PRODUCTION OF MOTION VERBS: EVIDENCE FROM L1 AND L2 GREEK
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Abstract
This paper investigates the production of manner-of-motion verbs by three groups of participants: monolingual Greek adults, 6- to 7-year-old monolingual Greek children and 6- to 7-year-old Albanian children acquiring Greek as a second language. The production of motion constructions has been tested through short videos that depicted (a)telic motion events. The aim of the study was to examine the role of grammatical aspect in the expression of (a)telic motion events. The results showed that the monolingual children’s performance differed from that of the adults, suggesting that (a)telicity is a late acquired concept. In addition, the L2 children experienced difficulties with the description of telic events compared to the L1 children and relied more on lexical cues to encode telicity rather than on grammatical aspect.

1. Introduction
The present paper investigates the production of constructions involving manner-of-motion verbs in three populations: monolingual Greek adults and children as well as Albanian children acquiring Greek as a second language. In particular, we explore the role of aspect in the encoding of (a)telic motion events and we examine possible differences between adult and child Greek on one hand and L1 and L2 child Greek on the other.

The Albanian children of our study started acquiring Greek between the ages of four and five years and, therefore, following Schwartz (2003), they constitute a case of child L2 acquisition. Child L2 acquisition is supposed to be different from child L1 and adult L2 acquisition and its investigation may contribute to the understanding of both (Schwartz 2003). Schwartz (2003) proposed an account of child L2 acquisition, the “Domain by Age Model”, according to which child L2 acquisition resembles child L1 acquisition in the development of inflectional morphology, whereas it resembles adult L2 acquisition in the domain of syntactic development. In the present study, we contribute to the examination of child L2 acquisition by comparing the performance of L1 and L2 children on a syntax-discourse interface phenomenon, the production of (a)telic motion events.
The structure of the paper is as follows. Section 2 provides an analysis of manner-of-motion verbs in Greek. In section 3 we present previous studies which have tested motion structures in L1 and L2 acquisition. The method and the results of our study are presented in section 4. Finally, in section 5 our findings are discussed with respect to first and second child language acquisition.

2. Manner-of-motion verbs in Greek

Motion verbs are activity predicates which can acquire an accomplishment (telic) reading depending on the situation and the viewpoint aspect of the verb itself as well as on the properties of their PP modifiers (Talmy 1985). In Greek, as in other languages, motion verbs differ in whether they are compatible with a PP_PATH complement, thus denoting directed motion, or not. Accordingly, motion verbs are distinguished between unambiguously locative manner-of-motion verbs (without directed motion) (e.g. (1)), unambiguously non-locative motion verbs (with directed motion) (e.g. (2)) and ambiguous manner-of-motion verbs between a locative and a non-locative reading (e.g. (3)-(4)).

(1) I Maria xoreve / xorepse (mesa) sto spiti.
   the Maria danced.IMP / danced.PERF (inside) s-the house
   “Maria danced inside the house / in the house / *to the house.”

(2) a. I Maria pijene / pije (mesa) sto spiti.
   the Maria went.IMP / went.PERF (inside) s-the house
   “Maria went inside the house / into the house / to the house.
   b. I Maria ebene / bike (mesa) sto spiti.
   the Maria entered.IMP / entered.PERF (inside) s-the house
   “Maria entered inside the house / into the house.”

(3) O skilos etrehe ston kipo.
   the dog ran.IMP.3S in-the garden
   “The dog was running in/towards the garden.

(4) O skilos etrekse ston kipo.
   the dog ran.PERF.3S in-the garden
   “The dog ran into/towards/inside the garden.”

Sentences (3) and (4) are ambiguous in Greek and the preferred interpretation is closely related to the aspectual form of the verb (see also Horrocks & Stavrou 2007). The
imperfective verb forms may denote only atelic\(^1\) events, i.e. location or direction, as shown in (3). On the other hand, perfective verb forms are ambiguous between the two atelic readings and the telic interpretation, which implies that the complement of the PP has been reached (cf. (4)). Nonetheless, Greek native speakers seem to favor a particular reading with each aspectual form. Namely, in a previous study (Παπαδοπούλου 1996) it was found that Greek monolingual adults prefer to interpret sentences such as (4) as telic, while sentences such as (93) are understood as locative. Following Zubizarreta & Oh (2007), we assume that the locative reading has a different structure from the directional and the telic readings. More specifically, when the PP denotes location, the PP is a VP-adjunct, as shown in (5)\(^2\):

\[
\text{(5) } \begin{array}{c}
\text{VP} \ [\text{PERF/IMP}]
\\
\text{DP} \quad \text{V'}
\\
\text{V'} \quad \text{PP}_{\text{PATH(loc)}}
\\
\text{V}
\end{array}
\]

