

Acquisition of Russian gender agreement by monolingual and bilingual children

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Abstract

Aim and Objectives/Purpose/Research Questions: The main goal of this study was to examine noun–adjective gender agreement 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 comparison was made to investigate the influence of L2 grammar on the acquisition of gender agreement by (L1) Russian-speaking children.

Design/Methodology/Approach: The participants included four groups of 4–5-year-old bilingual children with Russian as L1 and English, German, Finnish, or Hebrew as L2, who were compared to monolingual children in Russia in two age groups (3–4 and 4–5 years old). The children were matched by socioeconomic status and parents' educational background. All children were tested individually during one testing session. Agreement data were elicited using a semi-structured elicitation test, with verbal and visual stimuli.

Data and Analysis: We used qualitative data analysis to identify types and categories of errors, and quantitative data analysis to compare the tendencies of noun–adjective gender agreement in Russian (L1) between the groups.

Findings/Conclusions: Development of gender agreement in the bilingual children from different L2 backgrounds was *qualitatively* similar to that of the 3–4-year-old monolingual Russian-speaking children. This result suggests that bilingual development in L1 follows the same developmental path as monolingual development, albeit with a delay. In addition, bilingual children whose L2 has grammatical gender (German, Hebrew) outperformed the other bilinguals on gender agreement, indicating that the presence of a grammatical category in both languages spoken by a bilingual facilitates category acquisition.

Originality and Significance/Implications: The study contributes to the discussion on how the transparency and phonological saliency might affect the bilingual children's acquisition of inflectional morphology and on how influence of L2 on L1 might in some cases help and in other cases impede the acquisition of L1.

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Keywords

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Introduction

The focal point of this study was the role of bilingualism in the acquisition of gender agreement. Different grammatical domains have distinct developmental trajectories, and differences between bilingual and monolingual populations have to be investigated in each particular case. More specifically, our focus was on noun–adjective agreement in Russian. This is rather complex because of the interaction of declensional classes with gender assignment and because many nouns have phonologically non-transparent (opaque) endings, making gender prediction difficult. Our goal was to determine whether or not bilingual Russian-speaking children acquire this pattern of agreement differently from their monolingual Russian-speaking counterparts.

This paper is structured as follows. In the first section, we present existing data on the role of transparency and phonological saliency in bilingual children's acquisition of inflectional morphology in general and gender agreement in particular. In the second section, we present a brief overview of Russian gender and the relevant grammatical information concerning the four languages spoken by the bilingual groups in this study. In the third section, we summarize existing studies on acquisition of gender agreement with emphasis on Russian. In the fourth section, we describe the current study, and in the fifth section, we present our results. In the sixth section we discuss our results and in the seventh section we present our conclusions.

Transparency and phonological salience in gender agreement acquisition among bilingual children

Gender agreement is part of inflectional morphology. Early development of inflectional morphology depends on the consistency and transparency of inflection forms (Brown, 1973). Regular forms are acquired before irregular forms (Berman, 1985, 2004; Ravid, 1995a, 1995b), and full control of inflectional systems takes years to accomplish (Ravid & Schiff, 2009).

Transparency and phonological salience are two main characteristics of inflectional morphology that have been found to have considerable impact on acquisition patterns among monolingual children (Laaha & Gillis, 2007). Transparency is defined as the extent of regularity of a stem or a suffix (Dressler, 2007). For example, the English regular plural *-s* is transparent, whereas the shape of plural forms such as *children* is opaque. Phonological salience can be illustrated by the contrast between stressed and unstressed vowels at the end of the word (Dressler, 2007; Gillis, 2003), with a stressed vowel being prominent and easily identifiable by the learner. It is known that children pay particular attention to stressed syllables (cf. Liberman, Shankweiler, Fischer, & Carter, 1974; Treiman & Zukowski, 1996, among others), which are salient, and this salience induces faster learning.

It is important to note that morphological forms that are less transparent or salient pose greater challenges to learners. The bulk of early research on the difficulty in acquisition of opaque or irregular morphology was based on data from monolingual English-speaking children, primarily on the acquisition of noun plurals and irregular verb forms (Bybee & Slobin, 1982). Other studies have found that bilingual children in particular have difficulty with complex morphology. More specifically, several researchers have noted that the production of

irregular (non-transparent) forms of inflectional morphology in languages rich in such forms seems to be especially challenging for bilingual children during L1/L2 acquisition (Gathercole, 2006; Nicoladis, Palmer, & Marentette, 2007; Paradis, Nicoladis, & Crago, 2007; Schelleter, 2007). For example, in the corpus-based study by Kupisch et al. (2002), the focus was on determiner–noun agreement in monolingual Italian, monolingual French, and Italian–French bilingual children. Gender assignment rules in French are more opaque than the rules in Italian. Italian nouns can be classified according to their endings, which in 70% of cases are clearly associated with the particular gender on the base of formal properties (*-a* for feminine and *-o* for masculine nouns). The bilingual children produced more gender errors in determiner–noun agreement in French than in Italian. The researchers concluded that the relative transparency of gender assignment in Italian helps the acquisition of agreement among monolingual as well as bilingual children. In French, the bilingual children showed a delay in determiner–noun agreement in comparison to the monolingual cohort.

In another study by Gathercole (2006), the focus was the acquisition of grammatical gender in three groups of children (ages 5, 7, and 9): those exposed at home only to Welsh, to Welsh and English, and only to English. The children were educated either in Welsh or Welsh–English settings. In Welsh, some singular feminine and masculine nouns show morpho-phonological mutations; feminine nouns change after the definite article, and adjectives and masculine nouns change after a possessive reference to antecedent nouns. Gathercole (2006) showed that all the children were near the ceiling on gender production of non-mutated forms, but on mutated forms, the children from Welsh-only homes outperformed those from Welsh–English and English-only homes. However, the gap between the groups diminished as the children grew older and had received sufficient input of mutated forms.

Schwartz, Kozminsky, and Leikin (2009) found similar tendencies of a reduced gap between monolinguals and bilinguals as they grew older. They compared Russian–Hebrew sequential bilingual children with monolingual Hebrew-speaking children in their command of irregular forms of Hebrew plural nouns at two data collection points: the beginning of the second grade (7 years old) and the beginning of the third grade (8 years old), at a time when the acquisition of these forms was still underway among monolingual Hebrew-speaking children (Lavie, 2006). In an elicitation task, the children were asked to name the plural forms of certain objects, with emphasis on irregular plurals. At the second data collection point, the bilingual children were still producing the irregular forms less accurately than their monolingual peers, but the difference between the groups was only marginal. This study also attests to both groups' significant improvement in the course of one academic year in all categories of irregular plural forms.

To conclude, there is a growing body of data on bilingual children's difficulty in the acquisition of irregular forms of inflectional morphology during L1/L2 development. As these forms cannot be acquired by generalized rules and must be learned as separate lexical items, their acquisition is related particularly to the frequency of input. It has been suggested, therefore, that an initial delay in bilingual children's development of certain structures might be due to reduced input; the bilingual children have much less exposure to each language than monolingual children (Gathercole, 2006; Kupisch et al., 2002; Nicoladis et al., 2007; Paradis et al., 2007; Schwartz et al., 2009).

In light of the research presented above, bilinguals' acquisition of Russian gender agreement is of interest because Russian gender also shows significant opacity. The acquisition of more opaque gender agreement forms by Russian monolingual children is a prolonged process, which continues up to 6 or 7 years of age (Ceytlin, 2000, pp. 115–122; Gvozdev, 1961). In this study, we compared the bilingual versus monolingual acquisition of these challenging forms in Russian as L1.

Grammar basics: Russian gender and the relevant facts about the four L2s

In this section, we present a short overview of Russian gender assignment and agreement. In addition, since our study was designed to examine the possible role of the L2 in production of the noun–adjective gender agreement in Russian (L1), we will briefly discuss the linguistic landscapes of English, Finnish, German, and Hebrew with respect to their inflectional morphology characteristics and, in particular, grammatical gender and its agreement.

The Russian gender system

Russian has three classes of grammatical genders: masculine, feminine, and neuter (Corbett, 1982, 1991; Zaliznjak, 1967). Masculine nouns comprise approximately 46% of the nominal lexicon, feminine nouns comprise 41%, and neuter nouns comprise 13% (Ahutina et al., 2001, p. 296; Comrie, Stone, & Polinsky, 1996, p. 109). Masculine and feminine nouns denoting humans are assigned gender on the basis of natural gender; for the rest, gender can be predicted by phonological and morphological properties (for details, see Ceytlin, 2005; Corbett, 1982; 1991; Timberlake, 1993).

