Greek Embedded Aspect in Child and Adult L2/L3 Acquisition

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Abstract

The focus of the present work is the acquisition of Greek embedded aspect by early and late L2/L3 learners. The study was conducted in two countries, Mainland Greece and the Republic of Cyprus, with five groups of participants: Russians and Georgians living in Cyprus and acquiring Cypriot Greek (CG) as their L2/L3, Russians who live in Greece and use Standard Modern Greek (SMG) as their L2, and two control groups of native speakers of CG and SMG, respectively. Considerations of typological distance between the languages were compared to the different aspectual paradigms looking for possible transfer from L1/L2 (Russian) to L2/L3 (CG or SMG); length of residence in the country was found to influence the participants' production most.

1. Introduction

In line with the Interpretability Hypothesis (Tsimpli 2003) aspect, being a grammaticalized, interpretable feature in Greek, is relevant to the syntax-semantics and the syntax-discourse interfaces. This study investigates influence of L1 (or possibly L2) on L2 (L3) acquisition of Greek aspect, comparing participants who have a homogeneous L1 background (Russian) in Mainland Greece (L2 Standard Modern Greek/SMG) and Cyprus (L2 Cypriot Greek/CG) with participants whose L1 is Georgian, L2 Russian, and L3 Cypriot Greek — consequently, with Russian being an overlapping language in all three non-native groups, as L1 in one and L2 in the other group. That is, this study aims to find out whether the grammar of Russian shared by all participants interacts at all with mastering embedded aspect in Greek in either or both of these groups.

Both in CG and SMG verb complementation takes a finite form, while in Russian this form is infinitival. The main interest of the study will be subjunctive clauses in Greek with *na*, the subjunctive marker (Roussou 2009), where the

main verb controls the *na*-complement clause. The choice of aspect in the *na*-clause depends on the type of matrix verb and the interaction between lexical aspect (states, activities, achievements, and accomplishments) and grammatical aspect (perfective and imperfective) (Malagardi 1993; Moser 1993). Russian, in contrast, allows two types of verb complementation: (i) infinitival complementation, in which case the subject of the main clause and the embedded clause should be the same, and (ii) finite verb complementation, in which case the complementizer *čtoby* 'in order to' is used but the verb should be only in the past tense, and matrix and embedded subject should not be identical.

The paper is organized as follows. Section 2 provides an overview of aspect in Georgian, Russian, and Greek and presents the research questions to be investigated in the study. Section 3 deals with the methodology of the experiments. In Section 4 the results of the written and oral tests are presented. Section 5 concludes and offers an interpretation of the results in light of current L2/L3A theories.

2. Background

2.1. Aspect, Lexical vs. Grammatical

The internal temporal constituency of a situation or event is described by aspect through beginning, continuation, and completion (Comrie 1976: 16). Aspect can be distinguished into lexical and grammatical. The inherent lexical or semantic meaning of a verb is determined by lexical aspect, which has four types: states, activities, accomplishments, and achievements (Vendler 1957). *States* (e.g., 'love', 'enjoy', 'hate') describe atelic, stable consistent situations without change, dynamicity or successive stages (Smith 1991). *Activities* (e.g., 'eat', 'walk') describe atelic, but dynamic events without a natural endpoint. *Accomplishments* (e.g., 'The children built a sandcastle.') show the heterogeneous process with successive internal stages that leads to a completion or an outcome of an action or change of state. *Achievements* are instantaneous events that result in a change of state and lack duration (e.g., 'Our team won the game'). States and activities share the feature of atelicity, but they differ in dynamicity: states are [–dynamic], activities are [+dynamic], while accomplishments and achievements share the feature of telicity, but differ in duration: accomplishments are [+durative] and achievements are [–durative].

Grammatical aspect is responsible for aspectual distinctions by means of morpho-syntactic marking with the help of grammatical devices such as

auxiliaries, inflectional or derivational morphology. Grammatical aspect is distinguished into perfective and imperfective. *Perfective aspect* describes a situation as a whole, without showing the internal view of an action or situation. *Imperfective aspect* describes the internal structure of a situation and views it as an open event (Comrie 1976; Shirai & Li 2000; Smith 1991).

