidence for L2 influence, because German requires OS in both cases. Accordingly, GED bilinguals treat both forms, OS and NS, alike, which leads to a uniform pattern of processing. Since Bulgarian is a rarely used language for these speakers, it can be inhibited more easily and the group performs more L2-like.

Overall, the analyses show that both LD and LoR have an impact on RTs but that this effect seems to be more pronounced for LD. Also, more of the analyses showed an effect of LDI in comparison to LoR. In the case of the results of the regression analyses for measuring point 3, LDI seems to explain the distribution of values better than LoR, covering 80% or more of it.

Taken together, the results of the study underscore the impact of LD, which seems to be a better predictor of the late L1 attrition effects investigated than LoR. As expected, for speakers for whom Bulgarian was more available for processing, performance came closer to that of the monolinguals. This is in-line with the results of the studies on re-exposure.

Differentiation between LD and LoR was somewhat impeded by the overlap of the two bilingual groups (higher LDI often goes together with higher LoR), an issue that remains to be resolved by future research. Importantly, this overlap might have the potential to explain some of the conflicting results on the effect of LoR in attrition research. The same goes for frequency of use.

The fact that the use of OS in TC is a feature of adult monolingual grammars is particularly revealing as to the nature of the alternation of OS and NS, for which gradience appears characteristic. The phenomenon depends on cross-linguistic microvariation, acquired overall late in L1 acquisition (syntactic aspects are early, discourse aspects late) and vulnerable in L2 development/L1 attrition. In a CNSL like Bulgarian, in which overt pronominal subjects can be

weak, there is a featural overlap between weak OS and NS, allowing their presence in the same grammatical contexts, those of TC in particular.

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