Embedded aspect in L2 acquisition: Evidence from L1 Russian learners of Greek[*]

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Abstract

This work investigates first language (L1) influence on the second language (L2) acquisition of aspect, comparing participants with homogeneous L1 background (Russian) in Mainland Greece (L2 Standard Modern Greek) and Cyprus (L2 Cypriot Greek), where verb complementation takes a finite form instead of an infinitival as is possible in Russian. Focus of the experimental study lies on embedded environments, which require only perfective aspect in Greek but allow either perfective or imperfective in Russian. The findings support the Full Transfer/Full Access Hypothesis, according to which aspect is part of Universal Grammar and L2 learners can reach native-like attainment due to access to it, while at the initial stage of L2 acquisition transfer from L1 into L2 takes place.

Keywords: cross-linguistic interference; imperfective; perfective; transfer; Universal Grammar.

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1. Introduction

According to Tsimpli's (2003) formulation of the Interpretability Hypothesis, aspect is a grammaticalized, interpretable feature in Greek relevant to the syntax–semantics interface as well as to the syntax–discourse interface. This study investigates influence of the first language (L1) on acquisition of aspect in a second language (L2), comparing participants with a homogeneous L1 background in Mainland Greece and Cyprus, namely: L1 speakers of Russian acquiring as their L2 Standard Modern Greek in one environment and Cypriot Greek in the other.

In both Greek varieties, verb complementation takes a finite form instead of an infinitival form as is possible in Russian. Sentences with the particle *na* are subjunctive clauses, with *na* traditionally analyzed as the subjunctive mood marker (Veloudis & Philippaki-Warburton, 1983; Roussou, 2009). The *na*-clause is a complement clause that is controlled by the main verb. Aspect in the subjunctive subordinate *na*-clauses depends on the kind of verb in the main clause (Malagardi, 1993) and there is an interaction between lexical and grammatical aspect that influences the aspect of the embedded verb in *na*--clauses (Moser, 1993). Four lexical aspects (states, activities, achievements, and accomplishments) interact with two grammatical aspects (perfective and imperfective).

In Russian, if the complementation is infinitival, the subject of the main clause and the embedded clause should be the same. If the complementation is with a finite verb, the complementizer *čtoby* 'in order to' is used; there is a restriction on the tense of the embedded finite verb, the verb should be only in the past, and the subjects of the main and embedded clauses should be different.

This paper is organized as follows. Section 2 provides an overview of aspect in Russian and Greek and previous studies on L2 Greek aspect acquisition. The methodology of the experimental study is presented in section 3 and the results of the study in section 4. Section 5 offers an interpretation of the findings in light of current theories about second language acquisition (L2A).

2. Background

2.1. Aspect, lexical vs. grammatical

Aspect views the internal temporal constituency of a situation, marking different views of the event: beginning, continuation, completion (Comrie, 1976: 16). Aspect can be distinguished into lexical and grammatical. Lexical aspect is determined by the inherent lexical meaning in the semantics of the

verbs in their base form. Vendler (1957) proposed four types of the lexical aspect: states, activities, accomplishments, and achievements. *States* refer to stable situations, such as 'love', 'enjoy', or 'hate'. A state holds consistently for the moment or for the interval during which it obtains. Smith (1983, 1991) claims that states do not involve change, dynamicity, or successive stages. *Activities* are also atelic events; they differ from states in dynamicity. Activities are processes that involve physical or mental activity like 'eat', 'walk', and 'swim', which do not entail a natural endpoint. Accomplishments and achievements are telic events. *Accomplishments* are actions consisting of a process and an outcome or change of state. The outcome or the change of state is the completion of the process of an accomplishment (e.g., 'The children built a sandcastle' involves two steps, 'the children were building a sandcastle' and 'a sandcastle has been built'); the entailment of an outcome or a change of state implies that there is a natural endpoint in an accomplishment event. Smith (1991) claimed that accomplishments are heterogeneous, because they entail successive internal stages. Each different stage advances the process toward the natural endpoint. *Achievements* are instantaneous events that result in a change of state; they lack duration (e.g., 'Our team won the game'). Smith (1991) suggests that achievements differ from accomplishments in terms of detachability. Detachability refers to whether the process of an event is necessary for the completion of such event. States and activities are atelic events and accomplishments and achievements are telic events. Consequently, states differ from activities in dynamicity: states are [–dynamic], activities are [+dynamic], while accomplishments differ from achievements in duration and detachability where accomplishments are [+durative] and [–detachable], as they entail successive stages and the stages are essential to reach the endpoint, and achievements are [–durative], as they are instantaneous.

Grammatical aspect refers to the aspectual distinctions that are marked morpho-syntactically by grammatical devices such as auxiliaries, inflectional morphology, or derivational morphology. *Perfective aspect* presents a situation as a whole, indicating the external view of an action, and describes the situation as a closed event. Bybee *et al.* (1994) propose two subcategories of the perfective aspect: completive and resultative. Completive aspect denotes a complete and thorough action, while resultative aspect signals a state that has been brought out by a prior action (e.g., completive 'He ate an apple' vs. resultative 'He has built the house'). *Imperfective aspect*, on the other hand, presents a situation from inside, without regarding its beginning and completion, describing the situation as an open event, giving the internal view of an action (Comrie, 1976; Smith, 1991; Li & Shirai, 2000). Comrie (1976) proposed two subcategories of the imperfective aspect: habitual and continuous. Habitual aspect denotes a situation that usually involves repetition of an action ('used to'). Continuous aspect consists of non--progressive and progressive aspects. Progressive aspect typically refers to a

dynamic, continuous, and changing action in progress (e.g., 'He is eating an apple'). In short, perfective aspect consists of resultative and completive aspect and imperfective aspect consists of habitual, continuous, progressive and non-progressive aspects.