2.2. Aspect, Cross-Linguistically

The category of aspect is universal (Smith 1991), but there is cross-linguistic variation in the realization and encoding of lexical and grammatical aspect across languages. The mapping between lexical and grammatical aspect varies as well and so do forms and meanings of aspect. There is morphological aspect (e.g., the perfective/imperfective distinction in Slavic languages), aspectual tenses (e.g., perfect/imperfect in Romance languages, aorist/preterit in Greek and Bulgarian), or aspectual words and affixes (e.g., English *-ing* or Dutch and German *ge-*).

The concern of this study is the aspectual system of Georgian, Russian, and Greek — and how learners with L1 Russian and learners with L1 Georgian/L2 Russian acquire L2/L3 Greek embedded aspect. (When the distinction between CG and SMG does not matter, we simply refer to Modern Greek as 'Greek'.)

To begin with, Georgian is characterized by rich synthetic morphology with inflectional verbal morphology and a complex case system, and can be described with the help of screeves, a term used to refer to tense, aspect, and mood marking on Georgian verbs. There are eleven screeves which can be divided into three series: present, aorist, and perfect (Harris 1981: 47). The present series has two sub-series, present (present, imperfect, present subjunctive) and future (future, conditional, future subjunctive). The aorist series consists of two screeves, aorist and optative subjunctive, while the perfect series consists of three screeves, perfect first evidential, pluperfect (second evidential), and perfect subjunctive (third evidential). There are four verb classes in Georgian: transitive, intransitive, medial, and indirect verbs. A lot of verbs have common stems and differ only in terms of prefixes and thematic suffixes. Prefixes are realized only in the aorist and perfect series, and thematic suffixes only in the present series (e.g., root *shen*, infinite form *asheneba*). In the present series, the thematic suffix *-eb* is present, but without the preverb: present indicative (*v-a-shen-eb*), imperfect (*v-a-shen-eb-d-l*), present subjunctive (*v-a-shen-eb-d-e*). In the aorist series, there is a preverb, but no thematic suffix: aorist indicative (*a-v-a-shen-e*), optative (*a-v-a-shen-o*). In the perfective series, both preverb and the thematic suffix are present: perfect (*a-m-i-shen-eb-i-a*), pluperfect (*a-m-e-shen-eb-in-a*), perfect subjunctive (*a-m-e-shen-eb-in-o-s*). Only the present sub-series express the imperfective aspect, all other forms are perfective (Hillery 2006). Melikishvili (2008: 146) states

that the imperfective construction is unmarked and dominant in comparison to the aorist construction. All verbs have the imperfective series, but there are some with a defective paradigm lacking aorist and perfective series. The frequency of imperfective forms is higher than perfective and aorist.

In Russian, there is also a rich verbal inflectional system, where even infinitives are marked for aspect and voice. There are three tenses (present, past, future) and two aspects (perfective and imperfective) (Borik 2002; Slabakova 2005). Present tense allows only imperfective aspect (imperfective present tense stem plus personal endings, as in *čítai/-esh/-et/-em/-ete/-ut* 'I/you/she/we/you/they read.IMP'). Past tense allows both perfective (perfective past tense stem/infinitive stem plus suffix *-l* plus gender endings, as in *pročital/-a/-o/-i* 'I/she/it they read.PERF') and imperfective aspect (imperfective past tense stem/infinitive stem plus suffix *-l* plus gender endings, as in *čital/-a/-o/-i* 'I/she/it they read.IMP'). Future tense allows both perfective (auxiliary *byt'* 'be' in personal form plus the imperfective infinitive, as in *budu/-esh/-et/-em/-ete/-ut čitat'* 'I/you/she/we/you/they will read.IMP.INF') and imperfective aspect (perfective present tense stem plus personal endings, as in *pročítai/-esh/-et/-em/-ete/-ut* 'I/you/she/we/you/they will read.PERF').