On the other hand, the PP is a V-complement, when it denotes the GOAL of the motion event:

\[
\text{(6) } \begin{array}{c}
\text{VP} \ [\text{PERF/IMP}]
\\
\text{DP} \quad \text{V}
\\
\text{V'}
\\
\text{V} \quad \text{PP}_{\text{GOAL}}
\end{array}
\]

3. Previous Studies

Studies in first language acquisition have shown that telicity particles in languages such as Dutch, German and English are acquired early (van Hout 1998, 2000; Schulz et al. 2001; Schulz & Penner 2002; Schulz & Wenzel 2005). Moreover, the acquisition of motion verbs depends on whether the language lexicalizes directed motion, like English, or not, like

\(^1\) Notice that imperfective manner-of-motion verbs may denote telic events when they are used to express habituality (cf. Tsimpli & Papadopoulou forthcoming).

\(^2\) For a detailed syntactic analysis of ambiguous manner-of-motion verbs in Greek see Tsimpli & Papadopoulou (forthcoming).
The development of motion constructions has been studied in adult second language by Inagaki (2001), Matsunaga (2006), Montrul (2001) and Navarro & Nicoladis (2005). Their aim was to test whether the argument structure of the L1 constrains motion expressions in the second language. An additional aim of the studies by Inagaki and Montrul was to investigate whether positive evidence facilitates the acquisition of motion verbs. Inagaki (2001) tested the argument structure of manner-of-motion verbs in the interlanguage of intermediate Japanese learners of English and advanced English learners of Japanese. Notice that Japanese, contrary to English, does not allow goal PP complements to appear with manner of motion verbs (cf. 29b). Instead they use a periphrastic structure (cf. 29c), which includes apart from the main directed motion verb a gerund expressing the manner (examples taken from Inagaki 2001: 155):

(7)   a. He ran into the house.
          John-nom school-at walked
          John-nom school-at walking went

In a written grammaticality judgment task with pictures, Inagaki found that the Japanese learners of English accepted sentences such as (7a), which suggests that they were able to recognize the grammaticality of manner-of-motion verbs with goal PPs, due to the availability of positive evidence in the input (Inagaki 2001: 164). However, L1 effects were also obtained, since the learners accepted constructions which are possible in their L1 and which received low judgments by the native speakers of English. On the other hand, the English learners of Japanese exhibited difficulties in identifying the ungrammaticality of sentences such as (7b), due to the lack of positive evidence.

Matsunaga (2006) also tested manner-of-motion verbs with goal PPs in L2 English by German and Japanese speakers. German is similar to English in that it allows goal PPs with manner-of-motion verbs:

(8)   Er rannte ins Haus.
       he ran in.ACC house
       “He ran into the house.”
In a sentence-combining task, she replicated Inagaki’s finding that advanced Japanese learners of English did produce sentences such as (7a) and actually to the same extent as German speakers. L1 influence from Japanese was observed in less proficient learners of English.

Montrul (2001) investigated the (un)availability of transitivity alternations with manner-of-motion verbs in L2 English and Spanish. More specifically, in English unergative manner of motion verbs (9a) undergo a transitivity alternation when the PP denoting the endpoint is present (9b), whereas this construction is not possible in Spanish (9c) and Turkish (9d):

(9)  a. The soldiers marched.
     b. The captain marched the soldiers to the tents.
     c. *El capitán marchó a los soldados hasta el campamento.
     d. *Asker-ler heyke-l-e yürü-dü.

In a picture judgment and a grammaticality judgment task, she found L1 effects in the acquisition of the argument structure for manner-of-motion verbs. Namely, (i) Spanish and Turkish learners of English were reluctant to accept sentences such as (31b) and (ii) English learners of Spanish were more likely to accept sentences such as (31c) than Turkish learners of Spanish. The fact that positive evidence in the input did not facilitate Spanish and Turkish learners of English is attributed by Montrul to the fact that constructions such as (31b) are not very productive in English.