2.2. Aspect, cross-linguistically

Within the current generative framework of Universal Grammar, the Minimalist Program (Chomsky, 1995), aspect is often considered a functional category that brings referential and grammatical meanings to a sentence. Acquisition of aspect requires knowledge of aspectual morphology and the relevant syntactic and semantic properties, such as the interaction between morphology (grammatical marking), syntax (telicity of the complement noun phrase), and the lexicon (lexical aspect). Smith (1997) claims that aspectual categories are universal; however, there is cross-linguistic variation. Languages differ in how lexical aspectual categories are realized and how grammatical aspect is encoded by morphology. The mapping between lexical and grammatical aspect varies across languages as well. Li & Shirai (2000) suggest that, when learners acquire the aspectual system in L2, they have to acquire not only the aspectual morphology in the language but also the difference in the mapping and the interaction of lexical and grammatical aspects between L1 and L2.

The forms and meanings of aspect differ cross-linguistically. There is morphological aspect (e.g., perfective/imperfective aspect in Slavic languages), aspectual tenses (e.g., perfect/imperfect tenses in Romance languages, aorist/preterit in Greek and Bulgarian), or aspectual words and affixes (e.g., English *–ing*, Dutch and German *–ge).*

2.2.1. Aspect in Russian

Russian has a rich inflectional system, marking tense, number, gender, and person, and there is a requirement for subject-verb agreement. Infinitives are marked for aspect and voice. Russian verbs are marked for three tenses (present, past, future), which are distributed among two aspects, perfective and imperfective (Borik, 2002; Slabakova, 2005). Table 1 summarizes:

	Past	Present	Future
PF	+	–	+
IMP	+	+	+

Table 1: Russian Aspect and Tense

Aspect in Russian is expressed morphologically. Perfective aspect can be formed either with the help of a perfective prefix added to the imperfective stem of the verb (e.g., *pisat* 'write-IMP' plus the prefix *na* to yield *napisat*

'write-PERF') 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 verbs can become imperfective through aspectual suffixation (e.g., *otkyt* 'open-PERF' vs. *otkryvat* 'open-IMP'). According to Borik (2002) and Slabakova (2005), quantization of the object does not influence telicity/perfectivity in Russian as opposed to Greek.

2.2.2. Aspect in Greek

In (Modern) Greek, grammatical aspect (perfective vs. imperfective) is expressed morphologically in past and future tenses, subjunctive mood, and imperative forms of the verb through stem vowel change (e.g., *trogo* 'I eat--IMP' vs. *efaga* 'I ate-PERF') and/or changes of the final consonant of the verbal stem (e.g., presence of an –s sigmatic morpheme: *lino* 'I solve--PRES.IMP' vs. *elina* 'I was solving-PAST.IMP' vs. *elisa* 'I solved--PAST.PERF') (Triantafyllidis, 1941; Mirabel, 1959; Warburton, 1970; Joseph & Smirniotopoulos, 1993).

Perfective aspect describes the situation as a whole, while imperfective aspect has either a habitual or a continuous interpretation. In many languages, the telic/atelic distinction of predicates is influenced by the type of its direct object: definite objects/quantized incremental theme objects give telic/perfective interpretation, while cumulative incremental theme objects give atelic/imperfective interpretation (Verkuyl, 1972; Dowty, 1991; Krifka, 1998). Greek is one such language (Tsimpli & Papadopoulou, 2009).

2.3. Previous studies on L2A of Greek aspect

Tsimpli *et al.* (2009) investigated the role of grammatical aspect in the production of manner-of-motion verbs by monolingual Greek adults and children as well as Albanian children who learn Greek as L2. The participants were asked to describe video clips which showed (a)telic events. L2 speakers had a similar production to native speakers, but they relied more on lexical cues, rather than on grammatical aspect, in order to describe (a)telicity. The authors found differences between adults and children in the production of manner-of-motion verbs, which can be explained by assuming late acquisition of interface phenomena. Both monolingual and bilingual children overused imperfective constructions. Tsimpli & Papadopoulou (2009) expanded the study within the Interpretability Hypothesis (Tsimpli, 2003; see also Hawkins & Hattori, 2006 and Tsimpli & Dimitrakopoulou, 2007, among others) to determine whether aspect, an interpretable feature, is relevant to the syntax–semantics interface and/or the syntax–discourse interface. They used three types of experimental investigation: a sentence--picture matching task, a comprehension task, and a production task with short videos describing motion verb events. The results were consistent with the previous study. L2 speakers exhibited native-like production, correctly

relating perfective aspect to telic events and imperfective to atelic ones. Adult L2 learners again relied on lexical cues (prepositions and verbs) to encode telicity rather than on grammatical aspect, but in general their production was near-native. The findings of Tsimpli & Papadopoulou's study support the Interpretability Hypothesis: aspect is not a problem for L2 acquisition.

Up to now, very little is known about the acquisition of embedded aspect in Greek, and no research exists concerning L2A in Cyprus, particularly, as in the present study, comparing native and non-native speakers of Cypriot Greek.

