The Development of Metaphoric Motion: Evidence from Greek Children's Narratives*

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0. Introduction

Children's competence in producing and comprehending metaphors has been claimed to be a relatively late achievement by largely experimental studies (see Vosniadou 1987, Winner 1988, and Özçalışkan 2002 for reviews). In fact, some researchers have ascribed only rudimentary abilities, if any, to preschoolers (e.g. Vosniadou and Ortony 1983). Others have taken competence with figurative language to follow that with literal language and expect it fully only in late adolescence (e.g. Levorato and Cacciari 2002). However, the empirical findings seem more complicated (see Keil 1986 as well) and are, moreover, difficult to evaluate. For one, results differ depending on which ability is measured and how, e.g. comprehension through verbal explanation or paraphrasing. Above all, the studies were based on different conceptions of metaphor. For instance, Billow (1981) claimed early use of spontaneous metaphors, but largely on the basis of renamings of objects in pretend play. The metaphoric status of such expressions is, however, rejected by those (e.g. Vosniadou 1987) who define metaphor as perceptible similarity between tenor and vehicle. In fact, most experimental studies have focused upon innovative metaphors based on similarity.

The Conceptual Theory of Metaphor (CTM) introduced a wider conception of metaphor, as systematic mappings from often concrete conceptual domains onto other typically abstract ones (e.g. Lakoff 1993, Grady 1997). The target and source domains are not taken as physically similar. In addition, as metaphoric thinking is supposed to permeate everyday language, expressions realizing conceptual metaphors can at times be very conventionalized and even felt as literal. Acquisition research from this perspective has shown metaphoric abilities earlier in the preschool period. An experimental study by Özçalışkan (2002) found that English- and Turkish-speaking children understood abstract concepts (such as time and ideas) structured via motion verbs as early as 4 years of age. At age 5

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they also reasoned about the conceptual basis of metaphors. In addition, studies of spontaneous conversations showed uses of words which could be deemed metaphoric much earlier. They included, for example, conflation of the physical and abstract senses of words. The English preposition *for* was first used in its benefactive sense, which is simultaneously spatial and social (Rice 1999). But clearly metaphoric uses have also been reported. Greek motion verbs were observed to code temporal and bodily state changes as early as 1;10, with even earlier uses in the input suggesting precedence of comprehension (Selimis and Katis in press).

Full competence with metaphor may require integration of various linguistic and conceptual abilities, including metalinguistic ones which allow creative innovation, as Levorato and Cacciari (2002) have claimed. Nonetheless, the ability to produce and comprehend conventionalized metaphors seems to be one perhaps important component. After all, the CTM sees even linguistically frozen metaphors as conceptually alive and able to motivate novel expressions. Relevant research on how such metaphors emerge and subsequently develop is, however, limited. Discussing possible determinants of developmental order, Rice (1999) saw input frequency as more critical than cognitive complexity in early development. This would explain, she held, why the abstract sense of words can at times precede the physical one (e.g. the infinitive sense of English *to* earlier than the spatial one). Cognitive factors have been mostly related to experiential and conceptual accessibility of domains. For instance, motion is supposed to be exploited early as a source domain, because it is a basic sensorimotor experience (Özçalışkan 2002). Similarly, certain target domains (e.g. time) are assumed to be experientially more basic than others and thus more likely to be construed metaphorically across languages as well as early in development (Grady 1997). However, it is not clear how the conceptual content of target domains may affect subsequent development. While Özçalışkan (2002) concluded that comprehension at 4-5 years is domain-general, others (e.g. Keil 1986) have seen development as dependent upon growing knowledge about specific domains.

At this point, claims about development and its determinants need more systematic evidence from various languages and ages. To this end, we trace the development of motion metaphors in nearly spontaneous Greek child speech. We focus upon the source domain of motion, because it seems to be ontogenetically early and to pervasively structure abstract concepts across languages (e.g. Choi and Bowerman 1991, Özçalışkan 2002). We raise the following questions: a) what types of motion metaphors do children use, if at all?, and b) are developmental changes observed in their frequency and type, and how might they be explained?

