Non-Target Long-Distance Wh-Questions: Crosslinguistic Typological Distinctions in Early L1 Production

Evangelia K. Asproudi

Aristotle University of Thessaloniki
evangelia.asproudi@gmail.com

Abstract

This paper investigates the production of non-target long-distance wh-questions by preschool-age children across languages, including L1 Greek. Previous studies show that children frequently resort to partial wh-movement, wh-copying and wh-subextraction. To examine whether Greek children follow a similar developmental route, ninety 4-to-7-year-old children participated in production tasks designed along the principles of McDaniel et al. (1996) and Crain & Thornton (1998). Certain differences aside, Greek children seem to behave similarly to other children: partial wh-movement, wh-copying and wh-subextraction are interpreted in light of children's preference for the more economical LF- rather than PF- convergent representations of long-distance wh-chains.

1. Introduction

The aim of this paper is to investigate the production of non-target long-distance (LD) wh-questions by preschool-age children across languages, including L1 Greek. Specifically, children's production of LD wh-interrogatives is examined with respect to two questions:

A. Is there evidence for children's sensitivity to the successive cyclic nature of LD movement that operates in the adult language from early on?
B. Do children's deviant patterns during the development of LD questions reveal a strategy aiming at one-to-one mappings between semantic (LF) and phonetic (PF) output representations?

In order to provide answers to the above questions, reference will be made to certain parametric variations that wh-movement across languages is subject to. These are partial wh-movement (PM), wh-copying and wh-subextraction.

1.1. Long-Distance Wh-Movement Across Languages

PM refers to structures for question formation that serve to express LD wh-dependencies along with or instead of the common structure that involves LD extraction of the wh-phrase. In these structures the wh-phrase appears in the left edge of the subordinate clause, while another wh-word appears in the matrix scope-taking position (e.g. McDaniel 1989; Dayal 1994). Apart from PM, in a number of languages another strategy is employed as an alternative way of expressing LD wh-dependencies in interrogative structures. This strategy is known as wh-copying and refers to constructions that involve repetition of the wh-item in all the cycles of the derivation (e.g. Felser 2004; Bruening 2006). PM and copying are allowed in languages like German and Dutch but not in ones like English, and they are respectively exemplified in (1)-(3) and (4)-(6) below:

German (McDaniel 1989)
(1) Was *glaubt* *Hans* wen *Jakob* *anruft?*
what think-3SG Hans who Jakob call-3SG
'Who does Hans think Jakob is calling?'

Dutch (Jakubowicz & Strik 2008)
(2) Wat *zeg* *je (zeg)* waar *Marie (waar)* *heengaat?*
what say-2SG you where Marie go-3SG
'Where do you say Maria goes?'

English (McDaniel 1989)
(3) * What *does Hans think* whom *Jakob is calling?*

German (Felser 2004)
(4) Wen *glaubst* *du* wen *sie* *liebt?*
who think-2SG you who she love-3SG
'Who do you think she loves?'

Dutch (Jakubowicz & Strik 2008)
(5) Wie *denk* *je* wie *verhalen* *leest?*
who think-2SG you who histories read-3SG
'Who do you think reads histories?'

English (Felser 2004)
(6) * Who *do you think* who *she loves?*

Turning to wh-subextraction, this is the phenomenon where, in case of a D-linked wh-phrase (Pesetsky 1987), only the wh-determiner raises to the

edge of the left periphery. The accompanying nominal element is not pied-piped but remains stranded to a position lower in the clause, this often being its base-generated position. The possibility for wh-subextraction does not apply in languages like English ((7)) and Dutch ((8)) but is valid in other languages, as its application is largely determined by morphological 'richness'. Morphologically rich languages like the Slavic ones (e.g. Polish, (9)) freely allow for subextraction of the nominal part of the wh-phrase (e.g. Chen et al. 1998; Gavarró & Solà 2004; van Kampen 2004).

English (Chen et al. 1998)
(7) * How much *do you think I have* money?

Dutch (Chen et al. 1998)
(8) *Hoeveel *denk* *je* *dat ik* gelg *heb?*
howmuch think-2G you that I money have-1SG
'How much money do you think I have?'

Polish (van Kampen 2004)
(9) Jaki *wykreciles* numer?
which dial-2SG number
'Which number did you dial?'

1.2. Long-Distance Wh-Movement in Greek

PM and wh-copying do not constitute licit options of expressing LD wh-dependencies in Greek. LD extraction is formed in the more usual way of fronting the wh-phrase to the matrix left periphery; it is allowed in the presence of 'oti' and 'na', as illustrated in the following examples:

(10) *Ti* *ipes* oti *tha* *dhjavasun* *ta pedhja?*
what said-2SG that will read-3PL the children
'What did you say that the children will read?'

(11) *Ti* *ipes* na *dhjavasun* *ta pedhja?*
what said-2SG to read-3PL the children
'What did you tell the children to read?'