2.4. Hypotheses and predictions of the study

Based on the previous discussion, the following five working hypotheses with respect to the L2A of aspect in Greek by L1 Russian speakers can be put forth:[1]

i. There is transfer from L1 Russian in the initial stage of acquisition and advanced L2 learners reach native-like performance ('Full Transfer/Full Access': Schwartz & Sprouse (1994, 1996); Slabakova (2001, 2005); Schwartz (2003); White (2003); Gabriele (2005)).

ii. There is no transfer from L1 Russian and L2 learners show variability in their production but do not reach native-like attainment even at an advanced level ('No Access': Clahsen & Muysken (1986); 'Partial Access': Smith & Tsimpli (1995); Hawkins & Chan (1997)).

iii. Child L2 is similar to child L1 in the domain of inflectional morphology, but it is similar to adult L2 in the domain of syntax in that L1 transfer influences only the domain of syntax and not the domain of inflectional morphology, the age of onset influences the domain of inflectional morphology but not the domain of syntax ('Domain by Age Model': Schwartz (2003)).

iv. There is no difference between Russian–CG and Russian–SMG speakers in test production, consequently the differences between SMG and CG do not influence the L2 acquisition of Greek aspect.

v. There is a difference between Russian–CG and Russian–SMG speakers in test production, consequently the difference between SMG and CG influences the L2 acquisition of Greek aspect and Russian–CG speakers face more difficulties dealing with two Greek dialects.

[1] Note that when the difference is irrelevant to the discussion, both varieties of Modern Greek are simply referred to as 'Greek'; otherwise, Standard Modern Greek, the standard variety spoken in Greece, will be abbreviated as 'SMG' and Cypriot Greek, spoken in the Greek part of the Republic of Cyprus, as 'CG'.

Hypotheses (i)–(iii) would be straightforward adaptations of existing models (as referenced there); hypotheses (iv) and (v) constitute first reformulations of these applied to the specific context of L2A investigated here, namely, whether L1 Russian speakers acquire their L2 in Greece (SMG) or in Cyprus (CG), and additional factors related to the two varieties.[2]

3. The present study

3.1. Participants

This study was carried out with two types of L2 populations, children and adults in each, and their respective controls. There was a written task (for details, see section 3.2.1), an oral component (section 3.2.2), and a language history questionnaire, which was administered to obtain information regarding the participants' background and language learning experience (e.g., gender, age, the participants' native language, experience in learning, proficiency level, age of onset, and frequency of exposure to L2). Participants, of different socioeconomic status, were all volunteers recruited in two countries, Greece and Cyprus.

In total, 276 participants took part in the written task (see section 3.2.1): 63 Russian–SMG speakers (13 adults, 50 children) and 75 Russian–CG speakers (25 adults, 50 children) as well as two control groups, 75 monolingual SMG speakers (25 adults, 50 children) and 63 monolingual CG speakers (25 adults, 38 children). Details are provided in Table 2 addressing number of participants (N), gender, mean age, length of residence (LoR), age of onset (AoO), and the type of language acquisition:

Group	*N*	*Gender*		*Age (in years)*	*LoR (in years)*	*AoO (in years)*	*LA type*
		male	*female*				
Russian–CG adults	25	–	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
Russian–SMG adults	13	3 (23%)	10 (77%)	38.5	12.5	28.8	adult L2

[2] See Grohmann & Leivada (2012) and Rowe & Grohmann (under review) for a discussion of the sociolinguistic status of CG in (first) language acquisition, some differences between CG and SMG, and references to a large body of literature on the topic from formal and sociolinguistic perspectives.

Russian–SMG children	50	17 (34%)	33 (66%)	16.0	12.8	3.2	bilingual L1/L2
CG adults	25	10 (40%)	15 (60%)	39.8	–	–	L1
CG children	50	24 (48%)	26 (52%)	14.0	–	–	L1
SMG adults	25	5 (20%)	20 (80%)	35.4	–	–	L1
SMG children	38	16 (42%)	22 (58%)	14.5	–	–	L1

Table 2: Participants in the written task

There were 124 participants who took part in the oral video stimuli task (see section 3.2.2): 36 Russian–CG speakers (18 adults and 18 children) and 42 Russian–SMG speakers (5 adults and 37 children) as well as two control groups, 16 monolingual SMG speakers (10 adults and 6 children) and 30 monolingual CG speakers (9 adults and 21 children). Details are provided in Table 2:

Group	*N*	*Gender*		*Age (in years)*	*LoR (in years)*	*AoO (in years)*	*LA type*
		male	*female*				
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	21.0	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	–	–	L1
CG children	21	12 (57%)	9 (43%)	5.4	–	–	L1
SMG adults	10	3 (30%)	7 (70%)	31.2	–	–	L1
SMG children	6	3 (50%)	3 (50%)	6.1	–	–	L1

Table 3: Participants in the oral video stimuli task

3.2. Materials

3.2.1. Written task

For the written study, the materials included a language history questionnaire (25 questions) and a two-task test based on Malagardi (1993) and Moser (1993). There was a forced-choice task with 36 items and an elicited production task (cloze task) with 36 items. In each task, the 36 test items were made up of 6 structures for each type of main verb, 30 of which with a perfective target and the remaining 6 items for the imperfective condition.

In the forced-choice task, participants were asked to choose between two sentences in which the matrix clause was the same, while the aspect of the embedded clause was different (perfective vs. imperfective); the target was the perfective. In the cloze task, the participants were asked to fill in the gap with the embedded verb in its relevant aspectual form; each sentence was accompanied by a picture which facilitated the choice of the relevant verb. For the perfective condition, cases of such embedded environments were used where only perfective aspect is allowed in Greek, while Russian allows either perfective or imperfective; for the imperfective condition, sentences were used where only imperfective aspect is allowed in both languages, Russian and Greek.

For the perfective condition, five types of main verbs were used which all require perfective aspect in the embedded clause. The first type was the accomplishment verb *prospathusa* 'try' with a continuous interpretation, as shown in (1).

