Minimal Inquiries and the Acquisition of the Definite Article in Modern Greek

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1 Introduction

The acquisition of definite articles has often been related to the acquisition of functional categories (see e.g. Radford, 1990; Clahsen, 1996; Penner & Weissenborn, 1996),[1] since definite articles belong to the functional category (FC) D. Under this view, a problem that remains unsolved is why children pass through a stage in which they produce some definite articles, while at the same time there is a significant rate of definite article omission. If lack of definite articles reflects lack of FCs, the eventual presence of FCs should preclude definite article omission.

In this paper, making use of minimalist ideas concerning the feature specification of nouns and adopting Chierchia's Nominal Mapping Parameter (Chierchia, 1998), I will discuss the acquisition of definite articles in Modern Greek (MG) from a rather different perspective, one which is based on the idea that the syntax-semantics mapping in the nominal system is not cross-linguistically uniform. Total and partial omission of definite articles does not pose a problem for this analysis. In contrast, this model predicts that children learning Germanic, Romance languages and MG will pass through a stage of optional use of definite articles.

2 Theoretical considerations

In the Minimalist Program, 'UG makes available a set F of features (linguistic properties) and operations C_{HL} (the computational procedure for human language) that access F to generate expressions' (Chomsky, 1998: 12). Language acquisition involves feature selection, construction of lexical items, and refinement of the computational system.

According to standard assumptions concerning the mapping of nominal categories onto their denotations, common nouns are mapped onto predicates, they are of the type *<e, t>*, DPs are mapped onto arguments, they are of the type *e* (referential nominals), or *<<e, t> , t>* (quantificational nominals). This being so, bare common nouns should not appear in argument positions because they are of the wrong type, i.e. *<e, t>*. This line of reasoning has led to the assumption that the functional category D must be projected with a null D^0 each time a bare common noun appears in an argument position (Longobardi, 1994; 1996).

Under the assumption that proper names (PNs) are universally of type *e*, they are of the right type to appear as bare nouns in argument positions. However, there are languages in which PNs are preceded by determiners (among others Northern Italian dialects, Swiss German, High German and Modern Greek). In order to account for this fact, Longobardi (1994; 1996), Rousou & Tsimpli (1994), Penner & Weissenborn (1996), Marinis (1998), have claimed that definite articles used with PNs are expletives. Thus, they have argued for the distinction between substantive definite articles that turn predicates into arguments and

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[1] But see Pine & Martindale (1996) for a different approach to the acquisition of definite articles in English.

expletive definite articles that do not have any semantic content and do not have any effect on the semantics of NPs.

Chierchia's approach, which I will adopt in this paper, treats these facts differently. Common nouns are not cross-linguistically of the type $<e, t>$. They can and sometimes must refer to kinds, i.e. common nouns can and sometimes must be of the argumental type. Thus, there is no need to assume the presence of a DP shell with a null D^0 each time bare common nouns appear in argument positions. Moreover, in this approach, the denotation of PNs, like the denotation of common nouns, is not cross-linguistically uniform: PNs may have the semantic type $<e, t>$, meaning that they are predicates true of just one individual.[2] Therefore, there is no need to stipulate two types of definite articles.

Cross-linguistic variation is expressed in this model through the use of the binary features [±arg], [±pred], which constrain the way in which nouns are mapped onto their interpretations. A [+arg] specification means that nouns can be mapped onto arguments, consequently they can appear as bare nouns in argument positions, a [-arg] one means that they cannot, thus they need a DP shell when they appear in argument positions; similarly for [+pred] and [-pred]. Accordingly, there are three combinations, which represent the possible language types, i.e. [+arg, -pred], [+arg, +pred] and [-arg, +pred][3], each one of which represents a setting of the Nominal Mapping Parameter[4] (Chierchia, 1998: 352-358).

