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Research article

Israeli Russian: Case morphology in a bilingual context

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Abstract

The current study investigates case morphology development in a bilingual context. It is aimed at investigating potential mechanisms driving divergences in heritage language grammars as compared to the "baseline monolingual standards." For the purposes of the study, 95 bilingual and monolingual children and adults were compared. Bilinguals residing in Israel acquired Russian from birth, while the age of onset of Hebrew varied. The participants completed a production task eliciting accusative case inflections. Both child and adult heritage speakers of Russian with early age of onset of Hebrew (before the age of 5) showed divergences in the production of the accusative case inflections as compared to monolingual Russian-speaking controls (adult and child), whereas grammars of Israeli heritage Russian speakers with later ages of onset of Hebrew, after the age of 5, were found to be intact. On the basis of Russian in contact with Hebrew, the study discusses how heritage language grammars differ from the baseline grammars of monolingual speakers and which mechanisms are associated with heritage language ultimate attainment. The effects of the age of onset and cross-linguistic influence from the dominant societal language are discussed as potential factors affecting the acquisition / maintenance of linguistic phenomena in heritage language grammars.

Keywords: heritage language, case morphology, accusative case, the Russian language, Israel

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Научная статья

Израильский русский: падежная морфология в двуязычном контексте

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Аннотация

В настоящем исследовании изучается усвоение падежной морфологии в двуязычном контексте. Целью данного исследования является выявление потенциальных механизмов, вызывающих расхождения в «эритажной» грамматике по сравнению с «монолингвальными языковыми нормами». В исследовании приняли участие 95 детей и взрослых монолингвов и билингвов. Билингвы, проживающие в Израиле, слышали русский язык с рождения, в то время как возраст начала изучения иврита варьировался. Мы провели эксперимент, направленный на порождение форм винительного падежа. Результаты показали, что билингвы, которые начали изучать иврит в возрасте до 5 лет (как и дети, так и взрослые-«эритажники»), продемонстрировали расхождения в воспроизведении винительного падежа по сравнению с русскоязычными группами монолингвов. Винительный падеж билингвов с более поздним началом изучения иврита соответствует нормам монолингвов. На базе русского «эритажного» языка в контакте с ивритом данная статья иллюстрирует грамматические изменения в языке наследия и потенциальные механизмы, связанные с этими изменениями. Возраст начала усвоения второго языка и кросс-лингвистическое влияние под давлением доминирующего языка обсуждаются как потенциальные факторы, влияющие на усвоение / поддержание языковых структур в «эритажной» грамматике.

Ключевые слова: «эритажный» (унаследованный) язык, падежная морфология, винительный падеж, русский язык, Израиль

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1. Introduction

1.1. Heritage languages

The current study investigates case morphology of child and adult speakers of Israeli Russian, i.e., speakers who acquire Russian as their heritage language (hereafter HL) and Hebrew as the societal language (hereafter SL), with a special focus on case morphology. The term 'heritage language' also labeled 'minority language', 'community language', 'home language', 'family language', 'mother tongue', 'L1', refers to a language that is spoken at home but is not the SL of the society (Benmamoun et al. 2013, Montrul 2016, Polinsky 2018a, Polinsky & Scontras 2020, Rothman 2009). HL speakers are typically the second or third generation of immigrants who acquire their HL from birth until the onset of schooling (approximately ages 4-5) via naturalistic exposure to native input. Although HL speakers acquire HL as their native language in childhood, their linguistic performance shows divergences from the baseline, i.e., language spoken in the country of origin or language spoken by the first generation of immigrants who are dominant in this language (for more details see Montrul 2016, Polinsky 2018a). The exact mechanisms of the HL grammar formation and the exact trajectory of HL ultimate attainment are still the subject of ardent debates (see a keynote paper by Polinsky & Scontras (2020) and the commentaries to it). This current study documents the case system of HL-Russian speakers (children and adults) with the focus on the accusative case morphology. Our aim is to understand the underlying factors contributing to previously reported divergences in HL grammars as compared to the baseline ones. We compare child and adult HL-Russian in order to contribute to the ongoing discussions about the trajectory and mechanisms shaping HL formation (see a keynote paper by Polinsky & Scontras (2020) and the commentaries to it). Polinsky (2018b) suggests that

"[i]n order to fully understand adult HL, it is imperative to consider the language of 'future heritage speakers': childhood bilinguals who are still receiving daily input in the home language but who operate under similar sociolinguistic conditions to those reported for adult heritage speakers" (Polinsky 2018b: 548).

In the next subsections of the introduction (1.2–1.4), we will briefly discuss the socio-linguistic status of the Russian language in Israel. Subsequently, we will overview available studies on case acquisition in monolingual and bilingual Russian speakers. We will conclude the introductory subsection with the specific research questions and the rationale of the current study.