Furthermore, it is interesting to note that despite being a morphologically rich language, Greek does not allow for wh-subextraction:

(12a) * Posa *perilamvani* piimata *i* *siloji?*
how many contain-3SG poems the collection
'How many poems does the collection contain?'
(12b) Posa piimata *perilamvani* *i* *siloji?*
how many poems contain-3SG the collection
'How many poems does the collection contain?'

As shown in (12), the raised wh-phrase must necessarily be accompanied by the nominal element it specifies.

2. Child Studies on Long-distance Question Production

As stated from start, this paper focuses on the investigation of the patterns employed by children during LD question production. Across languages, extensive research has been conducted on child LD questions; yet, this area has so far remained largely uninvestigated with regard to child Greek. Studies in other early languages have shown that children often produce well-formed LD questions in which the wh-phrase surfaces in the matrix left periphery. (13) and (14) below exemplify child well-formed LD questions:

English (Thornton 1990)
(13) What *do you think is in the white box?*

French (Jakubowicz & Strik 2008)
(14) Où *a* *dit* *Lala que le* *poisson* *nage?*
where have-3SG said Lala that the fish swim-3SG
'Where has Lala said that the fish swims?'

As will be explained in the end of this section, well-formed LD questions provide evidence in favour of child sensitivity to successive cyclicity. Further evidence in this direction comes from deviant PM and wh-copying constructions, which are frequently used by children in target LD contexts. Let us first look at examples of PM:

English (Thornton 1990)
(15) What *do you think* who *jumped over the can?*

French (Jakubowicz & Strik 2008)
(16) Qu' est- ce que *Lala a* *dit* où *le poisson* *nage?*
what be-3SG it that Lala have-3SG said where the fish swim-3SG
'Where did Lala say that the fish is swimming?'

Dutch (Jakubowicz & Strik 2008)
(17) Wat *zei* *Lala* waarom *Kikker* *weggaat?*
what said-3SG Lala why Frog leave-3SG
'Why did Lala say that Frog leaves?'

And here are examples of child wh-copying:

English (Thornton 1990)
(18) What *do you think* what *the baby drinks?*

French (Oiry 2004)
(19) *Tu* *crois* quoi *que* *je* *bois* quoi?
you believe-2SG what that I drink-1SG what
'What do you believe I am drinking?'

Dutch (Jakubowicz & Strik 2008)
(20) Wat *zei* *Billy* wat *Kikker* *eet?*
what said-3SG Billy what Frog eat-3SG
'What did Billy say that Frog eats?'

Apart from PM and copying, another non-target strategy employed by children during LD question production is wh-subextraction; this is found in early languages like English (e.g. Chen et al. 1998; Gavruseva & Thornton 2001) and Dutch (e.g. van Kampen 1994, 1997).

English (Chen et al. 1998)
(21) How many *do you think* marbles *are in there?*

Dutch (van Kampen 1994)
(22) Welke *wil* *jij* liedje *zingen*?
which want-2SG you song sing-INF
'Which song do you want to sing?'

In addition, feature copying is attested in child language. Feature copying refers to instances of wh-subextraction, where the stranded nominal is accompanied by some type of resumptive element (e.g. Chen et al. 1998). Let us look at examples:

(23) Who *do you think* this bottle *is?*
(24) How many *do you think* how many marbles *are in there?*
(Chen et al. 1998)

The stranded nominal element may be accompanied by a resumptive determiner ((23)) or wh-word ((24)) which doubles the phi- and case features of the fronted wh.

On the whole, the occurrences of PM, wh-copying and wh-subextraction/feature copying in child grammar are assumed to be triggered by the UG constraint on successive cyclic movement. In PM and wh-copying, the medial wh-element is viewed as the overt expression of LD movement through the intermediate CP (Thornton 1990); in other words, the medial wh is a spelled-out copy of the raised wh-phrase. As noted in Stromswold (1995), medial-wh questions may be the result of children's effort to produce UG-consistent variants of LD questions that their grammars cannot yet generate productively in a well-formed way.

A copy-theoretical account has also been put forward for the explanation of feature copying constructions. The material that surfaces in the base-generated position of the wh-element and accompanies the stranded nominal head doubles features of the fronted wh-determiner, and it is hence attributed a resumptive function (cf. Chen et al. 1998). On the basis of this, feature copying is assumed to represent the spelling-out of a copy during the formation of the wh-chain by the incomplete child grammar (Yamane et al. 1999). In other words, this doubling phenomenon seems to reflect intermediate stages of successive cyclic movement (cf. Felser 2004).

To sum up, it can be concluded that apart from well-formed LD questions, even deviant structures like PM, wh-copying and wh-subextraction/feature copying attest for the presence of successive cyclic wh-movement in child grammar from an early age. Within Chomsky's minimalist theory (1995), this is interpreted, in turn, in light of children's preference for LF-like representations (van Kampen 1997): the child computational system gives priority to those options that involve movement of the minimum for LF/PF convergence, even if these options override language-specific PF conditions on the Spell-out (van Kampen 1996, Gavruseva & Thornton 2001).