Nouns have the feature specification [+arg, -pred] in languages of the Chinese type (e.g. Chinese, Japanese). In these languages, nouns are argumental (names of kinds) and their extension is mass; consequently they can occur as bare nouns in argument positions, they do not have plural marking, and they have a generalized classifier system.

Nouns in Germanic languages are [+arg, +pred]. For example, English has count nouns (CNs) and mass nouns (MNs) and allows nouns to be predicative (singular CNs) or argumental (plurals and MNs). CNs have plural marking, while a classifier system is operative with MNs. With respect to PNs, some are mapped onto arguments, and appear as bare nouns in argument positions, while others are mapped onto predicates and are used with determiners (e.g. *the Gulf Stream*).

In Romance languages and MG, nouns are specified by the features [-arg, +pred]. MG has MNs and CNs, however, both are mapped onto predicates, i.e. bare nouns in argument positions are generally disallowed, as illustrated in (1) and (2). Consequently, a DP shell has to be projected each time a noun appears in an argument position. Bare nouns in argument positions are licit only in restricted environments, i.e. in positions governed by a lexical head, as in (3) or in focus, as in (4).[5]

(1)   *zachari   ine   ghlikia.
      'Sugar   is   sweet.'
(2)   *Skilia dhagonun.

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[2] For the predicative use of PNs in Modern Greek, see Marmaridou (1982; 1989).

[3] The [-arg, -pred] specification is not a possible option, because it would prevent nouns from having any interpretation at all, i.e. nouns would be mapped neither onto arguments nor onto predicates.

[4] For alternative approaches to the typology of NPs, see e.g. Gil (1987), Löbel (1993).

[5] The same is true for Italian but not for French, in which bare arguments are disallowed altogether (Chierchia, 1998).

'Dogs   bite.'

(3) Efagha biskota me   to   ghala mu.
     ate   cookies with the   milk my
     'I ate cookies with my milk.'

(4) KOTOPULO thelo na fao,   ochi psari.
     CHICKEN   want to eat   not   fish
     'I want to eat chicken, not fish.'

Apart from bare plurals, as in (3), and bare mass nouns, as in (4), MG allows bare singular count nouns (BSCN)[6] as objects of verbs of accomplishment[7] (Vendler, 1967), as in (5).

(5) O Nikos chtizi spiti sti   Mykono.
     The Nikos builds house in-theMykonos
     'Nikos is building a house in Mykonos.'

In the case of bare nouns in argument positions, I assume, following Chierchia (1998) for Italian, and Sioupi (1999) for MG, the existence of a null D,[8] which is licensed by a lexical head, as in (3) and (5) or in a Focus Phrase, as in (4). With respect to PNs, there is a clash between the (unmarked) semantics of PNs and the mapping of the syntactic category of nouns onto predicates: PNs 'want' to be argumental, but their syntactic type has to be mapped onto predicates. This clash is resolved through the use of the definite article, when PNs are arguments, as illustrated in (6).[9]

(6) O Giannis   aghapai ti   Maria.
     the Giannis   loves   the Maria
     'Giannis loves Maria.'

3 Predictions for the acquisition of the definite article in Modern Greek

According to acquisition assumptions within the Minimalist Program (Roeper, 1999; Powers, under review), the feature specification of lexical items may initially be non-target like. Positive evidence from the input may force children to change their feature specification. If we view the Nominal Mapping Parameter through this perspective and assume the Subset Principle, according to which children initially hypothesize the most restrictive grammar, we expect them to start with the feature specification that rules out the most, so that they may revise their hypothesis on the basis of positive evidence alone. The most restrictive feature specification is [+arg, -pred] (Chinese type), since this excludes

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[6] BSCN as objects of verbs of accomplishment, are licit in the same restricted environments as bare plurals and bare mass nouns are.

[7] For an analysis of BSCN in MG, see Sioupi (1999).

[8] Pérez-Leroux & Roeper (to appear) analyze bare nouns in argument positions in English as NPs and not as DPs. This is in line with Chierchia (1998) and this paper. Since English nouns are [+arg, +pred], bare nouns appearing in argument positions are NPs.