1.2. Heritage Russian in Israel

Today Russian is the most frequently spoken HL in Israel, after Hebrew (the official language of the State of Israel) and Arabic (which has a special status in Israel) (Spolsky & Shohamy 1999, Meir et al. 2021). In the early 1990s, Israel experienced a massive immigration wave from the Former Soviet Union (FSU) resulting in more than one million speakers of Russian, or approximately 15% of the total population of Israel (Altman et al. 2014, Yelenevskaya 2015). Olim xadashim 'new immigrants' to Israel from the FSU continue to account for the largest proportion of immigrants to Israel. For example, in 2016 immigrants from Russia and Ukraine comprised 57% of all immigrants to Israel (Konstantinov 2017). The arrival of over one million immigrants from the FSU in the 1990s has changed the linguistic balance in Israel, fostering Russian, as a channel of information, education, and culture to facilitate faster integration of immigrants (Yelenevskaya & Fialkova 2017). The mass immigration from the FSU has created a rich ethnolinguistic community with its own economic, social, and political networks based on Russian language and culture, reflecting identity choices ranging from assimilation to separatism (Remennick 2003a). The Russian language is present in all spheres of Israel's public life, which is evident in Russian signs and Russian texts in business and commercial areas where they target both domestic and international customers, making the Russian language a valuable commodity in Israel (Yelenevskaya & Fialkova 2017). Russian-language commodification has seen a rise around the world with the flourish of mass and individual tourism for leisure, culture and shopping from the FSU (Muth 2017, Pavlenko 2017).

Many members of the Russian-speaking community in Israel are interested in maintaining the Russian language and culture and transmitting Russian to the next generation (Ben-Rafael et al. 2006, Leshem & Lissak 1999, Schwartz et al. 2011). Most immigrants perceive Russian culture and language as superior to the Hebrew culture and language (Niznik 2011). Russian-speaking immigrants promote the acquisition of the Russian language among their children, including those who are born in Israel (Schwartz et al. 2011). While the policy of the State of Israel recognizes the legitimate right of each community to acquire and support its native language, the transmission of heritage languages, including Russian, is considered to be the parents' responsibility (Niznik 2007). There are private Russian-only and

bilingual Russian–Hebrew kindergartens for children ages 2–5 as well as afternoon schools for elder children (Moin et al. 2013), reflecting the community's strong desire to maintain and transmit Russian to future generations. In addition to the Russian language, mathematics, science, logic, English, and the arts are taught in Russian complementary schools (Kopeliovich 2011). The *Mofet* network founded by a group of immigrant teachers from the FSU in 1991 provided a suitable educational system for Russian-speaking immigrant children (Epstein & Kheimets 2000a, b). Today *Mofet* supplementary evening schools and day-schools focus on math, science, computer skills, and the Russian language. In the first years of the *Mofet* schools, the language of instruction was Russian, yet today all the lessons are conducted in Hebrew (Epstein and Kheimets 2000a, b), reflecting the shift towards Hebrew in the second generation of immigrants.

Despite the ubiquitous presence of Russian in Israel and a strong desire to maintain and transmit HL-Russian to future generations, recent studies show a decline in Russian proficiency among 1.5 and second-generation speakers of HL-Russian in Israel (Meir & Polinsky 2021, Niznik 2011, Remennick 2003). Although there are Russian periodicals, Israeli radio and TV channels which broadcast exclusively in Russian, Russian speakers residing in Israel over 11 years show preference for watching Israeli channels, listening to Hebrew radio stations, visiting Hebrew websites and reading Hebrew periodicals (Remennick 2003). This trend is also observed in the second-generation children born in Israel. A recent survey conducted among Russian-speaking mothers in 4 countries, including Israel, showed that 96% of the respondents in Israel indicated that their children could speak and understand Russian. However, 47% of the respondents showed dissatisfaction with their children's proficiency in HL-Russian (Otwinowska et al. 2021). Furthermore, the respondents indicated that only 41% of children had literacy skills in HL-Russian. Thus, after 30 years of the massive immigration of Russian Jews to Israel, there is a linguistic shift to Hebrew. The gradual attrition of Russian among immigrant adolescents and the linguistic shift towards Hebrew is consistently reported in recent studies (Niznik 2011, Remennick 2003). The current study is set to investigate the change in the case system of HL-Russian child and adult speakers in Israel.

1.3. The Case of the accusative case in monolingual and HL acquisition

The Standard Modern Russian is a language with rich nominal inflectional morphology; all Russian nouns, adjectives, numerals, pronouns and demonstratives must bear a case inflection (Timberlake 2004). There are six main cases in Russian in singular and plural: nominative (NOM), genitive (GEN), accusative (ACC), dative (DAT), instrumental (INSTR), and prepositional (PREP). There are three more cases, which do not apply to all nouns: locative (LOC), partitive (PART), and vocative (VOC).

Following Zaliznjak's (1977) classification based on the gender and phonological type of the stem, Russian nouns are divided in three declension

classes. Feminine and masculine nouns ending in -a/ja (e.g., *zvezda* 'star'; *papa* 'father') are referred to as the 1st declension class; masculine and neuter nouns (e.g., *stol* 'table'; *pingvin* 'penguin'; *okno* 'window') are the 2nd declension class. Feminine nouns ending in a soft consonant (e.g., *tetrad*' 'notebook') are referred to as the 3rd declension class, and they were not tested in this study due to their low frequency in input.

Table 1 lists NOM and ACC case inflections for singular nouns across the 1st and 2nd declension classes. On some nouns (e.g., feminine nouns of the 1st declension and masculine animate nouns of the 2nd declension), a dedicated inflection is used for ACC which is different from the NOM one (i.e., NOM \neq ACC). However, on other nouns, the ACC case inflection is homophonous to the NOM one (e.g., inanimate nouns of the 2nd declension), i.e., (NOM=ACC).

