

Article

Use of Embedded Clauses in Heritage and Monolingual Russian

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Abstract: This study investigates the production of clausal embeddings by 195 Russian speakers (67 monolingually raised speakers, 68 heritage speakers in the US, and 60 heritage speakers in Germany) in different communicative situations varying by formality (formal vs. informal) and mode (spoken vs. written). Semi-spontaneous data were manually annotated for clause type and analyzed using a binomial generalized mixed-effects model. Our results show that heritage speakers of both groups and monolingually raised speakers behave alike regarding their use of embedded clauses. Specifically, all speaker groups produce embedded clauses more frequently in formal situations compared to informal situations. Mode was not found to influence the production of embedded clauses. This behavior suggests an underlying register awareness in heritage speakers of Russian. Such register awareness might be a result of the high involvement of heritage speakers with Russian. This study contributes to our understanding of linguistic outcomes of heritage speakers and highlights the influence of communicative situations on language production.

Keywords: heritage Russian; monolingual Russian; embedded clauses; formality; mode



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1. Introduction

In recent decades, scholars' interest in heritage speakers (HSs) has been increasing continuously. In a globalized world with migration processes taking place in nearly every industrial country, the US and Germany among them, bilinguals, and HSs in particular, represent a significant part of the (mostly) urban population (Brehmer 2007; Dubinina and Polinsky 2013; Laleko 2013; Rethage 2012). Thus, there is increasing research interest in dynamic processes taking place in these language communities, where many languages come in contact. This article focuses on Russian speakers in three different countries, namely monolingually raised speakers in Russia and HSs residing in the US and Germany.

We define HSs as bilinguals who acquire a heritage language (HL) at home and, after the onset of formal education, shift towards the majority language (ML) of their country of residence (Grosjean 1998; Valdés 2005; Rothman 2007, 2009; Cabo and Rothman 2012; Benmamoun et al. 2013; Montrul 2015; Guijarro-Fuentes and Schmitz 2015; Polinsky 2015; Papastefanou et al. 2019; Kim and Puigdelliura 2020). This definition implies that the language use of HSs is unbalanced. Also, the proficiency of HSs may vary between the two languages (Papastefanou et al. 2019; Kim and Puigdelliura 2020). Concerning these observations, there is an ongoing debate in the literature on the link between proficiency and nativeness in the context of HSs. Specifically, some scholars argue that nativeness generally requires dominance and high proficiency in a language, traditionally regarding monolingual attainment as baseline, whereas others claim that nativeness is rather a product of naturalistic L1 acquisition which does not necessarily imply high proficiency in all linguistic domains, e.g., when those are inaccessible due to the lack of formal language instruction (for a discussion, see Rothman and Treffers-Daller 2014; Tsehaye et al. 2021; Wiese et al. 2022; Rothman et al. 2023). Following the latter point of view, we consider HSs

to be a part of the nativeness continuum, since they acquire the two languages naturally from birth in contrast to L2 learners. While ML is used in a wider range of communicative situations, HL is usually restricted to informal conversations and therefore sometimes lacks features of formal language (Dressler 1991; Chevalier 2004; Polinsky 2018). Thus, HSs are usually not exposed to register variation, and this can lead to register leveling as shown by Wiese et al. (2022) for different HS groups. Also, HSs usually have no or a limited command of the written mode of their HL (cf. Montrul 2015).

Language contact situations in general and the shift of the dominance from the HL to the ML in particular may lead to substantial changes in the HL resulting in a reduced amount of linguistic knowledge in the HL as compared to the ML (Pavlenko 2000; Schmid 2010). One relevant question is how register knowledge develops under reduced input and dominance shift, and how sensitive it is to colloquial exposure. We will address this question by investigating the use of embedded clauses in semi-spontaneous narrations by HSs of Russian in the US and Germany and monolingual speakers¹ of Russian. This phenomenon is particularly interesting, because selecting embedded clauses may be considered a discourse strategy. Thus, it involves the interface between syntax and discourse, which, according to the Interface Hypothesis, increases variation in HS's production (Sorace 2011).

Our study contributes to the current HL research regarding several aspects. First, numerous studies on syntax in heritage Russian have focused on word order variation (e.g., Brehmer and Usanova 2015; Laleko and Dubinina 2018; Zuban et al. 2021; Martynova et al. forthcoming) and on production and comprehension of relative clauses (e.g., Polinsky 2008c, 2011), but not on the use of embedded clauses. Second, the current study investigates the possible effects of formality (formal vs. informal) and mode (spoken vs. written) on the distribution of embedded clauses since previous research discusses the correlation between the rate of embedded clauses and specific registers and/or mode in monolingual varieties (see Biber and Gray 2010; Buchmüller et al. forthcoming, among others). By examining different registers, this study will add to just a few existing studies on this topic regarding HLs (e.g., Tsehaye et al. 2021; Pashkova et al. 2022, both on heritage German). Third, to the knowledge of the authors, there has been almost no research on the production of embedded clauses in HSs of Russian, except for Schroeder et al. (forthcoming).

The paper is structured as follows. Section 2 provides an overview of previous studies on embedded clauses from different perspectives: embedded clauses and syntactic complexity (Section 2.1), embedded clauses and communicative situations (Section 2.2), and register awareness in bilingual speakers (Section 2.3). Subsequently, Section 3 presents the research questions and related hypotheses, followed by Section 4 that focuses on the method including sections on experimental design (Section 4.1), participants' information (Section 4.2), data annotation (Section 4.3), and statistical analysis (Section 4.4). Finally, Section 5 provides the results, followed by discussion presented in Section 6.

2. Theoretical Overview

2.1. Embedded Clauses and Syntactic Complexity

Embedded clauses² are dependent structures that are syntactically and semantically integrated into the main clause; furthermore, they are part of the same processing and planning unit as the associated main clause (Diessel 2004, p. 48). The latter fact is often used to motivate the assumption that the embedded clauses are more syntactically complex than the main clauses (e.g., Polinsky 2011; Sanchez Abchi and Mier 2017; Housen et al. 2019). Embedded clauses can be also considered syntactically complex since they require more steps in the syntactic derivation (Housen et al. 2012; Sanfelici and Schulz 2021). Research traditionally distinguishes between different types of embedded clauses, namely complement, adverbial, and relative clauses (Diessel 2004). In the present study, we investigate the use of all finite embedded clauses—irrespective of their type—as opposed to main clauses.

The use of embedded clauses is often regarded to be a marker of syntactic complexity (Norris and Ortega 2000; Biber and Gray 2010, 2011; Biber et al. 2011; Bulté and Housen

2012; Sanchez Abchi and Mier 2017; Neary-Sundquist 2017; Peristeri et al. 2017). Some embedded clauses might be indeed particularly complex. For instance, in relative clauses in Russian, a relative pronoun is marked for gender, number, and case. Also, although subject or object relativizers typically appear before other constituents of an embedded relative clause, the word order of other constituents (VO or OV) depends on the discourse requirements (for detailed discussion see Polinsky 2011; Levy et al. 2013).