1. Data and Analyses

We analyzed semi-spontaneous narratives embedded in conversations by 194 Greek-speaking children aged 3-10 years. Table 1 shows the number of children by age span. The data were originally collected for the purpose of studying narrative skills. Therefore, the children were encouraged to narrate personal experiences and films as well as to recount stories, without excluding discussion

about ways of life and opinions. Recording of each child varied from 15 minutes to 3 hours, and so did the length and number of narratives produced.

Table 1: The number of children in each age span

Age range in years	3	4	5	6	7	8	9	10
N of children	21	22	30	31	30	27	19	14

We restricted our analyses to motion verbs which may be taken as prototypical. These code internally generated translocation of an entity such as *beno* 'enter' (see Hohenstein et al. 2004 for a similar choice). Verbs coding caused and non-translocational motion (e.g. *piano* 'catch', *skorpao* 'scatter') were thus excluded. In addition, metaphoric expressions cannot always be sharply differentiated from other non-literal or even literal ones. In (1), light is metaphorically conceived as moving, but is also literally described as it is actually reflected in space.

(1) Meta irthe mia lampsi. (6;10)
after come.PAST.3SG a flash
'Then there appeared a flash.' (lit. a flash came)

We left aside all such expressions describing actual motion of any sort, even though they ultimately remain important for understanding what metaphor is and how it emerges. In doing so, we also conformed to the predominant view of metaphor as conceptualization of abstract phenomena.

We described the metaphoric expressions as follows. First, we tried to discern target domains onto which motion is mapped. Second, we looked at how it is mapped. Across several languages abstract concepts have been found to be structured either as moving objects or as spaces being traversed, even as both (e.g. Lakoff 1993, Yu 1998). Third, we recorded tokens and types of the source domain verbs as well as whether they lexicalize Path or Manner elements of motion. According to Talmy (2000) and Slobin (2004), among others, Path-lexicalizing verbs code direction, boundaries, and deixis (e.g. *ascend*, *enter*, *go*). Manner-lexicalizing ones code a great variety of dimensions such as motor pattern and rate but also subjective evaluation of motion events (e.g. *fly*, *flee*, *slink*). Manner verbs have been assumed to be cognitively more complex than Path ones and are thus expected later (e.g. Hohenstein et al. 2004). In addition, lexicalization of Manner or Path has been seen as an area of systematic cross-linguistic variation in both physical and metaphoric motion (e.g. Slobin 2004, Özçalışkan 2002).

2. Results and Discussion

Table 2 shows 338 metaphoric uses of motion verbs in our data. The number of children producing at least one rises from 43% at 3 years to about 85% after 9. In fact, at 3 years such metaphors are absent even in two extended speech outputs,

while at older ages they are typically present even in short outputs. The total of tokens also steadily rises, even if the number of older children is more restricted.

Table 2: Metaphor tokens and children producing at least one token by age span

Age range in years	3	4	5	6	7	8	9	10
Children (N = 194)	43%	59%	50%	58%	63%	59%	84%	86%
Metaphors (N = 338)	15	23	35	38	46	47	63	71

The ability to produce metaphors is also revealed in the use of other types of motion verbs and source domains (e.g. (2) and (3)). Moreover, comprehension is detected in responses to questions containing motion metaphors (e.g. (4)). Yet the metaphors used are overwhelmingly conventional, with rare innovative uses (e.g. (5)). The possible effect of the input is most obvious in recountings (e.g. (2)).

(2) Skasan ap' to kako tus. (3;0)
burst.PAST.3PL from the bad their
'They exploded from anger/jealousy.'

(3) Psinomuna ston pireto. (10;5)
burn/bake-PASSIVE.PAST.1SG in.the fever
'I was burning with fever.' (lit. was baking)

(4) Perasate kala sta ghenethlia su? (Adult to child aged 3;3)
pass.PAST.2PL well at.the birthday yours
'Did you have a nice time on your birthday?' (lit. pass well)

(5) Beni i fantasia. (7;1)
enter.PRES.3SG the imagination
'Imagination starts working.' (lit. enters)

2.1. Target Domains and Types of Mappings

Recognizing target domains and mappings behind linguistic metaphors is not a straightforward task (see above all Steen's (1999) warning). We relied above all upon semantic interrelation of several lexemes. For instance, jokes and tales were assumed to instantiate the domain of discourse. In addition, conceptual mappings were occasionally evidenced in diverse linguistic means. In example (6), the locative adverb and the stative verb reinforce the idea that discourse is conceived as a space upon which a speaker can move.

