**Developmental variation in the acquisition of L1 Russian verb inflection by monolinguals and bilinguals**

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## 1. Introduction

This paper investigates developmental variation in the early Russian verb development of Russian-Hebrew sequential bilingual children and Russian monolingual children, focusing on the erroneous use of verbal inflections. The questions addressed by this study arise from the underlying hypothesis that Russian–Hebrew bilinguals' use of verbs might be different from that of Russian monolinguals, showing a cross-linguistic influence (of Hebrew on Russian, in our case). While most previous studies have been primarily concerned with L1 interference into L2 acquisition (cf. Meisel 2004), the current study tests L2 impact on L1 development as manifested in the use of verb morphology. We show that verb-inflectional errors of monolinguals of a younger age are still rather typical for older bilinguals. In addition, bilinguals make some unique errors which can be attributed to the bilingual setting. Errors found in both populations may indicate a delay (for the early bilinguals) and even possible attrition (for the late bilinguals), while errors which are unique for bilinguals may hint at L2 influence. The disappearance of monolingual errors in the course of time supports an analysis in terms of L2 influence on L1 development.

*The early verb inflection in Russian*

Previous studies of Russian monolinguals showed that three to four months after the emergence of the first verb, children acquire the basic forms of the paradigm and productively use verbs in correctly composed full sentences. By the age of 2;6, children cannot be said to have rudiments of rote-learned forms (however, single instances of pattern-derived contrastive forms may be found even in the spontaneous speech of adults), and the child's verbal system is based on abstract grammatical rules. The inflectional paradigm acquired by the Russian monolinguals at the age of 2;6 will be taken as the grammatical norm for comparison with the inflectional morphology of older Russian-Hebrew bilinguals who have been exposed to L2 for over a year and a half.

Studies on the acquisition of verb inflection in Russian child language showed consistency regarding the age of the emergence of first verb forms and the timetable of their development towards a productive use. The first detailed study on the emergence of verb inflection, based on the diary notes 'from first words to the first grade' of Gvozdev (1949), already pointed to the fact that the early morphological categories of verb occur at the age 1;10 to 2;0, when the morpheme differentiation starts. Gvozdev's descriptive study reveals the active development of verb inflection, which leads to the productive use of these inflections after the crucial period of approx. four months from the onset of verb production, and the low rate of errors during this period. Later studies based on more sufficient and longitudinal databases corroborate the development of verb inflections originally demonstrated. Thus, Kiebzak-Mandera (2000), exploring the data of three children, wrote that 'the process of forming the verb system in Russian children takes very little time: after the early phase of system formation which takes a few months, children's material becomes comparable with adults' language' (:45). Gagarina (2003, in press) showed a similar time-pattern of acquisition for three other monolingual children, also points to the very low rate of inflectional (agreement) errors. The exception, however, is the extensive use of infinitives in finite constructions. An important peculiarity, which has not yet been well explained, is the

observation of the very rare aspectual errors (in contrast to second language acquisition of Russian) — the use of perfective instead of imperfective — in two types of analytical constructions, e.g. **ne nado pomyt* 'no necessary wash-pf:inf' and **budu pomyt* 'will-3s wash-pf:inf' (cf. Ceytlin 1989, 2000).

*The bilingual acquisition*

Most recent studies on bilingual development agree that the grammars of the two languages in bilingual acquisition develop separately in bilingual acquisition, yet with the various degrees of interaction (the opposite view proposed the unitary language development, i.e. non-differentiation of languages during the initial acquisition stage (e.g. Volterra and Taeschner 1978)). Within this framework Meisel (1989) argued for a separate and independent development of the two languages within a bilingual child. Recently, Pettito and Kovelman have claimed that "… if children are exposed to two languages from a very early age, they will essentially grow as if there were two monolinguals housed in one brain" (Petitto and Kovelman 2004:1, cf. Petitto and Kovelman 2003). On the other hand, Grosjean (1989, cited after Meisel 2004:93) argued that "… the bilingual is not two monolinguals in one person". Our study adopts the theoretical perspective assuming the interactive and interdependent bilingual development of languages in children.