[9] The same is true in Northern Italian dialects. A second option is operative in Standard Italian: PNs move to an argument position (D^0) (Longobardi, 1994; 1996).

plural morphology, definite articles and numeral quantifiers combining directly with nouns. As a consequence, children will initially omit definite articles.

Prediction 1: - *initial specification of nouns: [+arg, -pred]*
               - *drop of definite articles*

Upon discovering definite articles and plural marking in the input, children should change the initial feature specification to [-arg, +pred] (Romance type), triggering the obligatory projection of a DP shell in nouns appearing in argument positions. [-arg, +pred] is the next most restrictive feature matrix, because it excludes bare nouns from argument positions altogether. However, the input to children acquiring MG contains bare plurals, bare MNs and BSCNs in lexically governed and in focus positions. Thus, children must: a) distinguish which nouns are mass and which are count, b) identify, in which positions bare nouns are licit, and c) discover which verb classes allow BSCNs as arguments. Uncertainty with respect to these aspects may result into the optional use of definite articles.

Prediction 2: - *second specification of nouns:[-arg, +pred]*
               - *optional use of definite articles*

For children acquiring Germanic languages, the unrestricted occurrence of bare MNs in argument positions should lead them change the feature matrix of nouns to [+arg, +pred].[10]

Can the existence of bare arguments lead Greek children change the feature matrix to [+arg, +pred]? Are there any unambiguous triggers that nouns in MG are [-arg, +pred]?

Contexts involving PNs can provide unambiguous evidence that nouns are [-arg, +pred]. PNs are the only nouns that cannot be used as bare nouns in argument positions, irrespective of the verb class: in argument positions they must be obligatorily used with definite articles, as shown in (6), in non-argument positions, e.g. in the vocative, they must be obligatorily used without definite articles. This minimal pair can provide the relevant information for the feature specification of nouns. Importantly, PNs are very frequent in child-directed speech in both argument and non-argument positions, and we can thus be sure that children will get enough input from these two contexts.

    Thus, considering this last property of MG, we predict PNs to be used with definite articles, as soon as children start using definite articles productively. This does not imply that they will use definite articles only with PNs and not with other noun classes, since having the right specification will lead them to use definite articles with all noun classes.

Prediction 3: - *definite articles will appear with all noun classes simultaneously*

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[10] According to Chierchia, Guasti & Gualmini (1999), children revise their initial [+arg, -pred] hypothesis to [+arg, +pred]. Positive evidence from bare partitives or overt plural indefinites trigger the change to [-arg, +pred]. However, it is not clear, why the Subset Principle should constrain only the first hypothesis of the child, but not the second.

4 The Data

This study is based on two corpora, one longitudinal, the Christofidou Corpus, and one cross-sectional, the Stephany Corpus, consisting of the recordings of 5 monolingual Greek children between the ages of 1;7 to 2;9. The ages of the children, the number of recordings and the number of utterances produced by each child are shown in Table 1.

	Christofidou	*Stephany*			
Child	Christos	Spiros	Janna	Meri	Maria
Age	1;7-2;8	1;9	1;11-2;9	1;9-2;9	2;3-2;9
Nr. of recordings	69	2	9	12	5
Nr. of utterances	12,383	443	1,357	4,154	3,074

Table 1: Corpora

4.1 Stephany Corpus

All four children in the Stephany Corpus use definite articles from the first recording on, as shown in Table 2. Thus, Prediction 1, that there will be a stage in which children do not use any definite articles at all, cannot be falsified, since there are no previous recordings available.