The realization of aspect is done by means of morphology: The imperfective form of the verb is default; perfective aspect is achieved either by addition of perfective prefix to the imperfective stem of the verb (e.g., *pisat* 'write.IMP.INF') plus the prefix *na* to yield *na-pisat* 'PERF-write.INF') or by irregular formation, verb stem alternation, and stress shift (e.g., *brat* 'take.IMP' vs. *vzyat* 'take.PERF.INF') (Filin 1979: 40-41). Perfective forms can undergo a secondary imperfectivization through aspectual suffixation (e.g., *otkryt* 'open.PERF' vs. *otkryvat* 'open.IMP').

In Greek there are eight tenses, which represent certain aspects: imperfect (*elina* 'I solved.IMP'), aorist (*elisa* 'I solved.PERF'), present (*lino* 'I solve.IMP'), present perfect (*eho lisi* 'I have solved.PERF'), past perfect (*iha lisi* 'I had solved.PERF'), future progressive (*tha lino* 'I will solve.IMP'), future simple (*tha liso* 'I will solve.PERF'), and future perfect (*tha eho lisi* 'I will have solved.PERF').

Perfective aspect is derived by vowel change of the stem of the imperfective verbal aspect form (e.g., *trago* 'I eat.IMP' vs. *efaga* 'I ate.PERF') and/or changes of the final consonant of the imperfective verbal stem (e.g., a sigmatic morpheme as above in *lino* vs. *elina* vs. *elisa*) (Joseph & Smirniotopoulos 1993; Warburton 1970). The type of direct object influences the choice of telic/atelic predicate: definite objects/quantized incremental theme objects yield a telic/perfective interpretation, while cumulative incremental theme objects give rise to atelic/imperfective interpretation, and in this respect Greek differs from Russian (Krifka 1998; Dowty 1991; Verkuyl 1972).

The difference between Russian, Greek, and Georgian with respect to verb complementation, in particular the aspectual form of the embedded verb, is going to be examined in the present study to reveal possible transfer effects from L1 Russian into L2 Greek, L2 Russian in L3 Greek, or L1 Georgian in L3 Greek.

In certain sentential environments, Russian allows two aspectual options in the complement verb (either perfective or imperfective), while Greek permits only one. More specifically: when the accomplishment main verb has a continuous interpretation (*prospathusa* 'try'), the state main verb has a continuous interpretation (*borusa* 'be able'), and when the main verb is perfective non-ingressive (*fovithika* 'be afraid'), the complement verb should be only in perfective aspect; in Russian, it can be either perfective or imperfective.

In addition, there is a restriction in Greek when the matrix verb *thelo* 'want' is in past tense; it then requires a perfective aspect finite verb in the embedded clause, which is not the case for Russian. Activity verbs normally do not allow *na*-complements; they only do so when the clause expresses a purpose or goal. Also, with *na* as a short form of *gia na* 'in order to' (Moser 1993: 572), the verb of the complement clause should be perfective in Greek and either perfective or imperfective in Russian.

Regarding Georgian, it is known that in 'want'-type clauses, the complementizer is omitted and the embedded verb has an infinitival form (Haspelmath 2002). Only the verbs of the aorist and perfective series (focused either on the completed event or the result/resultative state of the event and thus being perfective) can be used for past tense (Samsel 1992).

The target sentences in Greek under investigation are in past tense; this means that if Georgian learners of Greek transfer from their L1, they would use the aorist and perfective verb series, and predominantly employ perfective aspect, meaning that imperfective condition should be more difficult for them than perfective. But if they transfer from their L2 Russian, then the perfective condition might be more difficult than the imperfective. There can be a third option, namely to mix between the three languages.

Discrepancies between aspectual paradigms and the way how aspect is encoded in a language cause difficulties in form-to-meaning relations, which is in line with the Morphological Salience Hypothesis (van Hout 2008), according to which form-to-meaning relations are influenced by how aspect is realized in a language: the more salient the morphological paradigm, the earlier the acquisition takes place. In Russian, aspect is realized by means of a prefix, but tense and agreement with the help of a suffix, while in Greek prefixes are not used at all for this purpose, only suffixes. So, Russian learners of L2/L3 Greek might have problem with the choice of the right morphological paradigm for aspect and with the mapping of verbal form to its meaning.