Table 1

	NOM≠ACC	NOM=ACC	
1st declension	klubnik-a→klubnik-u	n/a	
	'strawberry.FEM'		
	zvezd-a→zvezd-u		
	'star.FEM'		
2nd declension	petux→petux-a	stol→stol	
	'rooster.MASC'	'table.MASC'	
	krokodil→krokodil-a	mylo→mylo	
	'crocodile.MASC'	'soap.NEUT'	

The Russian case inflections ([NOM] \rightarrow [ACC]) across two declension classes

1.3.1. Acquisition of accusative case in monolingual Russian-speaking children

Monolingual children acquiring Russian have to acquire the case system of Russian, i.e., 72 possible nominal inflections (6 cases [NOM, GEN, ACC, DAT, INSTR, OBLO] \times 2 number classes [singular, plural] \times 3 genders [feminine, masculine, neuter] × 2 animacy classes [animate, inanimate]) (see Kempe & MacWhinney 1998). Animacy is not relevant for all the cases; thus Voeikova (2011) suggests that the number of cells in the paradigm should be lowered to 40. Russian-speaking children acquire the complex case system in a short period of time. Initially, base forms, i.e., singular NOM forms are predominant in monolingual child production (Gagarina & Voeikova 2009). Case oppositions (e.g., oppositions of NOM and other case markings) make up only 5% of all produced nouns at the very onset of noun production. The first case oppositions occur at about 1,9 (Voeikova & Gagarina 2002), and NOM-ACC opposition is the first to appear in speech production (Eisenbeiss et al. 2009, Gvozdev 1961, Voeikova 2011). Monolinguals start with adult-like ACC case inflections on feminine nouns (Hržica et al. 2015, Gagarina & Voeikova 2009, Protassova 1997, Protassova & Voeikova 2007), then the number of unmarked base forms drops to 50% within 3-4 months of initial appearance of case oppositions (Gagarina & Voeikova 2009). At the age of 3, monolingual Russian-speaking children show high accuracy of case production on familiar nouns. To sum up, monolingual Russian-speaking children

acquire case inflections before the age of 3, although the mastery of some irregular forms might continue up to age 6 (Babyonyshev 1993, Cejtlin 2009, Gvozdev 1961, Hržica et al. 2015, Gagarina & Voeikova 2009, Protassova 1997, Protassova & Voeikova 2007).

1.3.2. Acquisition of accusative case in bilingual children who acquire Russian as their HL

In contrast, child bilingual Russian-speaking children, i.e., "future HL speakers" as referred by Polinsky (2018b), are reported to show consistent difficulties with the production and comprehension of case inflections (Gagarina 2011, Janssen 2016, Meir & Armon-Lotem 2015, Meir, et al. 2017, Protassova et al. 2017, Ringblom 2014, Turian & Altenberg 1991, Schwartz & Minkov 2014), especially when the SL of HL-Russian speakers has a sparse case morphology. For example, Schwartz and Minkov (2014) investigated the acquisition of the Russian case system by three simultaneous and six sequential Russian-Hebrew speaking children acquiring HL-Russian in contact with Hebrew longitudinally, over a period of 7 months. The authors reported quantitative differences between simultaneous (exposure to Hebrew before 12 months) and sequential bilinguals (exposure to Hebrew around the age of 2). The accuracy rate for the ACC case was reported to be 55% among child HL-Russian speakers with the onset of Hebrew before 12 months, and 80% among children with the AoO after 2 years. Similarly, Kopeliovich (2010) reported on the change in the Russian case system in children and adolescents who acquire Russian as their HL in contact with Hebrew. The NOM case is used as a default case form in various syntactic environments which require cases other than NOM. The NOM case form is used by child HL-Russian speakers with such words as mnogo 'much/many', malo 'little/few', net 'there is no', which assign the GEN case in Modern Standard Russian. Furthermore, the OBLO case is also reported to be substituted with NOM forms in HL-Russian in contact with Hebrew.

Meir and Armon-Lotem (2015) reported low accuracy scores both on elicited production of the ACC case and on comprehension. The length of exposure (LoE) and age of onset (AoO) to the SL were found to be related to case production, but not to comprehension. Children with longer LoE to Hebrew were found to have more difficulties with case inflections in HL-Russian. Similar results were obtained in Meir, Walters, and Armon-Lotem (2017) based on a Sentence Repetition task: bilinguals with different AoO of Hebrew (before 24 months, between 24–48 months, and after 48 months) had significantly more case errors as compared to age-matched monolinguals on the Russian Sentence Repetition task. In monolingual and bilingual children, most of the case errors were produced in subject and object relative clauses. However, in the bilingual groups, ACC case errors were also found in object questions and simple sentences with non-canonical word orders (OVS and SOV); these structures elicited very few ACC case errors in monolingual Russian-speaking children. Janssen and Meir (2019) compared

HL-Russian speakers in Israel and in the Netherlands to monolingual Russianspeaking aged-matched and younger controls. The child HL-Russian speakers were found to be less accurate on the elicited production and on the comprehension of SVO and OVS sentences which require sensitivity to case morphology. Child HL-Russian speakers with earlier AoO of the societal language and less HL use at home were found to be less accurate on ACC case production and repeating sentences with different word orders. However, a recent study tapping into processing of ACC case morphology showed that despite lower accuracy of ACC production, HL-Russian child speakers showed sensitivity to case morphology when parsing OVS and SVO sentences, yet the integration of ACC case cue was delayed compared to monolingual controls (Meir et al. 2020).