The direct link between the use of embedded clauses and syntactic complexity has also been questioned. For instance, Kisselev et al. (2021) found that some particular types of subordination (e.g., gerund, participle clauses) correlate with the proficiency level of HSs of Russian, but not when different types of embedded clauses are viewed together. Also, Kuiken and Vedder (2019) give an overview of several studies that showed mixed results regarding the rate of subordination and syntactic complexity. Furthermore, as pointed out by Norris and Ortega (2009), embedded clauses represent only *one* dimension of syntactic complexity. Since the measurement of the overall syntactic complexity is beyond the scope of the present paper, we do not elaborate on this and on the appropriateness of embedding rate as a measure of syntactic complexity here.

The knowledge of the distributional patterns of main and embedded clauses by HSs may result in variation due to other reasons beyond those mentioned before in connection with syntactic complexity. First, previous research indicates that the acquisition of embedded clauses generally occurs at a later stage of language development compared to the acquisition of main clauses (Feilke 1996; Cejtin 2000; Ovčinnikova 2011; Kuiken and Vedder 2019, among others). This suggests that embedded clauses pose a greater challenge for language learners and HSs (since the latter might not have fully acquired embedded clauses due to the onset of the ML) and require more advanced grammatical abilities.

Second, embedded clauses are considered to be potentially prone to attrition in language contact situations due to their syntactic complexity, resulting in difficulties for individuals who are not regularly exposed to or actively using one of their languages (Slobin 1977; Dussias 2004; Pavlenko 2010; Ribbert and Kuiken 2010; Polinsky 2011; Sorace 2011).

Third, for monolingual speakers, the use of different clause types is connected to the discourse knowledge, e.g., formal vs. informal and spoken vs. written communicative situations (e.g., Biber and Gray 2011; Biber et al. 2011; Biber 2014; Buchmüller et al. *forthcoming*, see more details in Section 2.4). The knowledge of registers by HSs is another possible area for variation since they are typically not exposed to the formal variety of their HL as discussed in Section 1.

To sum up, the rate of embedded clauses is frequently considered to be an indicator of syntactic complexity; however, this link might not be very straightforward. Late acquisition of embedded clauses and their possible attrition in HLs might lead to the differences between HSs and monolingual speakers regarding the use of such clauses.

2.2. Embedded Clauses in Heritage Languages

Polinsky (2015, p. 16) states that HSs and L2 learners tend to use structures without subordinate clauses possibly due to their syntactic complexity. Several production studies confirm the claim by Polinsky (2015) by showing the differences between HSs and monolingual speakers regarding their frequency of embedded clauses, with the former typically using fewer embeddings than the latter.

Specifically, a study by Treffers-Daller et al. (2007) focuses on the use of embeddings in three Turkish-German bilingual groups, namely HSs in Germany and returnees, as well as in monolingual speakers of Turkish. The participants' task was to produce a story by describing two comic strip series. The researchers report that HSs of Turkish produce fewer embedded clauses in their narrations compared to monolingual Turkish speakers, showing lower syntactic complexity in heritage Turkish as opposed to monolingual Turkish (Treffers-Daller et al. 2007).

Some studies used the RUEG corpus (Wiese et al. 2019, 2021) of semi-spontaneous production data varying by mode and formality to address the use of clausal embeddings

in HSs. For instance, a study by [Pashkova et al. \(2022\)](#) looked at the distribution of three clause types (independent main clause, coordinate main clause, and embedded clause) in narrations of adolescent HSs of German in the US (in their heritage German and majority English) as well as in narrations of age-matched monolingual speakers of English and German. It was found that HSs of German in the US were similar to the monolingual speakers of German regarding the distribution of independent main clauses but not embedded clauses. Specifically, HSs produced fewer embedded clauses than monolingual speakers ([Pashkova et al. 2022](#)).

In line with [Pashkova et al. \(2022\)](#), [Tsehaye et al. \(2021\)](#) also report that HSs of German in the US produced embedded clauses less frequently than monolingual speakers of German in the RUEG corpus ([Wiese et al. 2019](#)).

Another study using the data from the RUEG corpus shows that some particular types of embedded clauses are challenging for HSs. [Alexiadou and Rizou \(2022\)](#) investigated the use of Greek restricted relative clauses with *o opios* 'the who' and *pu* 'that' in oral and written productions of monolingual and heritage Greek speakers in the US ([Alexiadou and Rizou 2022](#)). *O opios* is typically used in formal registers, is inflected for gender, case, and number, and agrees with the nominal head it modifies. *Pu* is typical for colloquial speech and bears no inflection. The findings showed no differences in the use of *pu* relative clauses, which were similarly distributed across all groups both in formal and informal situations ([Alexiadou and Rizou 2022](#)). In contrast, HSs produced significantly fewer *o opios* relative clauses as compared to monolingual Greek speakers, which is explained with reference to the difficulties in establishing agreement between nouns and modifiers by HSs ([Alexiadou and Rizou 2022](#)).

The finding that HSs produce fewer embedded clauses does not hold for all groups and HLs. For instance, [Schroeder et al. \(forthcoming\)](#) investigated, i.a., the distribution of main and embedded clauses by adolescent HSs of Greek, Turkish, and Russian residing in the US and Germany in the RUEG corpus ([Wiese et al. 2019](#)). It was found that HSs of Greek and Turkish produced fewer embedded clauses in their HL compared to the monolingual speakers of Greek and Turkish, while HSs of Russian in Germany and the US behaved similarly to the monolingual speakers.

Another study that did not find HSs to differ from monolingual speakers regarding their rate of subordination is that by [Sanchez Abchi and Mier \(2017\)](#). The study investigated syntactic complexity in written narratives produced by child HSs of Spanish (aged from 8.6 to 13.7 years) with German or French as the MLs in different regions of Switzerland. One of the assessment measures applied was the type (adjunct, object, and relative) and frequency of embedded clauses. The results revealed that HSs behaved similarly to their monolingual peers by producing the same rate of main and embedded clauses ([Sanchez Abchi and Mier 2017](#)). However, [Sanchez Abchi and Mier \(2017\)](#) observed a tendency towards an advantage of Spanish-French-speaking children as compared to Spanish-German children, which was explained by a typological similarity of Spanish and French.

Overall, previous research on the production of embedded clauses under language contact frequently reports on the differences between bilingual and monolingual speakers, with the former producing fewer embedded clauses than the latter. One possible reason for these differences might be related to the later acquisition of embedded clauses and the possibility that they might be subject to attrition in HSs. Additionally, a more general cross-linguistic influence has been also claimed to play a role in the outcomes of bilingual speakers.

