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Compounds in Early Greek First Language Acquisition – Including an Onomasiological Approach to Lexical Typology of Greek and German

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1. Introduction

The lexical resources of languages must continuously be renewed in order to fulfill the communicative needs of speech communities. According to Seiler (1975: 53) "the potentially infinite number of concepts which must be named in a language necessitates a recursive procedure for such naming" [translation U.S./E.Th.]. One of the most important means for creating new words is to draw on the lexical resources of a given language and derive words from other words or lexical elements by affixation or compounding.

Children must not only learn to understand sentences and form new ones from the words and phrases which they have extracted from them, but they must also acquire the meaning and form of the established simple or complex lexical items of their language. Besides, they will need to form new words by derivation or compounding in order to fill gaps in their early lexicon or name new concepts. The acquisition of compounding is of special interest because it is situated at the boundary of lexicon and morpho-syntax.

In this study we have adopted a usage-based and constructivist theoretical framework of language acquisition. Its fundamental claim is "that language structure emerges from language use" (Tomasello 2009: 85; see also Diessel 2013). Since this does not only apply "at the level of individual words, as their communicative function derives from their use," but also "at the level of grammar, as structure emerges from patterns of use of multi-unit utterances" (Tomasello 2009: 85), this theoretical approach seems particularly well suited for studying the domain of compounding, which "has the characteristics of both *syntactic* and *lexical* expression" (Bybee 1985: 106; see also Dressler 2005: 29). Although the combined units may resemble independent words, the resulting unit is a word (Bybee 1985: 106).

In usage-based theory, grammar is viewed as "the cognitive organization of one's experience with language" (Bybee 2013: 50) so that "constructions, with their direct pairing of form to meaning […] are particularly appropriate for usage-based models" (Bybee 2013: 51). Constructions are "conventional, learned form-function pairings at varying levels of complexity and abstraction" (Goldberg 2013: 17). Since they "range over units at the level of the word up to and including complex sentences" (Bybee 2008: 217), one of the advantages of considering constructions as the basic linguistic units is that grammar and lexicon are intertwined and form a continuum (Bybee 2008: 217, 231). Put otherwise, "generalizations over forms are not separate from the stored representations of forms but emerge directly from them" so that "in Langacker's terms, there is no 'rule/list separation'" (Bybee 2003: 7). Usage-based theory thus stands in contrast "to the generative proposals of an abstract grammatical system with a

redundancy-free lexicon" (Bybee 2008: 231). Rather, it is assumed that "knowledge of language includes both items and generalizations, at varying levels of specificity" (Goldberg 2013: 16). What is stored in memory are actual tokens of use rather than smaller units such as bound morphemes. Bybee (1985) has argued that "the internal structure of words is derivable from sets of connections made between words that have related parts" (Bybee 2007: 280) "making the segmentation of complex forms into morphemes unnecessary" (Bybee 1985: 127). Thus, the internal structure of the Greek word *paljó-peδo* (lit. bad-child) 'naughty child' is understood once it has been recognized that the element *paljó* 'bad' recurs in other words such as *paljó-skilo* 'bad dog' or *paljo-babás* 'bad Daddy'.[1]

Recurrent patterns are "the emergent generalizations or schemas that can be used to produce new combinations" (Bybee 2007: 280). One important determinant for morphological productivity is "the type frequency of a pattern: that is, the greater the number of distinct stems a pattern applies to, the greater is the likelihood that it applies to new patterns" (Bybee 2007: 280). Thus, generalizations on Greek adjective-noun compounds such as the ones just mentioned may lead to the (simplified) schema *paljó*___ whose slot can be filled by a number of different nouns. However, schemas are not necessarily used productively but "may just express generalizations of the structure of existing complex words" (Booij 2013: 258).[2] One of the essential arguments for construction grammar is that "a construction may have holistic properties that are not derivable from the properties of its constituents and/or its structure" (Booij 2013: 260). This is especially true of compounds, whose meaning has often specialized and does not equal the sum of meanings of their constituents (e.g., Greek *kaló-γria* (lit. good-old.woman) 'nun'). It furthermore applies to compound families such as the family of *paljo*-compounds in which the adjective *paljós* 'old, worn out' has developed pejorative meanings ('unworthy', 'bad') as part of the construction.

As far as the acquisition of compounds is concerned, detailed information is available for English, Hebrew, Swedish, German, and Dutch, all of which possess productive compounding devices, although to different degrees (Clark 1993, 2009; Clark and Berman 1987; Berman 2009; Mellenius 1997; Dressler, Lettner and Korecky-Kröll 2012; Fikkert 2001; Neijt, Krebbers and Fikkert 2002). The present study of compounds in the acquisition of MG will extend this list by a language in which compounding has become even more productive than in AG, not only in the nominal but also in the verbal domain (Ralli 2013; see Section 2).

In a study of the acquisition of German compounding Dressler, Lettner and Korecky-Kröll (2012: 250) found that noun-noun compounding emerges "simultaneously with noun inflec-

[1] See Bybee (1985: 128) for an English example.
[2] See Section (4.2.3) on the role of the bound stem *-fono* in neoclassical compounds such as *tiléfono* 'telephone'.

tion, diminutive formation and verb inflection, whereas other compounds emerge later." The earliest nominal compound types appearing before the end of the third or even the second year in two German-speaking children studied are noun-noun, verb-noun and adjective-noun compounds (Dressler, Lettner and Korecky-Kröll 2012: 254). The most productive type of German nominal compounds, namely juxtaposed [N N] compounds without a linking element, emerge first (e.g. *Segel-schiff* (lit. sail boat) 'sailing boat') (Dressler, Lettner and Korecky-Kröll 2012: 256). It was discovered that the typological factors of morphological richness and the consequent productivity of compounding are good predictors of early emergence (Dressler, Lettner and Korecky-Kröll 2012: 258). Other factors having an impact on early emergence are "morphotactic (phonological) transparency and pragmatic needs" (Dressler, Lettner and Korecky-Kröll 2012: 259). According to Dressler, Lettner and Korecky-Kröll (2012: 259), "input frequencies are rather weak predictors of early emergence", whereas input type and token frequency "are good predictors of frequency distribution in the child's output."

Main findings resulting from studies on the acquisition of compounds in English- and Hebrew-speaking children are the following: Children coin new words from an early age and construct noun–noun compounds from familiar forms that they already know in order to fill lexical gaps (Clark 2009: 294-295). English-speaking two-year-old children "construct noun–noun compounds to talk about sub-kinds (e.g., *plate-egg* vs. *cup-egg* for 'fried' vs. 'boiled' eggs […])" (Clark 2009: 295). Thus, "compounding may help children acquire the notion of subordinate members of a class" (Berman 2009: 309). It has also been found that children "attend to the separate roots in complex word-forms" (e.g., *high-chair*, *corn-flakes*), which suggests that they can "recognize smaller units inside larger ones" (Clark 1993: 109). Complex words or word forms are easier for children to map onto if they are transparent and the meanings of their elements are known to them (Clark 1993: 109). In constructing new words children favor transparency of meaning as well as simplicity of form (Clark 2009: 295). Going from the source elements to noun-noun compounds in English "the main modification is the imposition of a primary–tertiary stress pattern on the new compound" (Clark 2009: 295). However, there is little research available on the acquisition of compound stress patterns in Dutch, English, and Swedish (see Berman 2009: 311).

Children also appear to be sensitive to "the productivity of the form–meaning relation" (Clark 2009: 295) so that "the frequency with which children hear particular word-forms that they can analyse also plays a role" (Clark 2009: 296; see also Dressler, Lettner and Korecky-Kröll 2012: 259 quoted above). With Hebrew-speaking children, it was found that morphological form was the determining factor in processing compound constructions rather than

semantic relations between the head and the modifier noun, such as possession (*doll blanket*), material (*sand cake*) or location (*mountain tree*) (Berman 2009: 309-310).

Turning to the acquisition of Greek word formation it must be pointed out that, in contrast to the development of inflection and syntax, the development of the lexicon in Greek language acquisition has not been extensively studied so far. Thomadaki (1986) analyzed derivation and compounding devices occurring in neologisms formed by a 6-year-old Greek boy (see Stephany 1997a: 255-260). Stephany (1997b) investigated diminutives in early child Greek based on longitudinal data from the Stephany Corpus. The formal as well as semantic and pragmatic aspects of the development of diminutive suffixes in the speech of a Greek girl from the age of 1;8 to 3;0 years and the speech addressed to her has been studied by Thomadaki and Stephany (2007).[3] Neither Stephany (1997b) nor Thomadaki and Stephany (2007) found evidence for the emergence of derivational morphology, particularly diminutives, prior to inflectional development. Furthermore, since case distinctions emerge rather late and remain rare with diminutives, the latter are unlikely to facilitate the acquisition of case distinctions in Greek language acquisition (Thomadaki and Stephany 2007: 118).

In a partial replica of Berko's classical experimental study of the internal structure of compounds, Stephany (1980) studied the comprehension and analyzability of different types of nominal compounds in three age groups of Greek kindergarten children (2;8–3;8, 3;9–4;10, and 5;11–6;0). Subjects were asked to explain the meaning of invented nominal compounds and account for the names of conventional ones by analyzing them into their two constituent parts. The compounds invented or selected for the experiment exhibited different degrees of transparency. The invented lexemes were highly transparent and belonged to the group of 'descriptive' endocentric subordinative compounds such as *lik-ó-spit-o* (lit. wolf-CM-house-Isuf)[4] 'wolf house', the meaning of which is not specialized and where both constituents of the compound occur in its paraphrase.[5] Conventional compounds included less transparent ones with a specialized meaning such as *aftokinit-ó-δromos* (lit. car-CM-way) 'motorway' (not every road for cars is a motorway) and idiomatic (exocentric) ones such as *kokin-o-skufítsa* (lit. red-CM-cap.DIM) 'Little Red Riding Hood' whose head has to be inferred. It was found that "although the capacity of analyzing words and explaining their meaning or their names increases with age, higher degrees of transparency facilitate the analyzability of compounds to roughly the same degree in the three age groups studied" (Stephany 1997a: 260).

[3] Differences in the productivity of diminutive patterns in the speech of the same girl are discussed by Thomadaki (2007).
[4] On the Greek compound marker (CM), a linking vowel, see Section (2.2).
[5] On the principles of descriptive naming versus labeling see Seiler (1975).

In a task requiring unimpaired and SLI Greek-speaking children to produce compounds when presented with base constituents, Dalalakis (1999: 28-29) found that, contrary to SLI subjects, unimpaired young Greek children matched for language age were aware of constituent boundaries.[6] However, 23 percent of their errors were overgeneralizations in the production of the linking vowel (compound marker CM) *-o-* before a vowel-initial second constituent where it is not required in the language (e.g., *podik-o-ánθropos* (lit. mouse-CM-man), the target novel compound being *podik-ánθropos* 'mouseman').

Altogether, acquisition data from English, Greek, and Hebrew indicate that children (even of pre-school age) are sensitive to compound structure (Jarema 2006: 59). Constituent activation during compound processing in Greek shows an advantage of first over second constituents, despite the fact that Greek is right-headed. This finding led Kehayia et al. (1999) to conclude that position-in-the-string is a factor that influences compound processing (see Jarema 2006: 51). In an experimental study of Greek compound formation, Tzakosta (2009) found that adult native speakers prefer stem-stem formations to stem-word formations. However, learners of Greek as a second language primarily used word-word or stem-word patterns rather than stem-stem patterns in producing Greek compounds in two experimental studies by Kitsou (2009) and Rousoulioti (2009).

In contrast to children acquiring German or other Germanic languages, who use noun-noun compounds very frequently from early on (Dressler, Lettner and Korecky-Kröll 2012; Clark 1993: 151-159), Berman (2009: 305) found that in four Hebrew-speaking children aged 1;6 to 3 years noun compounds account for only 0.2 percent of all words used. This percentage is even lower than that found with the two Greek children studied in the present article, namely 0.9 percent and 0.4 percent, respectively (see Table 3 below). There may thus be important differences in the emergence and frequency of compounds in the acquisition of different languages such as German, Hebrew and Greek, in spite of the fact that all of them possess rich and productive compounding systems. As will be shown in the present study, typological as well as register and onomasiological differences have an important part to play in the emergence and frequency of compounds in language acquisition.

The state of the art of the acquisition or processing of compounds in German, English and Hebrew on the one hand and Greek on the other leads to a number of research questions which we will try to approach in the present study. It must be pointed out, however, that our naturalistic, longitudinal data are mainly suitable for studying compound production rather than comprehension. Still, the usage of different exemplars of endocentric subordinative com-

[6] See also Dalalakis and Gopnik (1995). Unfortunately, Dalalakis (1999) does not indicate the age of the young control group of the SLI children.

pounds sharing the head or modifier may indicate that they help children in acquiring the notion of subordinate members of a class (see Berman 2009: 309). Although it would be interesting to study the development of the intricacies of stress patterns of Greek compounds, this would presuppose the linkage of the available transcripts to the sound tier, something which has not yet been achieved for our data.