1.3.3. The accusative case in adult HL-Russian

Studies on adult HL-Russian speakers residing in Israel are sparse. However, previous studies on adolescents and adult HL-Russian speakers who are dominant in English show difficulties with case morphology (e.g., Isurin & Ivanova-Sullivan 2008, Polinsky 2006, 2008, but see Łyskawa & Nagy 2020). In the seminal paper, Polinsky (2006) reported a dramatic reduction of cases in American HL-Russian compared to Modern Standard Russian. Polinsky concluded that American Russian 'has a basic two-case system: the unmarked case and the case of the second object (goal)' for consistency (Polinsky 2006: 220): in American Russian, ACC forms were reported to be used for indirect objects. Some of the existing case forms are suggested to be fixed lexical items. Unlike Polinsky (2006), Isurin and Ivanova-Sullivan (2008) reported a slightly different picture for the American HL-Russian case system based on the narrative data. Although substitutions of DAT case with ACC were observed only for pronouns, no ACC case use was observed for indirect objects, as previously reported by Polinsky (2006). Furthermore, unlike Polinsky (2006), Isurin and Ivanova-Sullivan (2008) did not find the loss of oblique cases and the use of default NOM forms. Studies tapping into numerical phrases which require special morphology in Russian also bring conflicting evidence for adult American HL-Russian (n = 31) and German HL-Russian (n = 19) (see Denisova-Schmidt 2014, Ivanova-Sullivan 2015, Polinsky 2018). Some studies show that HL-Russian speakers showed no traces of case system re-structuring (Denisova-Schmidt 2014, Ivanova-Sullivan 2015, Polinsky 2018a). Similarly, a recent study showed that the processing of wh-questions is baseline-like in American HL-Russian speakers with various AoO to English (n = 24): 8 were born in the USA, 8 arrived before 6, and 8 between 7 and 13 years (Sekerina & Laurinavichyute 2020). It should be kept in mind that correct comprehension of *wh*-questions in Russian is ensured by the sensitivity to case morphology. In the same vein, Łyskawa and Nagy (2020) concluded that HL-Russian speakers retain the concept of the case. Their experiment was based on narrative data and shows that participants retain the rules (the syntax) of the case but have difficulties with selecting and producing normative

morphological forms; thus, acquisition of inflected forms of pronouns is easier than nouns. This may be explained by the existence of pronoun case marking in English (all participants live in English-dominant Toronto). More than that, HL speakers tend to shift to NOM across all cases (except DAT), but also the tendency for fairly high normative usage in ACC contexts was observed. To sum up previous research on adult HL-Russian, studies bring inconclusive evidence with respect to case system of HL-Russian speakers. Furthermore, previous research has been mainly conducted on HL-Russian in contact with English.

Research on HL-Russian in contact with Hebrew is scarce. Sociolinguistic research reports extensive insertions of Hebrew lexical items into Russian discourse among the first generation of Russian-speaking immigrants residing in Israel, turning "immigrant Russian" into a contact language, comprehensible only to bilinguals (Naiditch 2000, Remennick 2003a, Perelmutter 2018a, 2018b, Prashizky & Remennick 2018). The immigrants belonging to the 1.5-generation report mixing Russian and Hebrew in their daily use: 49% report that they mix Russian with some Hebrew, and 9% report using so-called HebRush, the code-switched variety of Hebrew and Russian, only 36% report using Russian without mixed Hebrew (Remennick 2003b). Despite extensive borrowings from Hebrew, studies on the first generation of immigrants who are dominant in Russian show that these borrowed Hebrew items (see (1) in bold) are inflected for case following the Russian system of case assignment based on the declension classes. The grammar of first-generation immigrants seems not to deviate from that one of Standard Modern Russian. Correct assignment of case (even on Hebrew borrowings) is indicative of intact grammatical structure among first-generation immigrant speakers who are dominant in Russian.

(1) včera bvl v bank-e, poprosil v pakid-a alva'-u, on mne jeje ne dal. yesterday was in bank-Loc, asked at clerk_MASC-ACC credit-ACC he me it not give ja pošjol k menahel-u snif-a i taki polučil išur alva'-u. na I went to head-DAT branch-GEN and got authorization.ACC credit.ACC. on Yesterday, I was at the bank, asked a clerk to arrange a credit for me, he did not give it to me, I went to the head of the branch, and I was given authorization for a credit.

A recent study by Meir and Polinsky (2021) investigated grammatical abilities of adult HL-Russian speakers in contact with Hebrew with various AoO of Hebrew. Three groups of participants were compared: HL-Russian speakers with AoO before age 5, HL-Russian speakers with AoO between 5–13, and Russian-dominant bilinguals. Participants in all the three groups had been exposed to Russian from birth and had been residing in Israel on average 20 years. Sensitivity to ungrammaticalities in adjectival phrases and numerical phrases were tested. The study tested sensitivity to case ungrammaticalities within numerical¹ phrases (**tri*

¹ In Russian, paucal numerals combine with the paucal count form (e.g., 2/3/4 *samolet-a* '*planes.PAUC*'), and numerals 5 and above combine with the genitive plural (e.g., 5/6/7 *samolet-ov* '*planes.PL.GEN*').

