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## RUSSIAN NOUN PLURALIZATION IN BILINGUAL CHILDREN: EVIDENCE FROM FOUR COUNTRIES. PART 2. QUANTITATIVE ANALYSIS

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**Abstract.** In several countries Russian is spoken by a considerable percentage of the population. The Russian language has been influenced by a number of different languages from throughout the world. As a result, it is crucial to look into how the first language (L1) of a family interacts with the language of the environment in early life and how this affects acquisition outcomes at different stages. This paper reports on a cross-sectional study of the acquisition of Russian plural morphology by preschool-age bilingual and monolingual children. The bilingual children speak Russian as their L1 and acquired English, Finnish, Hebrew or German as their early L2 around age 2 or 3. The L2s in this study belong to three typologically diverse groups. The results of an elicitation study show that all children make qualitatively similar errors but that the Russian/English bilinguals make the most errors, possibly due to the fact that plural morphology in English is much more regular than that in Russian and the other languages in this study. This paper contributes to our understanding of childhood bilingualism; there have been relatively few studies of Russian in the bilingual context. The study is placed within the framework of bilingualism, heritage speakers, and child L2-acquisition. The theories of how morphology develops in early sequential bilinguals / heritage speakers are put forth. Concrete predictions of particular theories are tested. The theoretical part shows how plurals are formed in Russian in contrast with other languages in this study. Our study purports to determine whether L2 affects L1 and makes the claim that availability of a grammar category in L2 is important for acquisition of that category in L1. The article actually consists of two parts, each dealing with qualitative and quantitative analysis, respectively.

**Keywords:** development of noun pluralization, early child bilingualism, Russian as the first language abroad, heritage speaker, acquisition difficulties, second language influence on the first language

## Introduction

There has recently been a surge of interest in how typologically different languages behave in situations where they are in contact with one and the same language (Forcker, Grenoble 2021). The researchers studied typologically different samples of nominal inflection in first language acquisition (Stephany, Voejkova 2009) and found out that, contrarily to semanto-syntactic function of case, that of number is mainly referential. In Russian, they are marked synthetically, and the nominative is the base for the declension. Even in typologically close languages the development of plural endings may follow various ways, whereas transparency and productivity play a role in it (Gillis 1998; Kjærbaek, Basbøll 2016). In Lithuanian, near-miss replacements of singular for plural, masculine for feminine, or the nominative/accusative for a less common case accounted for the majority of errors (Savičiūtė et al. 2018). In Palestinian Arabic, familiarity with the noun stem and frequency of the plural pattern affect acquisition; regular forms are adopted earlier and easier (Saiegh-Haddad et al. 2012). In German, the usage of plural forms begins early, with individual growth rates of type frequencies varying in correlation to adult frequencies, and the major error categories include false endings, incomplete marking, and no marking, reflecting the regularities of the German plural marking system (Szagun 2001).

The study by Chang-Smith compared L1 Mandarin Chinese which does not have (obligatory) plural marking with L2 English which has plural marking (Chang-Smith 2010). The findings showed that the developmental pathway of Mandarin nominal expressions in a bilingual child were highly comparable to that of the monolingual counterpart, and no apparent transfers from English nominal syntax to Mandarin were observed in the very early stage of acquisition. According to Setoh et al., language specificity plays a limited role in children's early lexical development when they are bilingual in English and Mandarin (Setoh et al. 2021). Having documented monolingual and bilingual acquisition of Spanish, Ticio Quesada came to the conclusion that nominal morphology production was lower in bilinguals than in monolinguals (Ticio Quesada 2018). Ionin et al. demonstrated that definite plurals in Spanish can have both general and specialized interpretations, whereas definite plurals in English must have distinct nongeneric readings (Ionin et al. 2013). Both monolingual and bilingual children performed better in learning about the (un)grammaticality of bare plurals in the target language than in assigning the target interpretation to definite versus bare plurals, and the first language transfer was observed in both directions at lower proficiency levels, whereas more target-like performance was observed at higher proficiency levels.

Hopp et al. (Hopp et al. 2019) and Kersten et al. (Kersten et al. 2021) compared and contrasted early foreign-language learners' and monolingual children's comprehension looking for syntactic first-language transfer effects, input effects on syntactic development, and individual variations. They found that early learners have less stereotypes and the variation in acquisition is linked to phonological awareness.

The aim of this study was twofold: (1) to examine qualitative and quantitative (distribution and frequency) characteristics of errors in production of plural noun forms in Russian (L1) among bilingual Russian-speaking children and monolingual children; (2) to compare bilingual and monolingual groups on their production of plural noun forms in Russian (L1) to check the possible effect of L2 grammar context. The description of the test and the qualitative analysis of deviances were present in the first part of the article.