Navarro & Nicoladis (2005) investigated the expressions of motion events used by native speakers and advanced English speaking learners of Spanish through a production task, in which the participants described two silent video excerpts. Spanish differs from English in that directed motion is expressed with path verbs – and not manner-of-motion verbs – combined with PP goals. The findings indicated that the learners, as the native speakers, produced more path than manner-of-motion verbs to denote directed motion events, even though this difference was not overwhelming. In addition, the L2 learners were less likely to produce bare path verbs than the native speakers. Navarro & Nicoladis (2005: 106) conclude that the L2 learners of their study show a clear trend towards the complete acquisition of constructions denoting directed motion, even though their first language is typologically different from Spanish in the encoding of path and they have not received explicit instruction on this phenomenon.

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3 For similar studies in L1 acquisition see (Berman & Slobin 1994; Oh 2003; Özçalişkan & Slobin 1999; Slobin 1996; Hickmann & Hendriks 2006).
To summarize, the main findings from the previous studies presented here show that, although L1 effects are evident, L2 learners can acquire motion structures even when they are differently encoded in their native language.

4. The present study

In this study we investigated the role of aspectual distinctions in the production of motion constructions. Based on results from previous studies (cf. Παπαδοπούλου 2006), we expect the monolingual Greek adults and children to use grammatical aspect to distinguish between telic and atelic motion events in terms of strong preference. Namely, we predict that they will prefer to employ imperfective manner-of-motion verbs to express atelic motion events, while the perfective aspect will be preferably used for the description of telic motion events. On the other hand, we expect the L2 children to experience difficulties with the integration of grammatical and lexical information to encode (a)telicity.

4.2 Method

4.2.1 Materials

The experimental material consisted of twenty-six short videos: two practice, eight filler and sixteen critical videos. The critical videos involved eight motion events presented in two different conditions: in one condition one entity was performing a motion event (i.e. walking) in a certain location (atelic video), whereas in the other condition the same entity was shown to perform the same motion activity and to arrive at a certain endpoint (telic video). For instance, a video showing a dog running in a garage represented the atelic condition. On the other hand, a video depicting a dog running towards and arriving at the garage represented the telic condition. The eight motion activities employed in this task were supposed to be illustrated by manner of motion verbs such as to walk (twice), to run, to fly (twice), to crawl, to drive and to jump. Moreover, the participants were expected to use prepositions such as in, on, into, onto and behind to express the motion events. The filler videos described various kinds of non-motion actions.

4.2.2 Procedure

The experimental items (short videos) were compiled into one movie file and were presented to the participants through a movie-player software (e.g. Windows Media Player). The videos were presented on a computer screen and the participants were instructed that they would watch a series of short videos and then they would be asked to describe what they saw. There was a small pause after each short video, during which the screen turned black. At that point, the experimenter paused the video and asked the question “What did the … do?”
response was written down by a second experimenter on an answer sheet. All participants were tested individually in a quiet room.

4.2.3 Participants
Overall twenty-seven subjects participated in the production experiment, ten adults, eight monolingual children and nine L2 children. The L2 children that participated in the study were all Albanian and they were all raised in an Albanian-speaking environment (both parents were Albanian). The age of first exposure to Greek was at 4-5 years. Details about the participant groups are provided in Table 1:

Table 1. Participant groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Number</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults (AD)</td>
<td>10</td>
<td>20-31</td>
</tr>
<tr>
<td>Monolingual children (MC)</td>
<td>8</td>
<td>6;8-7;2</td>
</tr>
<tr>
<td>Child L2 (L2C)</td>
<td>9</td>
<td>6;0-7;2</td>
</tr>
</tbody>
</table>

In addition, all child participants undertook the DVIQ test prior to the conduction of the production task. The mean scores per each group of children (monolingual and child L2) of the DVIQ test are presented on Table 2.