2.3. Embedded Clauses and Word Order in Heritage Russian

Various domains have been examined in numerous studies on heritage Russian: nominal morphosyntax and argument structure ([Polinsky 2006, 2008a](#); [Gagarina 2011](#); [Laleko 2018](#); [Martynova et al. forthcoming, forthcoming](#)), verbal morphology ([Romanova 2008](#)), aspect ([Polinsky 2006, 2008d](#); [Anstatt 2008](#); [Laleko 2010, 2011, 2015](#); [Gagarina et al. 2020](#)), pro-drop ([Isurin 2011](#); [Dubinina and Polinsky 2013](#); [Özsoy et al. forthcoming](#)), and lexicon of HSs

(Polinsky 2006; Isurin 2011; Gagarina 2011; Klassert et al. 2014). Studies on syntax mainly focused on word order linearizations (Brehmer and Usanova 2015; Laleko and Dubinina 2018; Kisselev 2019; Zuban et al. 2021; Martynova et al. forthcoming, among others), leaving the interaction between embedded clauses and word order out of attention. Little is known about the use of embedded clauses in heritage Russian. One exception is Polinsky (2008c, 2011), who analyzed the processing of Russian subject and object relative clauses in child and adult HSs in the US and monolingual peers in Russia using a picture-matching experiment. It was found that children in both speaker groups converged in their linguistic behavior, while adult HSs diverged from adult monolinguals regarding their processing of object relative clauses, which Polinsky (2008c, 2011) attributed to language attrition.

For our investigation of embedded clauses in heritage Russian, word order is particularly interesting, since recent studies report that clause type is an important factor that influences the word order choice in heritage and monolingual Russian. Zuban et al. (2021) found that in main clauses, HSs of Russian residing in Germany and the US were similar to the monolingual speakers regarding the overall distribution of different word orders. In embedded clauses, HSs in Germany were similar to the monolinguals, while HSs in the US differed from both monolinguals and HSs in Germany by producing significantly more SVO orders. The results of the study are discussed with reference to the differences between main and embedded clauses as well as the differences between the MLs of the HSs. Specifically, the increased use of the SVO order by the HSs in the US could be a result of the general higher complexity of embedded clauses compared to the main clauses (e.g., regarding the accuracy of processing or the time of acquisition). Also, the differences in the word order flexibility in the MLs could lead to the differences between the HSs of the two groups (see Zuban et al. 2021, for a detailed discussion).

Martynova et al. (forthcoming) investigated the choice between OV and VO word orders in heritage Russian in the US and Germany as compared to monolingual Russian. The results do not reveal any differences between the groups and suggest that the factors that are relevant for OV vs. VO choice in monolingual Russian, namely clause type (main vs. embedded clause) and object realization (noun vs. pronoun), are relevant for heritage Russian in the US and Germany in a similar way (Martynova et al. forthcoming). Specifically, HSs follow the monolingual pattern showing an increase in VO word orders in embedded clauses and with nominal objects (Martynova et al. forthcoming).

Only two studies on the production of embedded clauses in HSs of Russian are known to the authors of this paper. In a study on two HSs of Russian in the US and two monolingual speakers of Russian, Polinsky (2008c) reports that both HSs produced fewer embedded clauses than monolingual speakers. Another study by Schroeder et al. (forthcoming) is presented in Section 2.2. Although Schroeder et al. (forthcoming) do not find any differences between adolescent HSs of Russian and monolingual speakers of Russian in terms of their use of embedded clauses, these results should be viewed as tendencies since the study does not provide any statistical analysis (i.e., it gives a descriptive overview of by-group aggregated numbers). Thus, there is a need to verify the reported tendencies by applying an appropriate statistical method that takes into account speakers' variation.³

Overall, studies that look at the distribution of different word orders across main and embedded clauses report that some HS groups (namely in Germany) pattern with monolingual speakers of Russian while some other HS groups (namely in the US) do not always converge with monolingual speakers. As for the general distribution of main and embedded clauses in heritage Russian, two available studies come to different conclusions. Polinsky (2008b), presenting the data of only two HSs of Russian, reports that they produce fewer embedded clauses than monolinguals. Schroeder et al. (forthcoming) make observations that HSs are similar to monolinguals; however, as mentioned before, these observations need to be verified by applying statistical methods.

2.4. Register Awareness of Heritage Speakers

In this section, we report on results from studies investigating the link between register awareness and the use of embedded clauses. It has been claimed that a particular clause type is more typical for a particular type of discourse in a monolingual language variety. For instance, a study by [Biber and Gray \(2010\)](#) examines the use of embedded clauses in a corpus of academic research articles as compared to a conversation corpus. In [Biber and Gray \(2010\)](#)'s terminology, there are two polarities: oral speech as a whole vs. academic writing. One of the leading assumptions is an observation that speech and academic written texts are both highly complex, but in a different way ([Biber and Gray 2010](#)). Specifically, the authors conclude that for academic texts, phrases without verbs, such as modifiers and prepositional phrases, are typically used to achieve structural elaboration ([Biber and Gray 2010](#), p. 7). As for embedded clauses, they are used more often in speech than in academic writing ([Biber and Gray 2010](#)). A similar trend was confirmed cross-linguistically ([Biber and Gray 2011](#); [Biber et al. 2011](#)). Further, in a more recent study, a higher rate of embeddings was reported in spoken and "oral written" than in written and "literate spoken" communicative situations cross-linguistically ([Biber 2014](#), p. 32).

As for monolingual Russian, the reports in the literature are contradicting. On the one hand, embedded clauses in Russian are traditionally considered to be a feature of the "scientific style" ([Kožina et al. 2011](#)), which roughly corresponds to academic writing. However, it remains unclear which investigation(s) this assumption is based on.⁴ On the other hand, according to the results of a recent corpus study, the frequency of embedded clauses in monolingual Russian is primarily driven by the mode of an utterance. More specifically, [Buchmüller et al. \(forthcoming\)](#) investigated the link between syntactic complexity, including embedding rate, and so-called "functional spheres" which correspond to different registers. The study was performed on large-scale data from the Russian National Corpus. The results reveal that the rate of embeddings is higher in oral public texts than in official-business, technical, and educational-scientific texts ([Buchmüller et al. forthcoming](#)). This finding is in line with findings by [Biber and Gray \(2010, 2011\)](#), [Biber et al. \(2011\)](#), and [Biber \(2014\)](#). However, it needs to be pointed out that generalizing the results of different studies carried out on different kinds of data and using different methodologies is problematic. Thus, summarizing the abovementioned findings by [Biber and Gray \(2010, 2011\)](#), [Biber et al. \(2011\)](#), [Biber \(2014\)](#), and those by [Buchmüller et al. \(forthcoming\)](#), a higher rate of embeddings is found in spoken communicative situations (speech and oral public texts) compared to formal written communicative situations (academic writing, official-business, technical, and educational-scientific texts).

