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Motion event conflation and clause structure

Anna Papafragou, Christine Massey & Lila Gleitman
University of Pennsylvania

How do languages of the world refer to motion? According to one widely held view, languages draw on a pool of common 'building blocks' in representing motion events, such as figure and ground, path (or trajectory), manner, cause of motion, and so on (cf. Talmy, 1985). Nevertheless, individual languages differ both in the elements they select out of the available stock of motion 'primitives' and in the way they conflate them into specific lexical and clausal structures (Talmy, 1985; Slobin, 1996a; Choi & Bowerman, 1991; Jackendoff, 1990; and many others).

The study of cross-linguistic similarities and differences in the encoding of motion events offers important insights into how pre-verbal messages are translated into language-specific configurations of syntactic and semantic information. However, an account of the cognitive processes that underlie production of verbal descriptions of motion also has to examine the contexts in which these descriptions are embedded. This is especially so, since speakers are free to choose from among a number of alternative perspectives or elements in a scene when faced with the task of describing it:

> What we pick out from a scene in terms of entities and spatial relations to be expressed in language is not subject to fixed laws. There are preferences, for sure, following Gestalt properties of the scene, human interest, and so on, but they are no more than preferences.
>
> (Levelt, 1996, p. 102)

Evidence from language production shows that speakers are flexible in formulating spatial descriptions: speakers of languages that do not habitually employ absolute direction terms (*north, south, east, west*) can do so when these terms are suited to the experimental task (Tversky, 1996). Similarly, speakers make choices about when to introduce ellipsis into spatial descriptions (*go right to the blue and then Ø to purple*) that take advantage of language-independent configurational properties of spatial scenes (Levelt, 1996). Flexibility also characterizes comprehension, since hearers routinely go beyond linguistic aspects of spatial descriptions in inferentially reconstructing the details of spatial scenes: for instance, people interpret a verb such as *approach* differently depending on details of the moving object, its target location, the speed of motion and its purpose (cf. *A nun is just approaching the cathedral/the statue*; Morrow & Clark, 1988). Here we begin to address the issue of how speaker flexibility draws on different resources cross-linguistically in order to produce the (highly selective) linguistic encoding of motion scenes.

Beyond contributing to the growing literature on motion, the joint investigation of formal (lexical and grammatical) and pragmatic effects on the cross-linguistic encoding of motion has implications for the interface between conceptual and linguistic representations. For instance, models of language production assume that language-specific demands on the formulation of messages have become automatic in adult speakers and shape the preparation of encodable messages even before the activation of specific lexical items (Levelt, 1989). Similarly, in language acquisition, the mobilization of linguistic resources in preparation for speech (what Slobin calls 'thinking for speaking') is assumed to be affected by knowledge of what is normally encoded in the local language: '…children's attention is heavily channeled in the direction of those semantic distinctions that are grammatically marked in the language' (Berman & Slobin, 1994, p. 622; cf. Choi & Bowerman, 1991). In both cases, however, decisions about what to encode linguistically and what to leave unexpressed are crucially mediated by non-linguistic factors such as informativeness, or expectations about the specific demands of the conversational exchange. How such global considerations operate given the different expressive resources made available by linguistic systems has not been systematically addressed so far.

The degree of flexibility in the linguistic encoding of motion has broader implications for the relationship between language and thought. It has recently been proposed that, in order for cognitive representations to be usable in communication, their format needs to be sensitive to language-specific requirements: for instance, speakers of languages with different deictic or spatial systems must store non-linguistic representations of space in a format which is compatible with their language in case they need to talk about them (Levinson, 1996). On this position, cross-linguistic differences in event encoding are expected to have detectable effects on aspects of event cognition (e.g. memory and categorization). However, if language users can be shown to be flexible in adjusting their event descriptions in accordance with extra-linguistic (communicative) pressures, strict relativistic positions on the possible effects of language on thought become less plausible. In other words, *within-language* variability in event encoding needs to be considered alongside across-language variability in order to assess whether linguistic structure shapes cognitive structure.