(6) Epistrefume eki pu ichame mini. (8;3)
return.PRES.1PL there where have.PAST.1PL remain.INF
'We return to where we had stopped.' (i.e. in the narrative)

We were also guided by identification of domains and mappings in previous research, particularly with children. Özçalışkan (2002) identified domains like

time and bodily state in English and Turkish. In the end, we suggest with reservation that three quarters of the metaphoric tokens involve the domains of time (T), discourse (D), mental state (MS), and bodily state (BS) (see Table 3). But we also discuss other instances (O), which are either difficult to describe and/or involve infrequently instantiated domains. Assumptions about domains are not, however, claims about their psychological reality. In fact, it has been pointed out that a conceptual metaphor can motivate linguistic ones, without individual speakers' having full representations of the abstract concepts mapped (e.g. Steen and Gibbs 1999). This is more likely with children, who are still developing conceptually and may be strongly influenced by the input.

Table 3: Proportion of metaphoric uses across target domains

Target domain	T	MS	D	BS	O
Metaphor tokens	54.7%	8.3%	7.4%	3.8%	25.7%

Metaphors of temporal change are by far the most frequent, at 54.7% of the total. This is expected given not only the predominantly narrative nature of the discourse, but also Selimis and Katis' (in press) findings that they are the earliest and most frequent in Greek spontaneous conversations as well. They appear from 3 years and are subsequently enriched in various ways. Table 4 shows roughly a third of the children producing them at 3 but three quarters after 9 years.

Table 4: Children producing at least one time metaphor in each age span

Age range in years	3	4	5	6	7	8	9	10
Producing time metaphors	29%	41%	43%	32%	40%	41%	74%	79%

The specific metaphorically construed entities include time without explicit boundaries, coded through the polysemous words *ora*, *keros* and *chronos* or left implicit. Above all, they include bounded periods such as minutes, times of day, seasons, holidays, and lifetime periods (examples (7) to (10)). Until the age of 6 they are overwhelmingly presented as objects coming to or passing by the ego. But by 10 years they are increasingly presented as bounded spaces through which the ego passes. In the latter case, an evaluative stance is also often expressed (e.g. (9)). Rarely, a mixed version is also noted (e.g. (10)).

(7) Pente meres ine, tha perasun. (5;6)
five days be.PRES.3PL FUT pass.3PL
'It's (only) five days, they will pass (away).'

(8) Tora bike sta dhekatria. (10;5)
now enter.PAST.3SG in.the thirteen
'He just became thirteen.' (lit. entered the thirteenth (year))

(9) Tha perasume poli orea eki. (7;8)
FUT pass.1PL very nicely there
'We will have a very nice time there.' (lit. we will pass very nicely)

(10) Pighe i ora eniamisi. (9;0)
go.PAST.3SG the hour nine-thirty
'The time is now nine thirty.' (lit. went)

Metaphors conceptualizing changes of mental states and activities also appear at 4 years. In the conversations studied by Selimis and Katis (in press), they appeared only rarely and slightly before 4;6 years. While awareness of the mind has been claimed to mature late in the preschool period (e.g. Flavell 2000), they probably turned up more frequently in our data because of the more advanced age span studied as well as the type of discourse. The latter called for reference to protagonists' feelings, intentions, and thoughts. We have in fact included here metaphors for emotive as well as cognitive changes. Although the two are often distinguished (e.g. Özçalışkan 2002), this was not always possible in our data, as in (11), which refers to an idea/mood/intention. The particular metaphoric concepts include understanding, imagination, memories and ideas as well as more clearly emotive ones such as fear, unhappiness, anger, and guilt (see (11) to (14)). In fact, the latter appear only after 8 years. This is unexpected, if we assume emotions to be experientially more accessible than cognitive states/processes given their more perceptible displays. Indeed, they appear earlier in our data, even from 3 years, but through other means such as different types of verbs (e.g. (2) above). Again, both the object and location mappings appear, but the former is more frequent and earlier, with the verb *erchome* 'come' predominating (e.g. (11)). In the latter case, mental states appear as landmarks relative to which a human agent passes, taking an active stance either through evaluation of events or controlling of emotions (see (13) and (14), respectively).