Russian has three main declensional types with different endings in six noun cases. The following distinctions present basic gender assignment principles for singular nouns in nominative case (for details, see Comrie et al., 1996, pp. 105–112; Corbett, 1991):

- (a) nouns ending in a non-palatalized consonant (zero-ending) in nominative singular are masculine, for example, *stol*, ‘table’;
- (b) nouns ending in stressed *-a* in nominative singular are feminine, for example, *ruk-a*, ‘hand’;
- (c) nouns ending in stressed *-o* in nominative singular are neuter, for example, *okn-o*, ‘window’.

Such nouns can be characterized as phonologically transparent. However, many nouns have phonologically opaque endings, which make gender prediction difficult, such as masculine and feminine nouns ending in a palatalized consonant, or neuter and feminine nouns with unstressed endings (e.g., *oblak-o*, [*oblak-ə*], ‘cloud’: neuter; *sumk-a*, [*sumk- ə*], ‘bag’: feminine).

Russian gender is manifested in the agreement between nouns and adjectives, participles, demonstratives, possessive pronouns, past tense verb forms, and some numerals; gender is also encoded in pronouns. Since adjectival agreement is the main focus of this study, the following examples illustrate this type of agreement. Gender agreement is only present in the singular (1); it is neutralized in the plural (2). All the forms below are in the nominative.

- | | | | |
|-----|----|------------------------|-----------|
| (1) | a. | smešn- <i>oj</i> | kot |
| | | funny.MASC | tomcat |
| | | ‘a funny tomcat’ | |
| | b. | smešn- <i>a</i> | koška |
| | | funny.FEM | she-cat |
| | | ‘a funny cat (female)’ | |
| | c. | smešn- <i>oje</i> | suščestvo |
| | | funny.NEUT | creature |
| | | ‘a funny creature’ | |

- (2) smešn-ye koty/koški/ suščestva
 funny.PL tomcats/she-cats/creatures
 ‘funny tomcats/female cats/creatures’

Relevant properties of English, Finnish, Hebrew, and German

In this section, we briefly present the relevant grammatical characteristics of the target L2s, namely English, Finnish, German, and Hebrew. English and Finnish have no grammatical gender, as opposed to German and Hebrew, which do. However, whereas German and Russian differentiate between masculine, feminine, and neuter, Hebrew distinguishes only between masculine and feminine genders. The following paragraphs illustrate these differences between the target languages.

English has a restricted inflectional system with a small number of productive inflection classes (Laaha & Gillis, 2007). English does not distinguish between grammatical genders and has no gender agreement. Third-person singular pronouns do distinguish between the natural gender of humans (*he* versus *she*) and index inanimates as *it*.

Finnish is an agglutinating language in which derivational and inflectional suffixes are attached to the word stem (Hakulinen, 2004). Adjectives precede the noun that they modify and show case agreement for each of the 15 cases in singular and in plural (e.g., nominative case *iso kirja* ‘(a) big book,’ inessive case *iso-ssa kirja-ssa* ‘in (a) big book,’ and illative case *iso-ihin kirjo-ihin* ‘into big books’). Like English, Finnish is a genderless language with no gender agreement between adjectives and nouns. Nevertheless, the real-world gender of a target word is sometimes present, as in the case of a semi-productive feminine noun suffix *-tar* indicating a female person (Engelberg, 2002; Laakso, 2005; Tainio, 2006). Some lexical pairs express gender differences (e.g., with animals).

Hebrew is characterized by rich derivational and inflectional morphology (Ravid, 2012). Inflectional morphology marks four major grammatical categories: number, gender, person, and tense. All nouns in Hebrew 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*, for example, *sapah* ‘couch,’ *rakevet* ‘train,’ *zavit* ‘angle.’ However, a number of feminine nouns are unmarked, for example, *nefesh* ‘soul,’ *even* ‘stone,’ and some of these nouns are very frequent. Simplifying things somewhat, masculine nouns are typically pluralized with the masculine plural suffix *-im*, for example, *sfarim* ‘books,’ and feminine nouns are usually pluralized with the feminine plural suffix *-ot*, which replaces the singular feminine identifier, for example, *sapot* ‘couches,’ *rakavot* ‘trains,’ *zaviyot* ‘angles.’ Some singular forms, however, take irregular or unpredictable suffixes when pluralized. Masculine plurals can take the feminine *-ot* suffix (e.g., *kir* - *kir-ot* ‘wall-s’ and *rexov* - *rexov-ot* ‘street-s,’ 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* ‘egg-s’ instead of the expected *beyc-ot*). In some cases, plural gender suffixes may be added when changing a word stem, for example, *rakevet* ‘train’ – *rakav-ot* ‘train-s’.

Adjectives are inflected for gender and agree with the noun that they modify ((3) and (4)):

- (3) a. xatul tov
 cat.MAS.SG good. MAS.SG
 ‘good tomcat’

- | | | | | |
|-----|----|----------------------|--|---------------|
| | b. | xatulim | | tovim |
| | | cat.MASC.PL | | good. MASC.PL |
| | | ‘good tomcats’ | | |
| (4) | a. | xatula | | tova |
| | | cat.FEM.SG | | good. FEM.SG |
| | | ‘good cat (female)’ | | |
| | b. | xatulot | | toivot |
| | | cat. FEM.PL | | good. FEM.PL |
| | | ‘good cats (female)’ | | |

Of the languages in our study, the *German* gender system is the closest to the Russian gender system, as they both have three grammatical genders. Nouns ending in *-e* (schwa) are often feminine, for example, *Gurke* ‘cucumber,’ *Sonne* ‘sun,’ but there are exceptions to this rule, and some exceptional nouns are very frequent, for example, *Junge* ‘boy’ (masc.) and ‘*Auge* ‘eye’ (neuter). In the case of human referents, the natural gender typically determines the grammatical gender, but there are exceptions to this generalization as well when the form dictates the assignment of gender, cf. *Mädchen* ‘girl’ (neuter). German gender is not altogether arbitrary but is still a complicated system with multiple sub-generalizations (Dieser, 2009; Eisenberg, 1999; Helbig & Buscha, 2007; Köpcke, 1982; Köpcke & Zubin, 1984).

Adjectives precede the noun they modify; they agree with it in gender/number and show case concord. For example:

- | | | | | | | |
|-----|----|-------------------------------|--|-------------------------|--|-------------------------|
| (5) | a. | der | | kleiner | | junge |
| | | DEF.DET.MASC.SG.NOM | | little. MASC.SG.NOM | | boy. MASC.SG.NOM |
| | | ‘the little boy’ | | | | |
| | | ein | | kleiner | | junge |
| | | INDEF.DET.MASC.SG.NOM | | little. MASC.SG.NOM | | boy. MASC.SG.NOM |
| | | ‘a little boy’ | | | | |
| | b. | die | | kleine | | lampe |
| | | DEF.DET.FEM.SG.NOM | | little. FEM.SG.NOM | | lamp. FEM.SG.NOM |
| | | ‘the little lamp’ | | | | |
| | | eine | | kleine | | lampe |
| | | INDEF.DET.FEM.SG.NOM | | little. FEM.SG.NOM | | lamp. FEM.SG.NOM |
| | | ‘a little lamp’ | | | | |
| | c. | das | | kleines | | mädchen |
| | | DEF.DET.NEUT.SG.NOM | | little. NEUT.SG.NOM | | girl. NEUT.SG.NOM |
| | | ‘the little girl’ | | | | |
| | | ein | | kleines | | mädchen |
| | | INDEF.DET.NEUT.SG.NOM | | little. NEUT.SG.NOM | | girl. NEUT.SG.NOM |
| | | ‘a little girl’ | | | | |
| | d. | die | | kleine | | jungen/lampen/ mädchen |
| | | DEF.DET.PL.NOM. | | little PL.NOM | | boys/lamps/girls.PL.NOM |
| | | ‘the little boys/lamps/girls’ | | | | |
| | | kleine | | jungen/lampen/mädchen | | |
| | | little PL.NOM. | | boys/lamps/girls.PL.NOM | | |
| | | ‘little boys/lamps/girls’ | | | | |

The acquisition of gender agreement by monolingual and bilingual Russian children

The acquisition of Russian gender agreement: Monolinguals

Ceytlin (2005) reported that children first acquire nouns ending in *-a*, regardless of their gender, and masculine nouns with zero-ending. Based on production data, she pointed out that there were no errors in adjectival agreement with these nouns. Children also produced feminine nouns ending in *-a* considerably more often than masculine nouns with zero-ending (Ceytlin, 2009, p. 147). At the approximate age of 2;6, children seem to have acquired the basics of the Russian gender system. This intermediate system includes only two genders (masculine and feminine); gender agreement with such nouns seems error-free. The gender of neuter nouns ending in a stressed vowel is acquired between ages 3;0 and 4;0; around that age, such nouns appear mostly with correct gender agreement.