In the present analysis of the production of (mainly) nominal compounds in naturalistic settings by two monolingual Greek girls (1;8 - 3;0 years), emphasis will be put on the morphological structure of different Greek compound types represented in CS and CDS so that the role played by input type and token frequency in the children's output can be taken into consideration. It will be shown that there is more to Greek compound formation than mere juxtaposition of nominal roots. An important aspect of the study of compounds is to discover whether they are (at least partially) transparent and are thus considered as complex lexical items by the children or whether they are just opaque 'long words'. One type of evidence for the transparency of compounds is the occurrence of at least one of their constituents as a simple word in CS. From a lexical-typological perspective, Greek children must learn the naming processes and the linguistic means of their language (e.g., simple vs. complex nouns and derivational vs. compositional formations). We will focus on nominal compounds, dealing with verbal and adjectival compounds only marginally since the former are compound prototypes not only in Greek, but also in German and many other languages (see Dressler, Lettner and Korecky-Kröll 2012: 250; Dressler, Ketrez and Kilani-Schoch (eds.), to appear).

After an overview of the principal compounding patterns of MG, with special attention to nominal compounds (Section 2), and a presentation of the longitudinal Greek child and child-directed data studied in the present article (Section 3), the development of (mainly) nominal compounding in two monolingual Greek girls from the age of 1;8 to 3;0 years will be studied (Section 4). In order to account for some striking differences in the role of nominal compounds in Greek and German child speech, the findings on the development of Greek compounds will be supplemented by a lexical-typological approach to compounding (Section 5). In conclusion, the results will be discussed and related to Berman's (2009) stage model of the acquisition of compounding (Section 6).

2. Compounding in Standard Modern Greek

2.1 Introduction

MG is a typical Indo-European strongly inflecting-fusional language, especially as far as verbal inflection is concerned. It also possesses rich word-formation devices, both derivational and compounding.

Most authors agree that compounding is the most wide-spread technique for word formation in the languages of the world (Dressler 2006: 23; Booij 2013: 258). In a first approximation, compounds may be defined as "the juxtaposition of two words to form a new one (Bauer 2009)" (Booij 2013: 258) or as "grammatical combinations of words, that is of lexical items or lexemes, to form new words" (Dressler 2006: 24). The compounding of a modifying element with a head noun "must […] convey further information" (Aitchison 1987: 155) (e.g., Greek *lik-ó-skil-o* (lit. wolf-CM-dog-Isuf) 'German shepherd', a certain breed of dogs) and "the relationship between the two parts of the compound […] [is, U.S./E.Th.] normally expected to be a permanent or habitual one" (Aitchison 1987: 155). Thus, only a girl who habitually wears a red cap rather than one who puts on such a cap only once in a while will be called *kokin-o-skuf-ítsa* (lit. red-CM-cap-DIM) 'Little Red Riding Hood'.

According to Dressler (2006: 25), "prototypically all members of a compound recur as free forms (i.e. autonomous words)" and, furthermore, "compound members prototypically belong to major lexical categories (especially nouns, verbs, and adjectives […])". With regard to MG, Ralli (2013: 1) defines compounding as a word-formation process which "deals with lexemes or, in a more structural perspective, with stems and words, the combination of which leads to morphologically complex formations, the so-called compounds."

Further characteristics of prototypical compounds are the following (see Dressler 2006: 25-27): (a) the linear order of their constituents is fixed (e.g., Greek *lik-ó-skilo*/**skil-ó-liko* 'German shepherd';[7] (b) no element can be inserted between their constituents (e.g., Greek *meɣálo likó-skilo* 'big German shepherd', but not **liko-meɣalo-skilo*); (c) only the head of the compound is inflected while the subordinate constituent is inaccessible to inflection (e.g., *likóskilo/a* SG/PL 'German shepherd/s', but *líkos/i ke skílos/i* (lit. wolf.SG/PL and dog.SG/PL) 'wolf/wolves and dog/s'); (d) in many languages compounds carry a single accent, which is also the case in Greek.

[7] The order of the constituents of certain coordinative adjective-adjective compounds is reversible (e.g., Greek *aspró-mavros* 'white-black' vs. *mavró-aspros* 'black-white', but only *kuto-póniros* (lit. fool-cunning) 'crafty, sly'). Ralli (2013: 24, Fn. 27) explains this flexibility, which occurs only in this compound category, by "the rather loose relation between the two adjectival compound parts."

Compounding was "particularly productive in Sanskrit and Ancient Greek" and "has become even more productive" in MG (Ralli 2013: 1; see also Christofidou 1999; Christofidou et al. 2013; Thomadaki 1988). While keeping the structures attested in AG, MG has in addition developed new ones, such as coordinative [V V] verbal compounds (Ralli 2013: 2),[8] a category not commonly found in other Indo-European languages (Ralli 2013: 7).

MG compounding is found in the three major parts of speech of nouns, adjectives, and verbs. In spite of the productivity of compound verbs, the most frequent type are compound nouns. Compound adjectives are less numerous than compound nouns and compound verbs seem to be least numerous in spite of their productivity.[9] Thus, MG follows the same tendency as the languages of the world (Ralli 2013: 32). Since the main topic of this article is the development of nominal compounds in Greek child language acquisition, verbal and adjectival compounds will be dealt with only marginally in this overview (see Section 2.9) as well as in Greek CS and CDS (Section 4.2.5).

Nominal compounds, which are abundant in Greek (Ralli 2013: 30), mainly belong to the types of endocentric subordinative ones (examples 1a), but there are also endocentric coordinative nominal compounds (examples 1b) and exocentric subordinative ones (examples 1c).

(1) MG endocentric and exocentric nominal compounds

a. endocentric subordinative: *lik-ó-skil-o* (lit. wolf-CM-dog-Isuf) 'German shepherd'
palj-ó-peδ-o (lit. bad-CM-child-Isuf) 'naughty child'

b. endocentric coordinative: *jinek-ó-peδ-a* (lit. woman-CM-child-Isuf.PL)
'women and children'
psom-o-tíri (lit. bread-CM-cheese) 'bread-cheese'[10]

c. exocentric subordinative: *kokin-o-skuf-ítsa* (lit. red-CM-cap-F.DIM)
'Little Red Riding Hood'
kak-ó-mir-os (lit. bad-CM-fate-Isuf) 'unfortunate, poor'

Compounds may also be classified according to Seiler's (1975) complementary principles of "descriptive naming and labeling". In this approach, compounds are arranged on a scale of transparency[11] which comprises a transparent and an opaque pole, according to the transparency of both of their constituents (e.g., *skil-ó-spit-o* (lit. dog-CM-house-Isuf) 'dog kennel'),

[8] Verbal compounds were rare in Classical Greek and are an innovation of the Hellenistic period (Ralli 2013: 37).
[9] See also the relative frequency of nouns and verbs in Greek neologisms mentioned in Section 2.8.
[10] From Ralli (2013: 23).
[11] See Seiler (1975), Libben (1998) and Dressler (2006).

their head (e.g., *asti-fílakas* (lit. town-guardian) 'policeman'), the dependent constituent (e.g., *peδ-o-nóm-os* (lit. child-CM-administrate-Isuf) 'children's superintendent') or the opacity of both constituents (e.g., *elikóptero* 'helicopter'[12]). As is to be expected, the relative transparency of compounds will play a role in the acquisition of productive compounding patterns (see Section 4).[13]

2.2 Stem-based and word-based nominal compounds

Another important classification of Greek compounds relies on the morphological category of their constituents, namely stems and words. Ralli claims that a division into the four categories of [stem-stem], [stem-word], [word-stem] and [word-word] compounds "gives a better classification of Greek compounds from the point of view of their structure" because it not only takes their type of inflection, but also the position of stress into account (Ralli 2013: 100).[14] While compounds in the Germanic, Romance, and Slavic languages are typically word-based (Dressler 2006: 38), MG compounds are more commonly stem-based. The first constituent is usually a stem whereas the second (the head) may vary from a stem to a word (Ralli 2013: 14).

The stem-word compound *kukloθéatro* 'puppet theater' (example 2a) consists of the stem of the noun *kúkla* (lit. doll.F.NOM/ACC.SG) 'doll, puppet'), the compound marker *–o–* and the head noun *θéatro* (lit. theater.NEUT.NOM/ACC.SG) 'theater').[15] In the stem-stem compound *kakópeδo* 'bad child' (example 2b) the stem of the adjective *kak-ós* (lit. bad-M.NOM.SG) 'bad' is linked to the stem of the noun *peδí* (lit. child.NEUT.NOM/ACC.SG) 'child' by the CM *–o–* and the compound as a whole is marked by the inflectional ending *–o* 'NEUT.NOM/ACC.SG' (differing from that of the head). Ralli (2013: 134) points out that the constituents of stem-stem compounds are "'more tied' together than those which have an autonomous word as their first constituent."

(2) MG nominal compounds with a word or stem as their head

a. *kukl-o-θéatr-o* [[*kukl*]$_{\text{NStem}}$-CM-[*θeatr*-Isuf]$_{\text{N}}$]$_{\text{N}}$ 'puppet theater'

[12] This compound is at least opaque for young children. The degree of transparency of Greek compounds containing [+learned] constituents may vary from speaker to speaker.
[13] See Gagné (2009) on the facilitating role of transparency in the processing of compounds in comprehension.
[14] For a description of stress in Greek compounds see Ralli (2013: 79-82).
[15] Ralli (2013: 8) defines stems "as the basic units of Greek words bearing a lexical content, which cannot occur on their own but need inflectional affixes to function as independent words."

palj-o-babá-s [[*palj*]$_{\text{ADJStem}}$-CM-[*baba*-Isuf]$_{\text{N}}$]$_{\text{N}}$ ‘nasty daddy’

b. *kak-ó-peδ-o* [[[*kak*]$_{\text{ADJStem}}$-CM-[*peδ*]$_{\text{NStem}}$]$_{\text{NStem}}$-Isuf]$_{\text{N}}$ ‘bad child’

The compound marker[16] /o/, which is situated between the two constituents of many Greek compounds, is semantically empty (see Ralli 2013: 17, 222). Ralli points out that it “originates from an ancient thematic vowel” (2013: 60), but does no more than mark the process of compounding in typical MG compounds and is thus neither a derivational nor an inflectional affix (Ralli 2013: 222).[17] The fact that “its form remains invariable throughout the entire inflectional paradigm of the compound word” (Ralli 2013: 59) demonstrates that it is not an inflectional suffix in spite of its possible homophony with the latter (e.g., [*kak-ó-peδo*]$_{\text{N}}$ ‘bad child’ vs. [*kak-ó peδí*]$_{\text{NP}}$ (lit. bad-NEUT.NOM/ACC.SG child.NEUT.NOM/ACC.SG) ‘bad child’). In contrast to e.g. German or Dutch, the compound marker is obligatory in Greek (Ralli 2013: 68).[18] In MG as in many other languages “the property of one single stress makes compounds phonological words” (Ralli 2013: 13).

The most productive MG compounding patterns are [[stem stem]-Isuf]$_{\text{word}}$ or [[stem] [stem-Isuf]$_{\text{word}}$]$_{\text{word}}$ constructions, while [word word] and [[[word] [stem]]$_{\text{stem}}$ Isuf]$_{\text{word}}$ formations are less numerous. Words appearing as first constituents in the latter constructions belong to closed-class items or are “fossilised inflected nouns originating from AG” (Ralli 2013: 91).[19] An example of a word-word compound is the verbal compound *ksana-kléo* ‘cry again’ consisting of the adverb *ksaná* ‘again’ combined with the verb *kléo* ‘cry’ (lit. I cry) (example 3a). In the nominal compound *kato-sédono* ‘bottom sheet’, the first constituent is the adverb *káto* ‘down, low’ combined with the stem of the noun *sedóni* ‘sheet’ (example 3b). As is typical of such constructions, the inflectional ending *–o* relates to the entire compound rather than its second constituent.

(3) MG word-word vs. word-stem compounds

a. *ksana-klé-o* [[*ksana*]$_{\text{ADV}}$-[[*kle*]$_{\text{VStem}}$-Isuf]$_{\text{V}}$]$_{\text{V}}$ ‘cry again’

b. *kato-sédon-o* [[[*kato*]$_{\text{ADV}}$-[*sedon*]$_{\text{NStem}}$]$_{\text{NStem}}$-Isuf]$_{\text{N}}$ ‘bottom sheet’

[16] Also commonly called “linking vowel” or “interfix” (see Dressler 2006: 42).