3. The Present Study

3.1. Predictions

In view of previous research, the predictions formulated with regard to Greek children's production of LD wh-questions were the following:

Prediction 1: In their LD questions, the Greek children are not expected to converge fully with adult LD movement. Apart from well-formed questions, they should also employ - on a par with their peers crosslinguistically - alternative

strategies: PM and wh-copying are expected as variants to target LD questions (e.g. Thornton 1990; Oiry 2004; Jakubowicz & Strik 2008).

Prediction 2: In cases of D-linking, the crosslinguistic picture is not very clear. Early English studies (e.g. Chen et al. 1998; Gavruseva & Thornton 2001) have shown that children consistently pied-pipe wh-phrases, with wh-subextraction attested scarcely. On the contrary, Dutch children have been found to produce subextracted wh-phrases quite often (van Kampen 1994, 1997). With regard to Greek children, it is predicted that wh-subextraction should be quite frequent, especially in the younger ages. This is closely related to the rich morphological specification of Greek wh-phrases. On one assumption, the rich morphological load might impede the raising of the full wh-phrase to the matrix SpecCP; on another assumption, the rich morphology might render the link between the wh- and the nominal element so strong that there is no need for the child to also raise the nominal element in matrix SpecCP. Either way, the result should be the stranding of the nominal, which is in line with both children's assumed early preference for economical LF-like representations and the processing limitations of child grammar (e.g. van Kampen 1996; Chen et al. 1998; Gavruseva & Thornton 2001). Consistent pied-piping is expected to be the preferred choice for the older children.

3.2. Participants

The study group consisted of ninety typically developing children aged 4;0 to 7;0. For the analysis of the data, these children were divided into three equivalent subgroups A, B and C. Group A included thirty children between four and five (mean age range: 4;6), group B thirty children between five and six (mean age range: 5;5) and group C thirty children between six and seven years old (mean age range: 6;7). Group A and B children were in their first and second year in kindergarten respectively, while group C children attended the first grade in primary school.

3.3. Materials and Procedure

The children participated in a production task designed along the principles of McDaniel et al. (1996) and Crain & Thornton (1998). The aim was to see whether children produce adult-like LD questions. A puppet called 'Astrulis' that had come from another planet was introduced to the child, and both of them participated in two games. The first game included prompts of the type *Rotise ton Astruli X mandevi aftos* ('Ask Astrulis X he guesses'), where X stood for the

respective wh-element. As for the second game, it consisted of prompts which were of the form *Rotise ton Astruli X protimai aftos* ('Ask Astrulis X he prefers'), where X stood again for the respective wh-element.

Here is a sample of the first and second game protocol as well as of the stimulus sentences used.

1st game:

The experimenter presents five toys: one car, one pink and one blue comb, and one red and one yellow ball. She asks both the child and the puppet to cover their eyes while she is hiding each of these toys in different numbered boxes. Then she asks the child and the puppet to uncover their eyes, and the game proceeds. After the experimenter has elicited the child's guess, she prompts the child to elicit the puppet's guess.

Stimulus sentences:

Experimenter: *Sto kuti 3 ekripsa mia htena. Ja mandepse pja.*
'In box 3 I hid one of the combs. Guess which one.'
(the child says his/her guess...)

Experimenter: *Esi mandevis oti sto kuti 3 ekripsa tin ... htena. Rotise ton Astruli pja mandevi aftos.*
'You are guessing that in box 3 I hid the ... comb. Ask Astrulis which one he is guessing.'

Target question: *Pja htena mandevis oti ekripse sto kuti 3?*
'Which comb are you guessing that she (i.e. the experimenter) hid in box 3?'

In sum, 9 LD questions were elicited in this game from each child.

2nd game:

The experimenter presents four toy characters: one rabbit, one dog and two horses. She explains to the child that three of these toy characters have to be matched with certain actions.

Stimulus sentences:

Experimenter: *Kapjo alogaki θa pai volta. Rotise ton Astruli pjo protimai aftos.*
'One of the two horses is going for a walk. Ask Astrulis which one he prefers.'

Target question: *Pjo alogaki protimas na pai volta?*
'Which horse do you prefer that it go for a walk?'

In this second game, 6 LD questions were elicited from each child.

The duration of this task was about 20 minutes, 15 minutes for the first and 5 minutes for the second game, with the elicited LD questions on the part of each child being 15 in total. Each child was tested separately in a room next to their classroom, while each session was tape recorded and transcribed at a later stage. In case the child did not react to a prompt, this prompt (and the relevant part of the game) was repeated twice; if still no question was elicited, the procedure continued with the presentation of the next part of the game and the corresponding prompt.

4. Results and Discussion

Overall, the results obtained were in line with the predictions outlined in section 3.1. A detailed presentation of the relevant results is provided below.