samolet-ov 'three plane.M-PL.GEN' versus *pjat' samolet-a 'five plane.M-PAUC) were tested. Findings demonstrated a robust effect for AoO on the development and maintenance of HL-Russian in adult HL-Russian speakers. The group with late AoO (Russian-dominant bilinguals) showed ceiling-level performance in sensitivity to (mis)matches for both adjective-noun and numeral-noun conditions, confirming similarities to the Modern Standard Russian. HL speakers with earlier AoOs (before age 5 and from 5-13) were less accurate in detecting ungrammaticalities than the Russian-dominant group. The two groups of heritage Russian speakers showed reduced sensitivity to ungrammatical numeral-noun constructions in comparison to adjective-noun constructions. The authors suggested restructuring of the numerical phrases under indirect influence from the dominant language (i.e., Hebrew) as one of the possible explanations. Both groups of speakers with earlier AoOs (before age 5 and between 5-13) seemed to favor simpler structures within numeral-noun constructions. HL speakers with an earlier AoO were more likely to accept mismatches within numeral-noun constructions as grammatical all together (numeral-noun expressions with paucal numbers and numbers 5 and above). The authors suggested that HL-Russian speakers, who received exposure to Hebrew starting before the age of 5, might have problems with case forms more generally, under the influence of Hebrew which has sparse case morphology.

To summarize, previous research brings inconsistent evidence on case morphology in adult and child HL speakers. Some studies report restructuring and profound case difficulties in HL speakers: both children (Gagarina 2011, Turian & Altenberg 199, Ringblom 2014, Schwartz & Minkov 2014, Meir & Armon-Lotem 2015, Janssen 2016, Meir et al. 2017, Protassova et al. 2017) and adults (Polinsky 2006, 2008). Others show no evidence for case restructuring (Isurin & Ivanova-Sullivan 2008, Łyskawa & Nagy 2020, Sekerina & Laurinavichyute 2020). Furthermore, the research by Meir and Polinsky (2021) indicates that adult HL-Russian speakers with early AoO to Hebrew who are dominant in Hebrew might also have difficulties with case production. The current study is the first study to compare ACC case morphology in HL-Russian adult and child speakers to monolingual child and adult controls.

1.4. The current study

The current study was set to test the production of ACC case morphology in adult and child HL-Russian speakers, who acquire their HL-Russian in contact with Hebrew. Russian-Hebrew bilingualism offers a unique opportunity for understanding the ACC case morphology, as both languages mark ACC case, albeit differently. While Russian uses case inflections to mark ACC case, Hebrew marks the ACC case by the particle *et* only before definite nouns (Berman 1978). The contrast between Russian and Hebrew is presented below (2).

(2) "A/The penguin sees a/the crocodile"

RU П	ингві	lH		видит		крокодил -а .
pi	ngvin	.NOM.ANIM.N	IASC	sees.SC	Э.3Р	crocodile.ACC.ANIM.MASC
HE(INDE	EF)	ha- pingvin	ro'e		tanin.	
		DEF.pingvin	sees.M	I.SG.3P	crocod	lile
HE(DEF))	ha- pingvin	ro'e		et	ha- tanin.
		DEF.penguin	sees.M	.SG.3P	ACC	DEF- crocodile

The choice of ACC case morphology is not accidental. Morphology is known to be particularly fragile under HL bilingual acquisition, and language structures involving case assignment are reported to be among the most vulnerable (Albirini et al. 2013, Montrul 2016, Polinsky 2018a). Looking into the existing evidence on HL-Russian in contact with English for adult HL speakers, the rich case paradigm seems to be prone to divergences: HL-Russian speakers use unmarked NOM forms in contexts that require the use of dedicated case inflections (Polinsky 2006, 2008, Meir & Polinsky 2021, but Isurin & Ivanova-Sullivan 2008, Łyskawa & Nagy 2020, Sekerina & Laurinavichyute 2020 for an alternative view).

Yet, previous research showing simplifications in complex morphological paradigms relies mainly on the evidence from HLs in contact with English. Thus, it is not clear whether these divergences in rich case paradigms are the outcomes of all HLs or alternatively, the result of the specific contact situation with English, which has a sparse case system and lacks grammatical gender. Furthermore, it is not clear how ACC case morphology develops over the lifespan of HL speakers. This study aims to evaluate the effect of AoO and the influence of the contribution of Hebrew to the acquisition / maintenance of ACC case in children and adult HL speakers of Russian residing in Israel.

2. Method

2.1. Participants

A total of 95 participants were recruited for the study across the four adult groups and two child groups (see Table 2). The current study is part of the larger ongoing project aiming to investigate characteristics of HL-Russian among adult and child speakers residing in Israel and the USA. The adult participants from Israel were split into three groups based on their AoO, i.e., the onset of Hebrew exposure: before the age of 5 (HL-EarlyAoO); between the ages of 5 and 13 (HL-LateAoO), and after the age of 13 (RUS-DOM) (similarly to Meir & Polinsky 2021). All participants reported Russian to be their mother tongue. The adult Russian-speaking controls were recruited in the Russian Federation, Belarus, and Kazakhstan, all the monolingual Russian-speaking controls reported Russian to be their mother tongue and the language of their daily communication. Two child groups were recruited for the purposes of the project. The child HL-Russian speakers (hereafter HL-child) and their monolingual controls (hereafter Mono-Child). All the children in the HL-child group were born and raised in Israel in Russian-speaking families.

Reflecting the design of the study, there was a significant effect of age (F(5, 89) = 140.47, p < .001) and a significant effect of AoO for the Israeli groups (F(3, 52) = 85.68, p < .001). Starting with the AoO, there were significant differences between the adult groups (RUS-DOM > HL-LateAoO > HL-EarlyAoO, p < .001), yet there was no significant difference between HL-EarlyAoO and HL-child, p=.99). Importantly there were no significant differences between Mono-Adult and RUS-DOM, which are considered to be the baseline in the current study for the adult groups. There were no significant differences with respect to age between HL-LateAoO and HL-EarlyAoO. Furthermore, the two child groups (Mono-Child and HL-Child) were not significantly different from each other with respect to age.