A quantitative analysis of *error distribution* will be addressed by presenting the percentage of children who performed correctly or incorrectly regarding each type of error. This will be followed by a quantitative analysis of *error frequency*, which is counted by percentage of successful performances for each type of error. We will then show a comparative analysis between the groups

by presenting the intergroup differences in the distribution of errors for each type of error. Finally, to examine the possible effect of L2, we will compare the groups by the percentage of children performing at the lower bound of normal performance versus the percentage of children performing at the upper bound.

## Background: Basics of noun pluralization in the languages under consideration

### *Russian noun pluralization*

In this section we will consider only the nouns that have the singular — plural opposition. Russian is characterized by relatively rich inflection morphology (Laaha, Gillis 2007). In the written language, the plural of Russian nouns is normally formed by one of two allomorphs, *-i/-y* or *-a/-ja*. The ending *-i/-y* is more frequent than the ending *-a/-ja*. However, in the oral speech, the difference is not in the contrast of vowels (although stressed and unstressed vowels vary quantitatively and qualitatively), but in the value of the previous consonant (soft/hard/(un)palatalized). All feminine nouns and most masculine nouns form the plural with the ending *-i/-y*, whereas the neuter nouns prefer *-a/-ja*. The choice between one of the two allophones *-i* and *-y* is usually dictated by the last consonant of the word stem according to a number of rules. For example, masculine and feminine nouns with the stem ending in *-g*, *-k*, *-x*, *-zh*, and *-sh* will receive the plural ending *-i* in the written text: *ruk-a* — *ruk-i* ‘arms;’ *noz-h* — *noz-h-i* ‘knives.’ In the case of *-zh*, *-sh*, it is true that *-i* is the ending according to the spelling, though it is pronounced as *-y*; therefore, it is rather debatable whether the vowel after the palatal fricatives is in fact an *-i*. Some masculine nouns form the plural with the ending *-a*: *dom* — *dom-a* ‘houses;’ *glaz* — *glaz-a* ‘eyes.’ For masculine nouns, there is no rule regulating the choice between the two allomorphs, *-i/-y* or *-a/-ja*. Singular neuter nouns end in either *-o* or *-e*. The majority of nouns ending in *-o* receive the plural ending *-a*, whereas the majority of nouns ending in *-e* receive the plural ending *-ja*; for example, *okn-ó* — *ók-n-a* ‘windows;’ *mór-e* — *mor-já* ‘seas.’ Their pronunciation is similar (different for stressed and unstressed endings, but more saliently generalized in child language).

Noun pluralization is often associated with morpho-phonological alternations of the stem, most of which are unpredictable. Some alternations include the reduction or deletion of vowels; for example, *osjol* — *osl-y* ‘donkeys’ instead of the expected *\*osjol-y*. Other stem alternations relate to suffix change or addition, e. g., *stul* — *stul-j-a* ‘chairs’ instead of the expected regular *stul-y*. The suffix *-onk/-onok*, which is used for the names of young animals, changes in the plural into the suffix *-at/-jat*: *kotj-onok* — *kotj-ata* ‘kitten.’ In the plural forms, the stress is often moved from the noun stem to the ending or from the ending to the stem, e. g., *pol-e* — *pol-ja* ‘fields;’ *nog-a* — *nog-i* ‘legs.’ Some nouns form plural through suppletion (e. g., *rebjonok* — *deti* ‘children’).

### *Noun pluralization in Finnish, German, Hebrew, and English*

Since our study was designed to examine the possible role of the L2 in the production of plural forms in Russian (L1), we will briefly discuss the linguistic landscape of English, Finnish, German, and Hebrew with respect to their inflectional morphology characteristics and, in particular, the marking of the plural.

*English* has a restricted inflectional system with a small number of productive inflection classes (Laaha Gillis, 2007). Thus, number is the only productive morphological category of the English noun. Even so, there is a small number of exceptional forms in English noun pluralization; in most cases, the nominative plural is regularly formed with the morpheme *-s* (e. g., *wall* — *wall-s*). In this context, English plurals are a clear-cut instance of the regular form (98% type frequency; Marcus et al., 1995). The most frequent allophones is /z/ which characterizes nouns ending in a sonorant or a vowel, followed by /s/ for nouns ending in a voiceless consonant, and /iz/ for nouns

ending in /s/, /z/, /ʃ/, /ʒ/, /tʃ/ or /dʒ/ (Conrad et al. 2002; Köpcke 1998). In addition, there are very few cases of ‘umlaut’ (e. g., changing the vowel sound as in *foot* — *feet*, *mouse* — *mice*) and *-en* plurals (*child* — *children*). Children would learn these words by rote and would store them separately with the feature [plural] incorporated into their lexical entries (Köpcke 1998; Tomasello 2003). Several nouns take a zero plural morpheme (e. g., *fish*, *sheep*). Monolingual children master this grammar category by the time they are 3 years of age (Brown 1973).