2.3. Research Questions

The main research questions of the present study are the following:

1. Do learners transfer from L1 Russian to L2 Greek, or from L1 Georgian to L3 Greek, or even from L2 Russian to L3 Greek in the initial stage of acquisition, with respect to embedded aspect (supporting the Full Transfer/Full Access Hypothesis)? Can L2/L3 learners reach a native-like stage of performance or do they consistently show variability even at advanced levels?
2. Does typological distance between Georgian, Russian, and Greek play a big role in non-native production? Does the CG–SMG bilectal situation in Cyprus influence production of non-native participants in Cyprus in comparison to Mainland Greece?
3. Which type of main and embedded verb is the most problematic for L2/L3 learners (e.g., state, activity, accomplishment, achievement)?
4. Which variables influence L2/L3 production (e.g., length of residence in the country, L2 usage, age of onset to L2, education, L2 proficiency, frequency of L2 usage)?
5. Is there a difference between child and adult L2/L3 production, and is it possible to test the Domain-by-Age Model and the Morphological Salience Hypothesis with the results of the experimental study?

3. The Present Study

3.1. Participants

308 participants took part in the written task: 75 bilingual Russian–CG speakers (25 adults, 50 children), 32 multilingual Georgian–Russian–CG speakers (7 adults, 25 children), 63 bilingual Russian–SMG speakers (13 adults, 50 children), and two control groups of 75 monolingual SMG speakers (25 adults, 50 children) and 63 monolingual CG speakers (25 adults, 38 children). More detailed data are summarized in Table 1, including length of residence (LoR), age of onset (AoO) of Greek, and the language acquisition (LA) type for the different groups:

Table 1.
Participants for the written task

Group	N	Gender		Age	LoR	AoO	LA Type
		male	female	years	years	years	
Russian–CG adults	25	0	25 (100%)	36.2	8.8	28.4	adult L2
Russian–CG children	50	19 (38%)	31 (62%)	15.5	7.6	5.7	child L2
Georgian–Russian–CG adults	7	3 (43%)	4 (57%)	33	10.4	22	adult L3
Georgian–Russian–CG children	25	12 (48%)	13 (52%)	15	7.3	7.3	child L3
Russian–SMG adults	13	3 (23%)	10 (77%)	38.5	12.5	28.8	adult L2
Russian–SMG children	50	17 (34%)	33 (66%)	16	12.8	3.2	bilingual L1/L2
CG adults	25	10 (40%)	15 (60%)	39.8			L1
CG children	50	24 (48%)	26 (52%)	14			L1
SMG adults	25	5 (20%)	20 (80%)	35.4			L1
SMG children	38	16 (42%)	22 (58%)				L1

124 participants took part in the oral video stimuli task: 36 Russian–CG speakers (18 adults and 18 children), 42 Russian–SMG speakers (5 adults and 37 children), and two control groups of 30 CG speakers (9 adults and 21 children), 16 SMG speakers (10 adults and 6 children). This information is provided in Table 2:

Table 2.
Participants for the oral video stimuli task

Group	N	Gender		Age	LoR	AoO	LA Type
		male	female	years	years	years	
Russian–CG adults	18	1 (6%)	17 (94%)	31.3	8.6	22.7	adult L2
Russian–CG children	18	6 (33%)	12 (37%)	6.5	5.8	0.2	bilingual L1/L2
Russian–SMG adults	5	3 (60%)	2 (40%)	34.4	12.5	21	adult L2
Russian–SMG children	37	23 (62%)	14 (38%)	10.7	9.6	1.2	bilingual L1/L2
CG adults	9	4 (44%)	5 (56%)	36.4			
CG children	21	12 (57%)	9 (43%)	5.4			
SMG adults	10	3 (30%)	7 (70%)	31.2			
SMG children	6	3 (50%)	3 (50%)	6.1			

3.2. Materials

3.2.1. Written Task

For the written study, the materials included a language history questionnaire (25 questions), modeled on Li et al. (2006), and a two-task test based on Malagardi (1993) and Moser (1993).