Gender agreement with feminine nouns ending in a palatalized consonant is acquired later since the gender of such nouns cannot be identified based on their formal or semantic characteristics. Likewise, the gender of stem-stressed (end-unstressed) neuter nouns (e.g., *jablok-o* *яблок-о* 'apple') is acquired relatively late, around age 6;0 (Ceytlin, 2009). The difference in the acquisition of gender between end-stressed and stem-stressed neuter nouns is attributed to the saliency of the ending.

One of the most frequent developmental errors in Russian (L1) acquisition is the interpretation of feminine nouns ending in a palatalized consonant as masculine; this problem persists up to age 7;0. Children assimilate these feminine nouns to the masculine, probably over-generalizing the rule that nouns ending in a consonant are masculine. This is apparent from the agreement errors; compare the wrong gender in (6a) with the correct form in (6b):

- | | | | | |
|-----|----|---------------------------|----------|------------------------------|
| (6) | a. | bol'sh- <i>oj</i> | kost' | <i>больш-ой</i> <i>кость</i> |
| | | large-MASC.SG | bone.NOM | |
| | b. | bol'sh- <i>a</i> <i>a</i> | kost' | <i>больш-ая</i> <i>кость</i> |
| | | large-FEM.SG | bone.NOM | |
| | | 'big bone' | | |

In addition, Gvozdev (1961) pointed out the incorrect interpretation of masculine nouns ending in *-a/ja* as feminine, based on the surface similarity to the large body of feminine nouns ending in *-a/ja*. This error persists up to age 3. Compare the incorrect form in (7a) with the correct form in (7b):

- | | | | | |
|-----|----|---------------|-----------------|-------------------------|
| (7) | a. | moj- <i>a</i> | djadj- <i>a</i> | <i>моя</i> <i>дяд-я</i> |
| | | my-FEM.SG | uncle- MASC.SG | |
| | b. | moj | djadj- <i>a</i> | <i>мой</i> <i>дяд-я</i> |
| | | my-MASC.SG | uncle- MASC.SG | |
| | | 'my uncle' | | |

Another frequent developmental error is the re-interpretation of stem-stressed neuter nouns as feminine. The incorrect (8a) and the correct (8b) forms are presented below:

- | | | | | |
|-----|----|---------------|---------------|------------------------|
| (8) | a. | moj- <i>a</i> | ux- <i>a</i> | <i>моя</i> <i>ух-а</i> |
| | | my-FEM.SG | ear- FEM.SG | |
| | b. | moj- <i>o</i> | ux- <i>o</i> | <i>мое</i> <i>ух-о</i> |
| | | my- NEUT.SG | ear - NEUT.SG | |
| | | 'my ear' | | |

The overall number of feminine nouns is larger than the number of neuter nouns. In addition, the input among young children has a particularly high incidence of feminine nouns because most caretakers are female and they make numerous references to themselves. These factors reinforce the presence of feminine nouns and agreement with such nouns, which may contribute to the pattern of errors with the neuter nouns.

The acquisition of Russian gender agreement by bilingual children

We are aware of only one study that explored the bilingual acquisition of Russian gender. Dieser (2007a, 2007b, 2009) investigated gender acquisition among bilingual and trilingual children based on their speech production. In particular, she collected longitudinal data from a Russian-German bilingual child, Alex, from birth to around age 6 and found clear similarities to monolingual patterns of acquisition. For example, up to age 2, Alex had a tendency to overuse feminine nouns with the salient ending *-a/-ja*; this matches Ceytlin's (2005) findings concerning a similar pattern among Russian-speaking monolingual children. This pattern was attributed partly to the high incidence of feminine forms in the speech of female caretakers. In the families where the child was female, the incidence of feminine forms was even higher. For example, Dafna, a Russian-English-German trilingual, frequently over-generalized feminine gender up to age 3;0.

Dieser (2007a, 2007b, 2009) also found the following patterns of errors: the children re-interpreted masculine nouns ending in *-a* and neuter nouns as feminine (see examples (7a) and (8a) above). It should be noted that these nouns are stem-stressed, and given the Russian pattern of reduction, the unstressed vowel of the ending is realized as schwa or as ending in *-a* (the correct forms are shown in (7b) and (8b) above).

In addition, Dieser found that feminine nouns ending in a palatalized consonant were re-interpreted as masculine (see example (6a) above) or as feminine ending in *-a* (9a) up to age 7;0. Examples of correct forms are given in (6b) and (9b).

- | | | | |
|-----|----|-----------------|----------|
| (9) | a. | papin-a | ladonj-a |
| | | dad.POSS-FEM.SG | palm-NOM |
| | b. | papin-a | ladon' |
| | | dad.POSS-FEM.SG | palm.NOM |
| | | 'father's palm' | |

These errors match the pattern of errors observed in monolingual acquisition (see the section *The acquisition of Russian gender agreement: Monolinguals*); however, the bilingual children observed by Dieser showed this pattern for much longer, through ages 4;0 to 4;6 in the high-frequency words, and to age 7;0 in the low-frequency words.

Like monolinguals, the bilinguals relied on a form-related learning strategy, meaning that they relied on morpho-phonological characteristics of words and not on semantic gender up to age 3 and 4. In addition, like monolingual children, the intermediate system among bilingual children includes only two genders in both Russian and German: masculine and feminine in Russian, and feminine and not-feminine in German (Dieser, 2009, p. 276). To conclude, Dieser's study indicates that the developmental patterns observed in bilingual children are similar to those found in monolingual Russian-speaking children.

The current study

The main goal of this study was to examine noun–adjective gender agreement in Russian by comparing bilingual children with diverse L2 backgrounds with age-matched monolingual children

and monolinguals one year younger. This comparison was made to investigate the influence of L2 grammar on the acquisition of gender agreement by (L1) Russian-speaking children. We examined the following research questions:

- (1) What are the similarities/differences between bilingual Russian-speaking children and age-matched monolingual children in the patterns of acquisition of noun–adjective gender agreement in Russian (L1)?
- (2) What is the effect of L2 grammar context in the acquisition of noun–adjective gender agreement in Russian (L1) by bilingual (L1) Russian-speaking children?

To answer these questions, we focused on second-generation immigrants from Russian-speaking communities currently living in four countries: the United States, Finland, Israel, and Germany. The inclusion of different L2s allowed us to determine the role of L2 grammar in L1 acquisition by young bilinguals. We examined their acquisition of Russian noun–adjective gender agreement as compared to its acquisition by age-matched monolingual children and by a monolingual group one year younger.

Our expectations were as follows. If the differences in agreement patterns between the bilinguals and monolinguals turned out to be qualitative, this would constitute evidence that these groups follow dissimilar developmental trajectories in gender agreement acquisition. If the bilingual groups under investigation differed only quantitatively from the monolingual groups, a theory of different developmental trajectories would not be supported, but the idea that gender agreement is sensitive to reduced input would be sustained.

Turning now to the role of L2, we compared two L2s with the category of gender (German and Hebrew) and two genderless languages (English and Finnish). If the bilingual groups in our study *were all alike*, this would provide an argument against interference of the individual L2 in each case. If German- and Hebrew-speaking bilinguals patterned together and differently from the other two groups, this would support an argument for L2 influence on a rather abstract, categorical level. If L1 and L2 both had the category of gender (regardless of its structuring) this would facilitate acquisition and maintenance. Of the L2s examined in this study, German is the closest to Russian in gender structure, and if the results showed that the German bilingual group outperforms the other three, this would indicate that presence of neuter gender rather than the mere presence of the category itself is a facilitating factor in bilingual development. This assumption draws on the growing body of data on how influence of one language on another might in some cases help and in other cases impede the acquisition of that language (e.g., Paradis & Genessee, 1996; Paradis, Crago, & Genessee, 2005/2006). The facilitating effect of the cross-linguistic influence was evidenced in diverse morpho-syntactic domains. For example, Paradis et al. (2005/2006) found a facilitating effect of earlier acquisition of the English pronoun system on the acquisition of this system among bilingual French-English speaking children with specific language impairment (SLI). In another study, Zdorenko and Paradis (2008) showed a facilitating effect of proximity in L1 (Spanish) on early stages of acquisition of BE auxiliaries and definite articles in English (L2) among L1 Spanish-speaking bilinguals.

To recap, the cross-linguistic influence of the grammar properties of the L2 on the acquisition of noun–adjective gender agreement in Russian (L1) by bilingual (L1) Russian-speaking children might be facilitating as in the case of German, or impeding as in the case of English and Finnish. Regarding the Hebrew role, Hebrew has only two genders (masculine and feminine) and does not distinguish the neuter gender, the acquisition of which was found to be delayed and challenging among Russian-speaking bilingual children (Ceytlin, 2009). Hence, the present research design permitted us to examine, among other things, the influence of partial structural overlap in gender

between Russian and Hebrew on the acquisition of noun–adjective gender agreement in Russian (L1) by Russian-Hebrew-speaking children.