(1) a. *Prospathuse na epileksi to doro gia ti mama tis.*
She was trying NA choose-PERF the present for the mum her.
b. *Prospathuse na epilegi to doro gia ti mama tis.*
She was trying NA choose-IMP the present for the mum her.
'She was trying to... choose the present for her mum.'

The second type of matrix verb was the perfective non-ingressive state verb *fovithika* 'be afraid of':

(2) a. *Fovithike na kopsi tin tomata.*
She was afraid NA cut-PERF the tomato.
b. *Fovithike na kovi tin tomata.*
She was afraid NA cut-IMP the tomato.
'She was afraid to... cut the tomato.'

The third type was the perfective ingressive state main verb *borese* 'be able':

(3) a. *Borese na anapsi tin fotia*.
He could NA light-PERF a fire.
b. *Borese na anavi tin fotia.*
He could NA light-IMP a fire.
'He could ... light a fire.

The fourth type was the perfective volitional verb in the past tense *ithela* 'want':

(4) a. *Ithele na vri to musio*.
He wanted NA find-PERF the museum.
b. *Ithele na vriski to musio.*
He wanted NA find-IMP the museum.
'He wanted to ... find the museum.'

The fifth type was the activity verb expressing a purpose or a goal with *na* being a short form of *gia na* 'in order to':

(5) a. *I Elena ipie to kafe gia na ksekinisi ti mera tis*.
the Helen drank the coffee for NA start-PERF the day her.
b. *I Elena ipie to kafe gia na ksekina ti mera tis.*
the Helen drank the coffee for NA start-IMP the day her.
'Helen drank coffee to... start her day.'

For the imperfective condition, there was used one type of the main verb *arhise* 'start' was used, which requires only the imperfective aspect of the embedded clause:

(6) *a. Arhise na horevi.*
he started NA dance-IMP.
b. Arhise na horepsi.
he started NA dance-PERF.
'He started to... dance.'

3.2.2. Oral video-stimuli task

The oral-production video task included 36 short video stimuli with 6 types of main verbs (6 video clips for each type) and two conditions: perfective and imperfective. The video clips showed on-going actions and the participants were asked to complete the sentence with the embedded clause in the past tense, such as (7b) to complete (7a) for the imperfective condition and (8b) to complete (8a) for the perfective condition.

(7) a. *To koritsi arhise na…*
thegirl began NA
b. *... pleni ta heria.*
wash the hands-IMP
'The girl began to… wash her hands.'

(8) a. *To koritsi pire tin petra gia na…*
thegirl took the stone for NA
b. *... petaksi sti thalassa.*
throw-PERF into-the sea'
'The girl took the stone in order to… throw it into the sea.'

4. Results and Discussion

4.1 Written task

Not surprisingly, native speakers performed better than the L2 groups. In Greece, the performance of both monolingual and bilingual/L2 groups was better than the corresponding groups in Cyprus; see Table 4:

	GREECE		*CYPRUS*	
	63 Russian–SMG (adults + children)	*63 SMG (adults + children)*	*75 Russian–CG (adults + children)*	*75 CG (adults + children)*
prospathuse	1.21%	0.33%	1.94%	0.38%
fovithike	3.30%	1.10%	3.66%	2.46%
mborese	0.97%	0.28%	1.35%	0.16%
gia na	1.52%	1.21%	2.48%	1.20%
arhise	1.52%	0.33%	2.09%	0.40%
ithele	0.90%	0.11%	1.16%	0.31%
Total	9.43%	3.37%	12.70%	4.94%

Table 4: Non-target test production of the groups

According to an ANOVA (means) statistical analysis, there is a statistically significant difference concerning test production between the bilingual Russian–CG group and both monolingual groups (CG-speakers from Cyprus and SMG-speakers from Greece) as well as between the bilingual Russian–SMG group and the monolingual CG group. Compared within groups, the two bilingual groups of speakers (i.e. Russian–CG and Russian–SMG) and the two monolingual groups (CG and SMG) do not differ significantly in terms of their task performance. More interestingly, perhaps, there is also no statistically significant difference between the bilingual Russian–SMG and the monolingual SMG groups.

Group	*Group*	*t-value*	*Degree of freedom*	*Probability*
Russian–CG	Russian–SMG	0.248	136	.8041
Russian–CG	CG	3.947	148	.0001*
Russian–CG	SMG	2.058	136	.0415*
Russian–SMG	CG	3.523	136	.0006*
Russian–SMG	SMG	1.736	124	.0851
CG	SMG	–1.714	136	.0889

Table 5: ANOVA statistical analysis

The perfective condition was more problematic than the imperfective for non-native groups, since in L1 Russian both perfective and imperfective aspects are possible, so either positive or negative transfer might take place. The most problematic types of main verbs for all groups were *fovithike* 'afraid' and activity verbs with *gia na* 'in order to' (perfective condition), as Figure 1 shows:

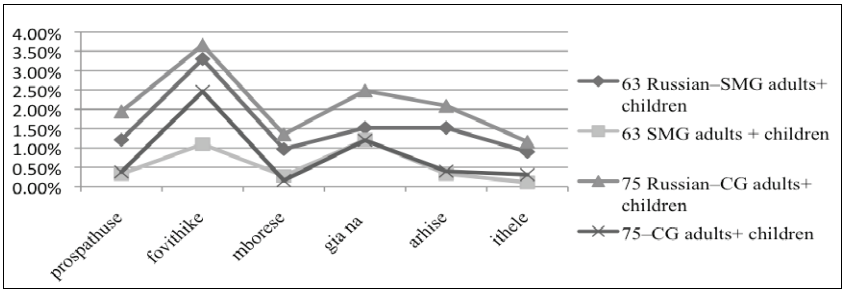

Figure 1: Types of main verbs

	Greece		*Cyprus*	
Target production	13 Russian–SMG adults	25 SMG adults	25 Russian–CG adults	25 CG adults
Total	71.59%	97.67%	84.3%	95.62%
Target production	50 Russian–SMG children	38 SMG children	50 Russian–CG children	50 CG children
Total	95.5%	95.95%	88.84%	94.78%