As for the HLs in contact with the MLs English or German, the studies on the distribution of different clause types across different registers provide more or less consistent results. Specifically, HSs were generally found to show knowledge of formality and mode in their HL similarly to monolingual speakers. For instance, [Schlepppegrell and Colombi \(1997\)](#) investigated the use of different clause types (paratactic, hypotactic, and embedded) in university essays by two HSs of Spanish residing in the US. HSs received formal education in English, but not in Spanish ([Schlepppegrell and Colombi 1997](#), p. 482). The results showed that the two HSs used the same strategies of clause-combining, both in their majority English and heritage Spanish. [Schlepppegrell and Colombi \(1997](#), p. 493) assume that HSs developed an awareness of academic writing in their HL based on their knowledge of formal writing in their ML. However, the same issue mentioned above arises here, namely the generalizability of the results obtained on one particular sort of language production—academic writing. To avoid this problem, in what follows, we will focus on studies carried out on the data from the RUEG corpus ([Wiese et al. 2019, 2021](#)), containing productions explicitly controlled for mode and formality.

[Pashkova et al. \(2022\)](#) investigated the distribution of different clauses in four communicative situations using the RUEG corpus. The results showed that HSs of German in the US had an underlying knowledge of different communicative situations in their HL. Both HSs and monolingual speakers of German used more independent main clauses in the written than in

the spoken mode. Furthermore, both speaker groups produced more coordinate main clauses in the informal than in the formal situation, and both speaker groups had more coordinate main clauses in the spoken productions compared to the written ones. Furthermore, regarding the use of embedded clauses, the HSs were found to be sensitive to the interaction of formality and mode by producing more embedded clauses in the formal written than in the informal written situation and by showing no formality differences in the spoken mode. Monolingual speakers were only sensitive to formality in producing more embedded clauses in formal situations independently of mode (Pashkova et al. 2022, pp. 23–26). HSs were similar to the monolingual speakers of their ML English in producing more embedded clauses in the formal than in the informal situations (Pashkova et al. 2022, p. 22). Pashkova et al. (2022) conclude that HSs have an underlying awareness of language use in different communicative situations in their HL even though their HL may be used in a smaller range of situations.

Tsehaye et al. (2021) examined the distribution of finite embedded clauses and their types (relative, complement, and adverbial) in semi-spontaneous spoken and written narrations by adolescent HSs of German in the US. As for the types of embedded clauses, formality was found to be important for both HSs and monolinguals in a similar way, i.e., both speaker groups produced more adverbial and relative clauses but fewer complement clauses in the formal situations than in the informal situations.

Schroeder et al. (forthcoming) report on the possible influence of formality and mode on the use of embedded clauses by HSs of Greek, Turkish, and Russian and the respective monolingual speakers. The study reveals a similar effect of formality for HSs of all groups and monolingual speakers, with a higher rate of embedded clauses in formal situations than in informal ones. Mode, on the other hand, was not found to be important for the distribution of embedded clauses.

Despite the abovementioned studies suggesting an underlying register awareness of HSs regarding their use of different clause types, various studies on other linguistic phenomena show that HSs diverge from the respective monolingual speakers and show register-leveling effects. For instance, a study by Alexiadou et al. (2022) investigated the use of the plural indefinite article *kati* 'some' by HSs of Greek in the US and Germany. The determiner *kati* is typically used in informal situations in Standard Modern Greek. It was found that HSs of both groups used *kati* across all communicative situations, while monolingual speakers of Greek used it only in informal situations (Alexiadou et al. 2022).

Schroeder et al. (forthcoming) investigated the post-verbal position of elements in semi-spontaneous narrations of adolescent and adult HSs of Turkish residing in the US and Germany using the data from the RUEG corpus. Standard Turkish is an SOV language that allows elements to appear post-verbally under certain conditions (e.g., in informal situations). According to the literature on standard Turkish, discourse-new referents are not predicted to appear post-verbally. Schroeder et al. (forthcoming) report that both HSs and monolingual speakers of Turkish produced discourse-new post-verbal referents, but bilingual and monolingual speakers differed in terms of register. Specifically, monolingual speakers of Turkish used discourse-new post-verbal referents only in informal situations while HSs of both groups, contrary to monolingual speakers, produced such discourse-new referents across all communicative situations.

Further evidence for register-leveling processes in HSs' productions comes from a study by Wiese et al. (2022). It was found that HSs of German in the US showed a similar distribution of non-canonical bare NPs in both formal and informal situations, in contrast to the monolingual speakers of German and bilingual speakers of majority German who mainly produced such bare NPs in informal situations. Furthermore, it was found that HSs of German in the US produced V3 structures (which are very restricted in Standard German) in both formal and informal situations, while such structures mainly appeared in the informal situations in productions of monolingual German speakers.

Finally, some studies provide mixed results on the register knowledge by HSs. For instance, Zuban (Zuban) and Zuban (2023) investigated the preference for the three-word orders (SVO, OVS, and SOV) by HSs of Russian in the US and monolingual speakers of

Russian in spoken and written narrations that differed in terms of formality (formal vs. informal). It was found that HSs showed a general register awareness regarding the choice of some word orders (more frequent SVO in the formal and more frequent SOV in the informal and spoken) and they were similar to the monolingual speakers in this respect. However, HSs, unlike monolinguals, did not show any effect of register on the use of OVS order.

Taken together, findings about HSs' knowledge of different communicative situations are somewhat conflicting. On the one hand, HSs were found to generally pattern with monolingual speakers of their HL regarding their knowledge of different communicative situations. What is noteworthy, however, is that all the studies that found the above-described convergent patterns investigated clause types. Studies that focused on other linguistic phenomena frequently found that HSs overgeneralized one pattern (often from informal spoken situations) across multiple communicative situations as opposed to monolingual speakers, whose patterns differed depending on a particular situation.

3. Research Questions and Hypotheses

Filling in the gap derived from the literature discussed above, we formulated two research questions (RQs). First, we address the different countries of elicitation, namely whether the language contact situation is at hand. This factor varies across the three groups representing monolingual speakers of Russian on the one hand and HSs of Russian, with the majority languages English and German, on the other hand:

- RQ1: Does the country of elicitation have an impact on the use of embedded clauses across different groups of Russian speakers?

H1: *HSs of Russian will produce fewer embedded clauses compared to monolinguals since embedded clauses are acquired later and therefore might be prone to attrition (Cejtlin 2000; Ovčinnikova 2011; Pavlenko 2010).*

Second, since HSs are often reported to lack register and mode awareness, we tease apart the speakers' use of embedded clauses according to the four different communicative situations, each controlled for mode (spoken vs. written) and formality (formal vs. informal):

- RQ2: Do communicative situations have an impact on the use of embedded clauses across different groups of Russian speakers?