[17] The view of the CM as a “linking vowel” goes back to Debrunner (1917). See also Triandafyllidis (1978), Thomadaki (1988), and Clairis and Babiniotis (2005).

[18] For a detailed discussion of Greek compound marking see Ralli (2013: chapter 4).

[19] Examples of fossilized formations or “constructions that are built according to an AG compounding pattern” (Ralli 2013: 50) are the town name *Neá-poli* (lit. new-town) or *panepistimiú-poli* (lit. university-city) ‘campus’ (Ralli 2013: 49).

If the head of a Greek compound is a word, it may pass on its gender and inflection class to the entire compound (Ralli 2013: 105) (see example 3a for the inflection class of the verb). In contrast to this, [stem stem] compounds, "which are underspecified with respect to inflection" "may display a different inflection from their internal constituents and thus from the head" (Ralli 2013: 106-107) (see example 3b). For this reason "the hypothesis that the involvement of the morphological features [of Greek compounds, U.S./E.Th.] […] derives from the head is untenable" (Ralli 2013: 107).

2.3 Endocentric subordinative nominal compounds

As mentioned above, the most frequently occurring category of MG nominal compounds are endocentric subordinative ones consisting of a right-hand nominal head combined with a modifying constituent which may belong to different parts of speech, most frequently nouns or adjectives (examples 4a and 4b). Compounds with adverbs, pronouns or numerals as their dependent constituent are much less frequent (examples 4c and 4d).[20] Endocentric subordinative compounds are hyponyms of the head (Ralli 2013: 105).

(4) Types of MG endocentric subordinative nominal compounds

a. [N N]: *anem-ó-milos* (lit. wind-CM-mill)
(< *ánemos* 'wind' + *mílos* 'mill') 'windmill'
(Clairis and Babiniotis 2005: 95)

b. [ADJ N]: *αγri-o-lúluδ-o* (lit. wild-CM-flower-Isuf)
(< *ágrios* 'wild' + *lulúδi* 'flower') 'wild flower'

c. [ADV N]: *pano-sédon-o* (lit. upper-sheet-Isuf)
(< *páno* 'upper' + *sedóni* 'sheet') 'upper sheet'
(Clairis and Babiniotis 2005: 95)

d. [PRO N]: *aft-o-θisía* (lit. self-CM-sacrifice)
(< *aftós* 'self' + *θisía* 'sacrifice')
'self-sacrifice'

[20] Compound nouns with a numeral as their dependent constituent are exocentric formations which may contain a derivational suffix (e.g., *δeka-et-ía* (lit. ten-year-Dsuf) '(period of) ten years', *prot-o-xron-já* (lit. first-CM-year-Dsuf) 'New Year').

In contrast to languages like German, where endocentric [V N] compounds occur relatively frequently (Dressler, Lettner and Korecky-Kröll 2012: 254), this pattern does not exist in MG.[21] Exocentric [V N] compounds such as *mis-o-jíni-s* (lit. hate-CM-woman-Isuf) 'misogynist' or *fil-ó-sof-os* (lit. love-CM-wisdom-Isuf) 'philosopher' do not occur frequently in SMG. There are, however, some MG formations created in analogy to this AG pattern (e.g., *xas-o-δíki-s* (lit. lose.PFV-CM-trial-Isuf) 'trial loser' (lawyer) (Ralli 2013: 182-183)).

2.4 Endocentric coordinative nominal compounds

In comparison with other languages, coordination is a particularly productive MG compounding type which is found with all major parts of speech (Ralli 2013: 157) (examples 5).

(5) MG coordinative compounds

a. [N N]: *savat-o-kíriak-o* (lit. Saturday-CM-Sunday-Isuf) 'weekend'
avγ-o-lémon-o (lit. egg-CM-lemon-Isuf) 'egg and lemon (sauce/soup)'

b. [ADJ ADJ]: *mavr-ó-aspr-os* (lit. black-CM-white-Isuf) 'black-white'
aspr-ó-mavr-os 'black-white'
sten-ó-makr-os (lit. narrow-CM-long-Isuf) 'oblong'
makr-ó-sten-os 'oblong'

c. [V V]: *ben-o-vjén-o* (lit. I.go.in-CM-go.out-NONPAST.1SG) 'go in and out'
pijen-o-érx-ome (lit. I.go-CM-come-NONPAST.1SG) 'come and go'

A type of compounds related to endocentric subordinative as well as coordinative ones are appositive compounds such as *Barba-jánis* (lit. uncle-John) 'Uncle John' or *Papa-níkos* (lit. priest-Nicholas) 'Father Nicholas'. In appositive nominal compounds, both constituents have the same referent and, in contrast to attribution, "there is no clear tendency for either element to qualify the other" (Matthews 1997: 22). Put differently, in apposition a noun is incurporated in a more general category. Thus, in *Barbajánis*, a person called Janis is included in the category of uncles.[22]

Although binary coordinative or appositional compounds (dvandva) may be taken to have two semantic or syntactic heads (Dressler 2006: 34 referring to Wunderlich 1986: 241), Ralli

[21] Examples of German [V N] compounds are Standard German *Lauf-stall* (lit. walk-stable) 'playpen' or Austrian German *Geh-schule* (lit. walk-school) 'playpen'.

[22] For different conceptions of the notion of appositive compounds see Scalise and Bisetto (2009) and Ralli (2013).

(2013: 108) argues that it is most appropriate to postulate a single right-hand head for Greek coordinative compounds since "in certain coordinative compounds consisting of two nouns of different gender […] or two verbs of different inflection classes […] the constituent responsible for the morphological features of the construction as a whole is situated at the right side" (examples 6, from Ralli 2013: 108). However, this does not hold for compounds such as *savatokíriako* 'weekend' (5a) or *anem-ó-vrox-o* (lit. [wind-CM-rain-Isuf]$_{N.NEUT}$) 'rain storm' (from *ánemos*.M 'wind' and *vroçí*.F 'rain') which belong to the neuter gender in spite of their feminine second constituent.

(6) Inflection of MGcoordinative compounds

a. *jinek-ó-peδa* (lit. woman.F-CM-child.NEUT.PL) 'women and children'
ta.NEUT.PL *jinekópeδa*.NEUT.PL 'the women and children'
(not **i*.F.PL *jinekópeδa* 'the women and children')

b. *vrom-o-miríz-o* (lit. stink-CM-smell-NONPAST.1SG) 'stink-smell'
vromomiríz-is 'you stink-smell', not **vromomiriz-ás*
(cf. *vrom-ás*.NONPAST.2SG 'you stink')

2.5 Exocentric bahuvrihi compounds

The status of exocentric compounds has been debated in the literature for many years and is still being discussed. Rather than adopting Bauer's (2008: 70) suggestion of considering bahuvrihi compounds as well as possibly "all exocentrics as endocentrics [to be, U.S./E.Th.] interpreted by figures of speech" such as synecdoche,[23] we will follow a more traditional view and regard this type of compounds as one of the two main types of exocentric compounds, the other one being exocentric synthetic compounds (see Section 2.6). The most important feature of exocentric compounds is that neither of the two constituents assumes the role of the head (Ralli 2013: 99) so that they "have their head outside [the construction, U.S./E.Th.] or, more precisely, the head has to be inferred" (Dressler 2006: 33; see also Ralli 2013: 110). In spite of the fact that endocentric compounding patterns are preferred to exocentric ones in Greek as they are in the languages of the world (Dressler 2006: 33; Bauer 2010), "exocentric compounding is not a marginal phenomenon" in MG (Ralli 2013: 113). The most important type of MG exocentric compounds are bahuvrihi compounds.

[23] Synecdoche is a special case of metonymy, a figure of speech in which an expression denoting a part is used to refer to a whole, i.e. a pars pro toto expression.

Bahuvrihi compounds[24] are "a robust type of exocentric compound, found in various subtypes in a large number of languages" (Bauer 2008: 61). They are typically "made up of a noun (the possessed noun) and a modifier for that noun" (Bauer 2010: 169) and express "some salient facet of the denotatum" (Bauer 2008: 56). For example, Greek *kokinoskufítsa* 'Little Red Riding Hood' (example 7a) denotes a little girl who usually wears a red cap, *tríγono* 'triangle' (example 7b) an object with three angles and *fegaroprósopos* 'moonface' (example 7c) a person with a moon-like face. Many Greek bahuvrihi compounds are adjectives, but may also function as nouns (examples 7c - g).[25]

(7) MG bahuvrihi compounds

a. *kokin-o-skuf-ítsa* (lit. red-CM-cap-F.DIM.Isuf) 'Little Red Riding Hood'

b. *trí-γon-o* (lit. three-corner-Isuf) 'triangle'

c. *fegar-o-prósop-os* (lit. moon-CM-face-Isuf) 'moonface'
(Thomadaki 1988: 117-118)

d. *kal-ó-tix-os* (lit. good-CM-luck-Isuf) 'fortunate'(Ralli 2013: 111)

e. *kak-ó-mir-os* (lit. bad-CM-fate-Isuf) 'unfortunate, poor (one)'

f. *aspr-o-máli-s* (lit. white-CM-hair-Isuf) 'white-haired, old'

g. *polí-tekn-os* (lit. many-child-Isuf) 'having many children'
(Ralli 2013: 111)

The modifying first constituent of Greek bahuvrihi compounds is often an adjective (examples 7a, d, e, f), but it may also be a quantifier (examples 7b, g) or a noun (example 7c). Since there is a subordinate relation between the constituents of exocentric compounds they may be attributed with "a relative head" (Dressler, p.c.) (e.g., *skufítsa* 'cap.F.DIM' in *kokinoskufítsa*).

2.6 Nominal formations involving compounding and derivation

Since "derived items are very common at the right-hand position" of MG nominal compounds (Ralli 2013: 30-31), and "the two processes may intermingle in several ways" (Ralli 2013: 222) no clear distinction can be drawn between derivational formations and compounds.

[24] Due to the gloss of *bahuvrihi* as "having or possessing much rice" (Bauer 2010: 169) bahuvrihi compounds are also called 'possessive compounds'.
[25] See Bauer (2010: 169) on such bahuvrihi compounds in other languages.

Thus, derivation is involved in synthetic compounds consisting of "a verbal base with an affix and an argument of the verb as the modifying element" (Bauer 2008: 61), which parallel syntactic constructions (Matthews 1997: 369). Typical examples of synthetic compounds, which are also called verbal or deverbal compounds (Lieber 2010: 127; Ralli 2013: 185), are agent nouns such as English *bus-driver* (Bauer 2008: 61) and Greek *nixo-kóptis* 'nail clippers' and *ksilo-kópos* 'lumberjack' (examples 8a and 8b, Ralli 2013: 122, 185-186, 226) or action nouns such as English *map-reading* (Bauer 2008: 62) and Greek *iljo-θerapía* 'sunbathing' and *iljo-vasílema* 'sunset' (examples 8c and 8d, Ralli 2013: 185-186).

(8) MG synthetic compounds

a. *nix-o-kóp-ti-s* (lit. nail-CM-cut-Dsuf-Isuf) 'nail clippers' (Ralli 2010: 62)

b. *ksil-o-kóp-os* (lit. wood-CM-cut-Isuf) 'lumberjack'

c. *ilj-o-θerap-ía* (lit. sun-CM-heal-Dsuf.Isuf) 'sunbathing'

d. *ilj-o-vasíle-ma* (lit. sun-CM-set-Dsuf) 'sunset'

The compounds in (8) all relate to a verbal stem (*kop-* < *kóv*(*o*) 'cut'; *θerap-* < *θerap*(*évo*) 'heal'; *vasilév*(*o*) 'reign, set'). In *ksilokópos* (*ksílo* 'wood') and *nixokóptis* (*níçi* 'nail') the modifying element is the object of the verb, but in *iljoθerapía* and *iljovasílema* (*íljos* 'sun') it is the subject or instrument. In contrast to *nixokóptis, iljoθerapía*, and *iljovasílema*, the compound *ksilokópos* does not have an overt derivational suffix.[26]

Despite the parallels between the constructions *ksilokópos* 'lumberjack' and *nixokóptis* 'nail clippers', only the second may be considered an [N N] compound. Since the verbal compound **nixokóvo* 'cut nails' does not exist, *nixokóptis* is taken to consist of the deverbal derivative head noun *kóptis* 'cutter' and the modifying noun *níxi* 'nail' (Ralli 2013: 226). Unlike *nixokóptis*, *ksilokópos* 'lumberjack' cannot be analyzed as an [N N] compound, because there is no noun **kopos* 'cutter'. Rather, its second constituent is considered as a "bound stem" (Ralli 2013: 186, 209). Although the analysis of *nixokóptis* 'nail clippers' as an [N N] compound suggests that it is endocentric (Ralli 2013: 185), it may also be interpreted as exocentric ('something which cuts nails').[27]

[26] On further derivational suffixes in formations involving both compounding and derivation see Ralli (2013: 185-190).