The second prediction is supported by the data: all children pass through a stage in which they use definite articles optionally, as we can see in Table 2.[11]

Child	*Age*	*MLU*	*definite articles present*	*definite articles missing*
Spiros	1;09	1.6	23 % (n = 35)	77 % (n = 118)
Janna	1;11	1.4	15 % (n = 9)	85 % (n = 50)
	2;05	2.4	93 % (n = 67)	7 % (n = 5)
	2;09	2.8	97 % (n = 144)	3 % (n = 5)
Mairi	1;09	2.0	77 % (n = 294)	23 % (n = 90)
	2;03	2.2	88 % (n = 219)	12 % (n = 31)
	2;09	2.5	91 % (n = 258)	9 % (n = 26)
Maria	2;03	2.3	67 % (n = 32)	33 % (n = 16)
	2;09	2.9	93 % (n = 136)	7 % (n = 11)

Table 2: Use of definite articles in obligatory contexts

With respect to the third prediction, all children use definite articles with CNs, PNs and kinship terms (KTs) at the same time,[12] see Table 3. Thus, Prediction 3 is supported by these data.

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[11] It should be noted that the rate of definite article omission correlates with MLU. Spiros and Janna who had the lowest MLU have the highest rate of definite article omission.

[12] I have counted KTs with PNs, because colloquially they replace PNs, both when used in argument positions and in the vocative (see Longobardi, 1996: 3).

Child	Age	MLU	with CN	with PN & KT
Spiros	1;09	1.6	21	11
Janna	1;11	1.4	5	3
	2;05	2.4	50	9
	2;09	2.8	90	38
Mairi	1;09	2.0	182	71
	2;03	2.2	110	60
	2;09	2.5	147	68
Maria	2;03	2.3	20	9
	2;09	2.9	71	33

Table 3: Use of definite articles with CNs, PNs and KTs

4.2 Christofidou Corpus

Prediction 1 is supported by the speech of Christos. At the age of 1;7, he does not use any definite articles at all, as illustrated in Figure 1.
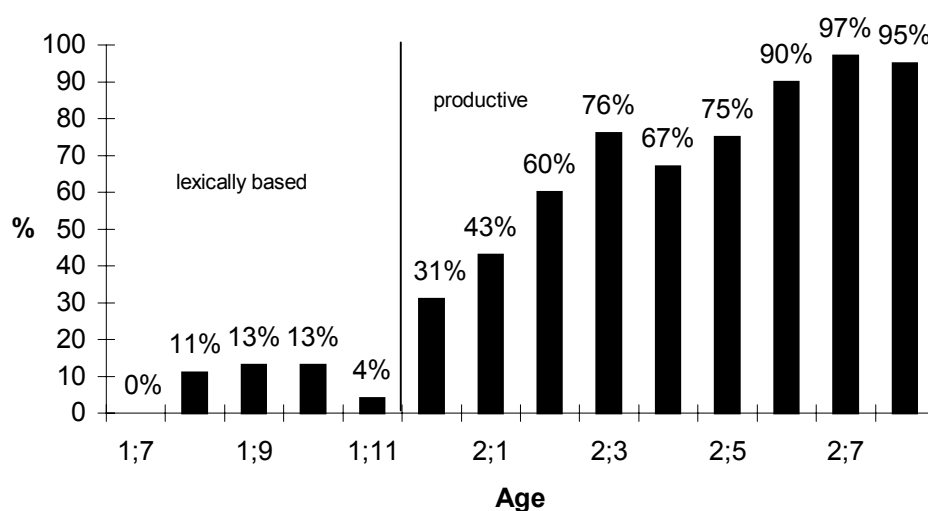

Figure 1: Use of definite articles in obligatory contexts

Between 1;8.21 and 1;11.0, he uses only a small number of definite articles (type/token = 3/12) with a restricted set of nouns (type/token = 9/12). Between 1;11.10 and 1;11.19, he does not use any definite articles at all. These facts provide evidence for a *lexically based* use of definite articles (see Pine & Martindale, 1996).

From 1;11.27 onwards there is evidence for a productive use of definite articles: a) the number of tokens increases rapidly (from 4% in 1;11 to 31% in 2;0), b) Christos uses definite articles with more noun types than he did before, and c) from 2;0.7 onwards, nouns that are used for the first time appear with definite articles. However, only at the age of 2;6 does the percentage of definite articles reach 90% in obligatory contexts (Brown,

1973), i.e. between 2;0 and 2;5, definite articles are used optionally, a fact that supports Prediction 2.