Encoding motion cross-linguistically: Path vs. Manner

We focus on a well-known difference in the segmentation and packaging of path and manner of motion in English and Greek (Talmy, 1975). In English and other languages (German, Russian, Chinese, Swedish), manner of motion is typically encoded in the main verb (e.g. *walk, crawl*), while path information appears in nonverbal elements such as prepositional phrases (e.g. *through the forest*). In Greek and related languages (French, Spanish, Japanese, Hindi, Turkish), the verb usually encodes the trajectory of motion (e.g. *descend*), while manner information

may appear in gerunds, prepositional phrases, adverbials or verb compounds with a path and a manner component. The contrast is brought out in the following examples:

(1) English

Mary	drove	to	Venice.
FIGURE	MOTION+MANNER	PATH	GROUND

(2) Greek

I Maria	pige	sti	Venetia	me to aftokinito.
'the-Mary	went	to	Venice	with the car'
FIGURE	MOTION+PATH	PATH	GROUND	MANNER

The lexical resources of English include a large inventory of manner verbs (*strut, bounce, slide, stroll, sashay*, etc.) which can be freely combined with adverbs, particles or prepositional phrases encoding trajectory information (*away, into the forest, upwards*, etc.); path verbs (*enter, exit, descend,* etc.) are fewer in number and more restricted in distribution. By contrast, Greek mostly expresses trajectory information in path verbs (*beno* 'enter', *bgeno* 'exit', *perno* 'cross', *pao* 'go', etc.) combined with prepositional phrases or adverbials which further specify path (*sto spiti* 'into the house', *makria* 'away', etc.).

Greek possesses a number of ordinary manner of motion verbs (*sernome* 'crawl', *perpato* 'walk', *peto* 'fly', etc.). However, their combinatorial options are less open than in English (cf. Aske, 1989; Jackendoff, 1990; Slobin & Hoiting, 1994). Specifically, Greek canonically[1] disallows the co-occurrence of a manner-of-motion verb with a path PP within the same clause when the motion event involves some sort of change of state. For instance, the Greek counterpart of (1) given below lacks the reading according to which Mary started out outside Venice and ended up in the city:[2]

(3)

*I Maria	odigise	sti	Venetia.
'the-Mary	drove	to	Venice'

Contrast such 'resultative' uses to cases where no change of state is involved – for example, cases where a path PP denotes simply direction but not reached endpoint. Manner verbs are now allowed to combine with these PPs:

[1] About one-third of the set of manner-of-motion verbs in Greek do allow bounded path readings; similar exceptions appear in Hindi and other languages (Narashimhan, 1998). However, the explanation for these exceptions is not clear; furthermore, any explanation will have to account for the complication that synonyms across languages do not behave identically (French allows *slipping into the closet*, while Greek does not). See also fn. 3.

[2] (3) can have a reading on which Mary is driving while remaining within Venice. In this case, the PP gets a purely locative interpretation.

(4) I Maria odigise pros ti Venetia.
'the-Mary drove towards the-Venice'

Thus Greek (alongside other languages in its group), unlike English, lacks the option of linguistically packaging complex motion events in the compact way in (3).[3] There are three alternatives available for Greek speakers for expressing resultative motion: they can select a path verb and express the manner-of-motion information as a gerund, prepositional phrase or other modifier (see (5)); they can break down the event into two separate conjoined clauses (see (6)); or they can use a path verb and omit manner information altogether (see (7)):

(5) I Maria pige sti Venetia me to aftokinito / odigontas.
'the-Mary went to Venice with the car / driving'
(6) I Maria pire to aftokinito ke pige sti Venetia
'the-Mary took the car and went to Venice'
(7) I Maria pige sti Venetia.
'the-Mary went to Venice'

The manner-rich alternatives in (5-6) are cumbersome, so unless there is specific reason for manner information to be mentioned, the preferred expression of resultative motion in Greek involves simply the expression of direction as in (7). The resultative constraint thus indirectly contributes to the limited use of manner-of-motion verbs in a language such as Greek.