If HSs are aware of formality and mode variation in their HL (as reported by Tsehaye et al. 2021; Pashkova et al. 2022, on heritage German; Schroeder et al. forthcoming, on heritage Russian), they will pattern with monolingual speakers of Russian, i.e., either according to the H2a or H2b:

H2a: *All speaker groups will produce more embedded clauses in the spoken than in the formal written productions (Biber and Gray 2010; Buchmüller et al. forthcoming).*

H2b: *All speaker groups will produce more embedded clauses in the formal situations than in the informal situations (Schroeder et al. forthcoming).*

If there are register-leveling processes in heritage Russian (shown by Alexiadou et al. 2022; Wiese et al. 2022 for HSs of other languages), we expect HSs to behave according to H2c:

H2c: *HSs will not show any effect of communicative situations on the use of embedded clauses.*

4. Method

4.1. Experimental Design

The data for the present study were drawn from the RUEG corpus, version 1.0 (Wiese et al. 2021). The corpus contains ecologically valid semi-spontaneous production data controlled for mode (spoken vs. written) and formality (formal vs. informal), which were collected according to the language situations approach (Wiese 2020). Detailed guidelines and all materials used in the experiment are available online.⁵ The sub-corpus of Russian represents 777 narrations⁶ of 128 HSs and 67 monolingual speakers. During the data elicitation, participants were shown a short video of a fictional car accident and were asked to retell what they had seen. To control for mode and formality in participants' narrations, we simulated four distinct communication situations: formal spoken (a witness call to a police department), formal written (a written witness report to a police officer), informal spoken (a voice message to a friend via WhatsApp (from 2.18.105 and higher version)) and informal written (a text message to a friend via WhatsApp).

The elicitation of the formal situations took place in a linguistic lab or in an office with a formally dressed elicitor, using standardized language with polite forms. The informal part was elicited in another place, such as a classroom or a library, with a different elicitor who was dressed casually and used vernacular language. A 15 min chitchat preceded the informal elicitation to create a more relaxed atmosphere. The whole elicitation was recorded for transparency. HSs narrated the event in both their HL and MLs in two different elicitation sessions scheduled at least 3 days apart. Elicitation orders were balanced. In the present study, we only focus on the Russian narrations by monolingual and HSs.

4.2. Participants

The current study examines the data of 195 Russian speakers residing in three different countries:

1. 68 HSs in the US with ML English (42 F, mean age = 21.6, SD = 6.45);
2. 60 HSs in Germany with ML German (40 F, mean age = 21, SD = 5.14);
3. 67 monolingual speakers in Russia (46 F, mean age = 21.6, SD = 5.67).

The data of the HSs in the US were collected in the Greater Washington metropolitan area (Virginia, Maryland, DC), HSs in Germany were recorded in Berlin, and monolingual speakers were recorded in Saint Petersburg. The participants were recruited in urban areas via calls in mailing lists, social media, educational institutions such as schools, universities, and language courses, and public organizations such as libraries, youth and sports clubs, and shopping centers. At the time of the experiment, all adolescent participants attended monolingual schools, and all adult participants had at least a high school degree, whereas the majority of them reported having a university degree. All participants reported no speech disorder, normal or corrected-to-normal vision, and normal hearing. The age ranges of the participants comprise 14–35 years. In the following, we will provide some more details on the linguistic background of the participants.

The main requirement for admission of the HSs to the experiment was that they spoke Russian at home daily with at least one of their caregivers. HSs from families with more than one HL were not admitted to the study. All HSs are 2nd generation speakers who were either born in the US or Germany to Russian-speaking families or moved there from the countries of the former Soviet Union (mainly from Russia, but also from Ukraine, Belarus, Kazakhstan, Uzbekistan, and Turkmenistan) until the age of five. They were exposed to Russian from birth at home. As for the ML, some HSs started acquiring it from birth while other HSs started learning English or German after Russian, but before the age of six (mean age of onset of ML: German = 1.3, English = 3.3). In sum, our HSs' sample consists of simultaneous and sequential bilingual HSs with an age of onset of 0 in their HL and an age of onset not exceeding 6 years in their ML.

As for formal exposure to the HL, some HSs attended Sunday schools to learn Russian for about 5 years on average. Overall, more HSs living in Germany (more than two-thirds) than HSs in the US (nine HSs) did so. Concerning Russian language input outside the

family, some HSs had leisure activities in Russian such as music, theater, singing, or art lessons. Regarding literacy, the majority of HSs could write in Russian Cyrillic script (Germany: 54/60, US: 57/68). The majority of HSs reported that they felt like native speakers both in Russian and in their ML, German or English, respectively; see Table 1.

Table 1. Self-reports of bilingual participants⁷: “Do you feel native in your HL/ML?”.

| Country | Native in HL and ML | Native in HL Only | Native in ML Only |
|---------|---------------------|-------------------|-------------------|
| Germany | 37 | 8 | 12 |
| US | 42 | 1 | 5 |

All participants were asked to report on their media use in their HL and MLs regarding the following media: video, audio, writing in social media, and reading. Participants were asked whether and how often they used the abovementioned media using the following options: ‘often’, ‘sometimes’, ‘never’. These options have been transformed into scores from 0 to 1 where 0 is ‘never’ and 1 stands for ‘often.’ The data analysis revealed that HSs of both groups used different media in Russian considerably less frequently than monolingual speakers, see Table 2.

Table 2. Self-reports of participants: media use in Russian.

| Country | Video | Audio | Social Media (Writing) | Reading | Average |
|---------|-------|-------|------------------------|---------|-----------------|
| Germany | 0.55 | 0.61 | 0.7 | 0.45 | 0.58, SD = 0.34 |
| US | 0.57 | 0.5 | 0.57 | 0.51 | 0.41, SD = 0.32 |
| Russia | 0.93 | 0.93 | 0.98 | 0.98 | 0.96, SD = 0.16 |

Furthermore, HSs of both groups used different media more frequently in their ML than in their HL, suggesting that they use English or German as their main language in daily life, see Table 3.

Table 3. Self-reports of participants: media use in ML English or German.

| Country | Video | Audio | Social Media (Writing) | Reading | Average |
|---------|-------|-------|------------------------|---------|-----------------|
| Germany | 0.86 | 0.76 | 0.99 | 0.9 | 0.88, SD = 0.21 |
| US | 0.98 | 0.96 | 1 | 0.96 | 0.98, SD = 0.11 |

In addition to the speakers’ self-assessments of media use, all participants were asked to assess their knowledge of their HL and ML in four domains: understanding, speaking, reading, and writing. Participants answered the following question: “How easy do you find it to understand spoken/ speak/ read/ write (in) your HL/ML?”. Participants could choose one of the five answers: ‘very easy’, ‘easy’, ‘neither easy nor difficult’, ‘difficult’, and ‘very difficult’. The answers were transformed into scores from 0 to 1 with 0.25 intervals where 0 stands for ‘very difficult’ while 1 stands for ‘very easy’. Regarding the speakers’ answers about their knowledge of Russian, the average scores of the HSs of both groups were similar to each other and were lower than the scores of the monolingually raised speakers, as shown in Table 4. Furthermore, ‘understanding’ and ‘speaking’ received higher scores than ‘reading’ and ‘writing’ by HSs of both groups.