*Finnish* is an agglutinating language in which derivational and inflectional suffixes are attached to the word stem (Hakulinen 2004). In Finnish, the nominative plural is regularly formed using *-t*, e. g., *koira* — *koira-t* ‘dogs.’ In declension, the suffix *-i/-j* as a plural marker becomes important, for example: *koir-i-a* as a partitive plural and *koir-i-en* as a genitive plural. Some consonants undergo gradation, so that *-kk-*, *-pp-*, *-tt-* in the stem become single, e. g., *kukka* ‘flower’ — *kukat* ‘flowers.’ There are some other alternations as well, such as *-t/-d-*, *-mp-/-mm-*, *-k-/-v-*, *-lt-/-ll-*, etc. Some of them are regular, some are unique. Number and case markers are often fused; the nominative plural is opposed to the oblique cases; there is some morphophonemic variation of the plural suffix in the oblique cases (Laalo 2009). The number of things is often referred to in the partitive case, which is rather complex; it requires not only an ending (*(t)a/(t)ä* (alternating according to vowel harmony), but often changes in the stem depending on its final sounds, following certain rules or as exceptions. If the child thinks of the quantity of objects in the picture, he/she may refer to it in partitive singular (*kaksi kukka-a* ‘two flowers’), if s/he thinks that these are certain objects from a bigger number, s/he may use a partitive plural in Finnish (e. g., *kukk-i-a* ‘some flowers’). Thus, the partitive marks indefiniteness whereas the nominative expresses definiteness. In colloquial speech, some endings are simplified. According to Laalo (Laalo 2009) and Toivainen (Toivainen 1980), the partitive case is acquired earlier than the nominative both in singular and in plural; the first nominative plural forms are designations of pairs (such as *silmä-t* ‘eyes,’ *tossu-t* ‘slippers’) and appear at the age of 1.7 (See also Mustajoki 1992; Protassova, Rodina 2018; Vlasova 2017 for bilinguals).

*German* is a weakly inflected language. The plural in *German* is marked by one of five allomorphs, listed here by their frequency: *-(e)n*, *-e*, zero ending, *er*, *-s*, which were found to be productive forms (Laaha et al. 2006). According to Marcus et al. (1995), the plural morpheme *-s* is very low in frequency (less than 10% type frequency). Some of them are combined with an alternation of the stem vowels with umlauted vowels, like /ä/, /ö/, /ü/, and diphthongs (e. g., *Wand* — *Wände* ‘wall — walls’; *Maus* — *Mäuse* ‘mouse — mice’). This pluralization pattern is considered as non-salient because it neither constitutes a separate segment nor involves a suffix (Schelletter, personal consultation). Except for *-er*, all allomorphs can occur with every gender. The assignment of the allomorphs is arbitrary to some degree, although some rules exist (based on the syllable structure and the gender) (Dimroth 2007; Eisenberg 1999; Helbig, Buscha 2007).

*Hebrew* is characterized by rich inflectional morphology (Ravid 2012). All Hebrew nouns belong to one of two grammatical genders. Masculine singular nouns are typically unmarked (e. g., *sefer* ‘book’), whereas feminine singular nouns are usually identified by the suffixes *-ah*, *-et*, or *-it*, e. g., *sapah* ‘couch;’ *rakevet* ‘train;’ *zavit* ‘angle.’ However, a number of feminine nouns are unmarked, e. g., *nefesh* ‘soul;’ *even* ‘stone;’ and some similar nouns are very frequent. Simplifying things somewhat, masculine nouns are typically pluralized with the masculine plural suffix *-im*, e. g., *sfarim* ‘books,’ and feminine nouns are usually pluralized with the feminine plural suffix *-ot*, which replaces the singular feminine identifier, e. g., *sapah*—*sapot* ‘couches;’ *rakevet*—*rakavot* ‘trains;’ *zavit*—*zaviyot* ‘angles.’ Some singular forms, however, take irregular or unpredictable suffixes when pluralized. Masculine plurals can take the feminine suffix *-ot* (e. g., *kir*—*kir-ot* ‘walls’ and *rexov*—*rexov-ot* ‘streets’ instead of the expected regular *kir-im* and *rexov-im*). Similarly, feminine nouns can be inflected with the masculine suffix *-im* (e. g., *beyca*—*beyc-im* ‘eggs’ instead



of the expected *beyc-ot*). Berman (1985) states that between ages 2 and 3 children are ready to acquire and productively use the plural number of nouns that are characterized by regular suffixation, whereas irregular forms are mastered considerably later after entering school. Finally, in some cases, plural gender suffixes may be added when changing a word stem, e. g., deletion of vowel: *simla* — *smal-ot*, ‘dresses.’

