On the productivity of the diminutive suffixation in Greek child language^{*}

Evangelia Thomadaki

Democritus University of Greece ninthom@otenet.gr, ethomada@bscc.duth.gr

Abstract

This paper addresses the issue of the productivity of derivational structures, namely diminutives, in the acquisition of Greek as a first language. In order to determine the productivity of diminutive patterns, the rate at which 'new' diminutives appear in the speech of a Greek child on a monthly basis ('rate of additions') is compared to the respective frequency rates of the diminutive patterns in the same data. The present approach shows how productivity may be determined in the absence of truly innovative uses.

Keywords: productivity, frequency, child speech, diminutives, lexical development, innovation

1. Introduction

Diminutives emerge very early in the speech of Greek children as well as in the speech of children learning other languages, such as Italian, Dutch, Lithuanian, or Russian (Gillis 1997; de Marco 1998; Savickiene 1998; Voeykova 1998). They are among the first word formation patterns attested with a considerable degree of frequency. Their frequent use in child speech (henceforth, CS) – as well as in child-directed speech (henceforth, CDS) – is not only due to their semantic but also to their pragmatic function: apart from conveying the meaning of 'smallness', they serve as a means of indicating endearment, intimacy or empathy (Dressler et al. 1994, 2001; Stephany 1997b; Thomadaki & Stephany submitted). Studying the role of diminutives in language acquisition will not only contribute to our understanding of the development of semantic vs pragmatic aspects in the lexicon but it will also help to understand the acquisition of word formation.

It has been assumed by Clark (1993: 140) that acquisition of derivational structures by the child implies acquisition of their differences in productivity. In fact, children show preferences for 'productive' word formation patterns, and, as argued by Clark (1993: 127), coinages produced by children offer the most reliable evidence for this. As will be shown in the present paper, productive word formation patterns in CS can be detected even in the absence of such coinages, since they are not only characterized by frequency of occurrence but also by their contribution to the enlargement of vocabulary by the addition of new lexical items.

The paper is structured as follows: A brief discussion of productivity and its relation to coinages, frequency and rate of additions in adult language as well as language acquisition (section 2) will be followed by the presentation of diminutive formation and

^{*}I am indebted to D. Katis for giving me access to her transcribed data. I am also very grateful to U. Stephany for inspiration and valuable comments. Any remaining shortcomings are my own.

use in standard Greek as well as Greek CD and child speech (section 3). After a presentation of the data (section 4), the relation of productivity, frequency and rate of additions in the child's speech will be studied (section 5). Next, the results will be discussed and some concluding remarks will be provided (section 6).

2. Productivity

2.1 Productivity in adult language

At least since the publication of Aronoff's monograph on word formation in 1976, the problem of finding a suitable way of defining and measuring productivity has been hotly debated and many attempts to solve it have been made¹. Productive patterns are typically those connected with the production of 'new items', innovations or coinages, although neither the notion 'production of items', nor the notion 'new' is completely clear². Furthermore, the nature of productivity as admitting either a categorical or a gradual definition is under discussion. Accordingly, many different ways of measuring productivity in adult language have been suggested.

Focusing on coinages or innovations, Bauer (2001: 156) proposes to measure productivity in adult language in terms of 'rate of additions', assuming that "the more productive a morphological process is, the more coinages that [*sic*] occur created by that morphological process in a given time period." This suggests that by studying the 'rate of additions', processes of word formation may be compared not only historically, but also within a given period, provided that a differentiation between new and old items is possible³.

2.2 Productivity in language acquisition

Although children's coinages differ from adults' in that they "tend to be a mix of legitimate and illegitimate forms", children "grasp some conditions on coinages very early", "productivity in the language community being one of them" (Clark 2003: 281). Defining a certain derivational pattern as productive in CS therefore means that this pattern is a candidate for innovative use by the child.

¹ To mention but a few, Aronoff (1983) discusses the notions of potential *vs* actual word and their relation to productivity, while Baayen & Lieber (1991) attempt to explore the productivity of affixes in a corpus. Others have concentrated on defining productivity with reference to notions like transparency (Dressler 1985), regularity and naturalness (Mayerthaler 1981). See Bauer (2001) for an illuminating presentation of the different perspectives found in the literature.