[27] The possibility of analyzing compounds in two different ways is not limited to Greek. Thus, German *Briefmarkensammler* 'stamp collector' may be analyzed as an endocentric compound based on a deverbal agent noun (*Sammler* < *sammeln* 'to collect') while *Briefträger* 'postman' is an exocentric synthetic compound paraphrasable as *jemand, der Briefe austrägt* 's.o. who delivers letters' but not as *Träger von Briefen* 'carrier of letters'. Still, *Briefmarkensammler* may alternatively be interpreted as an exocentric synthetic compound (*jemand, der Briefmarken sammelt* 's.o. who collects stamps').

Unlike synthetic compounds such as *nixokóptis* or *iljovasílema*, Ralli (2013: 32) considers a formation such as *ksana-ðjávazma* 're-reading' as "a secondary compound formation, in other words a deverbal noun" consisting of the verbal compound *ksana-ðjavázo* 're-read, read again' and the derivational suffix *–ma*. Although the derived noun *ðjávazma* 'reading' exists, it cannot be modified by an adverb such as *ksaná* 'again' (**to ðjávazma ksaná* 'the reading once more'), while productively formed compound verbs with *ksaná* (*ksan(a)-aníγo* 'open again', *ksan(a)-anevéno* 'go up again', *ksana-jemízo* 'fill again' etc.) correspond to verb phrases in which the verb is modified by the adverb.

Since Dressler (2006: 24) admits that, although "derivations from compounds are derivations, not compounds" despite the fact that "an exact distinction may be difficult", Ralli's (2013: 32) notion of "secondary compound formation" seems useful because it captures their characteristic that a derivational process following a compounding one is involved in such lexemes.[28]

It would go beyond the scope of the present study to deal with the question whether the presence or absence of a derivational suffix in Greek synthetic compounds has an effect on their exocentricity or endocentricity. Bauer (2010: 170) seems to consider synthetic compounds with a derivational affix "denoting the external argument of the verb" (e.g., *–er* in *bus-driver*) as endocentric, since he gives French *gratte-ciel* (lit. scratch-sky) 'scratch-sky, skyscraper' as an example of "the exocentric counterparts of this construction." Although there is "no marking corresponding to the external argument of the verb, yet the compound as a whole denotes the person or entity which performs the role of the external argument" (Bauer 2010: 170). MG synthetic compounds including a verbal stem as their left constituent represent this type of exocentric formation (e.g. *xas-o-ðíki-s* (lit. lose.PFV-CM-trial-Isuf) 'trial loser' (lawyer), *fil-ó-sof-os* (lit. love-CM-wisdom-Isuf) 'philosopher').

Ralli (2013: 114) states that certain compound formations of this latter type may be (mis)interpreted as exocentric or endocentric depending on the Greek speaker's education. Thus, a speaker who knows AG will interpret the stem *fil-* in *fil-ó-zo-os* (lit. love-CM-animal-Isuf) as representing the AG verb *filó* 'love' and accordingly interpret the formation as an exocentric [V N] construction meaning 'person who loves animals', but one who doesn't know AG will assign the meaning 'friend of animals' to the compound and interpret it as an endocentric [N N] formation with its left-hand head representing the stem of the noun *fílos* 'friend'. Since compounds with left-hand heads are not in accordance with the general Greek compounding pattern which requires right-headed structures "this may be the reason why in

[28] For a detailed discussion of the question whether constructions involving both compounding and derivation should be considered as $[Z\ [V\ Dsuf]_X]$ or $[[Y\ V]_Z\ [Dsuf]_X]$ structures see Ralli (2013: 190-196).

recent years, ancient-type exocentric compounds […] have been restructured into endocentric compounds with a head at the right side" (Ralli 2013: 114-115). This reanalysis has lead to the alternation of *filózoos* 'who loves animals' with *zoófilos* 'friend of animals' or *filélinas* 'who loves Greek people' with *elinófilos* 'friend of Greek people' (Ralli 2013: 115).

Compounds containing a bound stem, i.e. "a stem which does not become a word with the addition of the appropriate inflectional ending" (Ralli 2013: 186) are also described as endocentric nominal formations (examples 9, partially taken from Ralli 2013: 186, 210-211, 216). This structural pattern, which originates from AG, is still in use in MG and "constitutes an important source of lexical enrichment" (Ralli 2013: 186, 216). Thus, MG *vrefo-kómos* 'baby nurse' is formed in analogy to the AG pattern of *noso-kómos* 'nurse' (see example 9f).[29]

(9) MG nominal compounds with a bound stem

a.	*-loγos*	*γlos-o-lóγ-os* (lit. tongue-CM-talk (< *léγo*)-Isuf) 'who talks about language, linguist'
b.	*-γrafos*	*loγ-o- γráf-os* (lit. word/language-CM-write-Isuf) 'prose/discourse writer'
c.	*-nomos*	*astr-o-nóm-os* (lit. star-CM-administrate (< *némo*)-Isuf) 'astronomer' *peδ-o-nóm-os* (lit. child-CM-administrate-Isuf) 'children's superintendent'
d.	*-poros*	*aer-o-pór-os* (lit. air-CM-go.through (< *peráo*)-Isuf) 'aviator'
e.	*-foro*	*isti-o-fór-o* (lit. sail-CM-carry (< *féro*)-Isuf) 'sailboat'
f.	*-komos*	*nos-o-kóm-os* (lit. sickness-CM-take.care (< *koméo*)-Isuf) 'nurse'
g.	*-trofos*	*ktin-o-tróf-os* (lit. beast-CM-raise (< *tréfo*)-Isuf) 'cattle-breeder'
h.	*-klopos*	*loγ-o-klóp-os* (lit. word-CM-steal (< *klépto*)-Isuf) 'plagiarist'
i.	*-kopos*	*ksil-o-kóp-os* (lit. wood-CM-cut (< *kópto*)-Isuf) 'woodcutter'

Compounds with a bound stem may function as either nouns or adjectives (e.g., *edom-o-fáγ-os* (lit. insect-CM-eat-Isuf) 'insect-eater'). In spite of this, they often tend to lexicalize in one of the two classes. Thus, *ilektrolóγos* 'electrician' is a noun.

[29] Bound stems "belong to the nominal category" since some of them "are created by suffixation, while most of them are built on the basis of suffixless processes" (Ralli 2013: 213).

Ralli (2013: 215) points out that "bound stems belong to a closed class of items, and in this respect, they are similar to affixes." This feature may however be explained by the fact that they have to be linked to AG stems (Thomadaki 1988: 21-24).

Although synthetic compounds play an important part in MG word formation (Ralli 2013: 185), they are less frequent in early Greek CS and CDS.

2.7 Neoclassical nominal compounds

While in other European languages neoclassical compounds differ from native compounds structurally and lexically (Ralli 2013: 186), MG compounds involving constituents directly or indirectly inherited from AG (the so-called 'bound stems' such as *-nómos* in *peδ-o-nóm-os*, Ralli 2013: 201; see example 9c above) are "structurally integrated into the regular Greek compounding system" (Ralli 2013: 209). The term "neoclassical compounds" as it is used in this study does not only apply to formations which correspond to neoclassical compounds of other European languages (e.g., MG *fot-o-γraf-ía* 'photo(graph)', English *photograph*, German *Fotografie*, French *photo*(*graphie*)), but also to compounds containing [+ learned] constituents of AG origin (e.g., *ksil-o-kóp-os* (lit. wood-CM-cut-Isuf) 'lumberjack'; see Section 2.6). In other European languages, "the structure of neoclassical compounds differs from that of their native compounds since it exhibits the Greek pattern, involving the combination of two stems, and the presence of the compound marker *–o–*" (Ralli 2013: 186). Neoclassical compounds are very frequently used in everyday speech as well as in early Greek CS and CDS. Their affinity to the common MG vocabulary may make them more accessible to children acquiring Greek than to those acquiring other languages.

The fact that neoclassical compounds have become part of everyday MG vocabulary and are integrated into the Greek compounding system can be demonstrated by the fact that "bound stems currently combine with common words for the creation of neologisms" (e.g., *burδo-lóγ(os)* 'who talks trash', *kukulo-fór(os)* (lit. hood carrier) 'hooded')[30] (Ralli 2013: 204). Also, the constituents of neoclassical compounds may bear a relationship to other such compounds, to simple nouns or derivational formations. Thus, the first constituent of *fotoγrafía* 'photograph' recurs in lexemes such as those in (10a) while the second constituent is found in the examples in (10b).

[30] In this compound as well as some similar ones the stem *–for–* may also be semantically linked to the MG verb *foráo/foró* 'wear' (e.g., *ras-o-fóros* (cassock-CM-wear.Isuf) 'clergyman'). In others, this is not possible (e.g., *elpiδ-o-fóros* (hope-CM-carry) 'hopeful').

(10) Integration of neoclassical compounds into the MG lexicon
fot-o-γraf-ía 'photo(graph)'

a. *fót-a* 'light-PL', *fot-áki* 'light-DIM', *fot-íz-o* (lit. light-Dsuf-Isuf) 'illuminate', *fot-inós* 'bright', *fot-o-tip-ía* 'photocopy'

b. *γráfo* 'write', *γrafí* 'writing', *γraf-ío* 'desk, office', *γraf-o-mixaní* (lit. writing-machine) 'typewriter', *orθ-o-γraf-ía* 'orthography', *fot-o-γráfos* 'photographer', *kinimat-o-γráfos* 'cinema' (from French *cinématographe*)

Other neoclassical compounds such as *aeroδrómio* 'airport' and *pezoδrómio* 'sidewalk' display a similar structure. The latter is also related to the MG endocentric subordinative nominal compounds *pez-ó-δromos* (lit. pedestrian-CM-way) 'pedestrian zone' and *aftokinit-ó-δromos* (lit. car-CM-way) 'motorway'.

Transparency and opaqueness do not allow to distinguish clearly between productive MG compounds and inherited or borrowed neoclassical ones. Rather, more or less transparent and opaque formations are found in both classes. Thus, the neoclassical compound *asti-nómos* 'policeman' is more opaque than *astro-náftis* 'astronaut' or *asti-fílakas* 'policeman'. Although speakers' education may play a role for their ability to perceive neoclassical compounds as transparent (see above), this is obviously not the case for young children, who must rely on the relation of words with similar phonetic and semantic structure occurring in their own lexicon or that of CDS (see Section 4.2.3).

While most MG compounds are composed of [-learned] elements, others consist of [+learned] ones or are mixed (Ralli 2013: 153). A great number of compounds with [+learned] elements "have revived from AG with the help of Katharevousa (e.g., *aeropóros* 'aviator' […]) or were formed during the last two centuries from stems of AG origin, either directly (*δimosioγráfos* 'journalist', *astifílakas* 'policeman', *leoforío* 'bus' […]) or indirectly, through a west [sic] European language, which used those stems in neoclassical formations (e.g., *astronáftis* 'astronaut', *nekroloγía* 'necrology')" (Ralli 2013: 152). They are common in scientific terminology (see also Anastassiadis-Symeonidis 1986). Neoclassical compounds inherited from AG or containing [+ learned] constituents of AG origin[31] but belonging to today's common vocabulary may be semantically opaque lexicalized formations (e.g., *sik-o-fándis* (lit. fig-CM-reveal.Dsuf.Isuf) 'slanderer') or partially morphosemantically transparent to different degrees (e.g., *leo-forío* 'bus' (*forío* 'stretcher'), *asti-fílakas* 'policeman' (*fílakas* 'guard')) (see Ralli 2013: 152). Ralli (2013: 152) points out that in spite of their totally or

[31] See Thomadaki (1988: 20-24).

partially opaque structure the inflection of neoclassical compounds "is fully identifiable, since it constitutes a productive process."

2.8 Phrasal compounds and other neologisms

Multi-lexical formations such as those presented in (11) are called loose compounds (Dressler 2006: 28) or phrasal compounds (Booij 2010, Ralli 2013).