Table 2. DVIQ test

<table>
<thead>
<tr>
<th>Participants</th>
<th>Production</th>
<th>Comprehension</th>
<th>Repetition</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocabulary</td>
<td>Morphosyntax</td>
<td>Metalinguistic concepts</td>
<td>Morphosyntax</td>
</tr>
<tr>
<td>L1 children</td>
<td>87.8</td>
<td>6.99</td>
<td>88.7</td>
<td>11.2</td>
</tr>
<tr>
<td>L2 children</td>
<td>43.2</td>
<td>17.56</td>
<td>48.6</td>
<td>11.41</td>
</tr>
</tbody>
</table>

4.3 Results
All irrelevant responses, i.e. responses that did not involve motion events, have been eliminated. This resulted in the elimination of 4% (6 out of 160 responses) of the adult, 11% (14 out of 128 responses) of the L1 child and 20% (32 out of 144 responses) of the L2 child data. The monolingual children produced significantly more irrelevant responses than the adults ($\chi^2=5.685$, $p<0.02$) and fewer than the L2 children ($\chi^2=6.141$, $p<0.02$). In all subsequent analyses only relevant responses have been counted.
Table 3. Analysis of irrelevant (inappropriate) responses per participant and group

<table>
<thead>
<tr>
<th>Participant</th>
<th>N</th>
<th>Participant</th>
<th>N</th>
<th>Participant</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>EK</td>
<td>1/16</td>
<td>Theodora</td>
<td>0/16</td>
<td>Henry</td>
<td>4/16</td>
</tr>
<tr>
<td>ML</td>
<td>2/16</td>
<td>Elpida</td>
<td>3/16</td>
<td>Alisia</td>
<td>4/16</td>
</tr>
<tr>
<td>IK</td>
<td>2/16</td>
<td>Stelios</td>
<td>1/16</td>
<td>Onesia</td>
<td>0/16</td>
</tr>
<tr>
<td>BM</td>
<td>0/16</td>
<td>Kiriaios</td>
<td>0/16</td>
<td>Sara</td>
<td>3/16</td>
</tr>
<tr>
<td>GF</td>
<td>0/16</td>
<td>Rea</td>
<td>4/16</td>
<td>Ernest</td>
<td>10/16</td>
</tr>
<tr>
<td>GI</td>
<td>0/16</td>
<td>Anna</td>
<td>2/16</td>
<td>Christos</td>
<td>1/16</td>
</tr>
<tr>
<td>KY</td>
<td>0/16</td>
<td>Dimitris</td>
<td>3/16</td>
<td>Alex</td>
<td>4/16</td>
</tr>
<tr>
<td>MA</td>
<td>0/16</td>
<td>Vassilis</td>
<td>1/16</td>
<td>Eleni</td>
<td>2/16</td>
</tr>
<tr>
<td>AG</td>
<td>1/16</td>
<td></td>
<td></td>
<td>Anastasia</td>
<td>4/16</td>
</tr>
<tr>
<td>LI</td>
<td>0/16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6/160 (4%)</td>
<td>Total</td>
<td>14/128 (11%)</td>
<td>Total</td>
<td>32/144 (22%)</td>
</tr>
</tbody>
</table>

The monolingual children produced significantly more irrelevant responses than the adults and fewer than the L2 children.

First, we present the target and non-target responses per video condition and participant group (see Tables 5a and 5b). Any utterances that unambiguously denoted telic motion events in the atelic video condition and atelic motion events in the telic video condition were considered as non-target. For example, the predicate in sentence (10) describes an unambiguously telic event, since the verb beno (enter) incorporates the PATH and the PP stin kuzina (into the kitchen) is necessarily a complement. Such a response is non-target, when the video describes an atelic motion event, and target, when the video illustrates a telic motion event.

(10) I jineka bike stin kuzina.
    the woman entered PERF.3S s-the kitchen
    “The woman entered the kitchen.”

In addition, sentence (11) denotes an atelic, locative, motion event, because the manner-of-motion verb is in the imperfective. Such an utterance was considered as non-target for the telic videos and as target for the atelic videos.

(11) To aeroplanaki petuse se mia ethusa.
    the airplane flew IMP.3S in a room
    “The airplane was flying in a room.”

Consider, finally, sentence (12):

(12) I petaludha petakse mesa sto vazo.
    the butterfly flew PERF.3S in s-the vase
    “The butterfly flew inside/towards/into the vase.”

As already discussed in section 2, the predicate in (12) is ambiguous with respect to the description of (a)telic motion events. In other words, as far as the grammatical representation
is concerned, there are two possible structures. In one, the PP denotes the GOAL and is the complement of the verb, whereas in the other the PP denotes the PATH and is an adjunct. Therefore, such utterances have been counted as target responses in both the telic and the atelic video conditions.