Several psycholinguistic studies have confirmed these cross-linguistic differences in mapping motion events onto clausal structure. For instance, English speakers have been shown to be more likely to use manner verbs in the description of motion episodes than either Spanish or Greek speakers (Naigles, Eisenberg, Kako, Highter & McGraw, 1998; Gennari, Sloman, Malt & Fitch, 2002; Slobin, 1996b; Papafragou, Massey & Gleitman, 2002). Similar asymmetries in encoding aspects of motion episodes have been documented for child speech cross-linguistically (Choi & Bowerman, 1991; Slobin, 1996; Berman & Slobin, 1994; Özçalişkan & Slobin, 1999; Papafragou et al., 2002; Allen, Özyürek, Kita, Brown, Turanli & Ishizuka, 2003). After reviewing the relevant evidence from Spanish, Sebastián & Slobin (1994, p. 262) concluded that, in Spanish, 'manner is rarely attended to, at any age'.

We have seen that languages differ with respect to the amount of manner information that can be freely combined with path information within a single

[3] The resultative constraint has implications for verb syntax beyond the manner of motion class. On the possible roots of the constraint and its cross-linguistic effects, see Jackendoff (1990), Levin & Rapoport (1988), Narashimhan (1998), and many others.

clause. How does that property affect the organization of speech during communication? We know that competent speakers are able to adjust messages depending on the informational expectations of the talk exchange: they can be more specific when specificity matters, or leave aspects of what they mean to be recovered through inference, rather than encoding them explicitly. A natural question to ask is how such pragmatic factors affect the inclusion of manner information in motion descriptions in languages like Greek.

One plausible hypothesis is that speakers of Greek might be less likely to include manner information if it is inferable from other aspects of the linguistic description or the extra-linguistic knowledge of the hearer. For instance, a speaker who knows that Mary (who lives in Italy) is planning to visit the States can safely say *Mary will go to the States* and let the hearer infer that she will use the normal way of crossing the Atlantic (i.e. she will fly). If Mary decided to take the boat instead, the speaker might be more likely to describe this event by mentioning the manner in her description (*by boat*). Effects of inferability on the structure of event descriptions have been documented elsewhere in the literature: Brown & Dell (1987) found that, in retelling a story, people are more likely to mention atypical (hence non-inferable) instruments for actions than typical ones (e.g. icepicks were more likely to feature in descriptions of stabbing incidents than knives). It is reasonable to expect then that a distinction between inferable and non-inferable kinds of manner might create asymmetries in the encoding of manner in languages such as Greek where manner is otherwise not verbally prominent.

In the following study, we compare linguistic descriptions of motion events by adults and children who are native speakers of English and Greek. We examine how language-specific restrictions on lexicalization/clause structure interface with (probably universal) pragmatic pressures on event encoding such as the omission of inferable information. Additionally, we investigate how the co-ordination of formal and pragmatic factors in motion event encoding develops during language learning.

Study

Participants

Participants were monolingual native speakers of English or Greek who fell into two age groups. One group comprised 22 Greek-speaking 8-year-olds (range 7;2 - 9;2 years; mean 8;4) and 14 English-speaking 8-year-olds between (range 7;5 - 10;0 years; mean 8;11). The second group comprised of 21 Greek-speaking and 20 English-speaking adults.

Method

Materials

Materials consisted of a picture-book containing 24 motion scenes. We used a sequence of three digital color photographs to depict the beginning, the mid-point and the endpoint of each motion episode (e.g. an airplane flying over a barn). In this respect, our study differs from previous studies which used static drawings to depict motion (e.g. the Frog Stories; cf. Naigles et al., 1998). Our motion events were chosen so as to represent familiar everyday actions but also involved certain complex manner-path scenes (e. g. sneaking). In order to maximize consistency, all events involved self-initiated (spontaneous) motion. We also restricted the events protagonists to two animate agents (a man and a dog) and an inanimate but self-propelled object (an airplane). A list of the stimuli is given in Table 1.