² Apart from the well known difficulty of tracing and defining innovations in adult language, comments such as "lexical innovation is not automatic" (Bauer 2001: 212) indicate that production of new items relates to 'availability' and 'profitability' of a given process. In addition, since "children know much less of the conventional vocabulary than adults do" (Clark 2003: 281), lexical innovation in child language differs from adult coinages in a number of ways.

³ Bauer (2001: 156-161) suggests different ways of applying this kind of measurement. When standard dictionaries or dictionaries of neologisms are used, the 'rate of additions' indicates how many new words have appeared per year for a given period of time. Bauer notes that the number of new words/additions is not easy to estimate, given the fact that dictionaries usually ignore neologisms, rare words or words unlikely to be of value to the target audience. Moreover, the issue of what is a 'new' word remains unresolved (e.g. does a meaning extension/change count as a different word?). Accordingly, he proposes comparing a dictionary with a suitably large corpus. This comparison could give a measurement of the number of words of the appropriate type found in the corpus (a) but not in the dictionary (b), expressed as *a* minus *b*. Although he admits that "this measurement in itself is relatively meaningless", he points out that "a comparative measure of productivity can be gained if two or more similar measures are taken" (Bauer 2001: 159). For a simpler procedure adopted in the present paper see sect. 5.2.

It must be noted, however, that coinages in CS are a priori tentative or impromptu vocabulary items. Data collected on a more or less fixed time schedule, as in the case of the data studied here, will rarely succeed in capturing them. On the other hand, children "start out not knowing, for the words they hear, which are innovative and which conventional" (Clark 1993: 137). This suggests that at the point when they "come to match adult preferences in their own coinages", they must already have arrived at some "abstraction of productive word formation patterns" based on type frequency in the input, not on token frequency.

In view of the foregoing, frequency differences between related patterns of word formation in CS can in principle be considered to reflect productivity differences, especially in the absence of coinages.

3. Diminutives in standard Greek, Greek CDS and CS

As far as Greek diminutives are concerned the following must be borne in mind:

• Diminutive suffixes of standard MG differ in productivity, both in the sense of obeying different structural constraints and of being attested with differing degrees of frequency in adult language (Babiniotis 1970; Daltas 1985).

• Differences in the frequency of use of diminutive suffixes also occur in CDS, both in terms of types and tokens.

• Although the data studied here do not include any coinages based on the conventional diminutive patterns⁴, new diminutives appear in the child's speech every month. These are not proper neologisms, however, since all of them are part of the vocabulary of Standard MG and most of them are also attested in CDS. Furthermore, diminutives and simple nouns usually coexist in the child's speech and, at least until the 3rd year (the age up to which the present data were studied), no stable meaning differentiation between such doublets emerges (Thomadaki & Stephany submitted). The new diminutives occurring in the child's speech differ from coinages in at least one respect: they fill some 'gap' in the child's vocabulary⁵, but unlike real coinages, they do not always serve a need to denote an object, since they coexist with simple nouns. Nevertheless, similarly to coinages, they attest to the gradual growth of the child's vocabulary and hence relate to the factor of productivity governing vocabulary growth in language.

4. Data

The present analysis is based on a part of the audio-taped speech of a monolingual Greek girl (Anna) growing up in Athens. The data analyzed for the present paper totals almost 37 hours of spontaneous interaction between the child and her mother (or other adults) in various everyday situations. The data, which covers the period from age 1;8 to 3;0 has been transcribed according to the conventions of the CHILDES project (MacWhinney 2000)⁶.

⁴ Diminutive coinages in the present corpus mainly consist in non-standard forms derived by the suffix – *ina* (*/-inos/-ini*) (1;10 *kuklina* 'dear little doll', 2;0 *papulinos* 'dear grandpa') carrying an affective meaning. They are not included in the present study since the issue of productivity is treated here with reference to standard diminutive patterns. They are interesting, however, because they pertain to the way children "come to match adult preferences" (Clark 1993: 137) (for details see Thomadaki & Stephany submitted).