General socio-cultural context of Russian in diaspora

Russian-speaking diaspora is now found in all continents. The political, social, and economic reforms of the late 1980s, followed by the collapse of the Soviet Union in the early 1990s, produced considerable surges of Soviet immigrants and refugees, commonly called ‘the fourth wave’ (Ben-Rafael et al., 2006). According to the United States Census 2007, Russian was spoken at home by over 850,000 people. A considerable number of these immigrants settled in large cities, where they have created new networks and social infrastructures.

In Finland, almost 63,000 of the nearly 5.5 million people living in the country are speakers of Russian. Russian speakers, the largest group of foreign language speakers, live in 177 municipalities, clustering in Southern Finland (where 46% of all Russian-speakers live) and near the eastern border. In 26,151 families, at least one of the parents speaks Russian (accounting for 22.3% of all families with a foreign background) (Statistics Finland, 2013). The so-called ‘Old Russians’ (approximately 5000, not included in the general statistics) are descendants of different waves of migration since the 17th century. The last migration wave arrived after the collapse of the Soviet Union and was formed of Ingrian Finns (returnees, predominantly during the 1990s) and those who came for study, marriage, and work (mostly in the new century). In some schools and kindergartens, Russian is taught as a foreign or home language (some of the schools existed as early as the 19th century). The Russian-speaking community produces its own media and organizes many social and cultural activities, including events for children (Protassova, 2007).

In Israel, 992,236 immigrants arrived from the former Soviet Union between 1989 and 2008, by which time they comprised approximately one-fifth of the total Jewish population of the country (Ministry of Immigrant Absorption in Israel, 2008). This Russian-speaking community constitutes the largest sub-cultural community in Israel (Spolsky & Shohamy, 1999). This immigrant group has actively created a Russian-speaking sociolinguistic milieu through the development of highly organized social structures at the local level, including consumer markets, educational and cultural institutions, local party branches, newspapers, magazines, and television programs, which have provided favorable conditions for maintaining heritage language and culture (Ben-Rafael et al., 2006).

In Germany, the Russian-speaking population has grown considerably over the last 10–15 years. Between two and three million people in Germany consider Russian to be their first language (Brehmer, 2007; Polian, 2005). This is a heterogeneous migrant group, including ethnic Germans, Jews and their family members, Russian spouses of German citizens, scientists, students, and asylum-seekers from different countries of the former Soviet Union. Despite such heterogeneity, most of them speak Russian (Brehmer, 2007; Polian, 2005).

Members of the Russian diaspora have a strong commitment to the Russian language and culture, but they are also successful at acquiring new languages and cultures (Ben-Rafael et al., 2006). Russian-speaking immigrant parents have invested in the maintenance of the language and its transmission to their children, which is a priority in Russian culture. Russian communities in each of the four target countries have created early bilingual education centers. The existence of such centers and the development of comparable Russian-speaking communities in several countries make Russian a promising test case for investigating bilingual language development. It is in this general context that we conceptualized the comparative study of gender agreement.

Table 1. Background information about the study participants.

Variables Language Context	Number of participants	Gender Boys/Girls	Parents' SES by education level
Russian- English	15	6/9	Technical college degree (<i>n</i> = 11) College degree (<i>n</i> = 15)
Russian- Hebrew	24	11/13	Technical college degree (<i>n</i> = 5) College degree (<i>n</i> = 19)
Russian- German	17	9/8	College degree (<i>n</i> = 13) High school diploma (<i>n</i> = 4)
Russian- Finnish	14	6/8	College degree (<i>n</i> = 10) High school diploma (<i>n</i> = 4)
Russian L1 Group 1	20	3;2-3;10	College degree (<i>n</i> = 5) High school diploma (<i>n</i> = 15)
Russian L1 Group 2	20	4;1-4;8	College degree (<i>n</i> = 5) High school diploma (<i>n</i> = 15)

SES: socioeconomic status.

Participants

The participants comprised four groups of bilingual preschool children aged 4–5 in the four countries (see Table 1). These bilingual children were compared to two age groups of monolingual Russian-speaking children in Russia, the younger monolingual group of 3–4 years and the elder monolingual group of 4–5 years. The data on the monolingual groups were collected in a preschool in St Petersburg at the same time as the data were collected in the bilingual groups. All the children were matched by socioeconomic status (average-high). Most of the parents reported a relatively high level of education (college and university level); a high educational level among parents is typical of immigrants, who prefer to maintain their children's Russian in an immigrant setting. Parents and teachers characterized bilingual children as Russian (L1)-dominant with early sequential onset of L2, which began with the entrance to bilingual preschool at ages 2–3. In accordance with the parents' reports, in the bilingual groups (L2 English, German, Hebrew, and Finnish), input at home referred to children's exposure to TV, to storybooks, and children's playground activities. The bilingual preschools applied the developmental enrichment bilingual program (García, 2009) with Russian maintenance for the children from Russian-speaking linguistic backgrounds. In the case of Finland and Germany, this program enrolled children from both Russian-speaking homes and Finnish- or German-speaking homes. In the case of Israel and the United States, most of the population constituted second-generation immigrants from Russian-speaking communities.

Recently, bilingual children whose age of first exposure to L2 was between 1 and 4 years were defined as early sequential bilinguals (Meisel, 2009; Rothweiler, 2008; Unsworth & Hulk, 2009). The early sequential bilinguals have been less investigated and it is still not clear how these bilingual children acquire grammar in L1/L2. Two main characteristics differentiate between simultaneous bilingual and early sequential bilinguals: the sequence of L2 acquisition and some grammatical knowledge acquisition in L1 before L2. This situation occurs frequently within immigrant families, where children are exposed to L2 (the dominant language of the host society) only after entering a preschool educational setting. In this case, the heritage or minority language is acquired first (Montrul, 2008; Paradis, 2007). The present study sought to extend the knowledge on acquisition of L1 grammar by early sequential bilinguals.

Materials

We conducted a semi-structured elicitation test, which involved verbal and visual stimuli. The task included 70 stimuli (see the Appendix). Test items were balanced for gender: 20 transparently feminine nouns in *-a/-ja*, e.g., *ruka*, ‘hand’; 20 transparently masculine nouns, for example, *dom*, ‘house’; 20 neuter nouns (10 items with stressed endings, e.g., *okno*, ‘window’; 10 items with unstressed endings, e.g., *serdce*, ‘heart’); and 10 feminine nouns ending in a palatalized consonant, for example, *kost*, ‘bone.’ It should be noted that the masculine nouns ending in a palatalized consonant were not included in the test because, as presented above, most difficulties found in the monolingual acquisition were with the feminine nouns ending in a palatalized consonant.

The choice of items was based on the following criteria. Firstly, the items and pictures representing them had to be culturally neutral and unambiguous, in the sense that children would have no difficulty understanding the meaning of the test item (Verhoeven, 2007). Secondly, the items were normed for the frequency of usage. Bilingual preschool teachers and Russian-speaking speech therapists were asked to grade the frequency of use (in speech) of each item by a 4–5-year-old child using a 1–4 scale (1: the child uses this word often; 2: the child uses this word sometimes, 3: the child seldom uses this word; 4: the child never uses this word). Based on 10 norming questionnaires, only frequently used items were included in the test. The items were then pre-tested with three children from the bilingual preschool in each country (who were not included in the study). The purpose of the pre-test was to see how the children coped with the tests and their instructions. At the end of the pre-test session, certain items that appeared too difficult, having received an incorrect response by all participants, were excluded from the test. In addition, based on the children’s questions and comments, we clarified, extended, and simplified the test instructions and replaced some unclear pictures.

Procedure

All children were tested in February–March, 2012. Each child was assessed individually in a quiet room at preschool. The testing session lasted approximately 30 minutes. A native Russian speaker administered the task. Instructions were given in Russian and included two practice examples.

Participants were shown a booklet containing pairs of pictures. The child was first presented with a picture depicting a small item (e.g., a doll), and the investigator said: ‘*Eto mal’en’kaja kukla*,’ ‘This is a little doll.’ The adjective presented by the experimenter was stem-stressed, *mal’en’kaja*, ‘small,’ and thus had a non-salient ending (see (10a) below); this allowed us to avoid gender prompting. Next, a large picture representing the same item was shown to the child, and the investigator asked: ‘And what is this?’ The expected answer included the end-stressed adjective *bol’soj*, ‘big’ (see (10b)), which made the child’s choice of gender transparent.

- (10) a. malen’k-aja/malen’k-oje [ˈmalʲenʲk əjə] ‘small’
small-FEM/small-NEUTER
- b. bol’š-aja [bəlʲʲʲajə]/ bol’š-oje [bəlʲʲʲojə] ‘big’
big-FEM big-NEUTER

The experimenter recorded the responses on a chart and the data were fully anonymized.