	Scenes
1	A man is stumbling into a room
2	A man is entering a room
3	A man is stumbling down the stairs
4	A man is jumping into a room
5	A man is jumping off a chair
6	A man is walking into a room
7	A man is going down the stairs
8	A man is sliding down the stairs
9	A man is walking to the bookcase
10	A man is running up the stairs
11	A man is running down the hall
12	A man is walking up the stairs
13	A dog is driving through a barn
14	A dog is walking through a barn
15	A dog is driving past a barn
16	A man is sneaking out of a room
17	A man is sneaking into a room
18	A man is walking out of a room
19	A man is jumping off the stairs
20	A man is falling off the stairs
21	A man is jumping on a couch
22	An airplane is flying over a barn
23	An airplane is flying around a barn
24	An airplane is flying upside down over a barn

Table 1: Experimental stimuli

Procedure

Each participant was interviewed separately in his or her native language. A single experimenter conducted all experimental sessions. Participants were asked

to verbally describe the pictures. No restrictions were placed on the type of description required and most participants gave a one- or two-utterance response.[4] We analyze the results in three steps focusing on (a) the lexicalization of motion in the main verb (path/manner); (b) the encoding of path/manner in other clausal elements; (c) effects of inferability on the linguistic encoding of motion events.

Event segmentation and lexicalization: Path vs. Manner verbs

Coding and Results

Main verbs in the subjects' responses were coded as Manner, Path or Other (non-motion) Vs. If a response was a combination of Path and Manner verbs, we coded it as Other for this analysis.[5] A list of Path and Manner verbs together with their distribution (tokens) in the speech of adults and children is given in the Appendix.

We created a dependent variable by summing the proportion of scenes for which the main verb was coded as Manner. This variable was then entered into a two-way ANOVA with Language Group (English vs. Greek) and Age Group (Children vs. Adults) as the independent variables. The analysis revealed a main effect of Language Group ($F(1, 73) = 205.60$, $p<.0001$), with English speakers using Manner verbs 69% of the time compared to 22.5% for the Greek speakers. There was also a main effect of Age Group ($F(1, 73) – 38.71$, $p<.0001$): adults used overall more Manner verbs in describing the motion scenes than children did (58.4% vs. 44.5% of responses respectively). The Language Group by Age Group interaction yielded a significant effect ($F(1, 73) = 7.53$, $p = .0076$). The interaction can be explained in terms of the tendency of English-speaking adults to use more Manner verbs than the English-speaking children (80% vs. 54% of responses respectively), while Greek speakers did not differ in the frequency of Manner V usage across ages (16% vs. 28% for adults and children respectively). English-speaking 8-year-olds used fewer Manner Vs than English-speaking adults but more Manner Vs than Greek speakers of either age group.[6]

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[4] Our materials were initially collected as part of Experiment 2 in Papafragou et al. (2002) which compared linguistic descriptions with non-linguistic representation of motion by speakers of the two languages. The linguistic results reported in that paper focused on an analysis of the main verb (path vs. manner) in a subset of the speakers' responses.

[5] The following responses were excluded from motion Vs and were categorized as Other: (a) certain periphrastic expressions of motion in Greek which conveyed path or manner information (e.g. *kano girus* - lit. 'do rounds', *kano gimnastiki* 'do gymanstics', etc.; $n = 29$); (b) responses with the verb *move*/Gr *kinume* and its periphrastic alternates, e.g. *make movements* ($n = 6$). Compounds of path verbs such as *ksanabeno* 'reenter', *ksanabgeno* 'exit again' etc. ($n = 10$) which appeared in the speech of some Greek children were collapsed with their corresponding base forms (*enter, exit*, etc.).

[6] Despite this difference, English speakers do not make use of more Manner V *types* than Greek speakers, as studies based on naturalistic discourse have suggested (Slobin, 1996a; cf. our Appendix). Findings similar to ours have also been reported in experiments comparing Spanish and English (Naigles et al., 1988).