The exact age of bilingual acquisition with its early vs. late sequential differentiation has been a matter for heated debates. While some researches, speaking about the late consecutive development, suggest a time-frame varying between age four and puberty, others speak about "childhood bilinguality in which the second language is acquired before 4-5 years but after the acquisition of basic skills in the mother tongue" (Hamers and Blang 2000: 368, cf. also Genesee et al., 1978). Assuming an interactive language development in late consecutive bilinguals and making use of the studies on verbal inflection in Russian-speaking monolinguals, our study proposes that (1) monolingual L1-Russian speaking children master and maintain the basic inflectional paradigm earlier than do Russian-Hebrew successive bilingual children and (2) the acquisition of Hebrew not only affects the learning of the verb paradigm in Russian but also causes some attrition effects by the age of 3;6 after more than a year of exposure.

The empirical findings on the rate of verb inflectional errors in bilinguals (10% of bilingual sentences containing verbs (Gupol and Moshyashvili 2002)) and monolinguals (3.4% of sentences with verbs (Gagarina 2006)) led to the following observations, which will be examined in this paper: (a) bilingual children demonstrate a different early verb development than their monolingual peers, a difference which is due to crosslinguistic interference; (b) successive bilinguals exhibit a slight deceleration of the verb development and some elements of attrition of Russian parallel to the steadily increasing competence of Hebrew (cf. Anstatt and Dieser, in press on Russian-German bilinguals).

## 2. A comparative analysis of Russian and Hebrew verbal morphology

Russian, a Slavic language from the Indo-European family, and Hebrew, from the Canaanite group of the Northwest Semitic subdivision of the Semitic family, are both characterized by rich inflectional systems. Both languages mark tense, number, gender, and person and require verbal agreement between the verb and the subjects . However, there are differences in the systems that are likely to influence the bilingual performance.

In Russian, infinitive verbs are marked for aspect and voice. Verbs are characterized by tense (present, past, future), mood, gender (masculine, feminine, neutral), person/number**,** and two basic types of the conjugation, e.g. *zhivut* 'live-pres:3s', but *zvon'at* 'call-pres:3s'.Three tenses - past, present and future - are distributed between two

aspects – perfective (henceforth, PF) and imperfective (henceforth, IPF) – in the following way:

| | PAST | PRESENT | FUTURE |
|---|---|---|---|
| PF | + | - | + |
| IPF | + | + | + (*byt'* 'to be' + main verb in the infinitive) |

Forms of IPF in the present and of PF in the future (also the auxiliary *byt'* 'to be' in the compound future with IPF) have three persons in SG and PL (there is no person distinction in the past). Past forms are marked for gender (only in SG) and number. One important peculiarity of the inflectional system is the presence of two stems or bases for the verbs. Open base (OB) (often stem-based) usually ends in a vowel, e.g., *smotr'e-t'* 'to look', *igra-t'* 'to play', and serves as a platform to build past tense forms. Close base (CB) (often root-based) ends in a consonant: *smotr'*-u - 'look-pres:1s.', *igraj-u* - 'play-pres:1s'. Forms of the present/future in the indicative and imperative are constructed from this stem. On the basis of the different types of the alternations between OB and CB, about fifty inflectional micro-classes are documented in contemporary Russian (Dressler et al. 2006). While the rich verbal morphology is synthetic and transparent in Russian, and, thus, 'disposes' a child towards its acquisition, the system of numerous verbal inflectional classes causes difficulties. While children learn the productive use of verb inflections within three/four months from the onset of verb production (Kiebzak-Mandera et al. 1997, Kiebzak-Mandera 2000, Pupynin 1998; Gagarina 2003), errors in the use of the stem variants of the different micro-classes can still be found in the children's speech still at the school-age (such overgeneralisations may even be found in the adults' spontaneous speech) (Ceytlin 2000).

In Hebrew, each verb is composed of a set of root consonant which carry the basic meaning of the verb and are associated with affixal stem elements called 'binyan' conjugation. Though the core semantics of each root is preserved across the patterns, each root-pattern combination constitutes a distinct lexeme. Hebrew verbs are divided into five conjugations (*binyanim),* which mark among other classifications transitivity/intransitivity and reflexivity. This system is part of the derivational rather than the inflectional system. All Hebrew verbs, regardless of their conjugation, are inflected for tense (present, past, future), mood (for transitive verbs), gender (masculine, feminine), person ($1^{st}$, $2^{nd}$, and $3^{rd}$), and number, whereas past and future tenses show agreement in person, gender, and number. No morphological manifestation of aspect is evident in Hebrew.