Data analysis

In this study, we used mixed qualitative and quantitative data analysis. We used qualitative data analysis to identify types and categories of errors, and quantitative data analysis to compare the tendencies of noun–adjective gender agreement in Russian (L1) between the groups. In addition,

we constructed scales for measuring the prevalence of different types and categories of errors, and for estimating the influence of the children's L2.

Types of errors. To address the question of qualitative differences in the acquisition pattern of noun–adjective agreement in Russian (L1) between bilingual Russian-speaking children and age-matched monolingual children, we analyzed error patterns produced by both the monolingual groups and the four bilingual groups. Based on patterns of error identified among monolingual Russian-speaking children and bilingual Russian-speaking children and adults (Dieser, 2007a, 2007b, 2009; Polinsky, 2008), we addressed the following five error types.

- (11) Error types in Russian gender assignment:
- a. change of neuter end-stressed nouns to masculine or feminine;
 - b. change of neuter end-unstressed nouns to masculine or feminine;
 - c. change of masculine nouns ending in a consonant to feminine or neuter;
 - d. change of feminine nouns ending in a palatalized consonant to masculine or to neuter;
 - e. change of feminine end-unstressed nouns ending in *-a* to masculine or to neuter.

Error scales. To analyze the data, we constructed three error scales: (1) bipolar scale (correct/incorrect); (2) three-point scale (change to masculine/change to feminine/correct production) to examine tendencies in the categories of error; and (3) general scale of the incorrect production that was calculated as the average of all five types of error. The factor analysis showed that all five types of error constructed one general factor, that is, that the observed types of errors were strongly related (Cronbach's alpha = .73).

The role of L2 grammar in the acquisition of noun–adjective gender agreement in Russian (L1). Dressler (2007) proposed a model of *ordering typology* to compare nine different languages with diverse structural characteristics according 'to the degree to which they display characteristics of the ideal agglutinating, inflecting and isolating types. The characteristics used for ordering the languages are morphological richness and related typological criteria' (p. 67). Following this idea, we assumed that if the L1 and L2 are comparable in their inflectional morphology, this might facilitate the acquisition of inflectional morphology by bilinguals, whereas significant morphological differences between L1 and L2 might be an impediment. (The negative effect of L2 English on gender agreement in noun phrases among Spanish-English bilingual children is discussed by Anderson (1999), and the positive effect of L2 German on gender agreement among Russian-German bilingual children is addressed by Dieser (2007a).

We also hypothesized that the presence of gender agreement in L2 might have a facilitating effect on the acquisition of gender agreement in L1; the absence of gender agreement in L2 might have a negative effect on the acquisition of gender agreement in L1 (see Anderson, 1999; Paradis & Genesee, 1996). We then evaluated the possible role of L2 in the acquisition of Russian noun–adjective agreement based on the presence of gender agreement in L2.

Of the four L2s in this study, German is closest to Russian as a language with three genders. Hebrew has gender agreement, as well, but only two genders, and it was thus assigned a lower score than to the German language. Similarly to Russian, Finnish has rich inflectional morphology but no gender and no gender agreement, so its score is lower than that assigned to German and Hebrew. Finally, English has impoverished inflectional morphology and no grammatical gender. We thus arrived at the following ranking of degree of proximity to Russian regarding gender agreement on a four-point scale: German (4) > Hebrew (3) > Finnish (2) > English (1).

Results

Qualitative analysis of errors

To address the qualitative comparison of noun–adjective gender agreement between the bilingual and monolingual children, we analyzed the types of errors produced by both the monolingual groups and the four bilingual groups. The analysis revealed *no qualitative difference* between bilingual and both younger and age-matched monolingual children: in all the groups studied (monolingual and bilingual) and in the all language contexts studied, we found that Russian-speaking children made the same types of errors in noun–adjective gender agreement. Since each type of error comprises two possibilities, these types were subdivided into the following categories (the stressed vowel is in bold font):

- (12) Error categories in Russian gender assignment
- a. change of neuter end-stressed nouns
 1. to masculine, e.g., *больш**и**-о**й*** (*masculine adjective form*) *окн-о*, *bol'sh-**o**j* *okn-**o***, instead of *больш**и**-о**е*** (*neuter adjective form*) *окн-о*, *bol'sh-**o**j* *okn-**o***, 'big window.'
 2. to feminine, e.g., *больш**и**-а**я*** (*feminine adjective form*) *окн-о*, *bol'sh-**a**j* *okn-**o***, instead of *больш**и**-о**е*** (*neuter adjective form*) *окн-о*, *bol'sh-**o**j* *okn-**o***, 'big window.'
 - b. change of neuter end-unstressed nouns
 1. to masculine, e.g., *больш**и**-о**й*** (*masculine adjective form*) *сердц**е**-е*, *bol'sh-**o**j* *serdce*, instead of *больш**и**-о**е*** (*neuter adjective form*) *сердц**е**-е*, *bol'sh-**o**j* *serdce*, 'big heart.'
 2. to feminine, e.g., *больш**и**-а**я*** (*feminine adjective form*) *сердц**е**-е*, *bol'sh-**a**j* *serdce*, instead of *больш**и**-о**е*** (*neuter adjective form*) *сердц**е**-е*, *bol'sh-**o**j* *serdce*, 'big heart.'
 - c. change of masculine nouns ending in a consonant
 1. to feminine, e.g., *больш**и**-а**я*** (*feminine adjective form*) *дом*, *bol'sh-**a**j* *dom*, instead of *больш**и**-о**й*** (*masculine adjective form*) *дом*, *bol'sh-**o**j* *dom*, 'big house.'
 2. to neuter gender, e.g., *больш**и**-о**е*** (*neuter adjective form*) *дом*, *bol'sh-**o**j* *dom*, instead of *больш**и**-о**й*** (*masculine adjective form*) *дом*, *bol'sh-**o**j* *dom*, 'big house.'
 - d. change of feminine nouns ending in a palatalized consonant
 1. to masculine gender, e.g., *больш**и**-о**й*** (*masculine adjective form*) *кость*, *bol'sh-**o**j* *kost'*, instead of *больш**и**-а**я*** (*feminine adjective form*) *кость*, *bol'sh-**a**j* *kost'*, 'big bone.'
 2. to neuter gender, e.g., *больш**и**-о**е*** (*neuter adjective form*) *кость*, *bol'sh-**o**j* *kost'*, instead of *больш**и**-а**я*** (*feminine adjective form*) *кость*, *bol'sh-**a**j* *kost'*, 'big bone.'
 - e. change of feminine end-unstressed nouns ending in *-a*
 1. to masculine, e.g., *больш**и**-о**й*** (*masculine adjective form*) *лам**п**-а*, *bol'sh-**o**j* *lamp-a*, instead of *больш**и**-а**я*** (*feminine adjective form*) *лам**п**-а*, *bol'sh-**a**j* *lamp-a*, 'big lamp.'

2. to neuter gender e.g., *больш-ое* (neuter adjective form) *ламп-а*, bol'sh-oje lamp-a, instead of *больш-ая* (feminine adjective form) *ламп-а*, bol'sh-aja lamp-a, 'big lamp.'

Quantitative analysis of errors

Types of errors. To measure the quantitative difference between bilingual Russian-speaking children and age-matched monolingual children in Russian (L1) noun–adjective gender agreement, we calculated the percentage of errors for each group of comparison. Table 2 presents the percentage of errors in noun–adjective agreement by type of error and by group. In addition, we counted the overall rate of correctly and incorrectly supplied noun–adjective agreement form by group, which is displayed in Figure 1.

To examine differences between the groups in the five types of errors mentioned above, we also conducted one-way analysis of variance followed by post-hoc comparisons. The quantitative analysis of errors revealed that the distribution of error types was significantly different across the groups. The results of the comparisons are presented according to the type of error.

Change of neuter end-stressed nouns to masculine and feminine. The groups differed significantly in the noun–adjective agreement of end-stressed neuters, $F(5, 106) = 12.07, p < 0.001$. More specifically, the older monolingual group significantly outperformed both the younger monolingual group and all four bilingual groups. At the same time, the data revealed no significant differences between the performance of the younger monolinguals and bilinguals from the four target groups, and across all four bilingual groups.

Change of neuter end-unstressed nouns to feminine or masculine gender. Similar to the above category, the comparison revealed significant differences between the groups on the agreement

Table 2. Percentage of errors in noun–adjective agreement by type of error and by group.