A corresponding analysis was performed using the proportion of Path Vs used by each subject as the dependent variable. There was a main effect of Age Group ($F(1, 73) = 46.48$, $p < .0001$), with adults overall using fewer Path Vs than children (44.8% compared to 72.8%); a main effect of Language Group ($F(1, 73) = 24.23$, $p < .0001$), with Greek speakers using more Path Vs than English speakers (64.1% vs. 25.5% respectively); but no interaction ($F(1, 73) = 0.21$, $p = .6452$). The proportion of Path Vs in the speech of English children vs. adults was 37% vs. 20% respectively; for Greek, the corresponding figures are 66% and 60%.

Overall, then, these results confirm findings in the literature which have documented an asymmetry in the use of Manner and Path Vs in speakers of the English and Greek language group. We next asked whether a similar asymmetry persists once we consider semantic information beyond the main verb.

Event segmentation and clause structure

Coding and Results

This analysis looked at the total amount of information contained in each subject's response including Path and Manner Modifiers. Path Modifiers consisted of source, goal and extend/route nominals (*He's leaving THE ROOM, He's entering THE ROOM*, *He's ascending THE STAIRS*), as well as adverbials and particles/prepositions (*He's going AWAY*) and PPs denoting source, goal, etc. (*He's jumping away FROM THE STAIRCASE, He's going INTO THE ROOM*). Manner Modifiers included Manner PPs, adverbials and gerunds (*He's walking WITH CARE/QUICKLY/DRAGGING HIS FEET*).

Our coding scheme summarized the types of semantic information encoded in subjects' responses regardless of structural position (e.g. in the main verb, a modifier, or an additional clause) in the following three categories: Path-Only, Manner-Only or Mixed. Path-Only responses included a Path V (*He entered*), or a Path V with a Path Modifier (*He went up*). Manner-Only descriptions involved a Manner V (*He's running*), sometimes together with a Manner Modifier (*He's running quickly*). Finally, Mixed descriptions included cases in which a Path V appeared with a Manner Modifier (*He came running, He left towards the end of the hallway running*), a Manner V was combined with a Path Modifier (*He walked in, He slowly walked out of the room*), or both a Manner and a Path verb were used in a multi-clause response which may have contained other Modifiers (*He entered and fell).* We excluded from this analysis those verbal responses which included (a) Stacked Path/Manner Vs (over multiple clauses), since these may have included modifiers of different motion-semantic information than the verb, and (b) irrelevant (non-motion) verbs. The overall distribution of responses is given in Table 2.

	Greek		English	
Sentence structure	**Children**	**Adults**	**Children**	**Adults**
PATH ONLY				
Path V	16.60%	3%	0.60%	0.40%
Path V + Path modifier	32.60%	26.80%	32.40%	12%
MANNER ONLY				
Manner V	5.49%	2.80%	3.90%	2.50%
Manner V+ Manner modifier	0.60%	0.60%	0.90%	0.80%
MIXED				
Path V + Manner modifier	4.50%	5.30%	0.30%	0%
PathV + Path mf + Manner mf	3.90%	23%	1.20%	3.50%
Manner V + Path modifier	4.50%	20.20%	39.60%	71.40%
Manner V + Path mf + Manner mf	0.30%	1.80%	2.70%	4.50%
Manner V + Path V	13.20%	8.70%	5%	1.70%
STACKED/IRRELEVANT Vs				
Stacked Path Vs	9.80%	1.80%	1.80%	0%
Stacked Manner Vs	2.30%	0.60%	4.80%	2.30%
Irrelevant Vs	5.80%	5.10%	6.80%	0.60%
Total	***100%***	***100%***	***100%***	***100%***

Table 2: Overall distribution of participants' responses

We entered the proportion of Path-Only responses into a two-way ANOVA with Language Group (English vs. Greek) and Age Group (Children vs. Adults) as the independent variables. The analysis revealed a main effect of Language Group ($F(1, 73) = 24.23$, $p<.0001$), with English speakers using fewer Path-Only responses compared to the Greek speakers (21.4% vs. 40.6% respectively). There was also a main effect of Age Group ($F(1.73) = 46.48$, $p<.0001$): adults used overall fewer Path-Only strings in describing the motion scenes than children did (20.4% vs. 41.6% of responses). The Language Group by Age Group interaction did not yield a significant effect ($F(1, 73) = 0.21$, $p = .6452$).