(11) MG phrasal compounds

a. ADJ + N: *trítos kósmos* 'Third World'
atomikí vómva 'atomic bomb'

b. N + N_{GEN}: *vúrtsa maljón* (lit. brush hair.GEN.PL) 'hair brush'
zóni asfalías (lit. belt safety.GEN.SG) 'safety belt'

Ralli (2013: 244) proposes "a continuum of morphologically complex nominal formations" with "typical one-word compounds placed on one of its ends, while the other end contains syntactically built noun phrases sharing with compounds the same grammatical categories."[32] In order to qualify as phrasal compounds rather than syntactic phrases, these formations must be lexicalized and have an idiomatic meaning (Dressler 2006: 28; see also Ralli 2013: 246). In spite of the fact that formations such as those in examples (11) carry a phrasal rather than a compound accent, the following characteristics distinguish them from syntactic phrases and make them resemble 'morphological compounds' (Booij 2010): The order of constituents cannot be reversed (e.g., *atomikí vómva* 'atomic bomb' vs. ?*vómva atomikí* '?personal bomb', but *meγáli vómva* and *vómva meγáli* 'big bomb'). No element can be inserted between their constituents and the dependent element cannot be independently modified (e.g., **vúrtsa mávron maljón* (lit. brush of.black hair), **vúrtsa ton maljón tis Marías* (lit. brush of.the hair of.the Maria) 'brush for Mairi's hair'; but *i vúrtsa maljón tis Marías* (lit. the brush hair.GEN.PL of.the Maria) 'Mary's hair brush'). Furthermore, in [N N_{GEN}] phrasal compounds only the head is fully inflected (e.g., *vúrtsa/vúrtses maljón* 'hair brush/es'). As opposed to morphological one-word compounds, it is placed on the left (e.g., *kréma iméras* 'day cream' vs. *frutókrema* 'fruit cream') (Ralli 2013: 246-247).

[32] Phrasal formations such as *léksi-kliδí* (lit. word-key) 'key word' or appositive structures like *metafrastís-δierminéas* 'translator-interpreter' belong to a category which progressively passes "from a full syntactic status to that of phrasal compounds" (Ralli 2013: 255).

Phrasal compounds may be ordered on a continuum according to their more syntactic or more morphological characteristics. Thus, *çimós portokáli* (lit. juice orange) 'orange juice' or *sáltsa domáta* (lit. sauce tomato) 'tomato sauce' may be considered to be special NPs and not to belong to compounding (Ralli 2013: 267). The reason is that, in spite of the fact that "their meaning does not completely originate from the meaning of the constituent parts", they "can accept insertion of a parenthetical element" and "the order of their constituents may be reversed" (Ralli 2013: 258).

Greek phrasal compounds date back "to the last two centuries and have been introduced under the influence of English and French" (Ralli 2013: 243 and references quoted there). They "do not belong to the general language use but are mostly scientific terms" (Ralli 2013: 250). In medical terminology and informatics, there is even a tendency to replace morphological by phrasal compounds (Ralli 2013: 250). Due to their paucity in the common vocabulary and their typical occurrence in the domain of terminology, Greek phrasal compounds "can be characterized as a marginal compounding phenomenon, the main compounding process being morphological" (Ralli 2013: 267).

However, neologisms provide evidence for the productivity of compounding patterns in standard languages (Dressler 2006; Dressler, Lettner and Korecky-Kröll 2012). Compounding patterns are most productive if they apply "freely and unconsciously to new loanwords" as, for instance, the German interfixless [N N] pattern found in *Laser-drucker* 'laser printer' and *Haupt-computer* 'main computer' (Dressler, Lettner and Korecky-Kröll 2012: 256; Dressler 2006: 30). In formal Greek, neologisms typically occur in scientific terminology (Christofidou et al. 2013; Ralli 2013). They are mostly nominal compounds following the most productive pattern of endocentric subordinative compounds while coordinative ones are few and verbal compounds are even more rarely found (Christofidou et al. 2013: 234). An overview of the structure of one-word neologisms occurring in Greek scientific terminology and their relative frequency is presented in Table (1) (see Christofidou et al. 2013: 234-235). Besides, phrasal formations such as *θematikó párko* 'theme park' or *epistolikí psífos* (lit. letter vote) 'postal vote' are very frequent in formal Greek (Christofidou p.c.; examples from Christofidou et al. 2013: 229). Such formations are, of course, beyond child-centered conversations.

In a study of neologisms occurring in different text types such as novels, poetry, daily or weekly journals, magazines and administrative texts, Christofidou (1999) found that the type of written texts influences both the amount and patterns of neologisms. Genuine neological one-word compounds were least frequent in all text types, while phrasal compounds such as

fakí epafís ‘contact lenses’ were most frequent, with the exception of poetry and administrative texts. Interestingly, no neologisms were found in the oral dialogues studied.

Table 1. One-word neologisms in MG scientific terminology

Compounds (46.5%)	Nominal subordinative	*asfalt-o-tápitas* ‘asphalt surface’
	Nominal coordinative	*epagelmat-o-viotéxnis* ‘professional craftsman’
	Verbal	*ixo-ripéno* ‘sound pollute’
Formations with a bound right constituent (31%) (*-pjo/piisi*, *-loγos*, *-voros*)	Noun	*klimat-o-lóγos* ‘climatologist’
	Verb	*afθediko-pjó* ‘authenticate’
Derivational formations (22.5%)	Prefixed	*apo-páγosi* ‘defrosting’
	Suffixed	*klon-izmós* ‘cloning’

2.9 Verbal and adjectival compounds

As mentioned above, verbal compounds belong to a particularly productive MG compounding device and emerge early in Greek language acquisition. Among the different types of verbal compounds presented in examples (12) [ADV V] formations are the most frequent and “show a high degree of productivity” (Ralli 2013: 36, 181). MG differs from other Indo-European languages particularly by [V V] compounds (Ralli 2013: 184). These compounds are taken to be [stem-word] structures because they are not subject to the compound-specific antepenultimate stress rule (Ralli 2013: 83).[33] It could be added that they follow the inflection of their right-hand constituent.

(12) MG verbal compounds

a. Subordinative verbal compounds

N V: *xart-o-pézo* (lit. card-CM-I.play) ‘play cards’

afis-o-koló (lit. poster-CM-I.stick) ‘stick up posters’

[33] There are also verbal formations with a bound stem as their second constituent (see *afθediko-pjó* ‘authenticate’ in Table (1) above).

ADV V: *sixn-o-rotó* (lit. often-CM-I.ask) ‘ask frequently’
ksana-páo (lit. again-I.go) ‘go again’
kak-o-metaçirízome (lit. badly-CM-I.treat) ‘ill-treat’
krif-o-tróγo (lit. secretly-CM-I.eat) ‘eat secretly’

b. Coordinative verbal compounds[34]

V V:[35] *ben-o-vjéno* (lit. enter-CM-I.go.out) ‘go in and out’
pijen-o-érxome (lit. go-CM-I.come) ‘come and go’
troγ-o-píno (lit. eat-CM-I.drink) ‘eat and drink’

Although compound adjectives, i.e. compounds with an adjectival head, are taken to be generally least frequent among the three types of nominal, verbal, and adjectival compounds (Dressler 2006: 32), it is uncertain whether this is true for MG.[36] Adjectival compounds display the structural patterns presented in examples (13), partly taken from Ralli (2013: 33).

(13) MG adjectival compounds

a. Subordinative adjectival compounds

N ADJ: *ilj-o-kaménos* (lit. sun-CM-burnt.ADJ (< PAST.PART)) ‘sun-burnt’
anθ-o-stolizménos (lit. flower-CM-adorned.ADJ (< PAST. PART)) ‘adorned with flowers’
ner-ó-vras-t-os (lit. water-CM-boil-Dsuf-Isuf) ‘boiled in water’

ADV ADJ: *kal-o-raménos* (lit. well-CM-sew.ADJ (< PAST.PART)) ‘well-sewn’
kak-o-diménos (lit. bad-CM-dressed.ADJ (< PAST.PART)) ‘badly dressed’

QUANT ADJ: *polí-xrom-os* (lit. much-color-Isuf) ‘multi-colored’

b. Coordinative adjectival compounds[37]

ADJ ADJ: *γlik-ó-ksinos* (lit. sweet-CM-sour) ‘sour-sweet’

As pointed out in Section (2.5), bahuvrihi formations may function as nouns or adjectives. Some further examples of this very productive MG pattern are *sten-ó-mial-os* (lit. narrow-

[34] The endocentricity of MG [V V] compounds is disputed (see Ralli 2013: 165-170).
[35] See also examples (5c) above.
[36] In a preliminary count of 1,086 neologisms, Christofidou et al. (2013: 236, fig. 1) found 77% nouns, 20% adjectives and 2% verbs.
[37] See also examples (5b) above.

CM-mind-Isuf) 'narrow-minded', *anixt-ó-mial-os* (lit. open-CM-mind-Isuf) 'open-minded' and *kokin-o-tríçi-s* (lit. red-CM-hair-Isuf) 'red-haired'. For adjectives or nouns with a bound stem as their second constituent such as *karp-o-fór-os* (lit. fruit-CM-bear-Isuf) 'fruit-bearing', *edom-o-fáγ-os* (lit. insect-CM-eat-Isuf) 'insect-eater' or *anθrop-o-któn-os* (lit. man-CM-kill-Isuf) 'man-slaughtering' see Section (2.6).

The foregoing analysis of MG compounds will serve as a framework for the analysis of compounding patterns found in Greek CS and CDS.

3. Data

The audio-taped data studied in the present article were gathered from two girls growing up in Athens, Greece, interacting with their caretakers, mostly their mothers, in natural speech situations. Anna's data (Katis Corpus) cover the period from 1;8 to 3;0 years and Mairi was observed at the age of 1;9, 2;3 and 2;9 years (Stephany Corpus).

Table 2. Types of simple nouns and nominal compounds (lemmas) in CS and CDS

	CS Anna	**CDS Anna**	**CS Mairi**	**CDS Mairi**
Age	1;8-3;0		1;9, 2;3 and 2;9	
Nouns	1097	1412	272	319
N Comp	78	111	11	13
% N Comp/N	7.11	7.86	4.04	4.07

Table 3. Tokens of simple nouns and nominal compounds in CS and CDS

	CS Anna	**CDS Anna**	**CS Mairi**	**CDS Mairi**
Age	1;8-3;0		1;9, 2;3 and 2;9	
Nouns	13,150	33,173	1,844	2,108
N Comp	629	961	38	60
% N Comp/N	4.8	2.9	2.1	2.85
% N Comp/words	0.9	0.6	0.4	0.4
Total word tokens	70,204	152,186	9,913	14,519

The proportions of nominal compound types (lemmas) and tokens occurring in Anna's and Mairi's CS and CDS before the end of the third year are presented in Tables (2) and (3). Both

tables show that in the four data samples, nominal compounds amount to only a small percentage of noun types and an even smaller one of noun tokens making up less than one percent of the total number of word tokens. Interestingly, the percentages of nominal compound types in CS parallel those in CDS for both subjects. However, Anna utilizes her compound lemmas more often than her mother so that the percentage of compound tokens is higher in CS than in CDS. There is individual variation between the two children: Anna uses nominal compounds more than twice as often as her peer Mairi.

4. Compounding in early Greek child speech and child-directed speech

4.1 Introduction

In the speech of both children and their CDS studied in the present article, compounding constructions emerge before the end of the second year in CS and are mostly nominal compounds in both CS and CDS (see Tables 5 and 6 in Section 4.2.1).[38] Subcategories and frequency of nominal compounds are presented in Table (4).

Table 4. Classes of nominal compounds in Anna's and Mairi's CS and CDS (types/tokens)

Compound type	**CS Anna**		**CDS Anna**		**CS Mairi**		**CDS Mairi**	
	types	tokens	types	tokens	types	tokens	types	tokens
endocentric subordinative and appositive	41 52.5%	116 18.4%	65 58.5%	272 28.3%	4 36%	7 18%	5 38.5%	11 18%
Neoclassical and bound stem as a 2nd constituent	25 32%	383 61%	30 27%	558 58%	5 45%	24 63%	6 46%	37 62%
exocentric subordinative	4	82	6	62	1	3	1	10
coordinative	2	23	1	12	1	4	1	2
other	6	25	9	57	0	0	0	0
	15.4 %	20.6 %	14.4 %	13.6 %	18 %	18 %	15 %	20 %
Total	78	629	111	961	11	38	13	60

The most frequently occurring subcategories are endocentric subordinative and neoclassical compounds amounting to about 80 percent both type- and tokenwise in the two girls'

[38] For verbal and adjectival compounds see Section (4.2.5).

speech as well as in CDS. Both compounding and derivation are involved in a further small group of complex nouns ('other'). The compounds occurring in Anna's CS and CDS will be analyzed in Section (4.2) and Mairi's in Section (4.3). Since productive compounding has not yet started to develop in Mairi's language by the end of the observational period, this development can only be traced in Anna's speech.