Type of error Groups	Change of neuter end-stressed nouns to masculine or feminine	Change of neuter end-unstressed nouns to masculine or feminine	Change of masculine nouns ending in a consonant to feminine or neuter	Change of feminine nouns ending in a palatalized consonant to masculine or neuter	Change of feminine end-unstressed nouns -a to masculine or neuter
Monolingual Russian (3–4 year olds) (n = 20)	90	85	25	90	40
Monolingual Russian (4–5 year olds) (n = 20)	10	30	20	30	15
Bilingual Russian-English (n = 15)	100	100	44	94	100
Bilingual Russian-Finnish (n = 14)	60	80	47	80	60
Bilingual Russian-Hebrew (n = 24)	58	96	25	83	37
Bilingual Russian-German (n = 17)	72	65	23	87	25

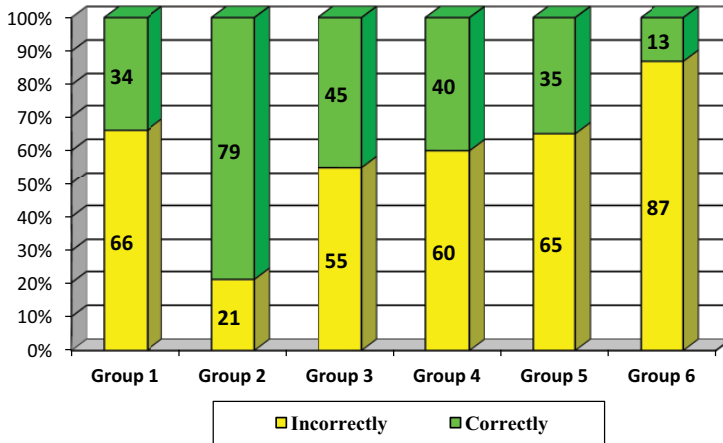


Figure 1. Overall rate of correctly and incorrectly supplied noun–adjective agreement form by group (%). Groups: 1 – Russian monolinguals (3–4); 2 – Russian monolinguals (4–5); 3 – Russian-German bilinguals; 4 – Russian-Hebrew bilinguals; 5 – Russian-Finnish bilinguals; 6 – Russian-English bilinguals.

of neuter end-unstressed nouns with adjective, $F(5, 106) = 9.85, p < 0.001$. The older monolingual group outperformed all comparison groups except the Russian-German bilinguals. The younger monolingual and all bilingual groups did not differ significantly on this error type.

Change of masculine to feminine or neuter. The data revealed that all six groups did not differ significantly on the agreement of the masculine nouns. This category seemed to be the least challenging for all the bilinguals, whose performance was above chance.

Change of feminine nouns ending in a palatalized consonant to masculine or to neuter. Similar to the agreement with adjective of the end-unstressed neuter nouns, the agreement of feminine nouns ending in a palatalized consonant was very difficult for all bilingual groups as well as for the younger monolingual group. The older monolingual group performed significantly better than the younger monolingual and all the bilingual groups, $F(5, 106) = 8.12, p < 0.001$.

Change of feminine end-unstressed nouns ending in -a to masculine or to neuter. The data showed that only the group of Russian-English bilinguals failed completely (0% of correct responses) to match the feminine end-unstressed nouns ending in -a with adjectives and significantly differed from all other groups with the exception of the Russian-Finnish children, $F(5, 106) = 8.56, p < 0.001$.

Tendencies in the categories of error. Our results showed different tendencies in the categories of error according to type of error and L2 background. We chose to focus on the types of error that were found to be most challenging in monolingual acquisition (see the section *The acquisition of Russian gender agreement by bilingual children*): (1) agreement of neuter nouns (Type 1 and Type 2) and (2) agreement of feminine nouns ending in a palatalized consonant (Type 4). These types each included two categories of error: change of neuter gender (end-stressed or end-unstressed) to feminine or masculine, and change of feminine ending in a palatalized consonant to masculine or neuter. Figures 2–4 show tendencies in different categories by type of error.

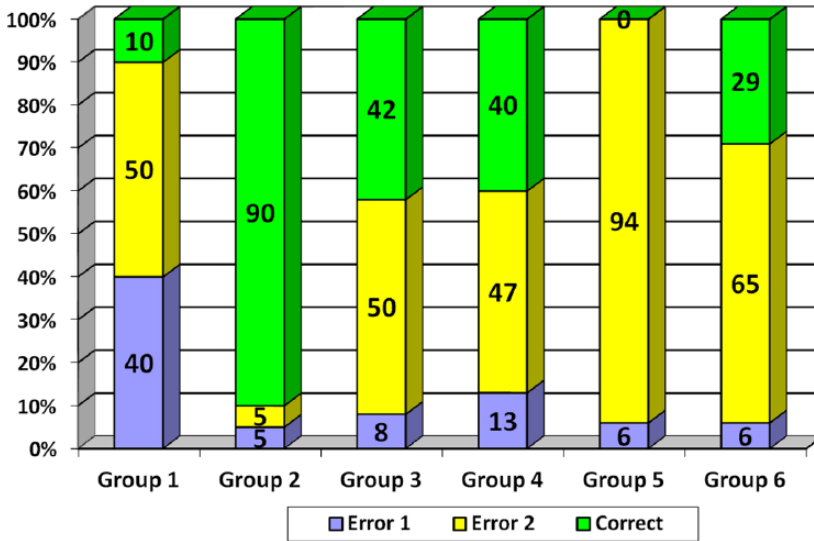


Figure 2. Change of end-stressed neuter nouns to masculine (Error 1) or feminine (Error 2) (in %). Groups: 1 – Russian monolinguals (3–4); 2 – Russian monolinguals (4–5); 3 – Russian-Hebrew bilinguals; 4 – Russian-Finnish bilinguals; 5 – Russian-English bilinguals; 6 – Russian-German bilinguals.

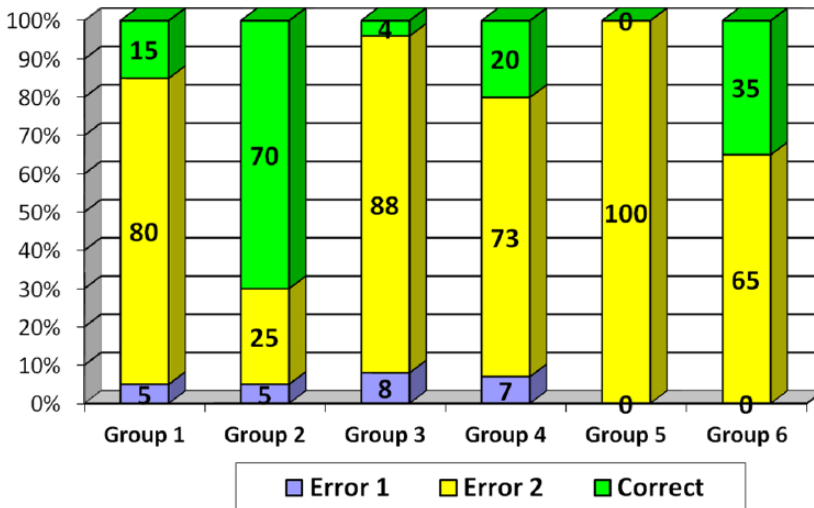


Figure 3. Change of end-unstressed neuter nouns to masculine (Error 1) or feminine (Error 2) (in %). Groups: 1 – Russian monolinguals (3–4); 2 – Russian monolinguals (4–5); 3 – Russian-Hebrew bilinguals; 4 – Russian-Finnish bilinguals; 5 – Russian-English bilinguals; 6 – Russian-German bilinguals.

With regard to neuter noun agreement, all groups tend to over-generalize the feminine ending *-a*. For feminine nouns ending in a palatalized consonant, most groups (except the older monolinguals and the Russian-Finnish bilinguals) treated them as masculine. The older monolinguals and the

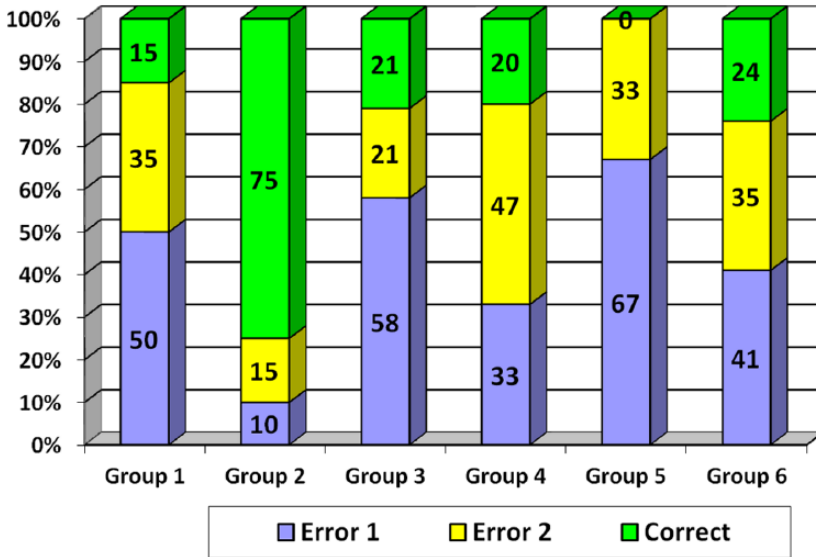


Figure 4. Change of feminine nouns ending in a palatalized consonant to masculine (Error 1) or to neuter (Error 2) (in %). Groups: 1 – Russian monolinguals (3–4); 2 – Russian monolinguals (4–5); 3 – Russian-Hebrew bilinguals; 4 – Russian-Finnish bilinguals; 5 – Russian-English bilinguals; 6 – Russian-German bilinguals.