4.1. Prediction 1

In Prediction 1 the interest lies in LD question production, and specifically in whether children gave PM and copying structures. Overall, LD questions were not the most preferred choice on the part of the children.

Table 1.
Target: LD Questions. Elicited Patterns

	GROUP A		GROUP B		GROUP C	
Pattern	**No**	**Mean**	**No**	**Mean**	**No**	**Mean**
LD (target)	74/450	16.45%	126/450	28%	220/450	48.89%
SD (non-target)	370/450	82.22%	322/450	71.56%	227/450	50.44%
Isolated wh (non-target)	1/450	0.22%	0/450	0%	0/450	0%
No response (non-target)	5/450	1.11%	2/450	0.44%	3/450	0.67%

As shown in table 1, in place of target LD questions, non-target short-distance (SD) question production was the pattern to which children resorted mostly in the two younger groups. Examples of all error types attested are presented below.

SD

(25) *Esi pja xtena mandevis?*
you which comb guess-2SG
target: Pja xtena mandevis oti ekripse sto kuti 3? (= 'Which comb are you guessing that she hid in box 3?')

(26) *Pja ine sto kuti 5?*
which be-3SG in the box 5
target: Pja bala mandevis oti ine sto kuti 5? (= 'Which ball are you guessing to be in box 5?')

(27) *Ti na kani to skilaki Astruli?*
what to do-3SG the dog Astruli
target: Ti protimas na kani to skilaki? (= 'What do you prefer that the dog do?')

isolated wh

(28) *Pjo?*
which
target: Pjo alogaki mandevis oti ekripse sto kuti 2? (= 'Which horse are you guessing that she hid in box 2?')

no response

(29) ...
target: Pja bala mandevis oti ine mesa sto kuti 5? (= 'Which ball are you guessing to be in box 5?')

With a closer focus now on LD production, the majority of the produced questions were well-formed. Table 2 presents the rates of grammatical and ungrammatical LD questions, with an emphasis on the PM and copying rates of children of all groups.

Table 2.
Long-Distance Question Production[1]

	GROUP A			GROUP B			GROUP C		
Pattern	No	Mean	StdD*	No	Mean	StdD	No	Mean	StdD
Grammatical LD questions	50/74	67.57%	11.64	86/126	68.25%	13.65	170/220	77.27%	15.57
LD questions involving subextraction (ungrammatical)	18/74	24.32%	10.31	22/126	17.46%	6.20	13/220	5.91%	3.43
LD questions involving feature copying (ungrammatical)	6/74	8.11%	3.14	9/126	7.14%	7.36	21/220	9.55%	11.77
Partial wh-movement questions (ungrammatical)	0/74	0%	0.00	2/126	1.59%	2.25	7/220	3.18%	4.88
Wh-Copying questions (ungrammatical)	0/74	0%	0.00	7/126	5.56%	9.88	8/220	3.64%	5.09
Wh in-situ LD questions	0/74	0%	0.00	0/126	0%	0.00	1/220	0.45%	1.08

*StdD = Standard Deviation

1 The number of contexts in each group reflects the number of LD questions produced by each group in total (see *table 1*).

As shown in the above table, children's LD questions were highly grammatical throughout. PM and copying were extremely rare and appeared only in the two older groups of children, as illustrated in the following figure.

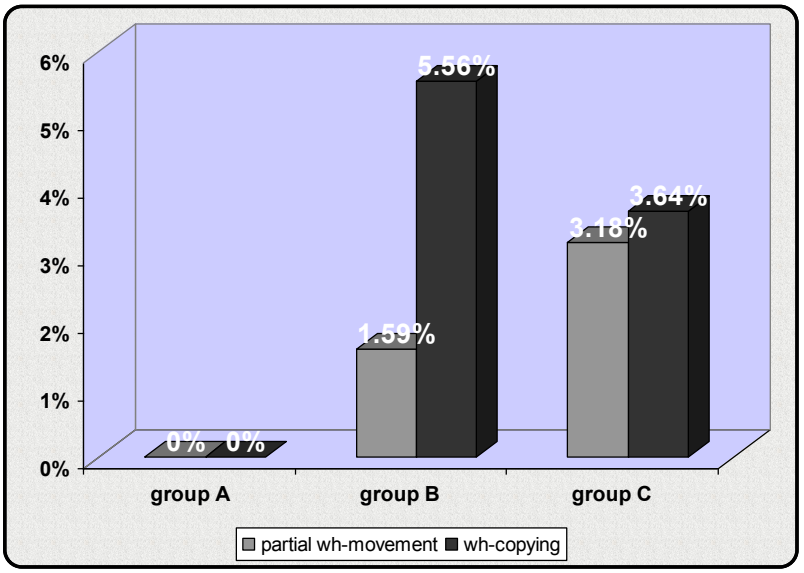

Figure 1. Partial Wh-Movement and Wh-Copying in Long-Distance Question Production

A two-way mixed ANOVA analysis was performed on the results: PM/copying (2) ¥ group (3). Overall, the main within-subject effects of PM/copying [F(1,87)=1.929, p=.168] and PM/copying by group interaction [F(2,87)=6.672, p=.175] were found to be non-significant. Between groups, no significant main effect was found either [F(2,87)=1.021, p=.365]. Given that no significant main effects or interactions were found, no post-hoc tests were run.