It is noteworthy that in all the aforementioned languages as well as in Russian, some nouns appear only in the plural form — pluralia tantum. Pluralia tantum nouns often refer to paired items. For example, the word ‘scissors’ is a pluralia tantum word in three of the languages under study: *nozhnicy* (Russian), *misparaim* (Hebrew), and *scissors* (English). Finnish also has pluralia tantum nouns (e. g., *kasvot* ‘face’), as does German (e. g., *Eltern* ‘parents’). In addition, all of these languages except Finnish contain uncountable nouns that have no plural form, such as mass nouns (e. g., in English, *water*; in Russian, *maslo*, ‘butter;’ and in German, *Zucker*, ‘sugar.’). As mastery of this last category of nouns occurs later (namely, mass nouns, which do not occur in the plural, and their contrast with mass nouns like *kartoška* ‘potato,’ which are termed ‘singularia tantum,’ but, in fact, they are different from a mass noun like *mebel* ‘furniture,’ which denotes a collection), such cases were beyond the scope of this study.

A deeper understanding of the nature of Russian plural formation could potentially lead to some linguistically interesting predictions of (un)expected patterns of errors. A deeper (at a theoretical level) understanding of how plural formation works in English / Finnish / German / Hebrew could be similarly useful. So, summarizing the behavior of plural formation in all the languages and contrasting it along some relevant dimensions, we see that they differ in regularity, use of suffixation vs. stem changes, phonological transparency, etc.

### *The acquisition of Russian noun pluralization by monolingual Russian-speaking children*

The cognitive awareness of quantity is a prerequisite for children’s acquisition of the plural. However, this acquisition requires mastering of morphemes and lexemes conveying plurality (Panfilova 2012; Tsejtlin 2000; Voejkova 2007). It should be noted here that the acquisition of noun pluralization as a grammatical category in various contexts and the cognitive processes involved were beyond the scope of this study. The marking of the plural is associated with adding one of the plural endings or suffixes to a word stem. In Russian, the child has to make a choice between the endings *-y/-i* or *-a*, while these endings may be stressed or unstressed; for example, *stól* — *stol-ý* ‘tables;’ *kón* — *kón-i* ‘horses;’ *dóm* — *dom-á* ‘houses.’

Tsejtlin stressed that the first use of plural forms in Russian does not mean that the child is mastering the grammatical category of plural. The first plural forms in the child’s speech may be frozen forms of the nouns such as *eyes*, *keys*, *sneakers*, and *socks*. These nouns are usually used in plural in the input, because, as a rule, they appear paired, and consequently they are referred to in plural in everyday situations. As a result, the child may use these forms without relating them to the quantity of the real objects. The child starts mastering the grammatical category of plural from the time when s/he consciously uses the number oppositions in real-life situations (Gagarina, Voejkova 2009; Gvozdev 2007; Tsejtlin 2009). The first number oppositions occur after approximately 2 months following the onset of noun production. Then the child exhibits the spurt of number oppositions 1–2 months after they first occur. At this stage, but usually not after age 2, the child might still use singular forms for multiple objects and vice versa, depending on the most frequent nomination of the object in the input. For example, the child might say, *socks* meaning a single sock or *children* meaning a single child, since the forms *socks* and *children* were more frequent in the input. Tsejtlin notes that this stage comes between the ages of 1, 5, and 2 years (Tsejtlin 2009).

According to statistics of the Institute of Early Intervention of Saint Petersburg, boys start producing plural noun forms at the age of 31.9 months, on average, whereas girls start producing

it at 29 months, on average (Shapiro, Chistovich 2000, 30). At this stage, the child usually uses the correct plural or singular form. It is noteworthy, however, that research to date has not directly addressed the age aspect of acquisition of noun pluralization in Russian. The erroneous forms are marked by an asterisk in the examples.

The research showed some difficulties in the course of acquisition of noun plural in Russian among monolingual children:

1. the ending *-y/-i* in Russian is much more frequent than *-a* and, as a rule, is overgeneralized in the children's speech (Voejkova 2007). In general, masculine nouns are marked by *-y/-i*, whereas neuter nouns are marked by the ending *-a*). Children tend to use *-y/-i* as the default ending and produce developmental errors. Some examples of these errors are as follows:
  - a. the use of the ending *-y/-i* instead of the ending *-a* for neuter or masculine nouns, e. g., *\*koles-y* instead of *koles-a* 'wheels'; *\*dom-y* instead of *dom-a* 'houses';
  - b. the addition of the ending *-y/-i* to the stem of the singular noun in a case of a suppletive plural form, e. g., *\*chelovek-i* (from *chelovek* 'man') instead of *ljud-i* 'people';
  - c. the addition of the ending *-y/-i* to the singularia tantum nouns, e. g., *\*kaput-y* 'cabbages' (Tsejtlin 2009).