Table 4. Self-reports of participants: language skills in Russian.

| Country | Understanding | Speaking | Reading | Writing | Average |
|---------|---------------|----------|---------|---------|-----------------|
| Germany | 0.88 | 0.77 | 0.64 | 0.57 | 0.72, SD = 0.24 |
| US | 0.85 | 0.77 | 0.6 | 0.48 | 0.68, SD = 0.24 |
| Russia | 0.94 | 0.89 | 0.94 | 0.84 | 0.90, SD = 0.12 |

Regarding the HSs’ answers about their knowledge of English and German, their average scores were higher than those on their knowledge of Russian; see Table 5. These results suggest that the HSs feel more competent in their MLs than in their HL.

Table 5. Self-reports of participants: language skills in ML English or German.

| Country | Understanding | Speaking | Reading | Writing | Average |
|---------|---------------|----------|---------|---------|-----------------|
| Germany | 0.98 | 0.96 | 0.97 | 0.95 | 0.97, SD = 0.13 |
| US | 0.98 | 0.98 | 0.98 | 0.97 | 0.98, SD = 0.08 |

As for some other measures of HSs’ fluency, speech rate (measured as the number of words/minute) was calculated for a subset of the data (namely, for 40 speakers in each group). The average speech rate was comparable across all speaker groups (HSs in the US: 114 words/minute; HSs in Germany: 113 words/minute; monolingual speakers: 119 words/minute). These results show that HSs of both groups were overall fluent in Russian (Zuban 2023, Zuban).

4.3. Data Sample and Annotation

In the RUEG-RU sub-corpus, the data were transcribed and annotated by linguistically trained speakers of Russian on the basis of the dual control principle in order to minimize typing errors and increase accuracy.⁸ The most relevant annotation layer for the current study is the clause type. The clause type annotation layer contains the following tags: main, object, subject, or adjunct. Greeting forms, interjections, and discourse markers, as well as structures containing copula drop or verb ellipsis, were not annotated. For the purpose of the present study, object, subject, and adjunct clauses were collapsed into one category, namely embedded clauses. Thus, embedded clauses represent all dependent subordinate structures within the associated main clause, i.e., they are incomplete and/or syntactically infelicitous without the main clause (see i.a. Diessel 2004). Furthermore, participles and their attributes were not annotated as separate clauses and structurally belong to the next higher clause:

- (1) main clause [proxod-jaščij mimo paren’ vyronil mjač]
walking-PTCP by guy dropped ball

‘A guy who was walking by dropped the ball’.⁹

This also applies for infinitives if they form tense or mode constructions in combination with auxiliaries like *byt’* ‘to be’, or are part of modal constructions in combination with modal verbs, such as *xotet’* ‘want’ or *moč’* ‘be able to’:

- (2) main clause [ja vsegda smogu dat’ dopolnitel’nuju informaciju].
I always can give.INF more information

‘I can always give (you) more information.’

However, infinitives forming infinitive clauses while being arguments of phase verbs, such as *zaveršit’* ‘complete’, *zakončit’* ‘end’, *načat’* ‘begin’, *perestat’* ‘stop’, or *prodolžit’* ‘continue’, or control verbs, such as *obeščat’* ‘promise’ or *poprosit’* ‘ask’, were annotated as embedded clauses:

- (3) main clause [papa, mama i malyš v koljaskesobiralis’ emb.clause [perexodit’ dorogu].
dad mom and baby in stroller were.about.to cross.INF road

‘A dad, mom, and a baby in a stroller were about to cross the road’.

Furthermore, structures with co-referential subjects and VP coordination were annotated within one clause:

(4) main clause [Potom mjačik upal i ukatilsja k seredine doroge].
 then ball fell and rolled toward middle road

‘Then the ball fell and rolled toward the middle of the road’.

The final data set contains 11,241 clauses, as shown in Table 6.

Table 6. Number of documents, main and embedded clauses per country of elicitation.

| Country | N of Narrations | Main Clauses | Emb. Clauses |
|---------|-----------------|--------------|--------------|
| Germany | 239 | 2959 | 1060 |
| Russia | 266 | 2349 | 931 |
| US | 272 | 2826 | 1116 |

Subsequently, the data points were split according to which of the four communicative situations they were produced in, as provided in Table 7:

Table 7. Number of main and embedded clauses across different communicative situations.

| Country | Formal Spoken | | Formal Written | | Informal Spoken | | Informal Written | |
|---------|---------------|------|----------------|------|-----------------|------|------------------|------|
| | main | emb. | main | emb. | main | emb. | main | emb. |
| Germany | 899 | 393 | 574 | 226 | 953 | 277 | 533 | 164 |
| Russia | 670 | 361 | 498 | 231 | 721 | 214 | 460 | 125 |
| US | 909 | 420 | 554 | 221 | 872 | 349 | 491 | 126 |

4.4. Statistical Analysis

For the statistical analysis, a binomial generalized linear mixed-effects model (GLMM) was used. Such an approach has several advantages. First, GLMM is most suitable for nested data, which is the case in our sample since the data points are not independent. The model can cluster dependent data by including the preferences of every individual speaker in the analysis, which is achieved by setting speaker variation as a random effect (Winter 2019). Second, GLMM allows us to investigate multiple fixed effects and their interactions at once. In sum, the GLMM framework enables us to disentangle the nuanced influences on linguistic behaviors, considering both individual factors and their interplay.

In the present analysis, we modelled clause type as a function of *country of elicitation*, *formality*, and *mode*. Since there are two clause types in the data, either main or embedded, only one of them, namely the embedded clause, was modelled as a dependent variable.

Our binomial GLMM is maximally specified, i.e., it includes all the theoretically relevant predictors following Winter (2019). Those predictors are *the country of elicitation* (Russia, Germany, and the US), *formality* (formal vs. informal), and *mode* (spoken vs. written). Furthermore, a three-way interaction term was included to capture the combined influence of *country of elicitation*, *formality*, and *mode* on the binary response variable. This enables us to examine how the effects of formality and mode vary across different countries of elicitation and how these variations interact to influence the speakers’ use of a clause type. The fixed effects *mode* and *formality* were sum contrast-coded. As for *the country of elicitation*, the level *Russia* was set as a reference, since the present study compares the heritage varieties of Russian with the monolingual one. Also, we incorporated random intercepts for *speaker* to account for potential within-speaker variability.