PM and wh-copying questions are respectively exemplified in (30)-(31) and (32)-(33) below.

(30) Pu *mandevis esi* pja *ine i kafe bala?*
where guess-2SG you which be-3SG the brown ball
target: Pu mandevis oti ine i kokini bala? (= 'Where are you guessing the red ball to be?')

(31) *Esi pjo mandevis sto 3 ti ine, to mikro aftokinitaki i to megalo?*
you which guess-2SG in the 3 what be-3SG the little car or the big
target: Pjo aftokinitaki mandevis oti ine sto kuti 3? (= 'Which car are you guessing to be in box 3?')

(32) *Astruli esi* ti *mandevis sto 3* ti *exi?*
Astruli you what guess-2SG in the 3 what have-3SG
target: Pjo aftokinitaki mandevis oti ine sto kuti 3? (= 'Which car are you guessing to be in box 3?')

(33) *Esi* pu *mandevis i kokini bala* pu *ine?*
you where guess-2SG the red ball where be-3SG
target: Pu mandevis oti ine i kokini bala? (= 'Where are you guessing the red ball to be?')

To sum up with regard to Prediction 1, the overwhelming majority of the produced LD questions were well-formed, with PM and wh-copying attested very rarely only in the older children's productions[2]. Across languages, the production of LD wh-interrogatives has also been found to involve use of PM and wh-copying. Certain studies are in line with the Greek data in the sense that PM and copying were rather rare compared to well-formed full wh-fronted LD questions; such studies come from English (e.g. Thornton & Crain 1994) and French (e.g. Jakubowicz & Strik 2008). Other studies, however, have revealed high frequency in use of PM/copying compared to full-movement questions. Such evidence is found in Thornton (1990) for English, in Strik (2007) and Oiry (2004, 2009) for French, in van Kampen (1996, 1997, 2009a, b) for Dutch and in Gutierrez (2004, 2006) for Basque and Spanish. On the whole, then, the Greek data differs from the majority of other early language data in that PM and copying were produced sporadically rather than systematically.

A further difference between Greek and other early language data with respect to PM is that the structures produced by the Greek children were actually reverse to the PM structures produced by other children in other languages. The Greek children inserted a wh-element in the embedded SpecCP, while the true wh raised to the matrix SpecCP, as exemplified in (30)-(31) above. As a matter of fact, examples like (31) are reminiscent of a similar pattern attested in cases of D-linking in some German dialects (Fanselow & Ćavar 2001) as well as in early English (Thornton 1990; Thornton & Crain 1994) and early Dutch (van Kampen 1996, 1997, 2009a, b); there, the true D-linked phrase raises to the matrix periphery and another wh-word is introduced in the embedded SpecCP. Yet, with non-D-linked wh-phrases, PM in all child languages resembles the more usual adult PM in raising the true wh to the embedded periphery and inserting a wh-

2 It is noteworthy that no PM and wh-copying instances were produced by the youngest children. Given the fact that such instances were scarce even in the older groups, their total lack in the youngest group may be attributable to chance performance and not to a certain underlying theoretical reason.

scope marker in the matrix periphery. It is precisely in this respect that the Greek data diverges, since the instances of 'PM' concerned not only D-linked but also non-D-linked wh-phrases.

Irrespective of these differences, however, PM and copying questions constitute an overt manifestation of successive cyclicity in the sense that they involve copying without deletion at PF. As a consequence, both well-formed and medial-wh questions reflect children's sensitivity to the successive cyclic formation of LD wh-chains.

4.2. Prediction 2

Prediction 2 states that in cases of D-linking, Greek children should often resort to wh-subextraction (and feature copying), especially in the younger ages; consistent pied-piping is expected in the oldest group. In order to test this prediction, the focus here will be only on the instances of *D-linked* LD questions that were produced by children; specifically, it is interesting to see whether children consistently pied-piped the extracted wh-phrase or produced alternative patterns instead. Table 3 presents the relevant patterns and their respective rates.

Table 3.

Patterns of D-Linking in Long-Distance Question Production[3]

	GROUP A			GROUP B			GROUP C		
Pattern	**No**	**Mean**	**StdD**	**No**	**Mean**	**StdD**	**No**	**Mean**	**StdD**
Pied-piping (target)	6/30	20 %	37.08	21/52	40.38 %	41.19	101/135	74.81 %	35.99
Wh-subextraction (non-target)	18/30	60 %	42.24	22/52	42.31 %	40.88	13/135	9.63 %	14.98
Feature copying (non-target)	6/30	20 %	36.65	9/52	17.31 %	31.97	21/135	15.56 %	33.32

As displayed in the above table, pied-piping, wh-subextraction and feature copying were the D-linking patterns to which children resorted, with only the first one being the target (and grammatical) choice. Schematically, the above results look as follows.