Occasional errors of this type may be observed among monolingual children up to the age of 6–7 (Gvozdev 2007):

2. the plural form of Russian nouns is often accompanied by changes in the noun stem. The tendency to join a flexion to the unchanged noun stem is very strong among Russian-speaking children and can be observed in monolingual children after the age of 5 (Eliseeva 2005; Gvozdev 2007). Some examples of erroneous stem preservation are as follows:
  - a. no vowel reduction: *\*os'ol-y* (from *os'ol* 'donkey') instead of *osl-y* 'donkeys';
  - b. no addition of suffix: *\*derev-y* (from *derevo* 'tree') instead of *derev-j-a* 'trees';
  - c. preservation of the suffix *-onk/-onok* in the names of young animals: *\*tel'-onk-i* (from *tel'onok* 'calf') instead of *tel'-jat-a* 'calves';
  - d. no stress relocation: *\*nos-y* (from *nos* 'nose') instead of *nos-y* 'noses';
3. singularia tantum nouns. This group of nouns has no plural form. This lack of transparency is difficult to acquire especially in the case of concrete nouns, which can practically appear as a number of objects. The children fill the gap in the paradigm by creating erroneous forms, such as *\*myl-y* (from *myl-o* 'soap'); *\*xleb-y* (from *xleb* 'bread'), *\*stuk-i* (from *stuk* 'knock'). This type of error might continue up to the age of 7–8 among monolingual children (Tsejtlin 2009, 140);
4. pluralia tantum nouns, e. g., the nouns without the grammatical singular form, are usually acquired by monolingual children between 2 and 4 years of age (Tsejtlin 2009, 135). In this period, the children produce singular forms for these nouns to designate one single object, for example: *\*nozhniz-a* (from *nozhniz-y* 'scissors'); *\*kačel'-a* (from *kačel'-i* 'swing'). This type of error may also be observed up to the age of 7–8 among monolingual children (Tsejtlin 2009, 140);
5. suppletive forms; for some nouns in Russian, the plural and the singular are formed with different stems; for example, *chelovek* 'person' — *ljud-i* 'people.' The children usually tend to unify these forms, producing them from the same stem, e. g., *\*ljudj-a* for 'person' or *\*chelovek-i* for 'people.'

Generally, the ultimate acquisition of noun pluralization in Russian extends well into school age, up to the age of 7–8 in the case of highly non-transparent plural forms such as suppletive nouns. It appears that, similar to noun pluralization in other languages, Russian-speaking children show a tendency for overgeneralization of the default ending and for stem preservation (Ravid, Schef 2009). The present study sought to examine whether young bilingual children show similar

or different patterns of errors in production of noun plural forms in Russian (L1) compared to their monolingual peers, in other words, whether developmental trajectories in Russian L1 are similar or different between the two target populations.

### *Quantitative analysis of error distribution and frequency for the whole sample*

To conduct the quantitative analysis of the errors, we used two main criteria:

- (1) Distribution of different types of errors among children. To examine this distribution, we calculated the percentage of children who performed the pluralization task correctly or erroneously.
- (2) Frequency of each type of error. To examine this frequency, we calculated the percentage of correct or erroneous performances of the pluralization task.

These criteria were applied to examine different types of errors in pluralization in the whole sample as well as to compare various monolingual and bilingual groups.

#### *Distribution of different types of errors among children*

Fig. 1 presents the percentage of children who performed correctly or erroneously with regard to each type of error. In this figure, 100% indicates that each participant made at least one error of the given type. It can be seen that all children in our sample made errors in noun pluralization in Russian. However, the distribution of errors by type was significantly different. Thus, four types of errors were produced by almost all participants in all the groups: the overgeneralization of the ending *-y/-i*, stress preservation, the use of suppletive forms, and diminutives. In addition, it is noteworthy that the use of the genitive instead of the nominative was a relatively rare error.