The crucial distinctions between these two languages with respect to the language acquisition are: 1) the different stem-based vs. root-based system; 2) different aspectual systems (presence/absence of aspect); 3) different gender system, i.e. the nonexistence of the neutral gender in Hebrew and different inflections for masculine and feminine forms in plural; 4) different inflectional categories in the present/future and in past tense.

The language-specific properties above mentioned allow us to claim that Russian-Hebrew monolinguals will have some difficulties in the acquisition of the stem alternation, aspect and gender rules.

### 3. Objectives

The present study aims to explore the following issues:

(1) In what way is the development of early verbal morphology of Russian in Russian-Hebrew bilinguals distinguishable from that of monolinguals?

(2) How can differences in early bilingual verb development be explained in terms of differing norms of linguistic monolingual behavior?

(3) Can the deviation serve as evidence for second language influence on the acquisition process of the first language?
(4) With what probability can one claim that the observed set of deviations will affect the Russian morphological system of Russian-Hebrew bilinguals on the whole?

In order to address these questions, we investigated the acquisition of verb inflection by sequential Russian-Hebrew-speaking bilinguals and compared our findings with monolingual verb inflection development. Based on the results of the previous studies on the acquisition of verb inflection, on the one hand, and on the general bilingual acquisition, on the other hand, we predict that: (1) common monolingual errors will be manifested in both groups, (2) unique bilingual errors will be found only in the bilingual group, and (3) while common monolingual errors will reduce over time, the unique bilingual difficulties are predicted to increase over time. That is, we expect bilingual verb development to show a delay with respect to the norms of linguistic monolingual behaviour; second language influence on the acquisition process of the first language will manifest itself in contrastive structures - this will reflect age and the length of exposure to L2.

## 4. Methodology

*Subjects and data*

The monolingual data (German Corpus) come from a long-term study of one girl and two boys. The two boys, Vanja (V.) and Vitja (Vi.), were the only children in their middle-class families in St. Petersburg at the time of recordings, where the standard *St. Petersburg* version of colloquial Russian is spoken. Liza (L.) is the second child in a family of linguists (her brother is ten years older). All monolingual children were tape/video recorded for two-five hours a month during the daily 'routine-situations' at home and in the street and country-house (in summer), from the onset of speech till the age of three or four. The mean length of recordings per month was about 150 minutes (2.5 hours). For the purpose of the present study three months were chosen for an extensive analyses and were compared with those of bilingual children. The target months were the onset of verb production, the onset of the productive use of finite forms registered two months later, and the age of 2;10, when all children exhibited the target-like finite verb production.

Table 1 presents for each participant, the age at the onset of verb production, the age at the onset of productivity and the age of adult/target-like use. For each of these points, the table presents the number of utterances, the percentage of utterances which include a verb (verb utterances) and the mean length of utterance (MLU).

| **Child** | **Age (year; month)**<br>**- onset of verb production**<br>**-- onset of productivity**<br>**--- target-like use** | **MLU** | **Verb Utterances (=Number)** | **Verb Utterances (=% out of all analyzed utterances)** |
|---|---|---|---|---|
| V. | - 2;1<br>-- 2;3<br>--- 2;10 | 1.3<br>2.2<br>2.7 | 53<br>454<br>281 | 4,6<br>32,1<br>36,0 |
| Vi. | - 2;1<br>-- 2;3<br>--- 2;10 | 1.8<br>1.9<br>3.4 | 33<br>129<br>259 | 10,0<br>30,7<br>47,3 |
| L. | - 1;8<br>-- 1;11<br>--- 2;10 | 1.0<br>1.2<br>3.1 | 13<br>64<br>322 | 11,1<br>22,5<br>53,2 |
| All children | | | 1608 | |

Table 1. General information about the monolingual participants.

The bilingual corpus consists of bilingual cross-sectional Russian data that come from 8 Russian-Hebrew bilingual children aged 3;6-5;0 (6 girls and 2 boys). All but one are sequential bilinguals. 3 of them are early bilinguals and have been exposed to Hebrew before the age of three and for at least two years at the time of the first recording. The other 4 are late bilingual who have been exposed to Hebrew after the age of three, for less than a year at the time of the first recording. All children use Russian with their parents and Hebrew with siblings and peers. The data were collected in one of the investigators home. The bilingual corpus consists of recorded face-to-face conversations between the interviewer and the bilingual child, with a length of 45 minutes per month and child. The participants were asked to describe the pictures in a book and/or a flyers of a popular cartoon film. If the children felt some discomfort, they were given a piece of paper and several crayons to draw something. Additionally, the children were always asked to retell some story or asked various questions. One recording of eight bilinguals and three additional recordings of two of them, Eldar (early sequential bilingual) and Leya (late sequential bilingual) – recorded every four months over one year - were analysed for the present study..