Table 6: Target test production: adults vs. children

In both contexts (Greece and Cyprus), the test production of monolingual adults (97.67% and 95.62%) was slightly better than that of monolingual children (95.95% and 94.78%). In the L2 groups (both SMG and CG),

children (95.5% and 88.84%) performed better than adults (71.5% and 84.3%). In general, L1 participants had near 100% target production (which can serve as evidence for test reliability) and L2 learners (except for the Russian–SMG adults) had a relatively high rate of production (above 84%). This is shown in Table 6.

According to an independent group t-test between means, statistically significant differences were found between the following groups:

Group	*Group*	*p-value*
Russian–CG adults	CG children	.0000*
	CG adults	.0000*
	SMG adults	.0000*
	Russian–SMG adults	.0005*
Russian–SMG adults	Russian–SMG children	.0000*
	SMG adults	.0000*
Russian–CG children	CG children	.0009*
	Russian–SMG children	.0002*
	SMG children	.0087*

Table 7: t-test between means analysis

L2 adults (both SMG and CG) performed significantly differently from L1 adults. The test production of Russian–CG adults and children was not statistically different, but Russian–SMG adults' and children's test performance was. L2 children in Cyprus and in Greece performed significantly differently; the same goes for the L2 adults. The results of the t-test can confirm that the bi--*x* (Grohmann, 2011; Grohmann & Leivada, 2012) or the bilectal setting in Cyprus (Rowe & Grohmann, under review) – that is, exposure to both SMG and CG – influences the production of L2 learners of Greek.

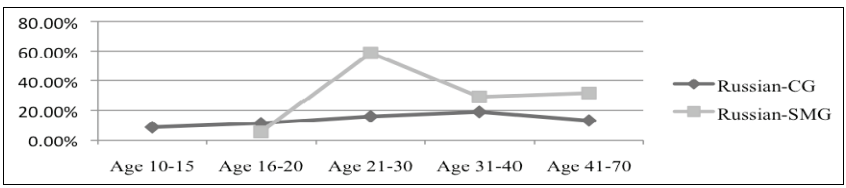

Figure 2: Age of the participants and non-target test production

As can be seen from the following figures, variables such as age of participants, length of residence in the country (LoR), age of onset (AoO), usage of Greek, self evaluation of Greek, and level of education play an important role in participants' test production. Figure 2 shows the distribution of the non-target production according to the age groups of the participants. Here it can be seen that both Russian–SMG and Russian–CG participants

from the age groups 16-20 and 31-40 performed nearly the same. There is no correlation between age of participants and their test production.

From Figure 3 it can be seen that there is a correlation between the length of residence or the length of exposure to L2 (CG or SMG, respectively) and the non-target test production of the participants (Russian–CG and Russian–SMG): the longer the participants stay in the L2 country, the better test production they show. It is interesting that participants from both bilingual groups with 6-10 and 11-15 years of exposure to L2 behaved nearly the same.

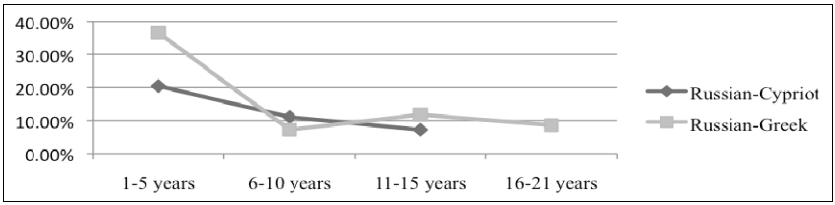

Figure 3: LoR of the participants and non-target test production

Figure 4 presents the distribution of the participants' non-target production according to their age of onset for L2 (CG and SMG). Both Russian–CG and Russian–SMG speakers pattern similarly: the lower the age of onset, the better test production the participants show.

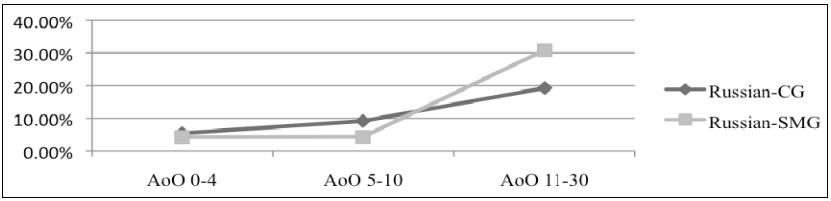

Figure 4: AoO of the participants and non-target test production

Figure 5 shows the correlation between the participants' non-target production and their usage of L2 (either CG or SMG) on a daily basis. It can be seen that the more the participants use the L2, the better test production they show. Both Russian–CG and Russian–SMG speakers display similar patterns.

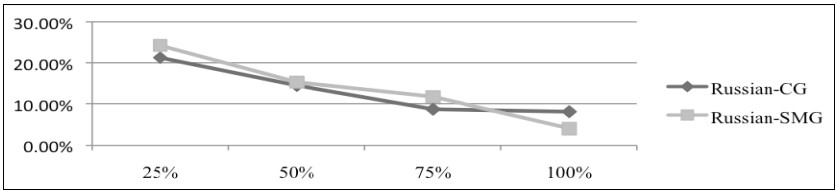

Figure 5: Greek use of the participants and non-target test production

Figure 6 reflects the interdependence of the participants' non-target test production and their self-evaluation of their knowledge of Greek. It can be seen that advanced learners performed better than beginners; this is true both for the Russian–CG group and the Russian–SMG group.