Table 2

Demographic data on the participants across the groups							
	Adult Groups			Child Groups			
	Mono-Adult	RUS-DOM	HL-LateAoO	HL-EarlyAoO	Mono-Child	HL-Child	
	(n=14)	(n=14)	(n=8)	(n=15)	(n=19)	(n=22)	
Age	46 (13)	42 (5)	32 (7)	24 (5)	6 (1)	6 (1)	
	26-66	33-52	20-40	19-33	4-10	4-8	
AoO of Hebrew	n/a	20 (6)	10 (1)	2 (1)	n/a	2 (2)	
		13-38	8-11	0-4		0-4	
Length of residency in	n/a	21 (4)	21 (8)	24 (5)	n/a	6 (1)	
Israel		14-28	9-29	17-33		4-8	
Self-rated proficiency	n/a	5.0 (0.0)	4.0 (0.5)	3.2 (1.2)	n/a	n/a	
in HL-Russian			4-5	1-5			
(Rating Scale 0-5)							
Self-rated proficiency	n/a	4.3 (0.6)	4.9 (0.4)	4.9	n/a	n/a	
in SL-Hebrew		3-5	4-5	(0.2)			
(Rating Scale 0-5)				4-5			

2.2. Experimental Task

An elicitation task elicits ACC case inflections on 36 nouns (Janssen 2016, Janssen & Meir 2019). The participant was asked to describe what he/she sees on the computer screen by saying *ja vizu* _____ 'I see (target noun)'. If the participant failed to respond to the sentence with *ja vizu* _____ 'I see (arget noun)'. If the sentence with *ja vizu* _____ 'I see ____', s/he was reminded to start the sentence with *ja vizu* 'I see'. This was done for each target noun to ensure that the syntactic environment for the ACC case was produced.

The participants' responses were coded as 'correct' and 1 point was given when a target ACC inflection was produced. Responses with non-target inflections were coded as 'incorrect', in this case the participants were allocated a score of 0. In addition, we noted the type of error.

The task elicited 3420 responses, yet 29 responses (totalling 0.8%) were excluded from data analysis as unscorable. For example, items code-switched into Hebrew were not analyzed.



NOM≠ACC ja vizu kuklu I see doll.ACC



NOM=ACC ja vizu vedro I see bucket.ACC

Figure 1. Examples of items used in the production task

2.3. Procedure

The current study is part of a larger project, funded by the Israel Science Foundation (ISF: 552/21), awarded to Natalia Meir, aimed at investigating characteristics of Israeli and American Russian among children and adults. The study was approved by the review board of Bar-Ilan University. Informed written consent was obtained prior to participation for adult participants. For children, informed parental consent was secured as well as child ascent before testing. Each participant was tested individually via Zoom. The task was presented via a PowerPoint presentation. The experimenter gave oral instructions. Four warm-up items were administered to familiarize the participants with the task, and they were not included into the analysis. Participants' responses were audio-recorded for off-line analysis.

3. Results

Figure 2 presents the performance on the case task across the groups comparing the accuracy production of the ACC inflections across the nouns requiring the dedicated ACC inflection (i.e., NOM \neq ACC) versus the noun on which the ACC case inflection is homophonous to the NOM one (i.e., NOM = ACC). The results indicated a ceiling effect in the Mono-Adult, RUS-DOM, HL-LateAoO and Mono-Child, while lower accuracy in the HL-EarlyAoO and the HL-Child groups. A large individual variability should be noted in the two groups of HL-Russian speakers with early AoO of Hebrew on nouns requiring the use of the ACC dedicated inflection (HL-EarlyAoO: M = 0.77, SD = 0.42; HL-Child: M = 0.73, SD = 0.44).

The analysis was conducted using a statistical package SPSS 25. Given the binary nature of our dependent variable — the accuracy of the ACC case production (target ACC production = 1, non-target ACC production = 0), we analyzed the data using a binomial mixed-effects logistic regression model. Participants and items were included as random factors with a random intercept and a random slope. The inclusion of these two variables enabled us to account simultaneously for participant-specific and item-specific variability and allowed for generalization

beyond both the sample of participants and the set of stimuli items. We included Inflection_Type, Group and the interaction Inflection_Type* Group interaction as fixed effects. The results demonstrated a significant effect of Inflection_Type (F(1, 3379) = 15.34, p < .001), a significant effect of Group (F(5, 3379) = 14.99, p < .001) and a significant Inflection_Type* Group interaction (F(5, 3378) = 5.86, p < .001).





Table 3

hestile for the rout field of the contrast per group							
Group	Contrast Estimate	Std. Error	t	Adj. Sig.			
HL-Child	-0.22	0.02	-9.16	p <.001			
Mono-Child	0.00	0.01	-0.13	<i>p</i> = .90			
HL-EarlyAoO	-0.18	0.03	-5.90	<i>p</i> < .001			
HL-LateAoO	-0.01	0.02	-0.43	p = .67			
RUS-DOM	-0.02	0.02	-1.02	<i>p</i> = .31			
Mono-Adult	0.00	0.02	0.00	<i>p</i> = 1.00			

Results for the NOM≠ACC vs. NOM=ACC contrast per group

As a follow-up on the interaction, we set pair-wise contrasts evaluating the difference between the accuracy across nouns requiring the dedicated ACC infection (i.e., NOM \neq ACC) and noun on which ACC is homophonous to NOM (i.e., NOM = ACC) with an adjusted alpha-level for multiple comparisons. The difference between the NOM \neq ACC nouns and the NOM = ACC was significant only for the HL-EarlyAoO (p < .001) group and HL-Child (p < .001) (see Table 3).