There was a forced-choice task with 36 items (6 for each type of main verb, 30 items with a perfective target and 6 items for the imperfective condition), where participants had to choose between the two sentences that differed in the aspectual form of the embedded, and a cloze task with 36 items (6 for each type of main verb, 30 items with perfective target and 6 items for the imperfective condition), for which participants had to fill the gap with the complement verb with a relevant aspectual form.

For the perfective condition, embedded environments were chosen where in Greek only perfective aspect is allowed, while in Russian either perfective or imperfective can be used; for the imperfective condition, those types of sentences were chosen which allow only imperfective aspect in both Russian and Greek. For the perfective condition, five different types of main verbs were used in a certain aspectual form which require only perfective aspect of the verb in the embedded clause: the accomplishment verb *prospathusa* 'try' with a continuous interpretation, the perfective non-ingressive state verb *fovithika* 'be afraid of', the perfective ingressive state main verb *borese* 'be able', the perfective volitional verb in the past tense *ithela* 'want', and activity verbs expressing a purpose or a goal with *na* being a short form of *gia na* 'in order to'.

The first four require complement clauses and the last one an adverbial clause. The sentences were supported by pictures, which restricted certain pragmatic conditions. One example is given in (1):

- (1a) Προσπαθούσε να επιλέξει το δώρο για τη μαμά της.
Prospathuse na epileksi to doro gia ti mama tis.
 'She was trying to choose (PERF) the present for her mum.'
 (at that certain moment, not habitual) [TARGET]
- (1b) Προσπαθούσε να επιλέγει το δώρο για τη μαμά της.
Prospathuse na epilegi to doro gia ti mama tis.
 'She was trying to choose (IMP) the present for her mum.'

For the imperfective condition, there was one type of the main verb *arhise* 'start', which requires embedded imperfective. An example is given in (2):

- (2a) Ἀρχισε να χορεύει.
Arhise na horevi.
 'He started to dance (IMP).' [TARGET]
- (2b) Ἀρχισε να χορεύει.
Arhise na horepsi.
 'He started to dance (PERF).'

3.2.2. Oral Video-Stimuli Task

The oral-production video task included 36 short video stimuli with 6 types of the main verbs (6 video clips for each type) and two conditions: perfective and imperfective. The video clips showed on-going actions. After watching the video clip, the participants were told the beginning of a sentence (in an oral mode), such as in (3a), and asked to complete the sentence with their own words, using their own embedded clause in the past tense (orally), such as (3b) for the condition and (4b) for the perfective condition. The session was audio-recorded and then analyzed accordingly.

- (3a) *To koritsi arhise na...*
 'The girl began NA...'
- (3b) ... *pleni ta heria*
 '...to wash her hands-IMP'
- (4a) *To koritsi pire tin petra gia na...*
 'the girl took the stone for NA...'
- (4b) ... *petaksi sti thalassa*
 '...throw-PERF into-the sea'

4. Results and Discussion

4.1. Written Task

Unsurprisingly, native speakers performed better than the bilingual Russian–SMG and Russian–CG participants as well as the multilingual Georgian–Russian–CG participants. In addition, the monolingual and bilingual participants in Greece performed better than the corresponding groups in Cyprus. Russian–SMG speakers performed best among the non-native groups, while the Georgian–Russian–CG speakers had the worst production; details are provided in Table 3.

Table 3.

Non-target test production of the groups.