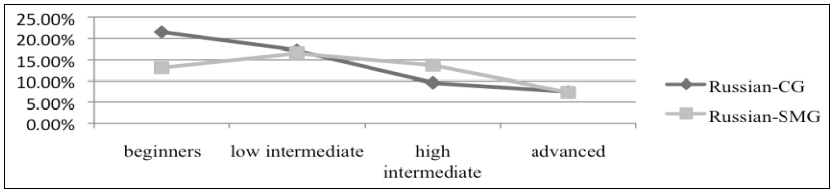

Figure 6: Self-evaluation of Greek of the participants and non-target test production

The correlation between the participants' non-target test production and their level of education is represented in Figure 7. It is interesting to see that the lower the level of education the participants have, the better test production they show, both for the Russian–CG and the Russian–SMG groups.

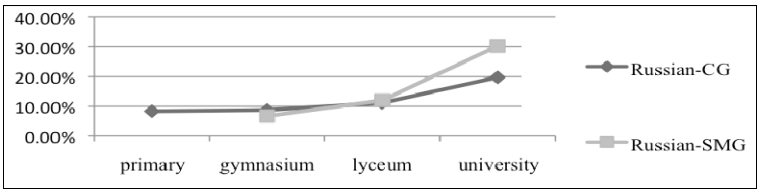

Figure 7: Level of education of the participants and non-target test production

4.2. Oral task

The results of the video task are overall consistent with the written task. The non-native speakers performed worse than the native groups. Children in both groups performed better than adults, except for the SMG group, where both adults and children displayed the same performance. Russian–SMG speakers performed better than Russian–CG speakers. As in the written task, the most problematic types of main verbs for all groups were *fovithike* 'be afraid of' and activity verbs with *gia na* 'in order to' (perfective condition). The native speakers (both CG and SMG) had above 98% of target production, which proves the reliability of the task, and the non-native speakers of CG and SMG had above 93% of target test production, except for the Russian–CG adult group (76.09%), as Table 8 shows:

Types of main verbs	*Russian–CG*		*CG*		*Russian–SMG*		*SMG*	
	adults	children	adults	children	adults	children	adults	children
	18	18	9	21	5	37	10	6
prospathuse	6.01%	1.23%	0.26%	–	1.11%	0.15%	0.27%	0.46%
mborese	2.93%	0.92%	0.26%	–	–	0.07%	0.27%	0.46%
fovithike	4.32%	1.54%	0.26%	0.30%	0.55%	0.15%	0.27%	–
ithele	3.85%	0.61%	0.52%	–	0.55%	0.07%	0.22%	0.46%
gia na	4.01%	0.77%	0.13%	–	3.88%	0.37%	–	0.46%
arhise	2.77%	1.23%	0.13%	–	–	–	–	–
total non-target	23.91%	6.32%	1.58%	0.30%	6.11%	0.75%	1.38%	1.38%
Total target	76.09%	93.68%	98.42%	99.7%	93.89%	99.25%	98.62%	98.62%

Table 8: Non-target production in the oral video stimuli task

The data from the written and oral experiments are in line with the Lexical Aspect Hypothesis (Andersen, 1991), according to which (i) learners first acquire perfective and then imperfective aspect, and (ii) 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 that the L2 beginners were more likely to choose imperfective aspect in comparison to L2 intermediate or advanced learners (Kempchinsky & Slabakova, 2005; Chin, 2009). Besides, according to Borik (2002), imperfective aspect in Russian describes not only on-going and episodic situations, but also knowledge about facts, so that 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 statistical analysis, there is a statistically significant difference only between Russian–CG and control groups of CG and SMG; see Table 9:

Group	*Group*	*t-value*	*Degree of freedom*	*Probability*
SMG	CG	–0.198	44	0.844
SMG	**Russian–CG**	**–5.555**	**50**	**.0000***
SMG	Russian–SMG	0.024	56	0.9809
CG	**Russian–CG**	**–6.504**	**64**	**.0000***
CG	Russian–SMG	0.286	70	0.7758
Russian–CG	**Russian–SMG**	**7.38**	**76**	**.0000***

Table 9: ANOVA statistical analysis

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; see Figure 8:

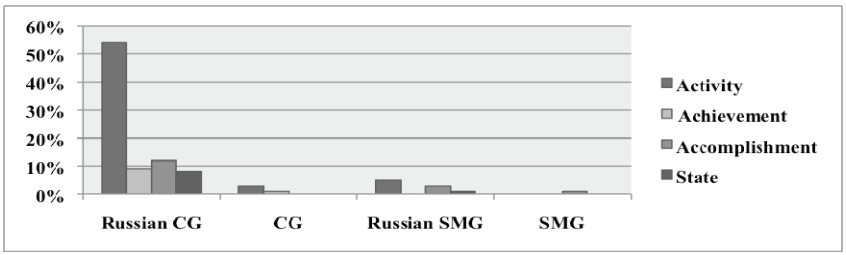

Figure 8: Non-target production: embedded verbs

Children, more than adults, substituted embedded aspectual forms with general all purpose verbs that do not have aspectual specification in Greek; see Figure 9:

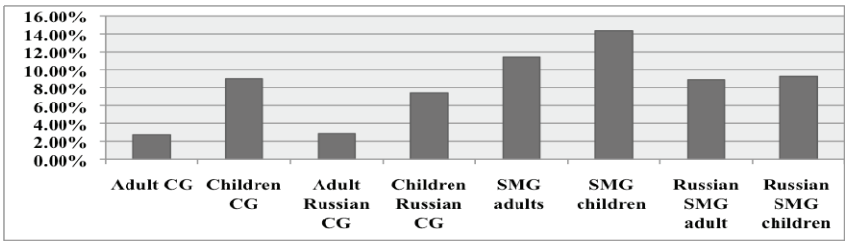

Figure 9: Non-target production: GAP verbs

As can be seen from the following figures, the most important variables for the participants' test production were LoR in the country and AoO. Figure 10 shows the distribution of the non-target production according to LoR in Cyprus and Greece. Russian–CG and Russian–SMG speakers pattern differently. For the Russian–SMG group, the more years the participants are exposed to SMG, the better test production they show, which is, however, not true for the Russian–CG group.

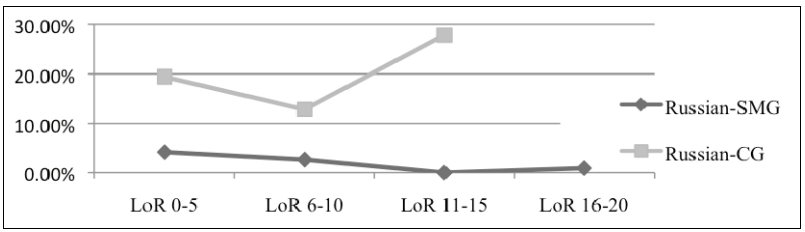

Figure 10: LoR of the participants and non-target test production

Figure 11 demonstrates that AoO to L2 plays a crucial role in the success of L2 acquisition. The participants with a lower AoO to L2 (either CG or SMG) performed better than the participants who were exposed to L2 later.

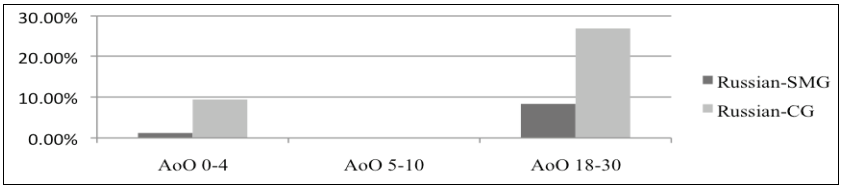

Figure 11: AoO of the participants and non-target test production

4.3. Comparison of written vs. oral tasks

The results of the oral video stimuli task are consistent with the results of the written task; the patterns are similar, for both groups of bilingual participants: all groups, except for the Russian–CG adults, performed better in the oral task than the written task. The written task might be more difficult for the participants as they had to write, while in the oral task they only had to pronounce the relevant aspectual form of the verb in order to complete the sentence. In general, both in the oral and in the written tasks, Russian–SMG and Russian–CG adults performed worst of all, while the native groups of CG and SMG adults performed best. Bilingual children (Russian–CG and Russian–SMG) performed better than bilingual adults, while monolingual children (CG and SMG) performed worse than monolingual adults. In general, monolingual learners scored above 94% in the written task and above 98% in the oral task, while L2 learners rated higher than 84% in the written task and higher than 93% in the oral task. It should be noted then that the mode of presentation (oral vs. written) affects the participants' productions. The rate of target production at more than 93% in the oral mode may give rise to the assumption that L2 learners might reach a near-native level of attainment (for embedded Greek aspect), though there is some variability, mainly concerning L2 adult acquisition.

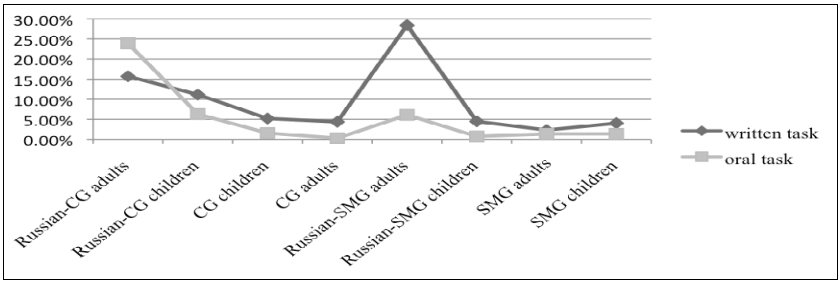

Figure 12: Written vs. Oral task non-target test production

There were more non-target test productions in the perfective condition than in the imperfective condition in the written task (Figure 13), except for the Russian–SMG adult group, and in the oral video stimuli task, except for the Russian–CG children (Figure 14). This provides evidence in support of the transfer hypothesis, as the errors in the perfective condition by Russian–CG and Russian–SMG groups might be due to the transfer from their L1 Russian; though we hasten to add that the percentages are not really high.