The following research questions emanating from the literature on the acquisition of compounding in different languages will be taken into consideration in the analysis of our data as far as possible:

- Are lexicalized compounds the earliest to emerge?
- Do Greek children start out "by treating compounds in much the same way as unanalysed monolexemic labels" (Berman 2009: 317)?
- Is there evidence that certain types of compounds are analyzable for the child because their constituents also occur as simple words?
- What is the role of transparency in compound acquisition?
- Are there indications of noun-noun juxtaposition in Greek around age 2 to 3 years as there are in English, German and Hebrew or is there evidence that Greek compounds are formed according to more complex compound structures such as stem-word or stem-stem?
- Is the compound marker /o/ overgeneralized to cases in which it does not occur in SMG for phonotactic reasons (Dalalakis 1999)? This would prove that its obligatory character has been recognized.
- What is the role of different compound types such as endocentric subordinative, exocentric bahuvrihi or synthetic compounds as well as neoclassical formations in the development of Greek compounding?
- Which kinds of innovative compounds occur in CS and CDS and what can be learned from them concerning pragmatic needs and the acquisition of Greek compounding patterns?
- What is the role of input type and token frequency in predicting the frequency distribution in the child's output?

4.2 The development of compounds in Anna's CS and CDS

4.2.1 Categories of compounds in Anna's CS and CDS

A number of different categories of nominal compounds emerge in Anna's speech from 1;8 to 3;0. Their ranking order in terms of type frequency (lemmas) is shown in (14). Although the inventory of compounds (especially of endocentric subordinative ones) is larger in CDS than in CS (see Table 4), the ranking of compound types in CS equals that in CDS. However, the ranking order of compound use (tokens) differs from that of types in that neoclassical compounds rank first in both CS and CDS. The different types of nominal compounds are described in Sections (4.2.2) to (4.2.4). Verbal and adjectival compounds, which are less frequent, will be briefly considered in Section (4.2.5).

(14) Ranking order of compounds (types) in Anna's CS and CDS
endocentr. subordin. N comp. > neoclass. N comp. > exocentr. subordin. N comp. > coordin. N comp. > other

Table 5. Development of MG nominal compounding in Anna's speech (types/tokens)

Compound type	**1;8 - 2;0**		**2;1 - 2;6**		**2;7 - 3;0**		**Total**	
	types	tokens	types	tokens	types	tokens	types	tokens
endocentric subordinative and appositive	13 43.3%	37 17.5%	10 29%	33 14%	26 54%	46 25.4%	41 52.5%	116 18.4%
neoclassical/bound stem as a 2nd constit.	10 33.3%	119 56%	19 56%	173 73%	16 33.3%	91 50.3%	25 32%	383 61%
exocentr. subordin.	3	39	1	7	2	36	4	82
coordinative	1	4	2	19	0	0	2	23
other	3	12	2	5	4	8	6	25
	23.3 %	26 %	15 %	13 %	12.5 %	24.3 %	15.4 %	20.6 %
Total	30	211	34	237	48	181	78	629

As shown in Table (5), the number of endocentric subordinative compounds increases noticeably both type- and tokenwise in Anna's speech in the second half of her third year. While the inventory of neoclassical compounds stays relatively low during the entire period studied, this category of compounds is by far most frequently used (see Table 4).[39] This is especially

[39] The total number of types of each class of compounds and the total number of compound types overall occurring in Anna's data and her CDS from 1;8 to 3;0 years are presented in the right-hand column of Tables (5) and (6). These numbers are smaller than the sum of compound types found in each of the three developmental phases because each lemma has only been counted once.

due to the frequency of occurrence of a few of these compounds in the child's speech (e.g., *aftokínito* 'car' (120 tokens), *mαγnitófono* 'taperecorder' (87 tokens)).

In the first two phases of Anna's development, the type frequency of endocentric compounds is higher in CDS than in CS so that a considerable number of exemplars of this type is presented to the child (compare Table 6 to Table 5). Most important for productivity vs. entrenchment of compound types is the variation of lemmas in CDS in the course of the child's development. While all neoclassical compounds used by the mother in an earlier phase of the child's development are retained in later phases, the inventory of endocentric subordinative compounds fluctuates between 'old' and 'new' lemmas so that the child is presented with a much greater variety of endocentric subordinative compounds (65 lemmas) than neoclassical ones (30 lemmas), furthering productivity in the first class and entrenchment in the latter (558 tokens of neoclassical vs. 272 tokens of endocentric subordinative compounds) (see Table 4).

Table 6. MG nominal compounds occurring in Anna's CDS (types/tokens)

Compound type	**1;8 - 2;0**		**2;1 - 2;6**		**2;7 - 3;0**		**Total**	
	types	tokens	types	tokens	types	tokens	types	tokens
endocentric subordinative and appositive	41 65%	130 28.6%	23 41.1%/	86 27.8%	26 48%	56 28.4%	65 58.5%	272 28.3%
neoclassical/ bound stem as a 2nd constituent	14 22.2%	252 55.4%	26 46.4%	201 65.0%	18 33.3%	105 53.3%	30/ 27%/	558 58%
exocentric subordinative	4	42	1	5	3	15	6	62
coordinative	1	2	1	10	0	0	1	12
other	3	29	5	7	7	21	9	57
	12.6 %	16 %	12.5 %	7 %	18.5 %	18.3 %	14.4 %	13.6 %
Total	63	455	56	309	54	197	111	961

The greater productivity of endocentric subordinative as compared to neoclassical compounds in the child's speech is evidenced by the appearance of additional compounds during the third year. While about the same number of new endocentric subordinative and neoclassical compounds occur between 2;1 and 2;6 (8 vs. 10), in the following six months the number of new entries of endocentric subordinative compounds to the girl's lexicon is four times higher than that of neoclassical ones (20 vs. 5).

4.2.2 Endocentric subordinative compound nouns in Anna's CS and CDS

The child's main task in acquiring Greek nominal compounding consists in mastering the structure of endocentric subordinative compounds. As far as Anna's speech up to the end of the third year is concerned, stem-word compounds (examples 15) are strongly preferred to stem-stem constructions (examples 16) and amount to 73 percent of endocentric subordinative noun compounds (N = 41). The same preference for stem-word compounds is found in CDS (70%, N = 65).

(15) Stem-word endocentric subordinative nominal compounds

a. Anna, 1;10
palj-ó-ɣata (lit. old-CM-cat)
'bad/damn cat'

b. Anna, 2;7
frut-ó-krema (lit. fruit-CM-cream)
'fruit cream'

(16) Stem-stem endocentric subordinative nominal compounds

a. Anna, 1;10 and CDS
asçim-ó-pap-o (lit. ugly-CM-duckling-Isuf)[40]
'ugly duckling'

b. CDS
trapez-o-mádil-o (lit. table-CM-cloth-Isuf) 'tablecloth'

This preference can be accounted for on the assumption that the constituents of stem-word compounds are less strongly tied together than those of stem-stem or word-stem compounds. Consequently, stem-word compounds should be morphotactically more transparent than stem-stem (or word-stem) compounds because it is easier to recognize the similarities between a

[40] Although stress has not been marked in the computerized transcript of either the Katis Corpus or the computerized parts of the Stephany Corpus, we are confident that Anna and Mairi stress compounds mainly correctly. The reason is that errors with lexical stress in nouns and verbs or grammatically conditioned stress shift have been found to be extremely rare in Stephany's data (Stephany 1997a: 213). We will therefore mark stress in most of the examples taken from child speech. Exceptions are cases with an alternating stress position in SMG such as examples (17a, c, and g) which may carry antepenultimate stress (e.g., *paljópetra*) or preserve the stress position of their head (e.g., *paljopétra*) (see Ralli 2013: 81-87 for further details and a possible explanation of the alternating stress position). In spite of the fact that both pronunciations are possible, the first alternative is more usual. Further cases of SMG compounds stressed in two different positions occurring in Anna's data are *kalóyries ~ kaloɣriés* 'nuns' (example 19b below) and *çilópites ~ çilopítes* (example 21(1)a). Since our assumptions concerning stress cannot at present be backed up by the data, we will not study stress patterns in this article.

word-shaped head and a simple noun containing the same inflectional ending than between the mere stem of a compound's head and a simple noun with a different inflectional ending. Stem-stem compounds are thus formally more complex than stem-word compounds because the inflectional ending of stem-stem compounds may differ from that of the head noun occurring as a free form (e.g., *asçim-ó-pap-o* 'ugly duckling' vs. *pap-í* (lit. duckling-Isuf) 'duckling', *trapez-o-mádil-o* (lit. table-CM-cloth-Isuf) 'tablecloth' vs. *madíl-i* (lit. (hand)kerchief-Isuf) '(hand)kerchief' in examples 16). In both stem-stem and stem-word compounds, the stress position may differ from that of the head occurring as an independent form (e.g., *frutókrema* vs. *kréma* 'cream' and *trapezomádilo* vs. *madíli* '(hand)kerchief' in examples 15b and 16b).

In contrast to Germanic languages such as German and English, where the most productive pattern of [N N] compounds predominates in the standard language and emerges early in language acquisition (see Section 1),[41] [ADJ N] compounds with an adjective as their first constituent are more frequently found in the Greek data than [N N] compounds and amount to 63 percent of endocentric subordinative noun compounds in CS and to 57 percent in CDS (examples 15a and 16a vs. 15b and 16b).

The high percentage of [ADJ N] compounds in Anna's data is mainly due to formations with *paljo-* 'bad' (lit. 'old'), which follow a very productive Greek pattern. Examples occur from early on in both CDS and CS (examples 17). The adjective *paljós* 'old, shabby, bad' expresses pejorative meanings, in particular when its stem occurs as a modifying constituent of nominal compounds rather than a modifier of noun phrases (e.g., *to paljó aftokínito* 'the old car'). Expressions such as *paljóγata* 'damn cat' convey the speaker's negative assessment of an animal, person or situation and their use or innovative formation is pragmatically motivated. Compounds such as *paljobabás* 'bad Daddy', *paljoéva* 'naughty Eva', or *paljomamá* 'bad mommy' referring to the child's father, her younger sister Eva or even the mother herself only occur in CDS and express playful intimacy rather than blame.

(17) Adjective-noun compounds in Anna's speech

a. 1;10
palj-ó-γata (lit. bad-CM-cat) 'bad/damn cat'

b. 2;0
palj-o-δuljés (lit. bad-CM-tasks) 'mischief'

c. 2;1

[41] For German see Korecky-Kröll, Sommer-Lolei and Dressler, to appear.

palj-o-tsiγáro (lit. bad-CS-cigarette) ‘damn cigarette’

d. 2;6
palj-o-skilí (lit. bad-CM-dog) ‘damn dog’

e. 2;6
palj-o-ataksíes (lit. bad-CM-disorder.PL) ‘naughty mischief’

f. 2;7
palj-o-pséfti (lit. bad-CM-liar) ‘rotten liar’

g. 2;8
palj-ó-petra (lit. bad-CM-stone) ‘damn stone’

h. only found in CDS
palj-o-éva (lit. bad-CM-Eva) ‘naughty Eva’

In the first stage of the child’s development from 1;8 to 2;0, formations with *paljo-* show an especially high type frequency and amount to 27 percent of all endocentric subordinative noun compounds (*N* = 41). One of the first compounds spontaneously used by the child at 1;10 in its standard phonological form is *paljóγata* ‘damn cat’. Furthermore, some formations with *paljo-* occurring in the child’s speech and following the standard pattern are not attested in CDS (examples 17c, e, f, and g). Although this does not prove their spontaneous creation by the child, 8 different types of these formations found in the child’s speech during the second half of her third year demonstrate that she is quite familiar with this compounding pattern. Due to the large family size of this class of adjective-noun compounds, one can speak of a productive use of the pattern. It may therefore be assumed that an item-based schema consisting of the adjectival stem *palj-* followed by /o/ and a slot for nouns has emerged (example 18).[42]

(18) An item-based compounding schema

*paljo-*_____Noun

examples: *paljóγata*, *paljoδuljés*, *paljoskilí*, etc.

Series of lexicalized greetings with parallel structure (examples 19a) may also contribute to pattern formation of adjective-noun compounds because they recur with the same modifier *kali-* ‘good’ and different head nouns. The adjective *kalí*.F ‘good’ as well as the head nouns *méra* ‘day’ and *níxta* ‘night’ of these greetings also occur as free forms. There are furthermore

[42] It is unclear whether the morphological status of –o– as a compound marker is transparent for the child.