(11) Tis erchotane na fighi. (9;7)
to.her come.PAST.IMPERF.3SG to leave.3SG
'She felt like going.' (lit. it was coming to her to leave)

(12) Ton kinighaghan i tipsis. (8;2)
him chase.PAST.IMPERF.3PL the pangs.of.remorse
'Pangs of remorse were chasing him.'

(13) Ja kuto me pernas? (7;8)
for dumb me pass.PRES.2SG
'Do you take me as dumb?' (lit. pass me)

(14) Kse-perase tus fovus tis. (9;7)
PREFIX-pass.PAST.3SG the fears her
'She overcame her fears.' (lit. surpassed)

Metaphors for changes in discourse appear from the age of 3 and are also subsequently enriched. Since they have not been previously discussed in child language, we assume that they are favored by the particular type of discourse, with its reference to shifts of topics and genres. Indeed, the particular metaphorically constructed entities include (besides tales and jokes, which were mentioned earlier), conversations, school lessons, and topics in general (see (15) to (17) and (6) above). Discourse metaphors appear overwhelmingly in the location version, as Sweetser (1992) has also noted for English adult speech. The verb *pao* 'go' predominates, marking human control over the discourse as in (15).

(15) Pame pali st' anekdhota? (10;2)
go.PRES.1PL again to.the jokes
'Should we go back to jokes?'

(16) Petaghete enas ke lei... (8;3)
fly.PASSIVE.PRES.3SG one and say.PRES.3SG
'Someone breaks in the conversation and says…' (lit. throws himself in)

(17) Min kse- fevghume ap' to thema mas. (7;3)
NEG PREFIX-leave.IMPER.1PL from the topic our
'Let's not slip away from our topic.'

Bodily state metaphors appear at 4 years and are relatively limited. Their earlier and more frequent appearance in spontaneous conversations (Selimis and Katis in press) suggests that they are less useful in this type of discourse. The more specific concepts involved include sleep, hunger, energy level, illness, being wounded, and death (see (18) to (20)). They appear predominantly as objects coming to or passing by an ego that cannot control them.

(18) Tu irthe mia meghali nista. (4;6)
to.him come.PAST.3SG a big drowsiness
'He became intensely drowsy.' (lit. intense drowsiness came to him)

(19) Tis perase i pina. (6;10)
by.her pass.PAST.3SG the hunger
'She was no longer hungry.' (lit. her hunger passed)

(20) …egho sin-erchome poli ghrighora. (6;6)
I PREFIX.come.PRES.1SG very quickly
'(I do feel tired but okay) I come around very quickly.'

We finally come to various heterogeneous metaphoric expressions. They appear mostly later than those already discussed, with only 11 of the total 87 tokens before the age of 6. Some are vague as to their conceptual underpinnings, something possible in any type of data, according to Steen and Gibbs (1999). This occurs probably because lexical concepts are either unrelated or insufficient to

suggest a target domain as in (21). In other cases, however, domains seem relatively easy to identify but are also infrequently instantiated. They are either more general, like life situations, as in (22), or more specific, like political regimes, as in (23). The latter more particularly may be expected later, in part because they are unlikely in the input to younger children. They also seem more culture-relative than supposedly more universal ones such as bodily states. Özçalışkan (2002) indeed found relatively few metaphors for political phenomena in English and Turkish written corpora. She, moreover, characterized them as complex, assuming that they are based on more than one primary metaphor, including above all the CHANGE IS MOTION and STATE IS LOCATION ones. They may indicate nascent metaphors, which have not yet turned into a coherent conceptual system. Finally, some expressions do not refer to changes of any sort but to a comparison of two states (e.g. (24)). In this sense, they code subjective or fictive motion of the speaker (e.g. Talmy 2000). But they are also metaphors, which probably build upon primary mappings such as SIMILARITY IS PROXIMITY (Grady 1997).