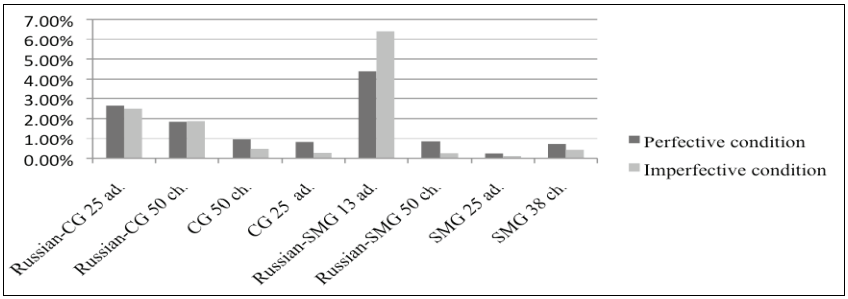

Figure 13: Perfective vs. imperfective condition in the written task

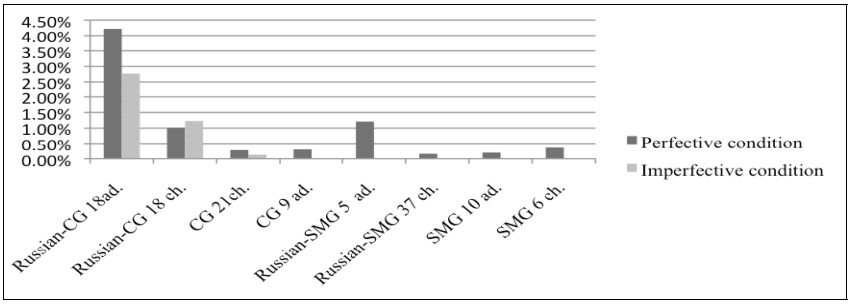

Figure 14: Perfective vs. imperfective condition in the oral task

5. Conclusion

The findings of the study support the Full Transfer/Full Access Hypothesis (Schwartz & Sprouse, 1994, 1996; Slabakova 2000, 2001, 2005; Montrul & Slabakova, 2002, 2003): aspect is part of Universal Grammar, L2 learners can reach native-like attainment due to access to it – but at the initial stage of L2 acquisition, transfer from L1 into L2 takes place. This study provides evidence in support of the Full Transfer/Full Access Hypothesis by investigating how learners with a homogeneous L1 background (Russian) acquire L2 aspect in different dialectal settings of Modern Greek (SMG in Greece and CG in Cyprus; for some discussion, see Grohmann 2011).

L2 learners of CG transfer from L1 in the early stages of acquisition; with an increase in the length of exposure to L2, a decrease in the age of L2 onset, and higher level of CG proficiency and education, the performance of L2 learners improves and L1 interference decreases. The near-target production by the native-speaker control group (above 98%) shows that the task was appropriate to test non-native learners. In general, the findings of the study show that L2 learners are able to achieve near native-like competence of embedded aspect in the L2, with a target performance higher than 93% (with the lower scores of L2 adults at 71% for SMG in the written task and 76% for CG in the oral task). On the basis of this, there is variability in terms of the adult populations. One explanation for deviant non-target performance of the Russian–CG group in the oral task in comparison to more target-like production in the written task is that the test was written and presented in SMG, the language of instruction at school in Cyprus and the only codified written language of Greek, while the mode of oral interaction in Cyprus is CG. We believe that for this reason Russian–CG learners found the written task, in which they had to use SMG, easier than the oral task, in which they heard the beginning of the sentence in SMG and then had the option of finishing it in either SMG or CG. In such a case, this might cause additional problems with the choice of the mode, delay, and substitution of the aspectual forms by general purpose verbs or non-target production. The distribution of errors among the types of main verbs shows that state verbs are problematic for L2 learners, as they tend to associate them with imperfective aspect rather than perfective. This seems to be in line with the Aspect Hypothesis (Andersen, 1991; Li & Shirai, 2000): L2 children, more than adults, substituted verb forms (perfective or imperfective) with general all-purpose verbs, which do not have aspect specification in Greek. 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.

There were some differences between children's and adults' test productions. In terms of the written task, it was found that Russian–SMG child L2 test production is closer to child L1 than to adult L2, while the production of Russian–CG shows that child L2 is both close to child L1 and adult L2. The oral task results show that both Russian–SMG and Russian–CG child L2 is closer to child L1 rather than adult L2. According to the Domain--by-Age Model (Schwartz, 2003), there is a similarity between child L2 and child L1 in the domain of inflectional morphology, but in the domain of syntax, child L2 is similar to adult L2. Age of onset influences only the domain of inflectional morphology and L1 transfer only the domain of syntax. The problems with the correct choice of the embedded aspect in Greek, perfective or imperfective, might be a problem with surface inflectional morphology, as the learners should decide whether to change or

not the final consonant of the verbal stem. Then the results of the experiment might be taken to serve as evidence in support of the Domain-by-Age Model – but only partially, as aspect combines syntax, semantics, and morphology: transfer from L1 was found in the initial stages of L2A and the Domain--by-Age Model claims that transfer takes place only in the domain of syntax but not with inflectional morphology.

The aim of the present paper was to compare child and adult L2 acquisition of Greek embedded aspect by L1 Russian populations in two representational modes (oral and written) and in two settings: bi-modal (Cyprus, with two modes of Greek: Standard Modern Greek and Cypriot Greek) and unimodal (Greece, with one mode of Greek: Standard Modern Greek). The mode of test presentation obviously affects our experimental results, which might be related to the perceptual and procedural working memory and executive functions issues in the participants (e.g., children vs. adults). Finally, the non-target test production by the Russian–CG group may be due to the diglossic (bilectal) situation in Cyprus that influences language acquisition and learning in very interesting ways. Russian–CG participants have to operate (switch, inhibit, update, plan) in three modes: Russian, CG, and SMG, while Russian–SMG participants only have to maneuver two modes, Russian and SMG. Thus participants from the former group require more complex patterns in the activation of languages in production and perception, being in a multilingual setting (cf. Cenoz *et al.*, 2001) than the relevant population in Greece, who are in a "simple" bilingual setting. Such sociolinguistic concerns seem to play an increasing role in L1 acquisition, especially in diglossic speaker communities (Grohmann, 2011; Grohmann & Leivada, 2012; Rowe & Grohmann, under review), and might also influence L2 acquisition processes, which we hope to investigate further in the future.

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