The proportion of Manner-Only responses was very low (see Table 2), so we only ran a similar analysis on the Mixed responses. The analysis revealed a main effect of Language Group ($F(1, 73) = 34.04$, $p<.0001$), with English speakers combining path and manner information in their responses 67.6% of the time compared to 43.2% for Greek speakers. There was also a main effect of Age Group ($F(1.73) = 99.09$, $p<.0001$): adults used overall more Mixed responses in describing the motion scenes than children did (70.8% vs. 37% of responses respectively). The Language Group by Age Group interaction yielded no significant effect ($F(1, 73) = 0.20$, $p = .6516$). We conclude that Greek speakers are more likely to omit Manner and give exclusively Path information in

describing motion than English speakers; this is especially true of Greek-speaking children.

Beyond the clause: inferred aspects of event structure

Coding and Results

Given the strong asymmetry in the encoding of manner information across English and Greek speakers, we next asked whether the inferability of manner of motion affects the content of the participants' descriptions. We split the motion scenes in two groups depending on whether manner of motion in the scene was inferable or opaque. The 'Inferable manner' group (n=7) included scenes in which manner was predictable even if not linguistically encoded. One such example was a scene in which a man was walking up the stairs: even if no manner of motion information is given in the scene's description (e.g. 'A man is going up/ascending the stairs'), the hearer can straightforwardly reconstruct the relevant manner details (walking) in the mental representation of the event. By contrast, in the 'Opaque manner' group (n=14), the manner profile of the motion event could not be reconstructed in the absence of linguistic information. For instance, in a scene in which a man is running down a hallway, this manner is not predictable given what else we know about the agent and the ground.

Scenes 2, 6, 7, 9, 18, 22 and 23 (see Table 1) were classified as 'Manner-inferable' and scenes 1, 3-5, 8, 10, 11, 13, 15-17, and 19-21 as 'Manner-opaque'. Scenes 12, 14 and 24 were excluded from the analysis because they included Manner modifiers which contrasted the scenes to previous scenes the subjects had seen (*Here he is walking* NORMALLY).

Our dependent variable was the proportion of participants' verbal responses which included Manner information. We entered this proportion in a repeated measures analysis with Age Group and Language Group as between subjects variables and Scene Type (manner inferability vs. opaqueness) as a within subjects variable (see Figure 1). The analysis revealed a main effect of Age Group ($F(1, 73) = 66.53$, $p<.0001$), since subjects were overall more likely to include Manner information in their descriptions as they grow older. There was also a main effect of Language Group ($F(1, 73) = 75.06$, $p<.0001$), since English speakers are overall more likely to include Manner information than Greek speakers. No significant Age by Language Group interaction was found ($F(1, 73) = 0.2994$, $p = .5858$).

The within subjects analysis revealed a main effect of Scene Type ($F(1, 73) = 109.73$, $p<.0001$). Interestingly, there was a significant Scene Type by Language Group interaction ($F(1, 73) = 70.35$, $p<.0001$): Greek speakers were much more likely to adjust their descriptions depending on whether manner was expected or unpredictable. There was also a significant Scene Type by Age Group interaction

(F (1, 73) = 4.37, p=.0399) but no Scene Type by Age Group by Language interaction (F (1, 73) = 3.04, p = .0852).

Summarizing, Greek speakers are more likely than English speakers to adjust their verbal description of motion to include manner information when this type of information is not inferable from the rest of their linguistic description. English speakers do not need to make such adjustments since their verbal descriptions overwhelmingly encode manner. Even though children are overall less successful in appropriately adding manner information, they are nevertheless sensitive to such language-specific aspects of message preparation.