3 The number of contexts in each group corresponds to the total number of D-linked wh-phrases produced on the part of the children.

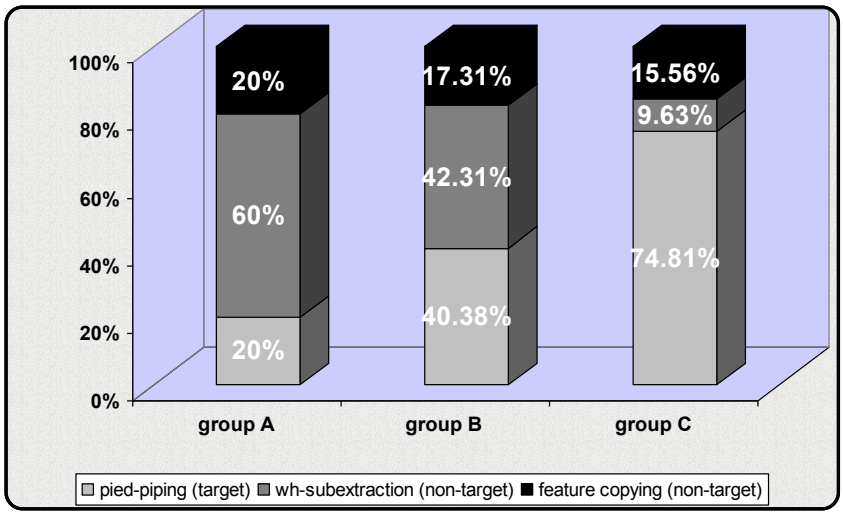

Figure 2. Patterns of D-Linking in Long-Distance Question Production

A two-way mixed ANOVA analysis was performed: pattern of D-linking (3) ¥ group (3). Overall, the main within-subject effects of D-linking pattern [F(2,144)=5.751, p=.004] and D-linking pattern by group interaction [F(4,144)=8.184, p=.000] were found to be significant. Between subjects, however, no main effect of group was observed [F(2,72)=1.713, p=.188]. This implies that there is heterogeneity of performance within groups. Focusing more narrowly on pairwise within-group comparisons, pied-piping prevailed and differed significantly from wh-subextraction (p=.000) and feature copying (p=.000) only in C. In A and B wh-subextraction was the prevailing pattern, with feature copying rates being significantly lower (A: p< .02, B: p< .05). Examples of these three patterns are presented below.

pied-piping:

(34) Pja bala *mandevis oti ine sto 5?*
which ball guess-2SG that be-3SG in the 5
'Which ball are you guessing to be in 5?'

(35) Pjo alogaki *protimas na pai volta?*
which horse prefer-2SG to go-3SG walk
'Which horse do you prefer that it go for a walk?'

wh-subextraction:

(36) *Astruli* pjo *mandevis* alogaki *na ine sto numero 2?*
Astruli which guess-2SG horse to be-3SG in the number 2
'Which horse are you guessing to be in number 2?'

(37) Pjo *protimas* *Astruli* *na pai* *me* *to* *kilo* alogaki?
which prefer-2SG Astruli to go-3SG with the dog horse
'Which horse do you prefer that the dog take with him?'

feature copying:

(38) Pjo *de bori* *na pari* *mazi tu* *o* *Petros* kapjo pragma?
which not can-3SG to take-3SG with him the Peter some thing
'Which thing can't Peter take with him?'

(39) Pjo *protimas* to alogaki *na pari* *to* *skilaki?*
which prefer-2SG the horse to take-3SG the dog
'Which horse do you prefer that the dog take?'

As illustrated in the above examples, in cases of wh-subextraction the stranded nominal element occurred either in situ ((37)) or in medial COMP ((36)), with the former position being the most preferred one (base position preference rates: A: 68.42%, B: 83.33%, C: 56.25%). In feature copying the nominal element was marked by a definite ((39)) or an indefinite ((38)) determiner which doubled the phi- and case features of the fronted wh. Similarly to LD questions involving subextraction, in the ones involving feature copying the nominal element, along with the resumptive determiner, surfaced either in situ ((38)) or in medial COMP ((39)). Again, the former position was most preferred as the landing site for the DP constituent (base position preference rates: A: 80%, B: 88.89%, C: 91.67%). The overt intermediate copies in feature copying may be taken as proof for the successive cyclic derivation of D-linked questions (Cinque 1990; Rizzi 1990).