Table 4. Analysis of target and non-target responses per participant and group

<table>
<thead>
<tr>
<th></th>
<th>ATELIC VIDEOS</th>
<th></th>
<th>TELIC VIDEOS</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Adults</td>
<td>L1 children</td>
<td>L2 children</td>
<td>Adults</td>
<td>L1 children</td>
</tr>
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</tr>
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<td>BM 8/8</td>
<td>Kiriakos 6/8</td>
</tr>
<tr>
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<td>Ernest 2/2</td>
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<td>Rea 3/5</td>
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<tr>
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<td>Anna 8/8</td>
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</tr>
<tr>
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<tr>
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</table>

In the atelic videos both child groups produced fewer target responses than the adults (L1 children: $\chi^2=9.503$, $p<0.01$; L2 children: $\chi^2=8.552$, $p<0.01$), while there were not statistically significant differences between the two child groups. On the other hand, in the telic videos all between-group analyses were significant. Specifically, the adults produced significantly more target responses than both child groups (L1 children: $\chi^2=5.747$, $p<0.02$; L2 children: $\chi^2=24.530$, $p<0.001$) and the monolingual children produced more target responses than the bilingual children ($\chi^2=5.907$, $p<0.02$).

The following table presents the percentages of ambiguous (cf. (12)) and unambiguous target responses in the atelic video condition. Utterances containing imperfective manner-of-motion verbs (e.g. (11)) and responses in which lexical means or inherently atelic verbs are used to express location (cf. (13) and (14) respectively) were counted as unambiguous:

(13) Enas antras ekane voltes stin apothiki.

a man did1sg rounds s-the loft

“A man was walking back and forth in the utility room.”

(14) To koritsi horopidhise mesa stis laspes.

the girl bounced_perf.3s in s-the mud

“The girl was bouncing in the mud.”
Table 5. Analysis of ambiguous and unambiguous responses in the atelic videos per participant and group

<table>
<thead>
<tr>
<th>ATELIC VIDEOS</th>
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<tr>
<td></td>
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<td>L2 CHILDREN</td>
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<tr>
<td></td>
<td>Participant</td>
<td>AMB</td>
<td>UNAMB</td>
<td>Participant</td>
<td>AMB</td>
<td>UNAMB</td>
<td>Participant</td>
<td>AMB</td>
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<td>5</td>
<td>Vassilis</td>
<td>2</td>
<td>4</td>
<td>Eleni</td>
<td>0</td>
<td>7</td>
<td></td>
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</tr>
<tr>
<td>AG</td>
<td>0</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>Anastasia</td>
<td>0</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>LI</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (20%)</td>
<td>15</td>
<td>60</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Total (80%)</td>
<td>8</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

The adults and the monolingual children produced significantly more ambiguous responses than the L2 children (adults: $\chi^2=6.348$, p<0.02; L1 children: $\chi^2=3.871$, p<0.05), whereas the two monolingual groups did not differ from each other.

The (un)ambiguous responses for the telic video condition are shown in table 6. Notice that unambiguous target responses in the telic condition were utterances including a perfective motion verb that inherently denotes PATH, i.e. go, enter (e.g. (10)).

Table 6. Analysis of ambiguous and unambiguous target responses in the telic videos per participant and group