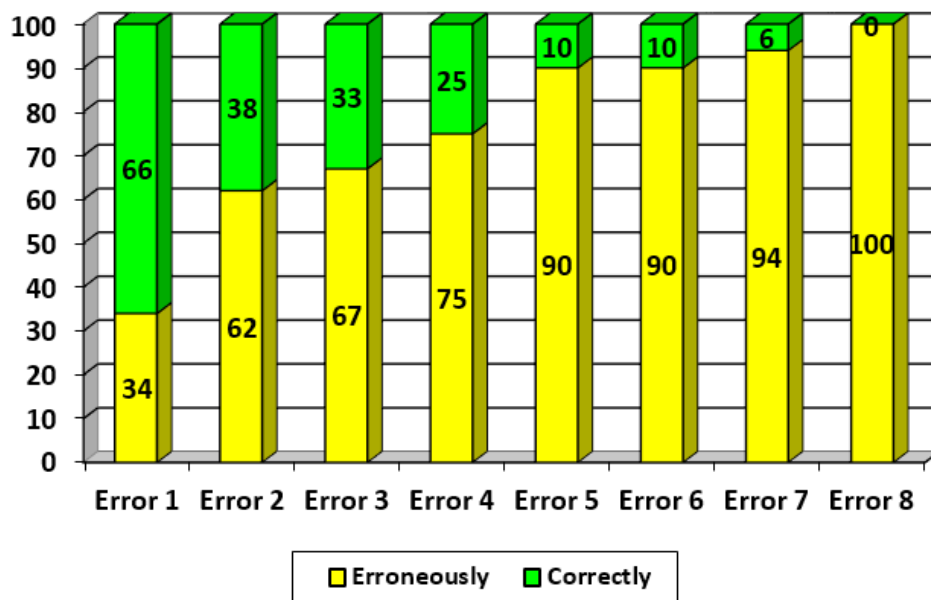


Fig. 1. Percentage of children who performed correctly or erroneously on pluralization in Russian by error type ( $n = 110$ )

Notes: Errors: 1 – Use of genitive instead of nominative case; 2 – Use of singular instead of plural; 3 – Use of suffix *-onk* instead of *-yat*; 4 – Stem preservation; 5 – Use of suppletive forms; 6 – Use of diminutives; 7 – Overgeneralization of the ending *-i/-y*; 8 – Stress preservation.

#### *Frequency of different types of errors among children*

In addition to data on error distribution, it was important to calculate the percentage of successful performance for each type of error, namely error frequency (see Fig. 2). In Fig. 2 the errors were ranged in accordance with the percentage of successful performance of tests on pluralization.

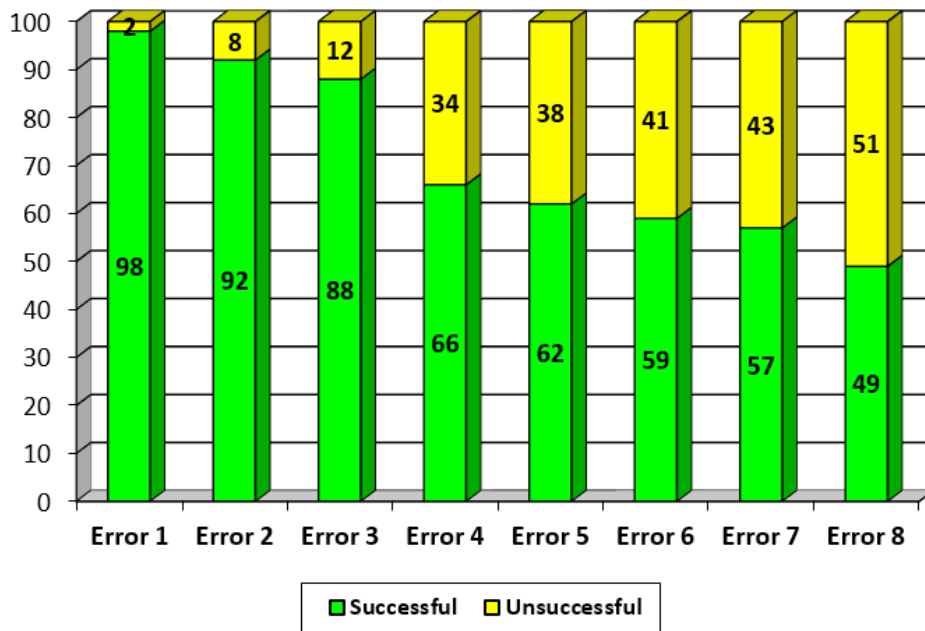


Fig. 2. Percentage of successful performance of tests on pluralization by type of error\*

Note: \*— Errors: 1 — Use of genitive instead of nominative case; 2 — Use of singular instead of plural; 3 — Use of diminutives; 4 — Overgeneralization of the ending; 5 — Use of suffix *-onk-* instead of *-yat*; 6 — Stem preservation; 7 — No production of the suppletive forms; 8 — Stress preservation.

It can be seen that the use of the genitive instead of the nominative, the use of singular instead of plural, and the use of diminutives were relatively rare errors; participants successfully performed between 88% and 98% of the tests. At the same time, the use of the ending *-a/ja*, the use of the suffix *-yat*, stem alternation, and suppletive forms were less well-mastered. Here, participants’ success ranged from 57% to 66%. Stress preservation was the most frequent error — more than half of the tests were performed incorrectly.

*Comparison among the groups on distribution of error types*

The comparison among the groups on pluralization in Russian was performed by analyzing the percentage of children who made errors in Russian pluralization (see Table 1).