On the whole with respect to Prediction 2, pied-piping predominated only in the oldest group, with the younger children resorting most often to subextraction and feature copying. Crosslinguistically, similar studies have revealed two main tendencies. In languages like English, on the one hand, subextraction and feature copying are found more rarely than pied-piping in children's productions (Gavruseva 1997; Chen et al. 1998; Gavruseva & Thornton 2001). In languages like early Dutch, on the other hand, subextraction and feature copying are employed much more frequently (van Kampen 1997, 2004).

On the basis of these comparisons, Greek children performed more in line with their Dutch rather than with their English peers, since subextraction and feature copying instances were rather frequent, at least in groups A and B. This performance may be due to that the rich case and agreement morphology in Greek (similarly to Dutch but unlike English) on both the wh-determiner and its accompanying noun facilitates the treatment of the two as independent morphological units (cf. Gavarró & Solà 2004). This might lead, in turn, to an incorrect licensing of a stranded nominal. Besides, in terms of processing, the rich morphological load that wh-determiner and noun bear in combination might discourage children from fronting the full wh-phrase to the matrix left periphery.

The result will be nominal stranding to a lower position, which is in line with the assumption that, under the dictations of natural economy, children prefer the overriding of PF requirements and the construction of LF-like representations with movement of the minimal wh-material to the matrix SpecCP (Chomsky 1995; van Kampen 1997; Gavruseva & Thornton 2001).

Finally, it is interesting to note that feature copying pertained to a partial set of features, with interrogative force being absent from the lower copy; the lower copy encoded feature doubling under quantificational rather than under interrogative force. On this ground, it is plausible to argue that the phenomenon of feature copying casts doubts on the full identity of all copies advanced in Chomsky's copy theory of movement (Chomsky 1995). A more satisfactory proposal seems to be the one put forward by Felser (2004), who claimed that all copies in a wh-chain are not identical in terms of feature specification: the highest copy carries the wh-feature, whereas the lower copies carry features other than the wh-feature. Similarly, Radford (2009) argued for the possibility of discontinuous spell-out of a moved constituent, with a partial copy of it that lacks the wh-feature specification appearing in a lower position.

5. Conclusions

In conclusion, this paper has dealt with the L1 acquisition of LD wh-movement. Apart from full-fronted wh-questions, children across languages, including Greek, often resort to alternative constructions, such as PM, wh-copying and wh-subextraction/feature copying. On the basis of such findings, more generalised conclusions can be drawn about the fundamental questions shaped in the introductory section.

Question A was whether there is evidence for the availability of successive cyclic movement in early child grammar. To begin with, the production of well-formed LD questions points to this direction. Further support for successive cyclicity comes from deviant question production. On the one hand, the rare occurrences of PM and wh-copying constructions manifest overtly the intermediate positions of a wh-dependency chain (e.g. Thornton 1990; van Kampen 1997; Gutierrez 2006); on the other hand, instances of feature copying with an overt copy in medial-COMP position also serve the same function. As a matter of fact, the reverse-to-usual PM as well as the feature copying pattern observed in the Greek data challenges the full identity of copies claimed by Chomsky (1995) in favour of the claim that lower copies are partial copies of the fronted wh deprived of wh-feature specification (Felser 2004; Radford 2009).

Turning to question B, it concerned child preference for early PF/LF convergence. The major source of evidence suggestive of this convergence is children's deviant production of D-linked questions. Given that movement at LF

pertains to the minimum, namely to movement of the wh-feature for checking purposes (Chomsky 1995), children's wh-subextraction and feature copying are closer to this LF representation than full pied-piping which carries excessive non-wh-material to the matrix left periphery. Instances of subextraction and feature copying in the Greek data were quite frequent, and this shows that children's overriding of PF wh-and-noun adjacency requirements in favour of LF-like representations was systematic. Furthermore, indirect evidence for the reduction of PF/LF discrepancies in child grammar comes from medial-wh questions. The occurrences of PM and wh-copying structures constitute, despite their rareness, manifestation of the fact that children's wh-chains might involve copying without deletion at PF. In other words, the successive cyclic LF construction of the wh-chain becomes equivalent to its PF realization for children, who thus override the PF requirement of overtly spelling out only one copy of the wh-chain (Chomsky 1995).

As a final note, all this evidence for early availability of successive cyclic movement and for early convergence of PF/LF representations can be subsumed under a general tendency to natural economy. Through the overtly manifested local steps, children's production system seems to 'refresh' the wh-element involved in a LD dependency; in other words, it may be concluded that during LD question production children attempt to minimise on the processing burden in every way possible (cf. Jakubowicz & Strik 2008).

References

Bruening, B. 2006. Differences between the *Wh*-Scope-Marking and *Wh*-Copy Constructions in Passamaquoddy. *Linguistic Inquiry* 37: 25-49.

Chen, D., M. Yamane and W. Snyder. 1998. On the nature of left-branch violations in child English. *BUCLD Proceedings* 22: 91-96.

Chomsky, N. 1995. *The Minimalist Program*. Cambridge, Massachusetts: MIT Press.

Cinque, G. 1990. *Types of A-Dependencies*. Cambridge, Massachusetts: MIT Press.