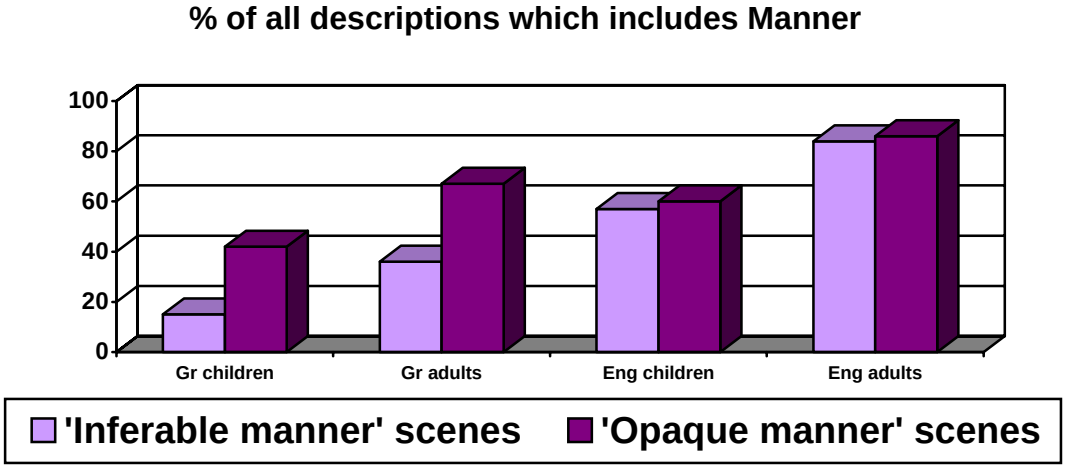

Figure 1: Effects of inferability on verbal descriptions of motion

General Discussion

In this article we investigated the role of formal and pragmatic/contextual factors in the cross-linguistic encoding of motion events. We compared experimentally the production of motion descriptions by children and adults who are native speakers of languages with distinct typological preferences in motion description: Greek and English. Our findings show an asymmetry between the two languages, in that English speakers are overall more likely to include manner of motion information than Greek speakers. However, mention of manner of motion in Greek speakers' descriptions increases significantly when manner is not inferable; by contrast, inferability of manner has no effect on motion descriptions in English, where manner is already preferentially encoded. Taken together, these findings suggest that general pragmatic requirements (e.g. the omission of easily inferable information) interface in different ways with lexical-structural properties of individual languages during the formulation of codable messages. They also suggest that young speakers are sensitive to such language-specific constraints on event encoding.

Our findings are interesting from the point of view of language planning and production. Recall that models of language production assume that language-specific demands on the formulation of messages (e.g. path/manner encoding in the verb) have become automatic in adult speakers and shape the preparation of encodable messages even before the activation of specific lexical items (Levelt, 1989). Similarly, in language acquisition, the mobilization of linguistic resources in preparation for speech is assumed to be affected by knowledge of what is normally encoded in the language (Berman & Slobin, 1994; Choi & Bowerman, 1991). While our results confirm what must be strong cross-linguistic differences in such planning preferences, they show that the precise shape of verbal messages (especially the inclusion of optional material such as manner modifiers in Greek) is crucially affected by extra-linguistic pressures. In other words, aspects of visual scenes which are not typically encoded (e.g. manner of motion in Greek) can be monitored and included selectively when their omission would be misleading for the hearer.

Our results are also relevant for current debates about the relationship between language and thought. Since speakers attend to more distinctions than they can (or will) encode linguistically, it follows that linguistic representations of space and motion cannot be taken too literally as an index of how speakers mentally represent such scenes and events. This conclusion is further supported by the fact that, in non-linguistic tasks involving the categorization and memory of motion episodes, English and Greek speakers behave identically with respect to manner and path distinctions (Papafragou et al., 2002; cf. also Gennari et al., 2002).