Table 1. Percentage of children, who performed erroneously on pluralization in Russian by type of error and by group

Type of errors	Groups						$\chi^2$
	1	2	3	4	5	6	
Use of genitive instead of nominative case	24	40	64	6	26	50	15.1**
Use of singular instead of plural	76	35	86	56	39	94	23.5***
Use of suffix <i>-onk</i> instead of <i>-yat</i>	81	55	14	69	83	94	26.3***
Stem preservation	67	50	79	75	83	100	12.0
Overgeneralization of the ending <i>-y/-i</i>	95	90	93	94	91	100	1.8
Stress preservation	100	100	100	100	100	100	0.0
No production of the suppletive forms	86	85	86	81	100	100	7.0
Use of diminutives	86	85	86	100	87	100	1.9

Note:

1. Groups: 1 — Russian monolinguals (3 to 4 y. o.); 2 — Russian monolinguals (4 to 5 y. o.); 3 — Russian-Finnish bilinguals; 4 — Russian-German bilinguals; 5 — Russian-Hebrew bilinguals; 6 — Russian-English bilinguals.
2.  $\chi^2$  was used because scales for monolingual and bilingual groups were nominal.



It can be seen that the group effect was significant for the following three types of errors: use of the suffix *-onk* instead of *-yat* ( $\chi^2 = 26.3^{***}$ ); use of the singular instead of the plural ( $\chi^2 = 23.5^{***}$ ), and use of the genitive case instead of the nominative ( $\chi^2 = 15.1^{**}$ ). Thus, the children with Finnish L2 showed the best results in the use of the suffix *-yat*. In addition, the elder Russian monolinguals had a lesser tendency to use the singular instead of the plural in comparison to the other groups. It is also evident that, contrary to expectations, the younger monolinguals performed better than the elder monolinguals regarding the use of the genitive instead of the nominative case, i. e., the younger children used the construction *mnogo* ‘a lot of’ + genitive less than the elder monolingual group. This data pattern might be attributed to the fact that the acquisition of the genitive plural is a long and complicated process (Sizova 2008). The younger monolinguals may feel less confident using this construction, and consequently prefer to use the nominative more often. It is also noteworthy that children with German L2 made the smallest number of errors in the use of the genitive instead of the nominative. This table also shows that the groups did not differ in the following five types of errors: stem preservation, overgeneralization of the ending *-i*, stress preservation, and use of suppletive forms and diminutives.

#### *Comparative assessment of number of errors on pluralization in different groups*

Our research dealt with numerous types of pluralization errors with a relatively limited number of children involved in the study. Therefore, we aggregated the different types of errors made by the children into a single score to improve the statistical significance of the result. Our aggregation methodology was as follows: the monolingual Russian group (ages 4–5) was chosen as the reference group for studying the acquisition of pluralization. In our study, the mean number of pluralization errors of all types made by the children in the reference group was 16.7, with  $SD = 5.9$ . We chose 15 errors (approximately the mean of the reference group less  $1/2 SD$ ) as the lower bound of normal performance, and 20 errors (approximately the mean plus  $1/2 SD$ ) as the upper bound. We then scored the children in the study as belonging to one of three groups: below normal (14 errors of all types or less), normal (15–20 errors), and above normal number of errors (20 or more).

Fig. 3 presents the distribution of children by the number of errors of each group in percentage. It can be seen that the children with English L2 performed less well than the other bilingual groups, with 75% of children who made more than 20 errors, whereas in the other bilingual groups and in the elder monolingual group, 30% to 38% of the children were in this subgroup. The elder Russian monolingual group showed better performance than the younger group. Finally, the children with Finnish L2 and elder Russian monolingual children showed a similar performance with few errors.

### **Discussion and conclusion**

The main aim of the present study was to investigate noun pluralization in Russian by comparing bilingual children with diverse L2 backgrounds (English, Finnish, German, and Hebrew) with age-matched monolingual children and monolinguals one year younger. This cross-linguistic project makes a considerable contribution to the existing research in a number of ways. Thus, the results show *no qualitative difference* between bilingual and monolingual children in production of noun plurals in Russian (L1). However, some *quantitative differences* between the bilingual and monolingual groups and within the bilingual groups were evident. In addition, our data indicate that L2 language typology seems to play a role in children’s performance in noun pluralization.