Table 2 presents the age of recording, and the length of exposure to L2 for each of the participants. It also presents the number of utterances in each session, the percentage of utterances which include a verb (verb utterances) and the mean length of utterance (MLU) for each of the participants in each of the analyzed sessions.

| **Child** | **Age** | **Length of exposure to L2** | **MLU** | **Verb Utterances (=Number)** | **Verb Utterances (=% out of all analyzed utt.)** |
|---|---|---|---|---|---|
| **Recording I - June 2005** | | | | | |
| Galit | 3;5 | 3;5 | 1.8 | 35 | 10 |
| Eldar | 4 | 3 | 3.4 | 167 | 57 |
| Lital | 3;9 | 2 | 2.9 | 132 | 32 |
| Michael | 3;6 | 1;11 | 3.1 | 159 | 50 |
| Zhenya | 3;6 | 0;9 | 3.1 | 176 | 59 |
| Tali | 4 | 0;9 | 1.3 | 113 | 70 |
| Leya | 4;3 | 0;9 | 4.8 | 244 | 72 |
| Patricia | 5 | 0;9 | 2.0 | 140 | 49 |
| **Recording II - November 2005** | | | | | |
| Eldar | 4;4 | 3;4 | 2.8 | 185 | 81,5 |
| Leya | 4;7 | 1;1 | 3.6 | 225 | 75,0 |
| **Recording III - March 2006** | | | | | |
| Eldar | 4;9 | 3;9 | 2.0 | 193 | 78,8 |
| Leya | 5 | 1;6 | 5.9 | 210 | 86,8 |
| **Recording IV - June 2006** | | | | | |
| Eldar | 5;1 | 4;1 | 4.9 | 208 | 87,0 |
| Leya | 5;4 | 1;10 | 5.5 | 236 | 86,8 |
| All children | | | | 2423 | |

Table 2. General information about the bilingual participants.

In both corpora, frozen forms, immediate repetitions, self-repetitions, citations, *yes-no* sentences, and exclamations were excluded from the analyses.

*Categories of analysis and comparability of data*

Firstly, the MLU for all verb utterances were computed for each corpus. Secondly, the number of verbal utterances were counted and related to the general number of all

analyzable utterances the child produced. Thirdly, the number of morphological errors was calculated for these utterances. The erroneous uses of the verbs were then classified qualitatively according to (1) the wrong form in the context (with the subdivision to the root infinitives, contextually infelicitous tense, and lack of subject-verb agreement in person, number, and gender), (2) the wrong use of aspect and (3) the wrong pattern formation for the stem shift.

These measurements made it possible to compare the bilingual children with the monolingual children. In the first sample, the MLU showed that one bilingual child was comparable to the onset of verb production by monolinguals, two other children were comparable to the onset of productivity, and the other five children can be compared to the monolingual children at the age of 2;10. In all samples, both the early bilingual and the late bilingual can be compared to the monolingual children at the age of 2;10 (with one exception for Eldar in the third sample). As far as the percentage of verb utterances is concerned in the first sample, seven of the bilinguals are comparable to the monolingual children aged 2;10 (this also holds for the later sample), and only one child, who is a simultaneous bilingual, is comparable with the monolingual children's onset of verb production.

## 5. Results

The comparison of the length of the utterances within monolinguals and bilinguals shows higher MLU in bilinguals except for Eldar's two recordings. The overall proportion of verb utterances is also considerably higher in this group. Monolingual children were analyzed from the onset of verb production, and clearly they produce only short utterances and only few verbs in this period. However, due to the verb spurt and the increase of the utterance's complexity, the number of verb utterances reaches almost half of all analyzed utterances by the age of 2;10. From all monolingual children, L.'s rate of 53,2% is the highest. By contrast, the bilingual children show a much higher rate of verb utterances (up to 85%) in all samples, which clearly indicate that their utterance complexity is even higher than that of the monolingual children.