The present investigation is only the first step towards a more systematic look at the factors that affect the verbal encoding of event structure. An interesting question is whether speakers actively monitor the hearer's needs and knowledge in omitting inferable information, or whether they simply adjust their speech to a generic addressee. In their study of event encoding, Brown & Dell (1987) found that inferable instruments for an action were less likely to be mentioned by speakers regardless of whether hearers manifestly had visual access to the action or not. More recently, Lockridge & Brennan (2002) showed that in interactions with real conversational partners, speakers were more likely to mention non-inferable instruments when hearers lacked visual access to the action and the instrument. At present our study does not address the mechanisms behind Greek speakers' flexibility in describing manner of motion. However, it is interesting to note that even in cases where manner was opaque, Greek adults and especially children included it in their descriptions only some of the time (67% vs. 42% of responses respectively). This might be because both speaker and experimenter had visual access to the set of motion scenes. Based on previous findings, we expect that Greek speakers would be even more likely to encode nontransparent manner of motion when addressing hearers who lack access to the motion scene.

We also expect that non-inferable manner details will be included more systematically depending on the specificity of the hearer's expectations and the perceived demands of the communicative task. We are currently testing these predictions in ongoing work.

Appendix

A1: Path Verbs

English				*Greek*			
	Children	***Adults***			***Gloss***	***Children***	***Adults***
approach	--	1		**aneveno**	*ascend*	51	42
circle	--	2		**aperxome**	*leave*	--	1
come	47	20		**apomakrinome**	*go-away*	9	5
enter	--	15		**apoxoro**	*depart*	--	1
exit	2	4		**beno**	*enter*	82	92
get	4	1		**benovjeno**	*go-in-and-out*	1	--
go	72	25		**vjeno**	*exit*	58	32
land	--	1		**diasxizo**	*cross*	--	4
leave	1	13		**dierxome**	*go-by*	--	2
pass	5	1		**iserxome**	*enter*	--	1
reach	1	--		**ekserxome**	*exit*	--	1
turn	7	--		**erxome**	*come*	5	--
cross	1	--		**ftano**	*reach*	17	5
				fevgo	*leave*	35	13
				girno	*go-back*	4	--
				kateveno	*descend*	98	72
				katefthinome	*go-towards*	--	5
				pao	*go*	69	25
				parakampto	*make-a-detour*	--	1
				perno	*pass*	22	37
				plisiazo	*approach*	2	1
				prosgionome	*land*	3	--
				prosperno	*overtake*	3	5
				proxoro	*advance*	24	10
				sikonome	*rise*	5	--
				strivo	*turn*	1	3
Total	*140*	*83*		***Total***		*489*	*358*

A2: Manner verbs

English				*Greek*			
	Children	***Adults***			***Gloss***	***Children***	***Adults***
bend	16	4		**vadizo**	*walk*	--	2
crawl	1	--		**berdevome**	*trip-over-oneself*	--	3
crouch	2	1		**busulo**	*go-on-all-fours*	1	--
dance	1	3		**glistro**	*slip*	1	4
drive	12	19		**kilieme**	*roll*	--	1
fall	7	22		**burduklonome**	*stumble*	--	2
fly	24	57		**odigo**	*drive*	--	12
hop	3	2		**parapato**	*trip*	--	7
jump	32	75		**pefto**	*fall*	19	24
lean	2	--		**perpato**	*walk*	19	9
ride	2	7		**peto**	*fly*	15	27
roll	--	3		**pido**	*jump*	38	43
run	17	36		**rixnome**	*throw oneself*	1	--
skip	1	2		**skarfalono**	*climb*	1	--
slide	11	24		**skontafto**	*stumble*	3	6
slink	--	2		**skivo**	*crouch*	33	6
slip	--	2		**treklizo**	*stumble*	--	2
sneak	9	--		**trexo**	*run*	22	20
stagger	-	2		**tsulo**	*slide*	--	1
step	2	--		**xorevo**	*dance*	2	3
stumble	--	11		**xoropido**	*jump-up-and-down*	6	5
swoop	--	1					
trip	--	8					
tumble	1	--					
walk	81	117					
Total	*224*	*398*		***Total***		*161*	*177*

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