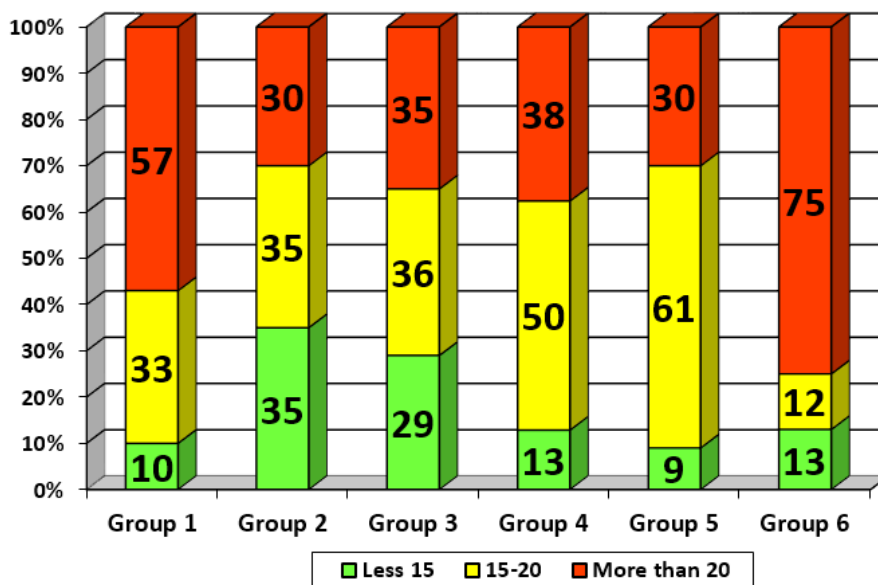


Fig. 3. Distribution of children by the number of errors and by group (%)

Note: Groups: 1 – Russian monolinguals (3–4); 2 – Russian monolinguals (4–5); 3 – Russian-Finnish bilinguals; 4 – Russian-German bilinguals; 5 – Russian-Hebrew bilinguals; 6 – Russian-English bilinguals.

In terms of the acquisition of the grammatical category ‘plural’, suggestions have been put forward that there are two distinct cognitive mechanisms for regular and irregular forms (dual mechanism model; Pinker, Prince 1994), alternatively, the usage-based theory (Tomasello 2003) would suggest item-based learning based on frequency. In both native and non-native data, there is usually a significant difference between regularly and irregularly inflected words (see also Schelletter 2020). We believe that some qualitative changes in mental representations of linguistic structures in the first and the second languages may have an impact on the outcome. Children’s mental representations, on the other hand, are age and usage dependent. The usage could affect bilingual and monolingual children’s acquisition. The question remains how exactly the transfer from L2 could work and what this transfer might be. We think that it is a complex idea of plurality expression combined with possible representations of reference to numbers. The ways of implementing plural morphology in L2 forms a new reality that influences the morphology in L1. Nicoladis et al. made the argument that input frequency affected bilingual children’s acquisition of morphology (particularly irregular forms) and showed some signs of transfer from their other language (speculating about what exactly was transferred) (Nicoladis et al. 2012). Yet, we do not even know what is more motivating for the maturity of a grammatical category – age (and therefore, to a great amount, cognitive development) of a child or the amount of exposure in either language. Bilinguals get less input than monolinguals, so quantitative differences can always be traced back to frequency in the input. The critical variable may still lay somewhere else.

The singularia tantum and pluralia tantum seem like such an obscure bit of language. Children’s performance on these items tells us that they have the notion of plurality, that they try to handle what they see and understand what they can perform.

At the same time, there were minor differences between the groups. The most notable difference was relatively low performance of the children with L2 English. Thus, this group consistently showed the highest percentage of children who performed erroneously on all types of errors. Moreover, the percentage of children who made more than 20 errors was highest in this group. We speculate that this pattern of data may be attributed to the relative simplicity of noun pluralization

in English compared to Russian, German, Hebrew, and Finnish. Even so, some cases of exceptional pluralization (stem alternations and irregular plural forms) do exist in English; they are few and rather frequent in input in early childhood. In Russian, Finnish, German, and Hebrew, the cases of morpho-phonological alternations of stem and cases of non-transparent plural endings are more frequent than in English. Thus, many forms in Finnish are typically pluralized in the partitive case, which is formed by adding a suffix and an ending to the frequently alternated word stem. In German, pluralization is rather complex due to the assignment of one of five allomorphs, which is mainly not governed by rules. In Hebrew, the complexity of noun pluralization is related to numerous cases of irregular and unpredictable endings as well as to stem alternation. In Russian, the pluralization is also often associated with irregular endings, stem alternations, and addition of suffixes. This complexity influences the pace of acquisition of this basic grammatical category in Russian (around the age of 7–8) as well as in German, Hebrew, and Finnish versus English (age 3). The regularity of the plural category in English may reduce the child's ability to acquire the complex and largely irregular category of the Russian plural. Finally, it is noteworthy that our assumption concerning some effect of the English L2 typology receives support by the fact that all four bilingual groups were characterized by Russian language dominance at home and a similar bilingual model at preschool. In this case, the data on the highest percentage of the children with English L2 who performed erroneously could not be attributed to the differences in L1 dominance at home or in the bilingual model of the preschool compared to the other three bilingual groups.

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### Conflict of interests

The authors declare that there is no conflict of interest, either existing or potential.

### Authors contribution

The authors have made an equal contribution to the paper.

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