End pattern promes among the ne-carry Abo and the ne-ciniu groups					
	HL-EarlyAoO	HL-Child			
The use of NOM default form instead of the dedicated ACC	76.6%	86.4%			
inflection on NOM # ACC nouns					
The addition of -u inflection on NOM=ACC nouns	9.0%	10.2%			
The addition of -a inflection on NOM=ACC nouns	9.0%	2.5%			
Other	5.4%	0.9%			

Error pattern profiles among the HL-EarlyAoO and the HL-Child groups

We further explored the error patterns in the adult HL-Early AoO and the HL-Child groups (see Table 3). The error pattern analysis revealed overall similarities between the two groups with early exposure to Hebrew (before age of 5). In both groups, the most common type of error was the use of the NOM form instead of the dedicated ACC inflection with feminine nouns ending in -a(i.e., *ja vizu gruš-a/ kukl-a/ golov-a/ lun-a/ zvezd-a/ zmej-a/ butylk-a* – I see a pear/ doll/moon/ star/ snake/ bottle) and masculine animate nouns (i.e., *ja vizu snegovik/ krokodil/ petux* – I see a snow-man/ crocodile/ roaster) (see Table 4). Furthermore, there were also cases of the overgeneralization of the ACC inflection -u and its use with nouns which require the homophonous ACC and NOM forms (i.e., ja vizu *kryl-u/ziraf-u/sapog-u/jablok-u/derev-u* – I see a wing/giraffe/boot/apple/tree) and over-generalization of the animate masculine inflection -a to inanimate masculine nouns (e.g., *ja vizu šarik-a/ zivot-a/ jajc-a/ sapog-a* – I see a balloon/ stomach/ egg/ boot). Yet, the latter patterns were less frequent (i.e., the erroneous use of -u and -a inflection) as compared to the use of NOM default forms. The pattern labeled 'other' included no response patterns, and the use of other infections (e.g., ja vizu krvlv).

4. Discussion

The current study investigated the accuracy of the ACC case morphology in child and adult HL-Russian speakers who acquire Russian in contact with Hebrew. Studies directly comparing child and adult HL speakers are rare (but see Polinsky 2011, Polinsky 2018). The rationale for testing the accuracy of ACC case morphology among adult and child immigrant groups and in monolingual controls was determined by two factors. First, previous studies convincingly demonstrated almost error-free production of the ACC case inflections among monolingual children (e.g., Gagarina and Voeikova 2009). Second, when looking into HL bilingual acquisition, case morphology seems to be fragile under HL bilingual acquisition (Albirini et al. 2013, Montrul 2016, Polinsky 2018a). The evidence on HL-Russian in contact with English demonstrates that the rich case paradigm seems to be prone to divergences: HL-Russian speakers use unmarked NOM form in contexts which require the use of dedicated case inflections (Polinsky 2006, 2008), yet there are also findings showing that HL speakers might develop grammars in accordance with the baseline ones (Isurin & Ivanova-Sullivan 2008, Łyskawa & Nagy 2020, Sekerina & Laurinavichyute 2020). Previous studies on child HL-Russian speakers demonstrate that case morphology poses difficulties under

HL bilingual acquisition (Turian & Altenberg 1991, Gagarina 2011, Ringblom 2014, Schwartz & Minkov 2014, Meir & Armon-Lotem 2015, Janssen 2016, Meir et al. 2017, Janssen & Meir 2019). In the current study, we compared child and adult HL speakers of Russian who acquired HL-Russian in contact with Hebrew. Russian-Hebrew bilingualism offers an excellent test case for understanding the formation of HL grammars: the two languages use ACC case marking, albeit differently: Russian utilized inflections, while Hebrew marks it with the particle *et*.

Starting with the monolingual baseline, the results of the current study confirmed at-ceiling performance in the adult and child monolingual Russian controls. The results demonstrate that monolingual Russian-speaking children show adult-like performance on the ACC case inflections regardless of the fact whether the noun requires a dedicated ACC inflection, or the ACC form is homophonous to the NOM form.

Similarly, error-free performance was observed for Russian-dominant participants (the RUS-DOM group), which confirms the stability of grammatical knowledge even after 20 years of the contact situation with a language which has sparse case morphology (Hebrew). Previous sociolinguistic studies demonstrated extensive borrowings from Hebrew in the speech of the 1st-generation immigrants. However, it was shown that lexical borrowings are inflected for cases following the Russian system of case assignment based on the declension classes. Correct assignment of case (even on Hebrew borrowings) is indicative of intact grammatical structure among first-generation immigrant speakers dominant in Russian. Interestingly, the results for the adult HL-Russian speakers with the AoO to Hebrew between 5–13 indicated at-ceiling performance. Thus, the study shows that ACC case production is error-free in first-generation immigrants and in 1.5-generation, who immigrated to Israel after the age of 5. It should be kept in mind that ACC case morphology is an early acquired linguistic phenomenon in monolingual children (Gvozdev 1961, Babyonyshev 1993, Protassova 1997, Protassova and Voeikova 2007, Cejtlin 2009, Gagarina & Voeikova 2009, Hržica et al. 2015), thus the results for the HL-speakers with later AoO (between 5-13) demonstrate the stability of early acquired phenomena. Future studies need to determine the effect of AoO on late acquired phenomena.