	GREECE		CYPRUS		
Non-target production	63 Russian–SMG adults+ children	63 SMG adults+ children	75 Russian–CG adults+ children	75 CG adults+ children	32 Georgian–Russian–CG adults+ children
prospathuse	1.21%	0.33%	1.94%	0.38%	2.21%
fovithike	3.30%	1.10%	3.66%	2.46%	4.64%
mborese	0.97%	0.28%	1.35%	0.16%	3.47%
gia na	1.52%	1.21%	2.48%	1.20%	3.34%
arhise	1.52%	0.33%	2.09%	0.40%	3.29%
ithele	0.90%	0.11%	1.16%	0.31%	2.9%
Total	9.43%	3.37%	12.70%	4.94%	19.85%

The perfective condition was more problematic than imperfective for Russian non-native groups, since in L1 Russian both perfective and imperfective aspect is possible, so either positive or negative transfer might take place. The most problematic types of the main verbs for all groups were *fovithike* 'afraid', activity verbs with *gia na* 'in order to' (perfective condition).

According to an ANOVA (means) statistical analysis, there is a statistically significant difference between Russian–CG speakers and the control groups of CG and SMG speakers, between Russian–SMG speakers and a control group of CG speakers, and between Georgian–Russian–CG speakers and all other native as well as non-native groups. The results are given in Table 4:

Table 4.

ANOVA statistics analysis

Group	Group	t-value	DF	Prob.
CG	Georgian–Russian–CG	–5.532	105	.0000*
Russian–CG	CG	3.947	148	.0001*
Russian–CG	SMG	2.058	136	.0415*
Russian–CG	Georgian–Russian–CG	–2.480	105	.0147*
Russian–SMG	CG	3.523	136	.0006*
Russian–SMG	Georgian–Russian–CG	–2.608	93	.0106*
SMG	Georgian–Russian–CG	–4.032	93	.0001*

Again unsurprisingly, the test production of monolingual children and adults was better than that of bilingual children and adults in both countries. Bilingual Russian–CG adults performed better than bilingual Russian–SMG adults, however, while monolingual SMG adults performed better than CG adults. Children performed better than adults, except for the monolingual CG and the multilingual Georgian–Russian–CG groups. Russian–SMG speakers performed best among the non-natives and Georgian–Russian–CG children had the worst production, with SMG children performing better than CG children. Table 5 provides the details:

Table 5.

Non-target test production: adults vs. children

	GREECE		CYPRUS		
non-target production	13 Russian–SMG adults	25 SMG adults	25 Russian–CG adults	25 CG adults	7 Georgian–Russian–CG adults
Total	28.41%	2.33%	15.7%	4.38%	14.48%
non-target production	50 Russian–SMG children	38 SMG children	50 Russian–CG children	50 CG children	25 Georgian–Russian–CG children
Total	4.5%	4.05%	11.16%	5.22%	21.38%

Embedded activity verbs were the most difficult as they can be associated both with perfective and imperfective aspect:

Figure 1. Non-target production: embedded verbs

As it can be seen from the following figures, it is obvious that variables such as length of residence in the country (which by and large goes with length of exposure to Greek) and age of onset play an important role in participants' test production:

Figure 2. Non-target production and length of residence in L2/L3 country

Figure 3. Non-target production and the age of onset to L2/L3

But there are certain differences among the groups that the bilingual Russian-CG and Russian-SMG participants have more in common, while the multilingual Georgian-Russian-CG speakers exhibit a different pattern. It seems that the participants with 6-10 years of exposure to Greek (all three non-native groups) behave in a similar way concerning the test production, as can be seen from Figure 2. Figure 3 shows that an early age of onset makes a markedly bigger difference for the L1 Russian bilingual speakers than the L1 Georgian multilingual participants.

4.2. Oral Task

The results of the video task are consistent with the written task. The non-native groups of bilingual Russian-CG and Russian-SMG speakers performed worse than the native group of monolingual CG and SMG participants. Children in both native and non-native groups performed better than adults, except for the SMG group, where performance was the same. Russian-SMG speakers performed better than Russian-CG participants. The most problematic types

of the main verbs for all groups were *fovithike* 'be afraid' and activity verbs with *gia na* 'in order to' (perfective). The results are provided in Table 6:

Table 6.