(21) Meta archisame na katevenume. (7;6)
after start.PAST.1PL to descend.1PL
'Then we started going down (taking our turn around the desks).'

(22) Kse- ghlistrise o Jerry. (8;6)
PREFIX- slip.PAST.3SG the Jerry
'Jerry escaped (from an unpleasant situation)' (lit. slipped away)

(23) I chunta irthe na pniksi tin Eladha. (10;1)
the junta come.PAST.3SG to choke.3SG the Greece
'The junta came to choke Greece.'

(24) Ta matia tu pane pros ta ble. (10;2)
the eyes his go.PRES.3PL toward the blue
'His eyes are nearly blue.' (lit. go towards the blue ones)

2.2. Source Domain Verbs

Table 5 shows 20 verbal lexemes in the data. However, three of them, i.e. *perno* 'pass', *erchome* 'come' and *pao* 'go', make up 77% of the total tokens, are found with more types of target domains, and are the only ones to appear from 3 years.

In distinguishing Manner- from Path-lexicalizing verbs, we relied upon widely accepted criteria (e.g. Slobin 2004). We characterized as Manner all those coding relevant elements regardless of whether they code Path as well (e.g. *pefto* 'fall'). Verbs coding solely Path were found to be predominant, with 13 types and 96% of the total tokens. They are also the only ones used with time metaphors. Moreover, the few and infrequent Manner verbs appear later. None are used at the age of 3, and two appear at 4-5 years (one being the common verb *pefto* 'fall'), with a notable range only after 8 years. The three early and frequent verbs noted above lexicalize Path and additionally have very general meanings. Path verbs with

more specific meanings such as *beno* 'enter' and *vgheno* 'exit', which code boundaries, appear somewhat later. As Manner verbs have been linked with more specific meaning more generally (e.g. Slobin 2004), a trend towards semantic specificity may be discerned in our data. Moreover, four of the seven Manner lexemes can be seen as complex, because they incorporate prefixes (*kse* and *sin*) which signal subjective elements of meaning, such as the strong intention implied in *kseghlistro* 'slip away'.

Table 5: Types and tokens of motion verbs by age range and target domain

Motion verbs	N	Age ranges				Target domains				
PATH		3	4-5	6-7	8+	T	MS	D	BS	O
perno 'pass'	157	●	●	●	●	●	●		●	●
erchome 'come'	53	●	●	●	●	●	●		●	●
pao 'go'	50	●	●	●	●	●	●	●	●	●
vgheno 'exit'	23			●	●	●	●			●
ftano 'arrive'	12		●	●	●	●		●		●
ksekino 'start moving'	9		●	●	●	●		●		●
beno 'enter'	7		●	●	●	●	●			●
akolutho 'follow'	4			●	●					●
fevgho 'leave'	4				●		●			
prochoro 'advance'	2				●			●		
epistrefo 'return'	1				●			●		
kateveno 'descend'	1			●						●
kikloforo 'circulate'	1			●				●		
MANNER										
pefto 'fall'	5		●	●	●		●		●	●
petaghome 'throw oneself'	3		●		●			●		
ksefevgho 'slip away'	2			●	●			●		
kinigho 'chase'	1				●		●			
kseghlistro 'slip away'	1				●					●
kseperno 'surpass'	1				●		●			
sinerchome 'come about'	1			●					●	
Verb types	20	3	8	13	17	7	9	8	5	11
Verb tokens	338	15	58	84	181	185	28	25	13	87