In contrast, the results of the current study indicated that two groups of participants showed a decreased accuracy of the ACC case production: child and adult HL-Russian speakers with the AoO to Hebrew before the age of 5. Both child and adult HL-Russian speakers with earlier AoO were significantly less accurate on nouns requiring the use of the dedicated ACC inflection, which is different from the NOM case. Child and adult HL-Russian speakers with AoO before 5 produced erroneous nominative default forms on nouns requiring the use of a dedicated accusative inflection on feminine nouns ending in -a (e.g., *ja vizu gruša* 'I see a pear.NOM' instead of *ja vizu grušu* 'I see a pear.ACC') and masculine animate nouns (i.e., *ja vizu snegovik* 'I see a snow-man.NOM' instead of *ja vizu snegovika* 'I see a snow-man.ACC').

The results of the current study re-iterate previous findings on HL-Russian acquisition in contact with a dominant language with sparse case morphology confirming that child HL-Russian speakers have difficulties with acquiring the ACC case and resort to NOM default forms, while their monolingual peers show at-ceiling performance (Turian & Altenberg 1991, Gagarina 2011, Ringblom 2014, Schwartz & Minkov 2014, Meir & Armon-Lotem 2015, Janssen 2016, Meir et al. 2017, Protassova et al. 2017). In addition to child HL-Russian speakers, the current study brought novel data on the adult HL-speakers, confirming that AoO is an important factor shaping adult HL grammars as well. The study adds to the previous research tapping into morphology of speakers of Israeli Russian. Meir and Polinsky (2021) proposed that HL-Russian speakers, who received exposure to Hebrew starting before the age of 5, might have problems with case forms more generally, under the influence of Hebrew which has sparse case morphology. Furthermore, case morphology has been reported to be challenging to adult HL-Russian speakers of American English, which also has sparse case morphology (Polinsky 2006, 2008). The current study brought additional evidence that case morphology is fragile under HL bilingual acquisition if the acquisition of the societal language with sparse case morphology starts before the age of 5.

The study aimed at contributing to the on-going debate on the exact mechanisms of HL grammar formations (see a keynote paper by Polinsky & Scontras (2020) and the commentaries to it). The results show that AoO is one of the important factors which shapes the HL grammar. The study showed that ACC case is vulnerable only in HL-speakers with earlier AoOs, before the age of 5, while ACC case morphology of immigrants of the first generation and the 1.5-generation, whose exposure to Hebrew started after the age of 5 shows no divergences from the monolingual speakers of Modern Standard Russian. Yet, based on the high heterogeneity with respect to ACC case acquisition observed in child and adult HL-Russian speakers with AoO before 5, future studies should address how internal and external factors modulate the acquisition of the complex case system in order to explain the conflicting evidence with respect to adult HL-Russian case system (Polinsky 2006, 2008, 2018a, Isurin & Ivanova-Sullivan 2008, Łyskawa & Nagy 2020, Sekerina & Laurinavichyute 2020). HL-speakers reported in this study represent a high variability in their ACC case accuracy. A recent study on the acquisition of grammatical gender demonstrated an intricate interplay between various factors shaping the acquisition of gender morphology in child HL-Russian speakers (Rodina et al. 2020). Based on the large variability observed in the current study for the child and adult speakers of HL-Russian who started acquiring Hebrew before the age of 5, it is plausible to suggest that external factors might play an important role in consolidating the morphological knowledge in addition to the AoO factor. The role of the type of family should be investigated, comparing acquisition of ACC case morphology in speakers raised in families in which both parents are speakers of HL-Russian versus mixed families, in which only one parent speaks HL-Russian. The role of schooling and input in HL should be also addressed in order to understand which factors shape HL acquisition.

5. Conclusions

The current study sheds light onto grammar development and maintenance under heritage bilingualism of child and adult HL-speakers. The study provides evidence that HL-Russian speakers with earlier age of onset of the societal language, that has sparse case morphology, show difficulties with case forms more generally, under the influence of Hebrew which has sparse case morphology.

Both child and adult speakers acquiring Russian as their heritage language who start the acquisition of Hebrew before the age of 5 are more likely to use the erroneous NOM default form with feminine nouns ending in *-a* (e.g., *ja vizu gruša* 'I see a pear.NOM' instead of *ja vizu grušu* 'I see a pear.ACC') and masculine animate nouns (i.e., *ja vizu snegovik* 'I see a snow-man.NOM' instead of *ja vizu snegovika* 'I see a snow-man.NOM' instead of *ja vizu snegovika* 'I see a snow-man.ACC'). The production of ACC case morphology in HL-Speakers with later Age of Onset of Hebrew (after the age of 5) and first-generation immigrants is error-free, i.e., similar to the one of the adult and child monolingual Russian-speaking controls.

On the basis of Russian in contact with Hebrew, the study demonstrates how heritage language grammars differ from the baseline grammar of monolingual speakers and which mechanisms are potentially associated with heritage language ultimate attainment. The study shows that divergences in heritage language grammars are related to the Age of Onset of the societal language, and possibly to the properties of the societal language.

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