Crain, S. and R. Thornton. 1998. I*nvestigations in Universal Grammar. A Guide to Experiments on the Acquisition of Syntax and Semantics*. Cambridge, Massachusetts: MIT Press.

Dayal, V. 1994. Scope marking as indirect wh-dependency. *Natural Language Semantics* 2: 137-170.

Fanselow, G. and D. Ćavar. 2001. Remarks on the economy of pronunciation. In G. Müller and W. Sternefeld (eds.), *Competition in Syntax*. Berlin: de Gruyter, 107-150.

Felser, C. 2004. Wh-copying, phases, and successive cyclicity. *Lingua* 114: 543-574.

Gavarró, A. and J. Solà. 2004. Wh-subextraction in child Catalan. Paper presented at *Second Lisbon meeting on language acquisition*, Universidade de Lisboa, June 1st, 2004.

Gavruseva, E. 1997. *Syntax of Possessive Phrases and Acquisition of Whose-Questions: a Comparative Study of Child L1 and Child L2 Grammars*. PhD Dissertation, Georgetown University, Washington.

Gavruseva, E. and R. Thornton. 2001. Getting It Right: Acquisition of *Whose*-Questions in Child English. *Language Acquisition* 9: 229-267.

Gutierrez, M.J. 2004. The acquisition of L1 Basque Long-Distance wh-questions: a longitudinal investigation. Paper presented at *BIDE04*, Bilbo, Spain.

Gutierrez, M.J. 2006. Acquiring long-distance wh-questions in L1 Spanish. In V. Torrens and L. Escobar (eds.), *The Acquisition of Syntax in Romance Languages*. Amsterdam, Philadelphia: John Benjamins, 251-287.

Jakubowicz, C. and N. Strik. 2008. Scope-marking Strategies in the Acquisition of Long Distance wh-Questions in French and Dutch. *Language and Speech* 51: 101-132.

van Kampen, J. 1994. The learnability of the left-branch condition. In R. Bok-Bennema and C. Cremers (eds.) *Linguistics in the Netherlands* 1994. John Benjamins, Amsterdam, 83-94.

van Kampen, J. 1996. PF/LF Convergence in Acquisition. In K. Kusumoto (ed.), *North East Linguistics Society Conference (NELS) 26*. Amherst: GLSA, 149-163.

van Kampen, J. 1997. *First Steps in Wh-Movement*. PhD Dissertation, University of Utrecht.

van Kampen, J. 2004. An acquisitional view on optionality. *Lingua* 114: 1133-1146.

van Kampen, J. 2009a. The learnability of A-bar chains. In M. Everaert, T. Lentz, H. De Mulder, O. Nilsen and A. Zondervan (eds.), *The Linguistic Enterprise*. Amsterdam, Philadelphia: John Benjamins, 115-139.

van Kampen, J. 2009b. *The 'Phased' Learnability of Long Wh-questions.* Cascadilla Proceedings Project.

McDaniel, D. 1989. Partial and multiple wh-movement. *Natural Language and Linguistic Theory* 7: 565-604.

McDaniel, D., C. McKee and H. Smith Cairns (eds.). 1996. *Methods for Assessing Children's Syntax*. Cambridge, Massachusetts: MIT Press.

Oiry, M. 2004. Evidence from L1 Acquisition for the Syntax of Wh-Scope Marking. Paper presented at *2nd WoSS*, University of Barcelona, September 15-17, 2004.

Oiry, M. 2009. A case of true optionality: Wh-in-situ patterns like Long Movement in French. Paper presented at *ISTAL 19*, School of English, Aristotle University of Thessaloniki, 3-5 April 2009.

Pesetsky, D. 1987. Wh-in-situ: movement and unselective binding. In E. Reuland and A. ter Meulen (eds.), *The Representation of (In)definiteness*. Cambridge, Massachusetts: MIT Press, 98-129.

Radford, A. 2009. *Analyzing English Sentences: A Minimalist Approach*. Cambridge: CUP.

Rizzi, L. 1990. *Relativized Minimality*. Cambridge, Massachusetts: MIT Press.

Strik, N. 2007. L'acquisition des phrases interrogatives chez les enfants francophones. *Psychologie française* 52: 27-39.

Stromswold, K. 1995. The Acquisition of Subject and Object Wh-Questions. *Language Acquisition* 4(1): 5-48.

Thornton, R. 1990: *Adventures in long-distance moving: the acquisition of complex wh-questions*. PhD Dissertation, University of Connecticut.

Thornton, R. and S. Crain. 1994. Successful cyclic movement. In T. Hoekstra and B. Schwartz (eds.), *Language Acquisition Studies in Generative Grammar*. Amsterdam, Philadelphia: John Benjamins, 215-252.

Yamane, M., D. Chen and W. Snyder. 1999. Subject-object asymmetries and Children's Left Branch Extractions. *BUCLD Proceedings* 23(2): 732-740.