With respect to the use of definite articles with different noun classes, Prediction 3 is borne out. Christos uses definite articles with CNs, PNs and KTs, when he starts using definite articles productively (after 1;11), see Table 4.

Child	Age	MLU	with CN	with PN & KT
Christos	1;07	1.2	0	0
	1;08	1.1	0	2
	1;09	1.1	1	1
	1;10	1.3	3	5
	1;11	1.4	0	2
	2;00	2.0	37	45
	2;01	2.2	73	86

Table 4: Use of definite articles with CNs, PNs and KTs

5 Discussion

The predictions deriving from the Nominal Mapping Parameter have been borne out by the data from MG. It has been shown, that children start from the most restrictive hypothesis, i.e. [+arg, -pred] and upon encountering input data, they change the feature specification of nouns until they come to the one of the target language.

Prediction 1 could be tested only in the Christofidou Corpus, since all children in the Stephany Corpus have been using definite articles from the very first recording (recordings start at 1;9, lowest MLU=1.4). However, absence of a stage, in which children do not use any definite articles is most likely an effect of sampling, for we do find some evidence of such a stage in the Christofidou Corpus, in which we have the earliest recordings (recordings start at 1;7, lowest MLU=1.2). Hence, the prediction that children initially map the features [+arg, -pred] into nouns is supported by these data.

Prediction 2 is borne out by the data from the Stephany Corpus. However, the fact that Christos initially uses a small number of definite articles followed by a period in which he does not use any definite articles at all seems to contradict our predictions. If Christos would change the feature specification from [+arg, -pred] to [-arg, +pred], we would expect a generalized and not a lexically based use of definite articles in obligatory contexts.

Does lexically based use of definite articles provide evidence against our predictions?

Obviously, it does not support them. However, since lexically based use of words along with imitations and the use of formulaic and semi-formulaic expressions is a strategy that does not characterize productive speech, it does not contradict them either. The existence of these strategies is independent from the learning algorithm that leads to productive speech, with which we are concerned in this paper. Crucial for our predictions is not the use of definite articles in such conditions but rather in productive speech. In the speech of Christos, this takes place after 1;11.27. Prediction 2 is, thus, borne out by the Christofidou

Corpus as well, since Christos uses definite articles optionally from the age of 2;0 (31%) until the age of 2;5 (75%).

Prediction 3 is also supported by the data in both corpora. All five children use definite articles with CNs, PNs and KTs, as soon as they start using definite articles productively.

It remains open, how children acquire null Ds which is related to: a) how they figure out, which nouns are mass and which are count, b) how they identify lexically governed and focus positions, and c) how they discover when BSCNs are licit. With respect to the distinction between MNs and CNs, it is possible for children to use as cues the distribution of nouns with different quantifier types, e.g. *much* vs. *many* in English, as well as the use of plural marking with CNs and classifiers with MNs (for the acquisition of CNs vs. MNs in English, see Katz, Baker & Macnamara, 1974; Gordon, 1988). Word order and stress could provide the relevant cues for the identification of lexically governed and focus positions. The relevant cues for the identification of the class of verbs, with which bare singular count nouns are allowed might be the semantics of verbs (verbs of accomplishment).[13] [14]

In this paper, Chierchia's Nominal Mapping Parameter viewed through acquisition assumptions within the Minimalist Program has been applied to the acquisition of the definite article in MG. Crucially, the optional use of definite articles which is problematic for theories that relate definite article omission to the lack of FCs, does not pose a problem, but it is rather predicted by this model.

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[13] This is in accord with the idea of Sioupi (1999) that BSCN are part of the semantics of the verb.

[14] The predictions deriving from these hypotheses are discussed in Marinis (in preparation).

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