The binomial GLMM was run in R (R Core Team 2020) using lme4, emmeans, sjPlot, tidyverse, readxl, and ggplot2 packages (Bates et al. 2015; Lenth 2023; Lüdtke 2022; Wickham 2016; Wickham et al. 2019; Wickham and Bryan 2022). In the present paper, we

report the z - and p -values of the model; for full model summary and confidence intervals, please see the R script on OSF https://osf.io/kgh3t/?view_only=90f5a96d7a4c4174b7972628069badff.

5. Results

The binomial GLMM revealed one main effect and one interaction. First, no effect of *country of elicitation* was reported by the model (HSs in the US vs. monolingual speakers: $z = -0.796$, $p = 0.4262$; HSs in Germany vs. monolingual speakers: $z = -1.280$, $p = 0.2007$). In other words, HSs in the US and Germany patterned with monolingual speakers in their use of main and embedded clauses. Second, a main effect of *formality* was reported: the likelihood of producing an embedded clause was higher in formal communicative situations than in informal situations. This effect is particularly strong and holds for all speaker groups ($z = 6.990$, $p < 0.001$). Furthermore, there was a significant two-way interaction between the *country of elicitation* and *formality*, see Figure 1. For the interaction of *country of elicitation* and *formality*, the Tukey multiple comparison test was applied, which revealed the following significant results. As reported above, *formality* turned out to be the strongest predictor of clause type preference in Russian: specifically, all speaker groups significantly increased their production of embedded clauses in formal communicative situations (HSs in the US: $z = 3.946$, $p < 0.01$; HSs in Germany: $z = 4.202$, $p < 0.001$; monolingual speakers: $z = 6.990$, $p < 0.0001$).

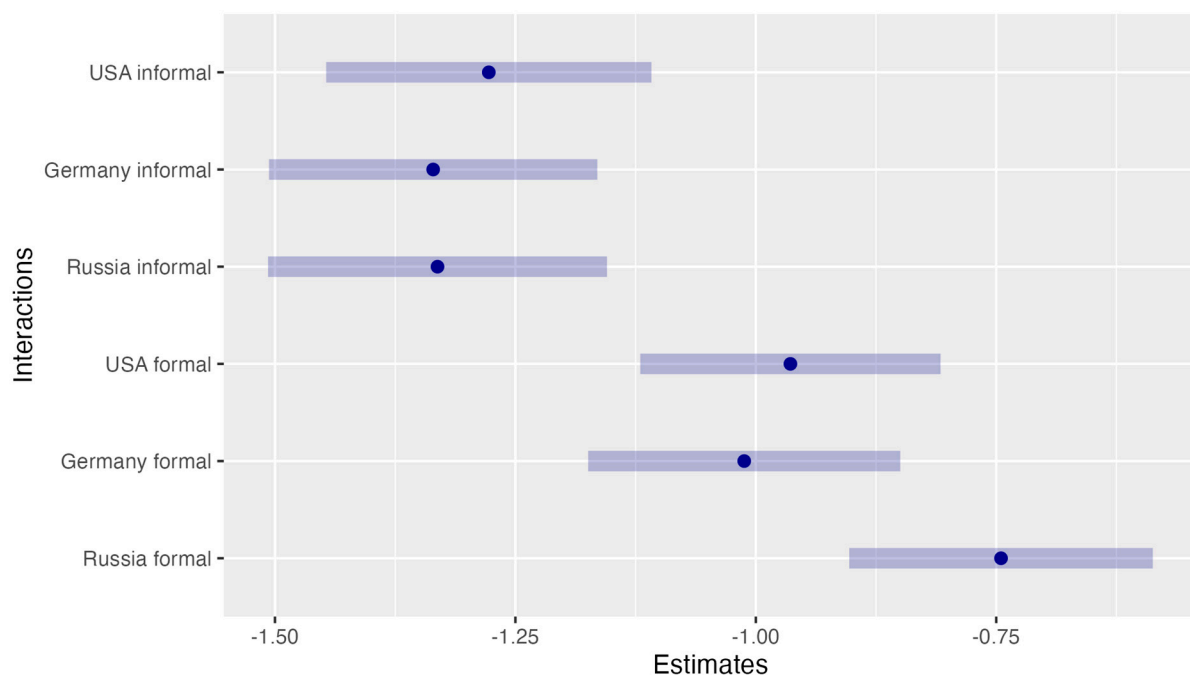


Figure 1. Likelihood of an embedded clause: interaction of country of elicitation and formality.

Finally, no main effect of *mode* was reported by the model ($z = 1.505$, $p = 0.1323$). Also, no interaction effects of *formality* and *mode* were revealed.

6. Discussion

In the following, we will link our results to the research questions and the related hypotheses. The first research question addressed the impact of the country of elicitation on the use of embedded clauses across different groups of Russian speakers. Our findings do not support Hypothesis 1, which states that HSs of both groups would diverge from monolingual speakers of Russian by producing fewer embedded clauses. Our analysis revealed that the use of embedded clauses is not influenced by the language contact, i.e.,

all speaker groups pattern alike, in line with the results reported by [Sanchez Abchi and Mier \(2017\)](#) for heritage Spanish and [Schroeder et al. \(forthcoming\)](#) for heritage Russian.

The second research question asked whether different communicative situations vary by mode and formality influence the production of embedded clauses across different groups of Russian speakers. Since there is no consensus on how formality and mode determine the distribution of embedded clauses in different speaker groups, we formulated three distinct hypotheses. Hypothesis 2a suggested a higher use of embedded clauses in spoken communicative situations than in formal written situations. Hypothesis 2b predicted a higher use of embedded clauses in formal communicative situations than in informal situations. Finally, Hypothesis 2c stated no impact of communicative situations on the use of embedded clauses by HSs due to possible register-leveling processes.

Only Hypothesis 2b was confirmed by our results, indicating a strong effect of formality across all speaker groups. In fact, all speaker groups produced more embedded clauses in the formal situations than in the informal situations, confirming previous findings by [Schroeder et al. \(forthcoming\)](#). As for mode, this factor did not turn out to be significant. Therefore, Hypothesis 2a is refuted. Lastly, since the impact of formality remains stable across all speaker groups, our findings do not provide any support for register-leveling in HSs (Hypothesis 2c). In other words, HSs in our sample are able to adjust their language production according to variation in formality, similar to monolingual speakers. Such register awareness in HSs regarding clausal embeddings has been reported earlier for HSs of German (see [Tsehaye et al. 2021](#); [Pashkova et al. 2022](#)).