Non-target production in the oral video stimuli task

Non-target production	Russian–CG		CG		Russian–SMG		SMG	
adults	18		9		5		10	
children		18		21		37		6
prospathuse	6.01%	1.23%	0.26%	0%	1.11%	0.15%	0.27%	0.46%
mborese	2.93%	0.92%	0.26%	0%	0%	0.07%	0.27%	0.46%
fovithike	4.32%	1.54%	0.26%	0.30%	0.55%	0.15%	0.27%	0%
ithele	3.85%	0.61%	0.52%	0%	0.55%	0.07%	0.22%	0.46%
giana	4.01%	0.77%	0.13%	0%	3.88%	0.37%	0%	0.46%
arhise	2.77%	1.23%	0.13%	0%	0%	0%	0%	0%
total non-target	23.91%	6.32%	1.58%	0.30%	6.11%	0.75%	1.38%	1.38%

The results from the written and oral experiments are in line with the Lexical Aspect Hypothesis (Andersen 1991; Salaberry 1998), according to which learners first acquire perfective and then imperfective aspect, and the telicity of the verbal predicate influences the mapping between lexical aspect and verb morphology in the initial stage of learning. So, at the beginning of the L2 acquisition process, dynamic and durative predicates are combined with imperfective aspect, and telic predicates with perfective aspect.

The pictures and videos in the experiments showed on-going events, so the L2 beginners were more likely to choose the imperfective aspect in comparison to the L2 intermediate or advanced learners (see e.g. Chin 2009 and the collection of papers in Kempchinsky & Slabakova 2005). Besides, according to Borik (2002), imperfective aspect in Russian describes not only on-going and episodic situations, but also knowledge about facts, so the participants might have chosen the imperfective aspect instead of the correct perfective simply to state the fact about the picture or a video in front of them.

According to an ANOVA analysis, there is a statistically significant difference only between Russian–CG speakers and the CG and SMG control groups:

Table 7.
ANOVA statistics analysis

Group	Group	t-value	DF	Prob.
SMG	Russian–CG	–5.555	50	.0000*
CG	Russian–CG	–6.504	64	.0000*
Russian–CG	Russian–SMG	7.38	76	.0000*

Again, embedded activity verbs were the most difficult, especially for the Russian–CG group, as they can be associated both with perfective and imperfective aspect:

Figure 4. Non-target production: embedded verbs

Children, more than adults, substituted embedded aspectual forms with general all purpose (GAP) or light verbs, such as *kano banio* 'have a shower' that do not have aspectual specification in Greek:

Figure 5. Non-target production of GAP verbs

Variables such as the length of residence in the L2 country (only for the Russian–SMG group) and age of onset to L2 (both for the Russian–SMG and the Russian–CG groups) play a crucial role in non-native production: the younger the participants, the better the test production.

Figure 6. Non-target production and the length of residence in L2 country

Figure 7. Non-target production and the age of onset to L2

4.3. Written vs. Oral Task

Comparing the written and oral tasks (two modes of the test: oral and written), it can be seen that all groups, except for the Russian-CG adults, performed better in the oral task than in the written task. This means that the oral mode is easier for the participants than the written mode:

Figure 8. Written vs. oral task non-target test production

Figure 9. Written perfective vs. imperfective task performance

Figure 10. Oral perfective vs. imperfective task performance

The two graphs above show the groups' production in written (Figure 9) and oral task (Figure 10) in terms of perfective and imperfective conditions: the participants performed slightly better for the imperfective than for perfective conditions in both written and oral tasks, but this difference is not significant. The behavior of adult Russian–SMG and adult Russian–CG participants in the written and oral tests differ.

5. Conclusion

In general, the results of the study can be taken to support the Full Transfer/ Full Access Hypothesis (Schwartz & Sprouse 1994; Montrul & Slabakova 2003; Slabakova 2005), although there was no big difference between production for perfective and imperfective conditions, meaning that Russian learners of Greek use either positive or negative transfer L2 learners of Greek transfer from L1 Russian at the initial stage of acquisition and then with more exposure to L2

transfer decreases. The behavior of the Georgian multilingual group was not consistent with the bilingual Russian non-native groups.