[ADJ N] compounds clustering around the stems of *kalós*/*kakós* 'good/bad' (examples 19b, c). The meaning of these evaluative antonyms must be assumed to be familiar to the child.[43] The type frequency of compounds containing the modifying constituent *kal-* followed by the CM *–o–* and a number of different head nouns may lead to the emergence of item-based schemas such as *kaló*___ 'good N' and *kakó*___ 'bad N' and further the development of productivity of such constructions. With the exception of lexicalized formations (examples 19a, b), most of the adjective-noun compounds occurring in CS and CDS express evaluative meanings or carry interpersonal context-bound connotations (examples 19c and 20; with the exception of 20b).

(19) Item-based patterns of adjective-noun compounds

a. *kali-níxta* 'good night'
kali-méra (lit. good-day) 'good morning'
kali-spéra 'good evening' (only in CDS)

b. *kal-o-kéri* (lit. good-CM-weather) 'summer'
kal-ó-jiro (lit. good-CM-old.man.ACC) 'monk'
kal-ó-γries (lit. good-CM-old.woman.PL) 'nuns'
kak-ó-miro (lit. bad-CM-fate) 'unfortunate, poor (one)'

c. *kal-ó-peδ-o* (lit. good-CM-child-Isuf) 'good child'
kak-ó-peδ-o (lit. bad-CM-child-Isuf) 'naughty child' (only in CDS)
kak-ó-skilo (lit. bad-CM-dog) 'bad dog' (only in CDS)

Other adjectives besides *paljo-* 'old' and *kalo-*/*kako-* 'good/bad' are also used with different heads in [ADJ N] compounds. Some of them are lexicalized formations (examples 20a and 20b), but many others are strongly context-bound and carry evaluative connotations (examples 20c and d). At least insofar as these occur in compounds sharing either the modifying constituent or the head their type frequency will contribute to the morphosemantic transparency of such compounds and thus further their productivity (e.g., *vromo-pláti* 'dirty back', *vromo-páputsa* 'stinking/dirty shoes' and *tebeló-skilo* 'lazybones', *kakó-skilo* 'bad dog').

(20) Further types of adjective-noun compounds

a. Anna, 1;10 and CDS
asçim-ó-papo (lit. ugly-CM-duck) 'ugly little duckling'

[43] The antonyms *kalós/kakós* 'good/bad' emerge early in Greek language acquisition (Stephany 2015).

b. Anna, 2;3 and CDS

aj-o-vasílis (lit. holy-CM-Basil) 'Santa Claus'

c. Anna, 2;5 and CDS

xodr-o-patáta (lit. fat-CM-potato) 'fat potato' (fig. for a fat person)

d. CDS only

vrom-o-δulítses/*vromer-o-δulítses* (lit. dirty-CM-business.F.DIM.PL)[44] 'stinking business'

vrom-o-pláti (lit. dirty-CM-back) 'dirty back'

vrom-o-páputsa (lit. dirty-CM-shoe.PL) 'stinking/dirty shoes'

xaz-o-púli (lit. silly-CM-bird) 'silly person'

xaz-o-anúla (lit. silly-CM-Anna.F.DIM) 'silly little Anna'

tebel-ó-skilo (lit. lazy-CM-dog) 'lazybones'

In contrast to the particularly productive type of [ADJ N] compounds which may have a context-bound evaluative pragmatic function comparable to that of diminutives (see Thomadaki and Stephany 2007), [N N] compounds typically serve to talk about sub-kinds (Clark 2009: 295) in a pragmatically neutral way and may help children to acquire the notion of subordinate members of a class (Berman 2009: 309). They are less numerous than [ADJ N] compounds in both Anna's CS and CDS, but their inventory in CDS exceeds that found in CS. All [N N] compounds follow the right-headed pattern of Greek compounds and are mostly stem-word rather than stem-stem formations (examples 21(1) vs. (2)).

(21) Endocentric subordinative noun-noun compounds in Anna's CS and CDS

(1) stem-word compounds

a. Anna and CDS

Anna, 1;10

ilj-axtíδes (lit. sun-beam.PL) 'sunbeams'

Anna, 1;11

çil-o-píta/*pítes* (lit. paste-CM-dough.cake.SG/PL) 'noodles'

[44] The first constituent of *vrom-o-δulítses* ~ *vromer-o-δulítses* 'stinking business.DIM.PL' (being used by the mother with reference to the child's poo) alternates between the stem *vrom-* and the synonymous, clearly adjectival stem *vromer-* which preserves the derivational suffix (*-er-*) of *vromerós* 'dirty, filthy'. Although the stem *vrom-(o)-* could possibly be related to the verb *vromáo* 'be dirty, stink, stench' (also found in the relevant context), this would result in an analysis of such compounds as verb-noun compounds, a pattern not attested in MG endocentric noun compounds (see Section 2.3).

Anna, 2;0

nix-o-kóp-ti-s (lit. nail-CM-cut-Dsuf-Isuf) ‘nail clippers’

Anna, 2;5

kukl-o-θéatro (lit. doll-CM-theater) ‘puppet show’

Anna, 2;7

frut-ó-krema (lit. fruit-CM-cream) ‘fruit cream’

oδod-íatros (lit. tooth-physician) ‘dentist’

Anna, 2;8

skil-o-spíti (lit. dog-CM-house) ‘dog kennel’

(for *skilóspito*, not in CDS)

Anna, 2;10

kol-o-túbes (lit. bottom-CM-rolls) ‘somersaults’

Anna, 2;11

tir-ó-pita/pites (lit. cheese-CM-pie.SG/PL) ‘cheese pie/pies’

b. CDS only

vatrax-o-péδila (lit. frog-CM-sandal.PL) ‘flippers’

maksilar-o-θíki (pillow-CM-case) ‘pillow case’

vivli-o-θíki (lit. book-CM-case) ‘bookcase, library’

lik-ánθropos (lit. wolf-man) ‘werewolf’

krevat-o-kámara (lit. bed-CM-room) ‘bedroom’

nixt-o-púli (night-CM-bird) ‘night bird’

podik-o-vivlío (lit. mouse-CM-book) ‘mouse book’

patat-ó-krema[45] (lit. potato-CM-cream) ‘mashed potatoes’

(2) stem-stem compounds

a. Anna, 2;9 and CDS

kol-ó-peδo[46] (lit. arse-CM-child) ‘little bastard’

b. CDS only

kiparis-ó-mil-o (lit. cypress-CM-apple-Isuf) ‘cypress cone’

trapez-o-mádil-o (lit. table-CM-cloth-Isuf) ‘tablecloth’

xart-o-mádil-o (lit. paper-CM-cloth-Isuf) ‘paper hanky’

poδ-ó-sfer-o (foot-CM-sphere-Isuf) ‘football’

[45] The usual standard term is the loanword *purés* ‘purée’ not found in the data.

[46] In contrast to most noun-noun compounds, *kolópeδo* is not a pragmatically neutral expression.

Many of the compounds listed in examples (21) may be at least partially transparent for the child because one or even both of their constituents occur as independent lexemes in her speech. Thus, Anna uses *kréma* 'cream' since 1;10 (often in the noun phrase *kría kréma* 'cold cream'), *frúto* 'fruit' at 2;5 and *frutókrema* at 2;7 co-occurring with *krem-úla* 'cream-DIM' at 2;7. The diminutive *peð-áki* 'little child' is frequently used by the child from 1;8 on and the simple noun *peðí* 'child' occurs since 1;9. Since its stem also appears as the head of other compounds (*kakópeðo* 'bad child', *kalópeðo* 'good child') in Anna's or her mother's speech, it may be assumed that the compound *kolópeðo* 'little bastard' is not fully opaque for the child. A few noun-noun compounds share their head or more rarely the modifying noun (*frutó-krema* 'fruit cream' and *patató-krema* 'mashed potatoes', *çilo-píta* 'noodles' and *tiró-pita* 'cheese pie', *maksilaro-θíki* 'pillow case' and *vivlio-θíki* 'bookcase', *trapezo-mádilo* 'tablecloth' and *xarto-mádilo* 'paper hanky' versus *kolo-túbes* 'somersaults' and *koló-peðo* 'little bastard'). These characteristics will assist the child in penetrating the structure of such compounds.

As is common for noun-noun compounds, the semantic relations between head and modifier vary (e.g., material in *xartomádilo* 'paper hanky' but purpose in *trapezomádilo* 'tablecloth'). Although it might be suspected that this variation will render the processing of such constructions more difficult for children, experimental studies have shown that semantic relations were not the determining factor (Berman 2009: 309-310).[47]

One of the rare instances giving evidence of the child's understanding of the composite structure of endocentric subordinative nominal compounds is found at 2;9, when Anna first characterizes a child by a noun phrase with an attributive adjective (*kakó peðí* 'bad child') and immediately afterwards introduces a compound (*kolópeðo* 'little bastard'), thus turning the negative feature of being wicked into a permanent one (example 22), an interpretation holding at least for adults. This example also provides further evidence that adjective-noun compounds with the modifier *paljo-* have become morphosemantically transparent and productive for the child by the second half of her third year.[48]

[47] The question whether adjective-noun compounds in which the modifier simply characterizes the head are more easily processed by children than noun-noun compounds in which the semantic relations between head and modifier vary, would have to be studied experimentally.

[48] Until 2;9, the compounds *paljópeðo* 'naughty child' and (less often) *kolópeðo* 'little bastard' are only found in CDS. *Paljópeðo* emerges in Anna's speech at 2;11 and is used more frequently than *kolópeðo*, which only occurs once at 2;9.

(22) Anna 2;9

íse éna kakó peδí pu se léne kaló-peδo.[49]
you.are a bad child that you.ACC they.call good-child
'You are a bad child whom they call a good child.'
kol-ó-peδo se léne.
arse-CM-child you.ACC they.call
'They call you little bastard.'

Further evidence for the partial transparency of compounds and their item-based acquisition can be gained from a comparison of the compound *kol-ó-peδ-o* 'little bastard' occurring a single time at 2;9 with the two tokens of *kol-o-túbes* (lit. arse-CM-tumblings) 'somersaults' found in a single utterance at 2;10. While the child pronounces *kolópeδo* in its standard form, *kolotúbes* is subject to the common child processes of vowel and consonant harmony and is rendered as *tulutúbes*. Both compounds are only pronounced once by Anna's caretakers after the child's use, so that they are not modeled. Since the heads of the compounds occur as simple nouns in the child's data several times before (and after) the appearance of the compounds themselves (*peδí* 'child' much more often than *túba* 'tumbling'), Anna's familiarity with at least the first of them seems likely (see examples 22). In contrast to this, the identity of the modifying constituents of the two compounds does not seem to have been recognized by the child. The simple noun *kólos* 'arse' is not used in isolation either in CDS or CS and only occurs in the two compounds in question so that the child will not be familiar with this simple noun. Furthermore, the different position of stress in the two compounds (*kolópeδo* vs. *kolotúbes*) is likely to obscure their morphological relationship.

The stem-word compound *frutókrema* 'fruit cream' (see 21(1)a) is a further example demonstrating the child's ability to associate the constituents of a noun-noun compound with the corresponding simple nouns by the second half of her third year. Although this compound occurs for the first time at 2;7, its head *kréma* 'cream' is frequently found in the expression *kría kréma* 'cold cream' from 1;10 on. In the given speech situation, the diminutive *krem-úla* 'cream-DIM' with a hypocoristic meaning is used to refer to the same cream as the compound (*kremúla* is frequently documented from 1;8 on). Since the modifying noun *frúto* 'fruit' is documented twice in the child's speech at 2;5/2;6, it seems likely that the compound *frutókrema* is transparent for the child and that she has even grasped the semantic relation of

[49] Unless this is a transcription error, the initial rendering of the compound *kolópeδo* as *kalópeδo* 'good child' points to its affinity with the antonym *kakópeδo* 'bad child'.

hyperonym and hyponym between the simple noun and the compound. The hyponym *patatókrema* ‘potato cream’ only occurs in CDS at 1;11.

Matters are different with the compound *nix-o-kóptis* ‘nail clippers’ (see examples 21(1)a) which occurs in a single speech situation at the age of 2;0 years. It is the only compound with an overtly derived agent head noun in the data (see Section 2.6). Two instances of its more ‘learned’ variant *nixokóptis* (without dissimilation of the consonant cluster) occur in CDS at 1;9 and an additional one at 2;0 in the speech situation to be analyzed here (example 23) accompanied by two occurrences of its less learned variant *nixokóftis* (with dissimilation). The child may be taken to be familiar to a certain degree with the plural form of the simple noun *níçja* ‘fingernails’ whose stem functions as the modifying constituent of the compound. This plural form occurs in CDS from 1;8 on as well as in the speech situation in question and is twice employed by Anna at 1;10. The child also uses inflectional forms of the verb *kóvo* ‘cut’ based on the perfective stem *kops-* (since 1;9) or the imperfective stem *kov-* (since 1;10), and the verb form *kóvi* ‘cuts’ is also uttered by her mother in the speech situation in question. What impact may all this have on Anna’s handling of the compound *nixokóptis* ~ *nixokóftis*?