Russian-Finnish bilinguals produced errors with feminine nouns ending in a palatalized consonant; in both groups, these errors were distributed similarly between the masculine and neuter genders.

Role of L2 grammar. Based on the availability of inflectional morphology and gender agreement in L2, we built the following four-point scale: German (4) > Hebrew (3) > Finnish (2) > English (1) (see section “The role of L2 grammar in the acquisition of noun–adjective gender agreement in Russian (L1)”). The higher the position of L2 on this scale, the greater facilitating effect of that language on the acquisition of Russian gender agreement is expected. The results confirm this expectation. In the comparison of Russian bilingual children and monolinguals, the L2 English-speaking bilinguals demonstrated *the lowest results*, while the L2 German-speaking bilinguals showed *the highest results*. Hebrew-speaking bilinguals were closer to the German-speaking peers and obtained higher scores than the Finnish-speaking bilinguals.

We also found significant correlations between this scale and all five types of error (see Table 3). This finding suggests that the types of errors are highly related to each other, which indicates that these types of errors reflect similar developmental tendencies in the acquisition of agreement in both bilingual and monolingual contexts, even if the magnitude of these tendencies is influenced by the L2 grammar.

Discussion

The main aim of the present study was to investigate a noun–adjective gender agreement in Russian by comparing bilingual children with diverse L2 backgrounds with one-year younger and age-matched monolingual Russian-speaking children. This cross-linguistic project makes a considerable contribution to the existing research in a number of ways. The results showed *no qualitative difference* between

Table 3. Pearson correlations between the Grammar Context scale and the type of errors.

Type of errors	r
1. Change of stressed neuters to masculine or feminine	.49***
2. Change of unstressed neuters to masculine or feminine	.51***
3. Change of feminine nouns with unstressed ending, third declension, to masculine or neuter	.40***
4. Change of feminine nouns unstressed ending, first declension, to masculine or neuter	.56***
5. Change of masculine, second declension, to neuter or feminine	.29*
General percentage of correct production	.63***

* $p < 0.05$; *** $p < 0.001$.

most bilingual groups and younger monolingual children. However, *the quantitative differences* between the bilingual and monolingual groups and among the bilingual groups were evident. The older monolingual group was significantly superior to the younger monolingual group and all four bilingual groups, whereas most of the bilingual groups were *quantitatively similar* to the younger monolingual group. In addition, we found clear-cut evidence that L2 plays a *considerable* role in acquisition of the most challenging cases of gender agreement. This role seems to be facilitating in the case of L2 with inflectional gender marking (i.e., German and Hebrew) or impeding in the case of L2 with no grammatical gender (English and Finnish).

The qualitative similarities between bilingual Russian-speaking children and age-matched monolingual children

In line with the previous data of Gathercole (2006) and Schwartz et al. (2009) on early sequential bilingual children's acquisition of the non-transparent and non-salient form of inflectional morphology, we found *qualitative similarities* between the bilingual groups and both monolingual groups. These similarities were evident in the following types of errors: (1) change of neuter end-unstressed nouns mostly to feminine gender; (2) change of neuter end-stressed nouns mostly to feminine gender; (3) change of feminine nouns ending in a palatalized consonant mostly to masculine; (4) change of feminine end-unstressed nouns ending in *-a* to masculine.

More specifically, similar to existing monolingual data (Ceytlin, 2009), both our monolingual and bilingual groups tended to interpret end-unstressed neuter nouns as feminine ending in *-a* due to the non-saliency of the ending, for example, bol'sh-**a***ja* (*fem.*) oblak-*a*, instead of bol'sh-**o***je* (*neuter*) oblak-*o*, 'big cloud.' In addition, the study showed that even though most errors were produced in the agreement of the end-unstressed neuter nouns, the bilingual groups (age 4–5) and the younger monolingual group (age 3–4) found the agreement of end-stressed neuter nouns challenging also. A clear tendency to interpret end-unstressed as well as end-stressed neuter nouns as feminine ending in *-a* rather than masculine with zero-ending could be attributed to the fact that the overall number of feminine nouns ending in *-a* is dominant in child-directed speech as well as in children's speech. As was reported by Popova (1973) in an analysis of monolingual Russian-speaking children's vocabulary at 2–4 years old, 70% of the nouns were feminine and ended in *-a*. The input received by young children includes a particularly high incidence of feminine nouns because most caretakers are female and they make numerous references to themselves. In addition, the feminine nouns with stressed ending *-a* are most saliently marked of the genders, having only one type of ending in the nominative case (Popova, 1973).

Another similarity to the existing monolingual data was a clear tendency of both bilingual and monolingual groups to interpret the feminine nouns ending in a palatalized consonant as masculine nouns with zero-ending. This tendency might be attributed to opacity or non-transparency of the zero-ending, leading to difficulty in assigning gender correctly. The change for the masculine nouns with zero-ending could be explained by high frequency of these nouns in Russian, whereas the feminine nouns ending in a palatalized consonant are characterized by low frequency and make up only 6.8% of all feminine nouns (Comrie et al., 1996).

It is important to note also that gender assignment of end-unstressed neuter nouns and feminine nouns ending in a palatalized consonant was challenging even for the older monolingual children in this study. Our data showed that at age 5, they were still mastering the genders of these nouns (70% and 75% success). These findings support Slobin's (1985) hypothesis on the critical role of salience and transparency in the child's perception of final morphemes of words: 'Overall, children have difficulty with grammatical morphemes that are less readily identifiable as distinct acoustic entities' (Slobin, 1985, p. 1164).

Finally, in the case of feminine nouns ending in *-a*, we found some difficulty in agreement production for all bilingual groups as well as in the younger monolingual group when this ending was unstressed and, as a result, non-salient. For example, the interpretation of *sobak-a*, 'dog' (feminine noun with an unstressed ending) as masculine results in an erroneous agreement: *bol'sh-**oj*** (*masc.*) *sobak-a*, instead of *bol'sh-**a**ja* (*fem.*) *sobak-a*, 'big dog.' In line with the existing data on monolingual acquisition, this pattern of errors might appear among young children up to age 4 (Ceytlin, 2005). To summarize, in the case of phonologically opaque noun forms in the Russian grammar system, we found clear-cut evidence of marked difficulty in gender assignment for both the bilingual groups and the one-year-younger monolingual group.

The quantitative differences between the bilingual and the older monolingual group

The quantitative differences between most of the bilingual groups and the older monolingual group resulted in a delay in correct production by approximately one year. This replicates Dieser's longitudinal data from the Russian-German bilingual child (Alex), and the Russian-English-German trilingual Dafna (see Dieser, 2009), but using a more rigorous quantitative methodology and focusing on four different L1–L2 dyads. This delay might appear in bilingual children's development of non-transparent and irregular structures in L1 as well as in L2, because they receive much less exposure to each language than monolingual children (Gathercole, 2006; Nicoladis et al., 2007; Paradis, 2009; Paradis et al., 2007). Bearing in mind that the delay in bilingual production was similar to the delay between the younger and the older monolingual groups (apart from the Russian-English bilingual children), we can expect this gain in critical mass of linguistic information, (i.e., the critical mass of input needed to master a target grammar category in L1) (Gathercole, 2006). If this is achieved, it might eventually reduce this delay. In the case of the Russian-English bilingual children, the results obtained showed a floor effect in agreement production of most nouns in the test. In the following section, we discuss this pattern of results.

The role of L2 in the acquisition of gender agreement by Russian (L1) bilinguals

Our second question asked about the role of L2 grammar in the acquisition of gender agreement by Russian bilinguals. We found *quantitative differences* between our bilingual groups with different L2 grammatical systems. The Russian-English bilinguals with L2 English demonstrated *the lowest results*. The US participants showed particularly poor performance on neuter nouns with stressed and unstressed endings and feminine nouns with unstressed ending *-a*, and only 6% successful

production of feminine nouns ending in a palatalized consonant. These results are consistent with Polinsky's (2006, 2008) study of gender in adult heritage speakers of Russian who were English-dominant. In the present study, (L2) English-speaking children differed in their linguistic and educational background from Polinsky's participants in age and bilingual preschool experience, and had greater exposure to Russian in early childhood. However, their performance on the agreement test indicates significant deficits in the categories that are challenging for L1 Russian learners.