⁵ S. Clark 2003: 281 "coinages fill lexical gaps".

⁶ The transcription has been done by V. Kantzou.

As can be seen in Table 1, the amount of data collected during the respective months varies significantly. While it amounts to an average of 3 hours per month until 1;11, it drops to 2.5h/m for the period 2;0 to 2;6 and even to 1.5h/m for the last half of the third year. This may influence the number of diminutives encountered at the respective ages.

Age	1;8	1;9	1;10	1;11	2;0	2;1	2;2	2;3	2;4
minutes	60	150	180	300	180	180	210	90	120
Age	2;5	2;6	2;7	2;	8 2;	9 2	2;10	2;11	3;0
minutes	180	90	60	12	0 60) 3	30	150	60

Table 1. Amount of data (in minutes) per month

5. Productivity, frequency and rate of additions of diminutives in CS

5.1 Productivity and type frequency'

The diminutives used by the child Anna between age 1;8 and 3;0 carry six different suffixes. The most frequently occurring diminutive suffix is -aki, while the suffixes – ula and -itsa are the next two most frequent ones in terms of type frequency. All other diminutive suffixes (-akos, -ulis and -uli) occur very infrequently (Figures 1a, b).



Figure 1b. Diminutives occurring in Anna's speech (types)

⁷ Figures 1- 5b, as well as the results reported in this section, are taken from Thomadaki & Stephany (submitted).



A similar picture emerges for child-directed speech (Figures 2a, b).

Figure 2b. Diminutives occurring in CDS (types)

As can be seen in Figure 3, the child tends to approach the number of types of diminutives used by her mother as she grows older.





What contributes to the productivity of a certain suffix in CS is type frequency in CDS rather than token frequency. This can be demonstrated by a comparison of diminutives carrying the suffix -aki (Fig. 4a, b) with those ending in -ula (Fig. 5a, b). The high token frequency of diminutives in -ula in CDS (Fig. 5b) does not lead to higher productivity of this suffix in CS in comparison with -aki (compare Fig. 4b and 5b) whereas the high productivity of -aki diminutives in CS, measured in terms of type

frequency (Fig. 4a), can be related to their higher type frequency in CDS as compared to -ula diminutives (compare Fig. 4a and 5a).



Figure 4a. Diminutives in *-aki* in Anna's speech and in CDS (types)



Figure 4b. Diminutives in *-aki* in Anna's speech and in CDS (tokens)



Figure 5a. Diminutives ending in -ula in Anna's speech and in CDS (types)



Figure 5b. Diminutives ending in *–ula* in Anna's speech and in CDS (tokens)

5.2 Productivity and rate of additions

Having established that suffixes which are productive in CDS in terms of type frequency are also productive in CS, a study of the following questions may further clarify the notion of productivity with respect to that of 'rate of additions':

- 1. Is the rate at which new diminutives appear in CS on a monthly basis related to the frequency rates of diminutive types in CS? The term 'new' is here used to indicate that a given diminutive appears for the first time in the child's speech in a given month.
- 2. Do the differences in productivity observed among diminutives carrying different suffixes also hold when applying the notion 'rate of additions', i.e. when counting the 'new' diminutive items appearing every month?
- 3. Given that the child's general vocabulary is continuously expanding, how does the addition of new diminutives relate to its growth, i.e. does the use of new diminutive types contribute positively to vocabulary growth?

In order to answer the first of the above questions, diminutives occurring in the child's speech must first be classified as old *vs* 'new' (Fig. 6).