Russian is an overlapping language for the groups of Russian–CG, Russian–SMG, and Georgian–Russian–CG speakers, though for the first two groups this language is their L1, while for the third group it is L2. The difference in the error patterns between the Russian and the Georgian groups might be due to the order and direction of transfer: L3 learners (as L2 learners) tend to transfer from L1 Georgian to L3 rather than from L2 Russian; alternatively (or in addition), it may be because of the extra cognitive load: imperfective aspect is unmarked in Georgian, screeves are characterized by feature complexity, but only aorist and perfective verb series (i.e. perfective aspect) can be used with the past tense, so transferring from their L1 Georgian, they tend to use perfective aspect instead of imperfective in the past tense (imperfective condition). Errors in the perfective condition, when imperfective aspect is used instead of perfective, can be explained by the unmarked feature of the imperfective aspect in Georgian.

Another issue is that the research was conducted in two countries, and the participants in Cyprus are exposed to two varieties of Greek: CG and SMG. This complex socio-linguistic, bi(dia)lectal, diglossic situation (documented in Grohmann & Leivada 2012 and Rowe & Grohmann 2013, for example) increases the difficulty of L2 acquisition of Greek and puts the L2 population in Cyprus in a more disadvantageous position than of the L2 population in Greece. Russian–CG speakers have to switch among three modes: CG, SMG, and Russian. The Georgian–Russian–CG group has a more difficult task, as they need to use CG, SMG, Russian, and Georgian on a daily basis. So, non-native residents of Cyprus require more complex patterns in the activation of languages in language production and perception, being in a multilingual setting (Ceñoz et al. 2001), than the relevant population in Greece, who are in a non-dialectal bilingual setting.

Typological distance between languages can explain transfer preferences to some extent: Russian–CG and Russian–SMG speakers transfer from L1 Russian into L2 Greek, since Russian and Greek are typologically (relatively) closely related, belonging to the Indo-European language family; Georgian–Russian–CG speakers, though with L2 knowledge of Russian, prefer to transfer from their L1 Georgian, which is a non-Indo-European Caucasian language and typologically more distant from Greek.

The successful test production of the native control groups, both in Greece and in Cyprus, shows that the experimental tools are reliable. Error analysis showed that the most problematic type of the main verb for L2/L3 learners was state verbs, as they might be easily associated with imperfective rather than perfective aspect, supporting the Aspect Hypothesis (Andersen 1991; Shirai & Li 2000). Embedded activity verbs caused more non-target production than the

other types of verbs (achievement, accomplishment, and state verbs), as they can have either perfective or imperfective interpretation.

The study also revealed some differences between children and adult L2 production: L2 children were closer to L1 children rather than L2 adults, which can partially support the Domain-by-Age Model (Schwartz 2003), according to which there is a similarity between child L2 and child L1 acquisition in the domain of inflectional morphology, but in the domain of syntax, child L2 acquisition should rather be more similar to adult L2 acquisition; age of onset should then only influence the domain of inflectional morphology and L1 transfer the domain of syntax. Since aspect belongs to the syntax–morphology interface, some overlap may be expected (which may in the future be further tested with the Interface Hypothesis of Tsimpli 2003, for example).

The Morphological Salience Hypothesis can explain the difficulties of L2 learners in the correct choice of embedded aspect, with perfective aspect more difficult than imperfective. L2 learners cannot easily map form to meaning, as Greek and Russian have different aspectual paradigms.

Another interesting point is that L2 children, more than adults, substituted verb forms (perfective or imperfective) with general all purpose or light verbs, which do not have aspect specification in Greek. This issue will be picked up in the future in more detail but is in line with concurrent studies on language development in Greek (see Grohmann & Leivada 2013; Kambanaros & Grohmann 2013).

One important issue of this study is that a large sample of participants was used to compare the acquisition of L2 Greek embedded aspect in monolingual (Greece) and bilingual settings (Cyprus), with SMG as the overlapping variety of Greek, by learners with one prior language (L1 Russian) and learners with two languages (L1 Georgian and L2 Russian), with overlapping Russian, in written and oral as well as comprehension and production modes.

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