While our bilingual children use more complex utterances than younger monolingual children with comparable MLU, their errors tell a different story. More precisely, the opposite picture emerges. In monolingual children, errors reach 16-27% during the onset of verb production; within the next months, by the onset of inflectional productivity, a strong reduction of errors (to less than 9%) can be observed. Whereas the percentage of errors dramatically decreases within the first two month after the onset of verb production, it further diminishes rather slowly towards the last months analyzed (see table 3).

| **Child** | **Age** | **Verb errors: tokens (N=)** | **Verb errors: tokens (% out of all tokens)** |
|---|---|---|---|
| V. | 2;1<br>2;3<br>2;10 | 9<br>7<br>9 | 16,1<br>1,5<br>2,9 |
| Vi. | 2;1<br>2;3<br>2;10 | 9<br>9<br>5 | 27,3<br>7,0<br>1,7 |
| L. | 1;8<br>1;11<br>2;10 | 3<br>6<br>12 | 23,1<br>8,7<br>3,3 |

Table 3. Errors in the speech of monolingual children.

In the case of the bilingual children, the rate of erroneous tokens is generally higher than in monolinguals, it fluctuates between 28,5% and 44,7 % and declines in the last recording (see table 4).

| Child | Age | Length of exposure to L2 | Verb errors: tokens (N=) | Verb errors: tokens (% out of all tokens) |
|---|---|---|---|---|
| I | 4;0 | 3;0 | 82 | 34,6 |
| Eldar II | 4;4 | 3;4 | 91 | 37,9 |
| III | 4;9 | 3;9 | 98 | 44,7 |
| IV | 5;1 | 4;1 | 94 | 28,9 |
| I | 4;3 | 0;9 | 106 | 29,0 |
| Leya II | 4;7 | 1;1 | 77 | 28,5 |
| III | 5;0 | 1;6 | 111 | 33,1 |
| IV | 5;4 | 1;10 | 107 | 27,4 |

Table 4. Errors in the speech of bilingual children.

Notably, in bilingual children the error rate is higher, even when MLU matches monolinguals at the age of 2;10, when the percentage of verb utterances is higher than those of monolinguals at the age of 2;10. Moreover, this high error rate is found even when the exposure to Hebrew is less than a year and starts after the age of three. There is no significant difference concerning the error rate ($p>0.05$ in $X^2$ test) in the bilingual children across the different samples.

*Distribution of errors*

To define a pattern of error distribution, we first divided all errors into two macro-groups: inflectional suffixes (wrong use in a context) and stem (wrong pattern of formation), with thirteen and four subgroups respectively (see Gagarina 2005). Inflectional suffixes embrace the subgroup of various agreement errors (with the two subclasses – infinitives vs. finite forms, like tense/aspect errors, person/number errors), whereas the stem-errors consists of four subgroups of innovations.

In monolinguals, the errors are distributed in the following way: by the onset of verb production, the majority of errors are root infinitives. There are instances of wrong gender agreement in the past and number agreement in the past and present. Some rare aspect errors, the use of perfective for imperfective in future and modal analytical constructions, e.g. **budu narisovat'* 'be-1s draw-pf:inf' and **ne nado narisovat'* 'not-necessary draw-pf:inf' can be observed. In the course of the development of the inflectional productivity, person/number agreement errors become more frequent, and the first erroneous stem-shifts can be observed. Root infinitives almost disappear and stem errors gradually become the main source of errors alongside the growth of verb utterances and children's approximation to the adult-like competence.

Bilingual errors exhibit a clearly different pattern (cf. Gagarina, Armon-Lotem, and Gupol 2005): tense and aspect errors form a prominent part of all errors. These tense errors and the use of imperfective for perfective are unique to the bilingual children. Root infinitives occur sporadically and do not form the main source of errors. Gender in the past is also one of the greatest sources of errors, and becomes the only one over time. Furthermore , number errors are evident for all children. The distribution of errors for the two children (with two consecutive samples) is given in figure 1:

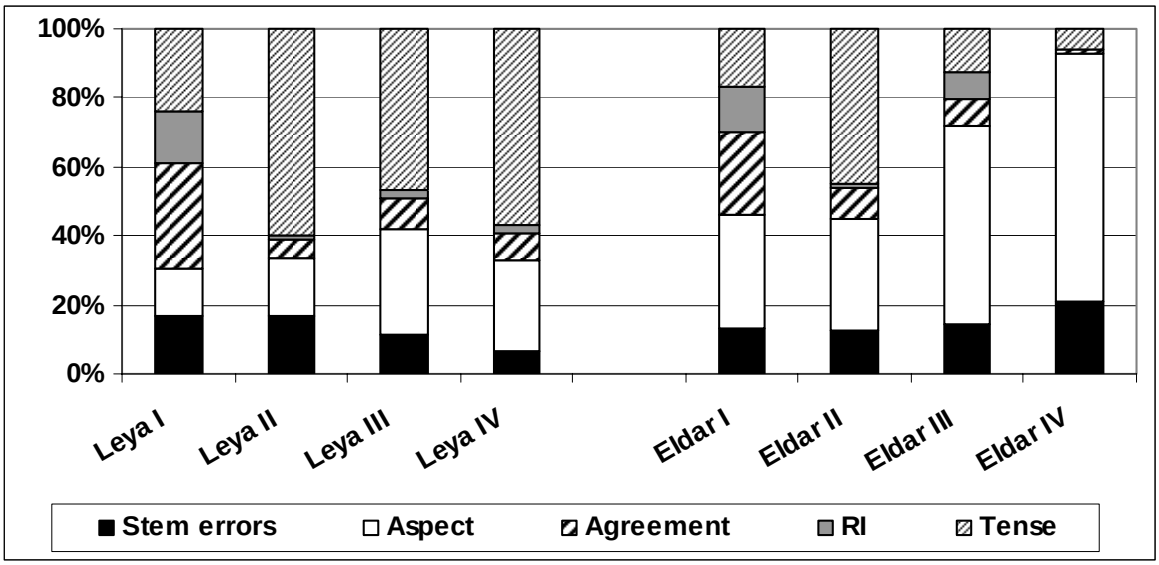


Fig.1. Distribution of errors within bilingual children.

Figure 1 shows two major trajectories in the individual developmental profiles of the children over the year. While root infinitives are very few and lessen over time, tense and aspect errors in Russian increase over the year as the children are exposed to Hebrew for a longer time. Figure 1 demonstrates that these errors, which already constitute 40-50% of the errors in the first recording, increase up to 80% in the last recording a year later. On the other hand, figure 1 shows that agreement errors decrease over time.

As can be seen in figure 2, gender in the past is the greatest sources of agreement errors, and becomes the only agreement error over time. Furthermore, number errors are evident for both children, but disappear in the last session.