<table>
<thead>
<tr>
<th>TELIC VIDEOS</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ADULTS</td>
<td>L1 CHILDREN</td>
<td>L2 CHILDREN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Participant</td>
<td>AMB</td>
<td>UNAMB</td>
<td>Participant</td>
<td>AMB</td>
<td>UNAMB</td>
<td>Participant</td>
<td>AMB</td>
<td>UNAMB</td>
<td>Participant</td>
<td>AMB</td>
<td>UNAMB</td>
</tr>
<tr>
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<td>4</td>
<td>Theodora</td>
<td>1</td>
<td>6</td>
<td>Henry</td>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ML</td>
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<td>6</td>
<td>Elpida</td>
<td>1</td>
<td>4</td>
<td>Alisia</td>
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<td>2</td>
<td></td>
<td></td>
<td></td>
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<td>IK</td>
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<td>4</td>
<td>Stelios</td>
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<td>4</td>
<td>Onesia</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>BM</td>
<td>4</td>
<td>4</td>
<td>Kiriakos</td>
<td>4</td>
<td>2</td>
<td>Sara</td>
<td>1</td>
<td>0</td>
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<tr>
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<td>5</td>
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<td>2</td>
<td>Ernest</td>
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<td>3</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>GI</td>
<td>6</td>
<td>2</td>
<td>Anna</td>
<td>3</td>
<td>2</td>
<td>Christos</td>
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<td>2</td>
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<tr>
<td>KY</td>
<td>7</td>
<td>1</td>
<td>Dimitris</td>
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<td>2</td>
<td>Alex</td>
<td>0</td>
<td>5</td>
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<td>Vassilis</td>
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<td>4</td>
<td>Eleni</td>
<td>0</td>
<td>4</td>
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</tr>
<tr>
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<td>4</td>
<td></td>
<td></td>
<td></td>
<td>Anastasia</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (47%)</td>
<td>33</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total (53%)</td>
<td>14</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (7%)</td>
<td>2</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

As in the atelic videos, the adults and the monolingual children produced significantly more ambiguous responses than the L2 children (adults: $\chi^2=13.938$, p<0.001; L1 children: $\chi^2=7.104$, p<0.01).

Table 7 presents the ambiguous and unambiguous responses per condition and group.

Table 7. Ambiguous and unambiguous target responses per condition and group

<table>
<thead>
<tr>
<th>Responses</th>
<th></th>
<th>Adults</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>atelic</td>
<td>telic</td>
<td>atelic</td>
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<td>atelic</td>
<td>telic</td>
<td>atelic</td>
<td>telic</td>
<td>atelic</td>
</tr>
<tr>
<td>Ambiguous</td>
<td></td>
<td>15</td>
<td>(20%)</td>
<td>33</td>
<td>(47%)</td>
<td>8</td>
<td>(16%)</td>
<td>14</td>
<td>(35%)</td>
<td>2</td>
<td>(4%)</td>
<td>2</td>
</tr>
<tr>
<td>Unambiguous</td>
<td></td>
<td>60</td>
<td>(80%)</td>
<td>37</td>
<td>(53%)</td>
<td>42</td>
<td>(84%)</td>
<td>26</td>
<td>(65%)</td>
<td>47</td>
<td>(96%)</td>
<td>26</td>
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</table>
As shown in Table 7 both monolingual groups use more ambiguous constructions in the telic than in the atelic video condition (adults: $\chi^2=12.046$, $p<0.01$; monolingual children: $\chi^2=4.344$, $p<0.04$), while this was not the case for the bilingual children. The L2 children are reluctant to use ambiguous constructions (perfective manner-of-motion verbs) in either the atelic or the telic condition.

A final analysis was run on the unambiguous responses obtained in the atelic videos in order to investigate whether the participants relied more on imperfective aspect (grammatical means) rather than on lexical means (light verbs with nouns showing atelic locative events (e.g. 13) and inherently locative verbs marked for perfective (e.g. 14)) to express atelicity.

Table 8. Analysis of unambiguous target responses in the atelic videos per participant and group

<table>
<thead>
<tr>
<th>Participant</th>
<th>Grammatical</th>
<th>Lexical</th>
<th>Participant</th>
<th>Grammatical</th>
<th>Lexical</th>
<th>Participant</th>
<th>Grammatical</th>
<th>Lexical</th>
</tr>
</thead>
<tbody>
<tr>
<td>EK</td>
<td>4</td>
<td>2</td>
<td>Theodora</td>
<td>5</td>
<td>0</td>
<td>Henry</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ML</td>
<td>2</td>
<td>3</td>
<td>Elpida</td>
<td>6</td>
<td>0</td>
<td>Alisia</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>IK</td>
<td>6</td>
<td>2</td>
<td>Stelios</td>
<td>4</td>
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<td>Onesa</td>
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<tr>
<td>BM</td>
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<td>Kiriakos</td>
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<td>Sara</td>
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<td>0</td>
</tr>
<tr>
<td>GF</td>
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<td>0</td>
<td>Rea</td>
<td>0</td>
<td>2</td>
<td>Ernest</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>GI</td>
<td>0</td>
<td>1</td>
<td>Anna</td>
<td>6</td>
<td>1</td>
<td>Christos</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>KY</td>
<td>6</td>
<td>1</td>
<td>Dimitris</td>
<td>5</td>
<td>2</td>
<td>Alex</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MA</td>
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<td>0</td>
<td>Vassilis</td>
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<td>0</td>
<td>Eleni</td>
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<td>4</td>
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<td>3</td>
<td></td>
<td></td>
<td></td>
<td>Anastasia</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>LI</td>
<td>7</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>17</td>
<td>Total</td>
<td>33</td>
<td>9</td>
<td>Total</td>
<td>31</td>
<td>16</td>
</tr>
</tbody>
</table>