3. Conclusion

Our data seem to reinforce claims that use and perhaps comprehension of conventionalized metaphors can begin early in the preschool period, without at the same time contradicting the idea that development is protracted. In fact, with advancing age more children use more metaphor tokens and types, which become increasingly more complex. This may be expected given the inevitability of metaphor in everyday language and what is widely assumed about children's cognitive growth and gradual enrichment of the input. The metaphors produced

are of course largely well-entrenched expressions in Greek and thus input-driven. They also seem motivated to an important extent by conceptual metaphors which are very likely basic cross-linguistically, i.e. mapping of motion onto changes in time, mind, body or changes more generally. The same holds even for the few innovations. In (5) above, where imagination is conceived as entering the head, the MENTAL CHANGE IS MOTION mapping co-occurs with the much-discussed HEAD IS A CONTAINER one. However limited, innovations strengthen hypotheses of conceptual mappings and need to be further investigated in spontaneous speech, not only experimentally as in the past.

Among the verbs used to construe abstract motion, those lexicalizing Path and having very general meaning predominate and precede others. In coding physical motion, speakers of Verb-framed Greek, including children, have been found to prefer Path verbs to a greater extent than speakers of Satellite-framed English, who prefer Manner verbs (Papafragou et al. 2002, Selimis 2005). Therefore, our findings support Özçalışkan's (2002) hypothesis that metaphoric motion conforms to typological lexicalization preferences for physical motion. However, these findings must be considered in a wider context. For one thing, the Path component of motion has been assumed to be cognitively simpler than Manner and has indeed been found developmentally earlier in physical motion, even if through particles rather than verbs (Choi and Bowerman 1991, Hohenstein et al. 2004). Selimis and Katis (in press) found that Path verbs predominate in early spontaneous motion metaphors in English and Greek, thus suggesting that such verbs allow children to start using metaphors across languages. This does not exclude emergence of typological differences later, as Özçalışkan claimed and is certainly not counteracted by our data. Secondly, as in physical motion, Manner verbs may emerge earlier and be richer in Satellite-framed languages (e.g. Slobin 2004), but they are slowly enriched in Verb-framed languages as well. In fact, their slight increase in our data, coupled with evidence that Greek journalistic discourse makes relatively extensive use of Manner verbs in metaphor (Selimis and Katis 2003), suggests that this line of development continues after the age of 10.

Conceptual mappings differ in type, frequency, and time of appearance. Of course, four target domains were instantiated more widely and early. Time, mind and body more particularly may be among the earliest cross-linguistically, as noted in previous research as well (Özçalışkan 2002, Selimis and Katis in press). Seemingly more abstract target concepts, like political status, seem to emerge later, although low frequencies do not allow safe conclusions. Overall, differences in the emergence of target concepts and mappings may be attributed to the following factors: a) how favored they are by the discourse content, b) how conventionalized motion metaphors are relative to alternative literal and non-literal codings, and c) how experientially accessible and thus less abstract they are.

Although these factors are often conflated, one may occasionally weigh more. For instance, discourse metaphors may appear early and relatively frequently in our data because, as already noted, children often need to mark shifts in topics and genres in the elicited talk studied here. Yet the domain of discourse seems quite

abstract and perhaps not so prevalent in daily conversations with young children as those of time, mind, and body. How important availability or not of alternative means for coding abstract changes is may be seen with time and emotion metaphors. Emotions are described earlier in our data through other means including other types of metaphors, while non-metaphoric description of time seems quite restricted in Greek (see Özçalışkan (2002) for English and Turkish as well). Finally, cognitive accessibility probably explains why target concepts which seem more abstract and culturally relative, such as political changes, emerge later. It may also explain why the object mapping precedes the location one in most cases. The latter typically signals control of the speaker over a situation. This is most natural in the case of discourse, but in the less controllable changes of time, mind and body, it can only be a subjective evaluative stance.

The overall unevenness in the emergence of conceptual mappings may counter claims that metaphor is a domain-general ability. Özçalışkan (2002) based this on evidence that time and bodily and mental states are equally comprehended as moving entities at 4-5 years. While we find this expected given the early and relatively frequent instantiation of these particular domains in our data, we also find it likely that across a wider range of ages and target domains, some mappings may be developmentally earlier than others. This would depend above all on how accessible they are linguistically, i.e. conventionalized and frequent in the ambient language, but also on children's conceptual understanding, as Keil (1986) argued.

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