One possible explanation for these data is the influence of L2 English as a language characterized by lacking the category of gender. The interference of L1 English in the acquisition of L2 gender has been demonstrated for several languages (cf. in acquisition of Hebrew (L2), Alfi-Shabtay & Ravid 2012; in acquisition of Spanish (L1), Anderson, 1999; in acquisition of German (L2), Ellis, Conradie, & Huddleston, 2012; in acquisition of Dutch (L2), and Sabourin, Stowe, & de Haan, 2006). Our pattern of data brings additional evidence for a case of early interference of L2 English due to the absence of grammatical gender.

We also found that the Russian-Finnish children's performance was better than that of Russian-English children. This might be due to a sociolinguistic factor, which cannot be ruled out but is harder to quantify. For example, Russian is more present in the educational system in Finland than in the USA. There are more bilingual preschools, more visits to Russia (which is important in language maintenance, see Halmari, 2005), more media in Russian, and a greater density and cohesion of the Russian community in Finland as compared to the USA (see Dubinina & Polinsky, 2013, for an overview). This in turn might encourage the children's better or earlier learning of Russian.

In line with the previous data of Paradis and Genessee (1996) and Paradis et al. (2005/2006), we found additional evidence for the facilitation hypothesis and the role of typological proximity versus typological distance in bilinguals' grammar development in L1 and L2. In contrast to English or Finnish grammar, German grammar seems to play a *facilitating role* in children's acquisition of gender agreement in Russian (L1). In most cases, the Russian-German bilinguals were quantitatively most similar to the baseline elder monolinguals in their production. This pattern could be attributed to the fact that nouns in German, like nouns in Russian, may belong to one of three genders: masculine, feminine, or neuter. The Russian-German bilinguals showed the best results compared to other bilingual groups. We suggested that if German- and Hebrew-speaking bilinguals showed similar and different patterns in relation to the other two groups, this would provide an argument in favor of L2 influence on a rather abstract, categorical level. The Hebrew-speaking bilinguals, with an L2 distinguishing gender category, performed better than the other two bilingual groups. The speakers of L2 Finnish and English, which are grammatically genderless, showed the closest results to their German-speaking peers, and scored even higher in one out of five types of the identified errors (i.e., category as change of neuter end-stressed nouns to masculine or feminine). Nevertheless, our results show that the German bilingual group outperformed the other three on most categories of analysis. This indicates that in addition to the existence of the category of gender per se, the presence of neuter gender is a facilitating factor in bilingual development.

Conclusions

The aim of the present study was to examine the acquisition of noun–adjective agreement by monolingual and bilingual Russian children, as manifested in production experiments. By comparing bilingual children exposed to four different languages, we also attempted to investigate interference or facilitation of L2 in the acquisition of L1 gender.

Our results show that Russian gender agreement is a difficult domain of Russian inflectional morphology; it is challenging for monolingual Russian-speaking children (especially the

3–4-year-old group) as well as for bilingual Russian (L1) children whose L1 input is relatively limited. The complexity of the Russian gender system is linked to its two typological characteristics: its low degree of transparency and low degree of phonological saliency, which is exactly where our subjects showed low performance (see discussion on the transparency and saliency in Russian morpho-phonology by Laaha & Gillis, 2007). The overall conclusion with respect to acquisition of gender agreement by monolinguals and bilinguals is that they show similar developmental trajectory and similar errors. The bilinguals in our study performed closer to the year-younger monolingual group than to the age-matched group.

Let us now turn to our second general question: What is the effect of L2 grammar context on the acquisition of noun–adjective agreement in Russian (L1) by bilingual (L1) Russian-speaking children? We found that the presence of gender in the child's L2 has a *facilitating effect* on the acquisition of gender in their L1. In particular, the German- and Hebrew-bilingual children produced fewer errors than their English and Finnish counterparts. However, there was a difference between the Hebrew and the German group as well; the latter group performed better, which suggests that facilitation of gender acquisition may come not from the presence of gender as an abstract category but from the similarity of categorization. German and Russian both have three-gender systems, and this similarity might have a positive effect on the acquisition of gender by Russian-German bilinguals.

These results represent only the first step in our investigation of the acquisition patterns of Russian inflectional noun morphology by bilingual children with diverse L2 backgrounds. Language environment has been suggested as one of the major factors in linguistic development in both monolingual (Lieven & Tomasello, 2008; Tomasello, 2003) and bilingual contexts (Hulk & Cornips, 2006; Paradis, 2009; Unsworth & Hulk, 2009). As was stressed by Paradis (2011), the 'more advanced morphosyntactic acquisition' is 'in the language of greater exposure, typically labeled their "dominant" language' (p. 67). Thus, the characteristics of L1/L2 input at home and in educational settings and its quantitative and qualitative characteristics might be an additional soci-olinguistic factor of influence on L1 grammar acquisition.

In addition, further research is required to determine the role of another factor that could explain the differences between our bilinguals: the level of lexical knowledge in L1. As we know from the monolingual data, developments in the lexicon and in inflectional morphology are highly correlated at a young age. However, our knowledge of the link between lexicon and inflectional morphology development among simultaneous and early sequential bilinguals is still rather limited. Nicoladis et al. (2007) emphasized the need to investigate the nature of the relationship between the French-English bilingual children's knowledge of vocabulary in L1 and L2 and the degree of accuracy in their production of past tense morphemes in French and English. However, because the researchers did not control for the vocabulary knowledge of bilinguals in the target languages, it was difficult to reach a conclusion about the link between the lower level of accuracy in the bilinguals' production of past tense verbs in either French or English and their limited vocabulary in these languages. The evidence for the magnitude of these relationships was provided by Schwartz et al. (2009), who found significant correlations between the performance of Russian-Hebrew sequential bilingual children on receptive vocabulary in Hebrew and their production of irregular forms of Hebrew plural nouns.

Moreover, in addition to the question of whether the presence or absence and type of target grammar domain in L2 might play a role in L1 acquisition, future research should focus also on the question of whether the transparency and saliency of morphological endings in the L2 also affect L1 acquisition. In this context, such language dyads as Russian and Hebrew and Russian and German might be of particular interest, since both languages include cases of irregularity in gender assignment. Nevertheless, there are considerable

differences between these languages in the nature of this irregularity and in its rate of acquisition by the monolingual children (Laaha, Ravid, Korecky-Kröll, Laaha, & Dressler, 2006; Ravid & Schiff, 2009).

Finally, our study was based on a production task, and even though this task was age-appropriate, the results might reflect not only the children's knowledge of gender agreement but also the complexity of the task. This means that future research on similar populations may use a different task whose results could then be evaluated in comparison to the results presented here.

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Appendix. Structure of the noun–adjective gender agreement test.

Gender	Masculine	Feminine		Neuter	
declension	2	1	3	2	
ending	Non-palatalized consonant	Unstressed -a	Palatalized consonant	Stressed -o	Unstressed -o/-e
Stimuli	<i>slon</i> 'elephant' <i>škaf</i> 'wardrobe' <i>stol</i> 'table' <i>stul</i> 'chair' <i>stakan</i> 'glass' <i>dom</i> 'house' <i>baraban</i> 'drum' <i>nos</i> 'nose' <i>telefon</i> 'phone' <i>kran</i> 'tap' <i>pomidor</i> 'tomato' <i>zont</i> 'umbrella' <i>žiraf</i> 'giraffe' <i>pirog</i> 'pie' <i>aist</i> 'stork' <i>televizor</i> 'TV'	<i>sobaka</i> 'dog' <i>sumka</i> 'bag' <i>kastrjulja</i> 'pot' <i>lenta</i> 'ribbon' <i>butylka</i> 'bottle' <i>svečka</i> 'candle' <i>kapusta</i> 'cabbage' <i>pugovica</i> 'button' <i>linejka</i> 'ruler' <i>kukla</i> 'doll' <i>lampa</i> 'lamp' <i>devočka</i> 'girl' <i>kartina</i> 'picture' <i>mašina</i> 'car' <i>korobka</i> 'box' <i>raduga</i> 'rainbow'	<i>morkov</i> 'carrot' <i>myš</i> 'mouse' <i>dver</i> 'door' <i>past</i> 'jaws' <i>košt</i> 'bone' <i>krovat</i> 'bed' <i>sol</i> 'salt' <i>skatert</i> 'map' <i>karusel</i> 'roundabout' <i>cep</i> 'chain'	<i>kolco</i> 'ring' <i>yayco</i> 'egg' <i>okno</i> 'window' <i>pyatno</i> 'spot' <i>palto</i> 'jacket' <i>vedro</i> 'bucket' <i>pismo</i> 'letter' <i>moloko</i> 'milk' <i>koleso</i> 'wheel' <i>sedlo</i> 'saddle'	<i>zerkalo</i> 'mirror' <i>moroženoje</i> 'ice cream' <i>serdce</i> 'heart' <i>jabloko</i> 'apple' <i>solnce</i> 'sun' <i>lekarstvo</i> 'medicine' <i>maslo</i> 'butter' <i>nebo</i> 'sky' <i>platje</i> 'dress' <i>derevo</i> 'tree'