Figure 6. Old and 'new' diminutives in Anna's speech

The extremely high proportion of new words before the age of 2;0 results to a large extent from the fact that defining an item as 'new' presupposes a stock of already existing words, which, of course, does not hold for the very first month analysed and only to a limited degree for the first few months which follow. It seems that only from age 2;0 onwards does the ratio of new and old words represent a 'realistic' situation, namely, one in which the child gradually adds new items to a given larger repertoire of diminutives. The fluctuation of new additions observed after age 2;0 cannot solely be attributed to differences in the amount of data, since new additions at 2;6 and 2;7 exceed those occurring at 2;3 although the respective amounts of data in terms of recording time are the same (see Table 1). Thus, a higher amount of new diminutives appearing in a given month in comparison to previous or subsequent months seems to suggest a difference in productivity.

A comparison of new diminutives (i.e. lemmata / lexemes) appearing in the child's speech on a monthly basis with the respective total amounts of diminutive types shows that the two curves run almost parallel to each other (Fig. 7). A difference can only be observed between 2;5 and 2;8 when the curve depicting 'new diminutives' slightly rises before dropping again while the other curve is dropping after having risen from 2;3 to 2;5. The difference between the two curves from 2;5 to 2;6 seems to point to some kind of 'diminutive spurt'. Further evidence for this is provided by the fact that, during the

period from 2;5 to 2;7, the amount of new lexemes appearing in Anna's speech constantly diminishes (from 140 at 2;5 to 91 at 2;6 and 82 at 2;7) so that the curve representing the development of new words in the general vocabulary is more similar to that representing the total of diminutives than to the one representing new diminutives⁸. We may therefore conclude from the above observations that diminutives represent a productive pattern also when compared to the growth rate of the general vocabulary in the period studied in the present paper.



Figure 7. 'New' diminutives vs total of diminutives (types)

Proceeding to the question of whether differences in the productivity of diminutive suffixes as reflected by their type frequency also hold when the rate of additions of diminutives carrying different suffixes is taken into account, a similar distribution of diminutive suffixes is indeed found when the total of diminutives occurring every month is compared with the new ones (Table 2). However, there is a less wide variety of diminutive suffixes in new diminutives than in the total of diminutives, since new diminutives represent only a subpart of the total of diminutives attested in every month. Consequently, the range of suffixes found in new diminutives for a given month is often narrower than that exhibited by the total amount of diminutives in the same month. Thus, at 2;2 and 2;4 there are four different suffixes attested in new diminutives, i.e., one suffix less than those found in the respective total amounts of diminutives. A stronger difference between the total amount of diminutives and new diminutives with respect to the number of suffixes is found at 2;10. Note also that only the suffix -aki appears with new diminutives in every single month. This is evidence for its higher productivity.

⁸ I would like to thank Th. Marinis for drawing my attention to this issue.

Age	all diminutives						new diminutives						
	-aki	-ula	-itsa	-akos	-ulis	-uli	-aki	-ula	-itsa	-akos	-ulis	-uli	
1;8													
1;9													
1;10													
1;11													
2;0													
2;1													
2;2													
2;3													
2;4													
2;5													
2;6													
2;7													
2;8													
2;9													
2;10													
2;11													
3;0													

 Table 2. Diminutive suffixes in CS (all vs new diminutives)

Let me finally turn to the question of how the addition of new diminutives relates to the growth of the child's vocabulary in general. In a given month, new diminutives may either occur along with the respective simple noun or without it. In the latter case they will directly contribute to vocabulary growth. For the present paper, only diminutives carrying the suffix -aki, which constitute the largest group of diminutives in the data at hand, have been investigated as far as this issue is concerned. As shown in Fig. 10, most new diminutives tend to occur without the respective simple nouns from 1;8 through 2;4⁹. In contrast to this, at 2;5 and especially at 2;11, every new diminutive occurs along with its base or almost so. It is difficult to say whether this demonstrates a tendency growing with age to use a given diminutive along with its base, since the amount of data available for different months varies considerably (thus, 2;11 is better documented than the previous three months, see Table 1 above).

⁹ Alternatively, the cumulative occurrences of simple nouns attested until a given month could serve as a basis for determining diminutives corresponding to a simple base in that month. This would allow to relate each new diminutive to an already existing simple noun, provided that the respective bases are more or less evenly distributed in the data since a single attestation of a given simple noun at, e.g. 1;9 seems to be of little significance for the occurrence of the respective diminutive several months later (e.g. at 2;6).