All in all, the results show that the production of embedded clauses in Russian is driven by formality and is neither affected by the country of elicitation nor by register-leveling under language contact. These results can be possibly explained with reference to HSs' knowledge of Russian. It seems that HSs in our sample are quite proficient and are highly involved in their HL, as described in Section 4.2: HSs' speech rate was comparable to those of monolingually raised speakers, and the majority of HSs reported feeling native in Russian, using it quite actively with their family members and friends, and being able to read and write in Russian Cyrillic script. This subsequently leads to very similar linguistic behavior to monolinguals regarding particular linguistic domains. However, similarities between HSs and monolinguals are not pervasive. For instance, [Polinsky \(2008c, 2011\)](#) has shown that HSs of Russian do not always encode relative clauses felicitously. Furthermore, non-canonical patterns deviating from monolingual Russian have been reported in the production of participles and converbs ([Wiese et al. 2022](#)), as well as in the use of pro-drop ([Özsoy et al. forthcoming](#)), being relevant for the production of embedded clauses. Hence, we cannot exclude the possibility that our sample contains cases of non-canonical use of embedded clauses since the data were not controlled for felicitousness due to the high number of observations. Also, in the present study, we did not control for different types of embeddings (object, subject, adjunct, relative clauses), which might vary in terms of preference across different groups of Russian speakers. Finally, it is difficult to determine the general mechanisms behind the selective behavior of HSs. As reported in previous studies, HSs' behavior can be caused by different factors, i.e., cross-linguistic transfer or system-induced changes (cf. [Wiese et al. 2022](#)). The use of embedded clauses is system-induced; thus, we observe similar behavior of monolinguals and HSs. It might be also the case that domains belonging to narrow grammar are less susceptible to reorganization in HSs. Clausal embedding arguably follows narrow grammatical principles. This division into structure- and discourse-related domains regarding their susceptibility to change is, however, not uniformly accepted (see [Slabakova et al. 2012](#); [Méndez et al. 2015](#)). Moreover, the divergent behavior of HSs in different studies may be also due to the difference in their proficiency. For instance, HSs in studies by [Polinsky \(2008c, 2011\)](#) had low proficiency in their HL, and such HSs are expected to diverge from monolingually raised speakers.

The increased use of embedded clauses in the formal communicative situations by both monolinguals and HSs might be explained by several factors. First, language teaching in Russia is traditionally very much focused on learning the formal literary language, which

is syntactically highly complex. This is very much anchored in teachers' education. We assume that the same approach might be also followed by institutions that offer private Russian classes in Germany and the US since the teachers often received their qualifications in Russia. During the data elicitation, the participants were prompted to produce formal language and they might have tried to sound as formal as possible to demonstrate their best language competence and meet the experiment's requirements.

Second, register awareness shown by HSs in this study might be related to the particular phenomenon under discussion since several studies found HSs to be similar to the monolinguals regarding the distribution of embedded clauses across different registers (e.g., [Schlepppegrell and Colombi 1997](#); [Tsehaye et al. 2021](#); [Pashkova et al. 2022](#); [Schroeder et al. forthcoming](#)). However, various studies on linguistic phenomena other than the distribution of embedded clauses reported register-leveling in HSs ([Alexiadou et al. 2022](#); [Wiese et al. 2022](#); [Schroeder et al. forthcoming](#)). It might be indeed the case that HSs show register sensitivity in the use of embedded clauses due to HSs' general knowledge about this structure in the formal situations that possibly comes from their ML (see [Schlepppegrell and Colombi 1997](#); [Pashkova et al. 2022](#), for a similar idea). This claim, however, needs to be tested in further research by looking at the productions of embedded clauses by the same HSs of Russian in their MLs.

An explanation of the discrepancy between the present results and those reported in [Biber and Gray \(2010, 2011\)](#), [Biber et al. \(2011\)](#), [Biber \(2014\)](#), and [Buchmüller et al. \(2014\)](#) might be related to distinct methodologies and data sets, as has been pointed out in Section 2.4. The findings in the abovementioned studies cannot be directly compared. In our study, a witness call to a police department and a written witness report to a police officer were used to elicit formal written and formal spoken productions, respectively. Regarding the formality parameter, the RUEG data were coded as a binary value (formal vs. informal) whereas in the corpora the abovementioned studies were carried out on, the text production classes or "spheres" (spoken private, spoken public, scientific, etc.) sometimes have no clear-cut distinction regarding formality; thus, the formality parameter was coded as a continuous category. The productions from the RUEG corpus are neither fully equivalent to academic writing, as investigated in [Biber and Gray \(2010, 2011\)](#), [Biber et al. \(2011\)](#), and [Biber \(2014\)](#), nor to official-business, technical, or educational-scientific texts, as analyzed in [Buchmüller et al. \(forthcoming\)](#). This means that the situational-functional parameters are only comparable to a very limited extent. Thus, the results of the current study cannot be automatically generalized, which is a limitation of the methodology used for the data elicitation.

In sum, our study's implications are manyfold. Firstly, our results demonstrate convergent linguistic behavior in all groups of Russian speakers and reveal formality as the decisive factor for the speakers' use of embedded clauses. Secondly, our findings suggest that HSs' production is not always affected by register-leveling. Register-leveling is rather restricted to particular linguistic domains. For the domain investigated in our study, HSs are able to adjust their language production according to formality. This result emphasizes the necessity of understanding the language variation among HSs, highlighting their capacity to navigate in diverse communicative settings. Moreover, the production of embedded clauses seems to be robust in a language contact situation, at least in HSs who are involved in their HL and use it on a daily basis.

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Data Availability Statement: The RUEG corpus is available in open access: <https://zenodo.org/records/5808870#.Ylg0CXhByHs> (accessed on 10 April 2024).

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Notes

- ¹ For the purpose of this paper, we will refer to such speaker groups as monolinguals, although we are aware that most speakers are not truly monolingual but are rather monolingually raised mainly using their first language which is the ML of the surrounding society.
- ² We do not make any principal distinctions between embedded and subordinate clauses in this paper, i.e., the terms embedded and subordinate are used interchangeably.
- ³ For nested data, aggregated numbers are source of Error Type I (false positive), see Baayen et al. (2008), Brezina and Meyerhoff (2014), and Winter (2019).
- ⁴ In Kožina et al. (2011, p. 295) the frequency of embedded clauses in the “scientific style” is claimed to reach 62% out of 41–50.3% of all compound sentences; however, no information on the data and methodology used is provided.
- ⁵ For all details about the experiment, see <https://osf.io/qhupg/> (accessed on 10 April 2024).
- ⁶ Due to technical reasons in three cases, we do not have all four narrations per speaker at our disposal; however, we decided not to exclude those speakers since the missing data do not impact the sample as a whole.
- ⁷ Three HSs in Germany and twenty HSs in the US did not provide an answer to this question.
- ⁸ Corpus documentation can be found online: <https://korpling.german.hu-berlin.de/rueg-docs/v0.4/> (accessed on 10 April 2024)
- ⁹ All examples are taken from the RUEG-RU sub-corpus; the original spelling of the participants is preserved.

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