No statistically significant differences were revealed among the three groups, which indicates that all three groups relied more on the imperfective aspect to express atelicity rather than on lexical means.

5. Discussion

First our results showed that the monolingual Greek children at the age of 7 years do not exhibit an adult-like behavior when expressing (a)telic motion events, which indicates that the encoding of (a)telicity, at least in the description of motion events, is not acquired early. This might be due to the fact that the expression of (a)telicity depends not only on grammatical but also on pragmatic knowledge.

Turning to the comparison between monolingual and bilingual children, our findings demonstrated that in the atelic video condition the bilingual children did not differ from the monolingual ones with respect to the number of target responses. Moreover, the L2 children, as the two monolingual groups, prefer to use grammatical means, i.e. imperfective aspect, to express atelic events. Therefore, the imperfective aspect is correctly associated with atelic motion events by both the monolingual and the bilingual children.
On the other hand, in the telic video condition the bilingual children performed worse than the monolingual children. In addition, the bilingual children preferred to use unambiguously locative verbs instead of manner-of-motion verbs marked for the perfective aspect in order to express telic motion events. Moreover, in the telic condition the L2 children produced significantly fewer ambiguous responses than the two monolingual groups. Hence, these findings denote that the L2 children seem to rely more on lexical means, i.e. the semantic features of the verb, to encode telic motion events.

Furthermore, the L2 children produced significantly fewer ambiguous responses than the two monolingual groups in the atelic condition, which suggests that the L2 children seem to not associate the perfective aspect with atelicity. Thus, taking together the results from the atelic and the telic videos, it seems that in the L2 children’s representations the imperfective aspect is marked as [atelic], while the perfective aspect is probably underspecified with respect to telicity and this is because they prefer to express telic events lexically. However, this issue needs further investigation with different constructions and verb types.

Another finding of this study was that both child groups exhibited more difficulties in the expression of telic than atelic events. In particular, both child groups were found to overuse the imperfective aspect: the percentages of imperfective verbs in the non-target responses of the telic condition were 62 and 80 for the monolingual and the bilingual children respectively. The overuse of the imperfective aspect might indicate that children favor atelic events. In a recent study, Tsimpli & Papadopoulou (2006) observed that monolingual Greek children prefer to use intransitive constructions more often than adults. Since atelic predicates are necessarily intransitive, the difficulties attested in the child data with the production of telic events might be accounted for by the children’s preference for intransitive constructions.

Another factor that might contribute to the overuse of imperfective aspect in the L2 child data is the morphological formation of the perfective aspect. Assuming that the imperfective form is the citation form, perfective forms involve the application of morphological processes, which might increase the processing load in on-line production.

To conclude, the present study showed that seven-year-old Greek monolingual children differ from adults in the production of (a)telic events, which suggests that interface phenomena are acquired late. This result is in line with recent studies (Clahsen & Felser 2006; Papadopoulou & Tsimpli 2005; Traxler 2003) that report divergent behavior between children and adults as late as at the age of ten years and is worth being further investigated. In addition, the two child groups differed from the adults in that they manifested a preference for intransitive constructions. Finally, the bilingual children were reluctant to use perfective manner-of-motion verbs to express (a)telic motion events, which was not the case for the two monolingual groups. In the telic video condition, they were preferred to employ lexical rather than grammatical means, i.e. perfective aspect, to encode telicity. Hence, it seems that the
highly ambiguous status of the perfective aspect, at least in the constructions tested in this study, is problematic for bilingual children, which has also been attested in adult second language acquisition (Tsimpi & Papadopoulou forthcoming) as well as in SII children (Papadopoulou et al. forthcoming).

References