Fig. 10. New diminutives occurring along with their bases

As pointed out by Stephany & Thomadaki (submitted), as the child grows older, she tends to use fewer diminutives in comparison to the total number of simple nouns (Fig. 11). Percentages of diminutives drop from 20.8% at 1;10 to 11.5% at 2;2 tending to stabilize at this low level through the end of the third year (13.2% at 2;5 and 12.6% at 2;11)¹⁰. Since diminutives in *-aki* constitute the most numerous type by far, they give especially clear evidence of the more balanced proportion between diminutives and their bases setting in at 2;2 (Fig. 12).



Figure 11. Diminutives vs simple nouns (types)



Figure 12. Diminutives in *-aki* compared with their simple bases

¹⁰ Note that from about 2;3 onward, the rate of diminutive tokens decreases both in CDS and the child's speech. Such a tendency has also been observed in Spanish when the speech addressed to 5-year-old children was compared to that addressed to 3-year-olds (Melzi & King 2003: 300).

Accordingly, the question of how new diminutives may contribute to vocabulary expansion will be addressed on the basis of the group of diminutives in -aki. In spite of their large number in the early period studied, the relevant word formation pattern cannot yet be grasped by the child, since the bases of the diminutives may not have been acquired yet. As the proportion of new diminutives to old ones decreases and the proportion of diminutives to simple nouns tends to decrease,¹¹ the most productive word formation patterns become more salient. Towards the end of the third year, newly attested words in -aki co-occur with their respective bases and the child almost reaches the frequency of diminutive types characteristic of informal adult-adult conversation.

In sum, our above questions have been answered positively: First, the examination of the monthly rate of additions of diminutives supports the productivity judgement based on frequency rates and permits the further conclusion that diminutives represent a productive pattern even with respect to the growth rate of the general vocabulary. Second, there is a similar distribution of diminutive suffixes when new diminutives occurring each month are compared with the respective total amount of diminutives, although the range of suffixes used with new diminutives tends to be narrower. Finally, up to a certain age, diminutives, and in particular their most productive pattern, contribute to the general vocabulary growth. This contribution seems to end when the child reaches a proportion of diminutives to simple nouns similar to that of adult speech.

6. Concluding remarks

The frequent use of diminutives in early child speech lends itself to a discussion of the productivity of derivational patterns in the context of child language. Since the differences in productivity between the relevant derivational patterns in the speech of the Greek girl studied in this paper could not be investigated through coinages, the notion 'rate of additions' taken from Bauer (2001) has been applied instead. It has been argued that 'new' diminutives, i.e., those appearing for the first time in the child's speech in a given month, may be considered as 'additions' since they enhance both the child's inventory with respect to diminutive derivations as well as the child's vocabulary in general. New diminutives in this sense follow a similar course of development during the period investigated to that demonstrated by the frequency rates of diminutive types. This has been interpreted as evidence for the productivity of diminutives, especially since the amount of new diminutives tends to increase during a brief period (2;5 through 2;8), contrary to the corresponding frequency rates of all diminutive types, as well as new words in general. Moreover, evidence for the differences in productivity between the relevant diminutive patterns has been found in the similar distribution of diminutive suffixes, when new diminutives are compared to the monthly totals of diminutive types.

The relation of new diminutives to their bases becomes more 'adult –like' as the child grows older. Their co-occurrence in the child's speech, combined with a decrease in the proportion of new diminutives to old ones as well as in the proportion of diminutives to simple nouns, is compatible with the idea that productive word formation patterns on the one hand are discovered by the child in a gradual manner and on the other hand are the first to become established in the child's language (Clark 1993: 127). In addition, it has been shown that a productive word formation pattern may contribute to vocabulary growth up to a certain age.

¹¹ The proportions of diminutive types to simple nouns found in Anna's speech at 2;2, 2;5 and 2;11, namely 11.5%, 13.2% and 12.6%, respectively, are similar to the rate of 11.8% reported by Daltas (1985: 83) for informal adult speech.

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