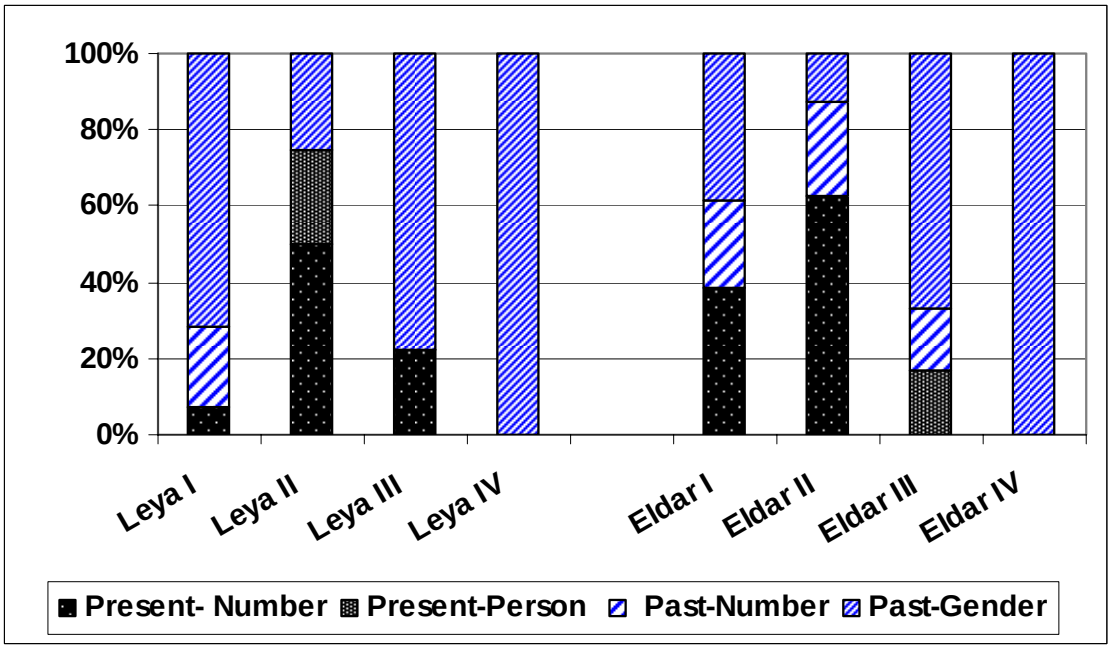


Fig. 2. Distribution of agreement errors within bilingual children.

In sum, four kinds of errors, irrespective of their (non-)prominence were found to be typical for both groups of children: a) the production of infinitives instead of finite forms, e.g., **on dostavat' samol'ot* 'he to reach airplane' – this type of error is very stable and the most numerous in monolinguals (cf. Gagarina, in press), b) the errors in the formation of the inflectional classes e.g., **pisaju'* for *pishu* 'write-pres:1s', and c) wrong agreement, for example, wrong gender in the past, e.g., **sobaka byl u nas doma* 'dog-fem:sg:nom was-masc:sg by us at home' (BL 3;6), and d) wrong aspect (see below). These errors, which are evident in the bilingual group at the age of 3;6, are more typical during the onset of the verb production in monolinguals, and are not found in the monolingual group beyond the age of 2;6. Finally, stem errors are typical for the older children of the both populations; they are not easily superseded by the correct forms.

A special category of errors is the use of wrong aspect. While monolingual children show only one direction, a perfective-for-imperfective pattern, bilingual children perform errors in both directions, with more imperfective for perfective. The number of aspectual errors, in general, and those of the later type in particular, increased significantly over the year. That is, two kinds of errors which are unique to the bilingual group, the wrong use of aspect (imperfective for perfective) and the wrong use of tense, increase over time. Finally, stem errors are typical for the older children of both populations, and they are not easily superseded by the correct forms.

The second kind of errors can only be documented in the bilingual children and deals with the inaptitude between the number of the verb and the number of the noun in the full (extended) sentences, e.g., **u menya tut bolit zubki* 'by me here aches-pres:3:sg teeth-pl' or **v malone byl seryi rybki* 'in hotel-[hebrew word] was-masc:sg grey fish-pl'. These errors, which are found in verb-subject word order, are unique to the bilingual group, and indicate transfer of a Hebrew verb-subject-structure in which number can be omitted (neutralized) in the spoken language.

## 6. Conclusions

Generally, Russian-Hebrew bilinguals showed high proficiency in the acquisition of the verbal system, taking into account the richness of the inflectional system for verbs Russian. They used inflectional markers for the indication of number, gender, person, tense, and aspect of verbs. Verbs were used in most sentences, i.e. the children acquired the verbal system of Russian considerably well and used utterances containing verbs in their production at a higher rate than the monolinguals who are two years younger. The bilingual children participating in the study used the non-finite and finite forms, and innovated forms of the verbs which are non-existent in the Russian language. Nevertheless, as the analyses of errors showed, their verbal system is far from being fully acquired, and a strong developmental variation with regard to verb inflections manifested in the erroneous production is seen in comparison with the monolingual children.

Our findings show that two general types of errors are typical for both, bilingual and monolingual children, but the main difference lies in the period at which these are (still) used, and in the level of syntax acquisition in which these errors are produced. That is, while errors found in monolingual acquisition are typical of the developmental phase of the children, errors found in the L1 of sequential bilinguals are atypical of monolinguals with similar syntactic abilities and can be attributed either to delay in achieving full mastery of the morphological system, to attrition or to L2 influence.

This paper suggests that most errors found in bilinguals populations may indicate a delay (for the early bilinguals) and attrition (for the late bilinguals) in their acquisition process. Errors which are unique for bilinguals seem to suggest L2 influence of Hebrew,

considering its target gender/number categorisation and the absence of the morphological category of aspect. The higher MLU rate of utterances with verb inflection errors (cf. Armon-Lotem, Gagarina and Gupol 2006) suggests that these errors are due to the processing difficulties children face generating longer utterances. The disappearance of the monolingual errors in both populations over time supports an analysis of the unique bilingual errors in terms of L2 influence.

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