The speech situation entirely quoted in example (23) contains one model of *nixokóptis* and two of *nixokóftis* by the two caretakers as well as five variants by Anna. Although the child starts with the learned standard pronunciation *nixokóptis* which is taken up by her mother immediately afterwards, she switches to a child variant of the less learned form in the next conversational turn (*kixokóftis*) and back again to the learned form (*kixokópti*) in spite of two further models of the less learned form used by her parents. The four variants following the first standard form undergo consonant harmony or stopping (*kixokóftis*, *kixokópti*, *nikopuɣóti*), truncation and reduction to the modifier *nix-o-* (including the compound marker) or they contain a second constituent *-puɣoti* only remotely resembling the standard form due to cluster simplification and vowel insertion.

(23) Anna 2;0

ANN: *píje to nixokóptis*?
went the nail.clipper
‘(Where) did the nail clippers go/did he put the nail clippers?’

MOT: *pu píje o nixokóptis, mátja mu*?
where went the nail.clipper, eyes of.me
‘Where have the nail clippers gone, my darling?’

ANN: *o kixokóftis* [for: *nixokóftis*].

'the nail.clipper.NOM'

MOT: *ne. jatí δen afínis to babakúli na su kópsi ta níçja*?
yes. why not you.let the daddy.DIM that you.GEN cuts the nails
'Yes. Why don't you let daddy cut your nails?'

ANN: *to nikopuγóti* [for: *nixokópti*]
'the nail.clipper.ACC'

ANN: *pu píje to nixo(kopti)*?
where went the nail(clipper)?
'Where have the nail (clippers) gone/did he put the nail clippers?'

MOT: *kápu to* (*e*)*çi o babás*.
somewhere it has the daddy
'Daddy will have it somewhere.'

MOT: *i annúla ti káni me to nixokófti*?
the Ann.DIM what does with the nail.clipper
'What does little Anna do with the nail clippers?'

FAT: *θe*(*li*)*s na ton féro to nixokófti*?
you.want that it I.bring the nail.clipper
'Do you want me to bring the nail clippers?'

ANN: *íne mésa* (*s*)*ti dulápa*.
it.is inside (in) the closet
'It's in the closet.'

FAT: *θe*(*li*)*s na ton féri o babás*?
you.want that it brings the daddy
'Do you want Daddy to bring it?'

ANN: *i ánna* xxx *to kixokópti* [: *nixokópti*] *íne mésa* [/] *mésa to álo babá ti*
the Anna xxx the nail.clipper is inside the other Daddy the
&z d(*u*)*lápa to &a δomátio na to δúme*.
closet the o(ther) room that it we.see
'Anna xxx the nail clippers are inside the other, Daddy, the closet the o(ther) room so that we can see it.'

What all this shows is that the compound *nixokóptis* is not well established in Anna's speech at 2;0. Although she is in principle able to pronounce it in its standard form, she falls back upon child strategies helping to simplify this 'long word' in an interaction during which

she is putting all her effort into achieving some communicative goal. It seems unlikely that handling this compound is supported by morphological transparency and that the relation between the constituents of the compound *nixokóptis* and the form *níçja* 'fingernails' of the simple noun or the verb *kóvo* 'cut' has been recognized by the child at this point of development. Thus, the mere occurrence of the constituents of a compound as stems of independent words in the child's speech does not seem to be a sufficient condition for rendering a compound transparent.

A decidedly creative compound formation occurring once in Anna's data at 2;8 is the non-standard endocentric subordinative nominal compound *skilo-spíti* 'dog house' (see examples 21(1)a) instead of standard *skil-ó-spit-o* (lit. dog-CM-house-Isuf) 'kennel', which is, however, not documented in CDS. In contrast to the standard compound, which is a stem-stem formation, the child's innovative construction may either be analyzed as a stem-word or a word-word formation, since it is not clear whether, for the child, *skilo-* represents a word-like element homophonous to the accusative singular form of *skílos* 'dog' or consists of its stem *skil-* and the compound marker *–o–*. The simplest way of explaining such spontaneous formations is noun-noun juxtaposition, a process which is also found in another spontaneous formation occurring at 2;5, the coordinative compound *fiδ-ína-ma*(*ma*) (lit. snake-F.Dsuf-mommy) 'female.snake-mommy' (see Section 4.2.4).

There is a small group of lexicalized appositive noun compounds consisting of a common noun usually juxtaposed to a proper noun to be found in Anna's data (examples 24). In contrast to languages such as English, German or French, in which such appositive constructions are expressed by noun phrases, in MG they may also be compounds consisting of the stem of a common noun such as *bárbas* 'uncle'[50] or *papás* 'priest, father' (e.g., *papa-níkos* 'Father Nicholas') and a noun functioning as the morphological head of the construction, usually a proper noun (see Section 2.4). As mentioned above, both constituents of these constructions have the same referent. Their structure resembles that of endocentric subordinative compounds with a stem-like left-hand constituent, while the second constituent functions as the morphological head. The appositive compound *barbaxrónos* is a proper name denoting the personified year in a story (comparable to English *Father Frost* or *Jack Frost*) in spite of the fact that it is headed by a common noun.

[50] The noun *bárbas* 'uncle' is an old-fashioned term used in its vocative form *bárba* when addressing a familiar elderly gentleman. Many modern family names derive from such lexicalized forms of address.

(24) Appositive noun compounds in Anna's CS and CDS

a. 1;10, Anna
ba(*r*)*ba-jáni* 'uncle John'

b. 2;0, Anna
baxaxróno [for: *barba-xróno*] (lit. uncle year) 'Father Frost'

c. 2;2, CDS
barba-mixális 'uncle Michael'

Since the three lexemes in examples (24) share the first constituent and occur frequently in both CS and CDS, it may be hypothesized that an item-based schema *barba*___ will eventually emerge from them. There seems to be little evidence, however, that this has already happened in the development of these compounds between 1;9 and 3;0 years. In spite of the fact that the proper noun *Jánis* 'John' occurs frequently in Anna's speech from 1;9 on, she renders the compound *barbajánis* holistically as *kajani/patzani/bajani* in the same month. Its first constituent appears also a month later as part of the amalgams *babrazos/barbazos* and finally *babaros*, when she imitates the phrase *o bárbas o tranós* (lit. the uncle the mighty) 'the mighty uncle' holistically as *babrazos/barbazos* and finally *babaros*.

At 2;0, the compound *barbaxrónos* also emerges in the holistic forms *bapaxro* and *baxaxrono*, which are the only tokens of this word in the child's data. Although *barbajánis* is the most frequent of the three appositive compounds, its adult phonological form only appears at 2;11, more than a year after its emergence. There is some evidence that Anna has become aware of the internal structure of the compound *barbaxrónos* 'Father Time' at 2;7, when she renders it by two independent words as *bárba xrónos*.

4.2.3 Neoclassical compounds

As pointed out in Section (4.2.1), the inventory of neoclassical compounds is much smaller than that of endocentric subordinative ones, but they are much more frequently used in CS as well as CDS (see Table 4 in Section 4.1). In spite of the fact that they come to only about half the endocentric subordinative noun compounds in terms of lexemes, their amount of tokens is more than twice that of endocentric noun compounds in CDS and even more than three times the one in CS (see Tables 5 and 6). As mentioned above, these high numbers of tokens result from the extremely frequent use of the two terms *aftokínito* 'car' and *magnitófono* 'recorder'.

Once these two items are excluded, the token frequency of neoclassical noun compounds almost equals that of endocentric subordinative noun compounds in CS (20.4 percent neoclassical vs. 20 percent endocentric subordinative) and even drops below it in CDS (22.3 percent vs. 28.3 percent).

Neoclassical compounds occurring in Anna's data belong to the common MG vocabulary (examples 25). They may be grouped into two partially overlapping classes which (a) either originate from AG or have been directly or indirectly formed from AG stems, or (b) comprise a bound stem as their second constituent (for details see Sections 2.6 and 2.7). The intricacies of their structure can be exemplified by a comparison of the compounds *aer-o-δróm-io* (lit. air-CM-way-Dsuf) 'airport' and *pez-o-δróm-io* (lit. pedestrian-CM-way-Dsuf) 'sidewalk' which share the second constituent, but differ by their first constituent consisting of a clipped form of *aeropláno* 'airplane' and the stem *pez-* of *pez-ós* 'pedestrian' respectively.

(25) Neoclassical compounds

a. AG origin/calques/hybrid formations
tiléfono 'telephone', *raδiófono* 'radio',
tileórasi 'television', *tilekontról* 'remote control'
aeropláno 'airplane', *aeroδrómio*, 'airport'
fotoγrafía 'photograph'
elikóptero 'helicopter'
ipopótamos 'hippopotamus'
akrovátis 'acrobat' (only in CDS)
aftokínito (calque, cf. French *automobile*) 'car'
maγnitófono 'tape recorder' (cf. French *magnétophone*),
kasetófono 'cassette recorder' (hybrid formation)
astifílakas 'policeman'
astronáftis 'astronaut'

b. with a bound stem as a second constituent
kinimat-o-γráfos 'cinema'
asti-nómos 'policeman', *trox-o-nómos* 'traffic policeman',
asti-nomikós 'policeman, police-', *astinomía* 'police',
peδ-o-nómos 'children's superintendent'
aer-o-póros 'aviator, pilot' (only in CDS)
lot-o-fáγos (lit. lotus-CM-eater) 'lotofag', *melis-o-fáγos* 'bee-eater'

ilektr-o-lóγos ‘electrician’
pez-o-δrómio ‘sidewalk’, *taçi-δromío* ‘post office’ (only in CDS),
nos-o-komío ‘hospital’
ksen-o-δoxío ‘hotel’ (only in CDS)
ksil-o-kópos ‘lumberjack’

Neoclassical compounds are semantically opaque for young Greek children because they typically involve [+learned] lexical stems such as *tile-* ‘far away’, *ip(o)-* ‘horse’ or [+learned] words such as *órasi* ‘vision’, *pteró* ‘wing’. Furthermore, the fact that elements occurring in these formations are either ‘bound’ stems (i.e. inherently non-words) or high-register vocabulary items and thus unlikely to occur in child-centered situations, renders their structure difficult to understand for young children.[51] In addition, neoclassical compounds are more opaque than endocentric subordinative compound nouns with respect to headedness. However, analyzability of neoclassical compounds may be facilitated even for young children by the patterning of formations with similar first or second constituents (e.g., *aero-pláno/aero-δrómio/aero-póros* ‘airplane/airport/aviator’ or *tilé-fono/raδió-fono/maγnitó-fono/kasetó-fono* ‘telephone/radio/tape recorder/cassette recorder’), and by the occurrence of one of the two constituents as a free form (*fílakas* ‘guardian’ in *asti-fílakas* ‘policeman’) or the stem of a simple word (*pez-* of *pezós* ‘pedestrian’ in *pez-o-δrómio* ‘sidewalk’).

Neoclassical compounds headed by a word, such as *asti-fílakas* (lit. city-guard) ‘policeman’ or *astr-o-náftis* (lit. star-CM-sailor) ‘astronaut’ occur more rarely than those headed by a bound stem (e.g., *asti-nómos* (lit. city-administrator) ‘policeman’).[52] The structure of the former seems to resemble that of endocentric subordinative noun-noun compounds such as *nixt-o-fílakas* (lit. night-CM-guard) ‘night-watchman’ because their heads *fílakas* ‘guardian’ and *náftis* ‘sailor’ also occur as simple nouns in the data. However, neoclassical compounds differ from [-learned] compound nouns in that their [+learned] first constituents are bound noun stems belonging to a high-register lexical stock of MG with an obscure meaning for young children. Still, [-learned] compounds such as *çil-o-píta/çil-o-pítes* (lit. paste-CM-dough.cake.SG/PL) ‘noodles’[53] may also be semantically opaque due to lexicalization.

[51] At the age of 3;2, one of the second author’s daughters rendered *tiranó-savros* ‘Tyranno-saurus rex’ partially transparent by reanalyzing it as *tiro-δinósavros* ‘cheese dinosaur’ with a [-learned] first constituent. We found no examples of this type in Anna’s or Mairi’s data.
[52] The stem *astr-* of *astronáftis* represents the word *ástro* ‘star’ alternating with the more familiar *astéri* in SMG, only the latter of which occurs in Anna’s data.
[53] Although both the singular and the plural form occur in Anna’s CS and CDS, according to the dictionaries the singular form (which has the further idiomatic meaning ‘rebuff’) is usually avoided in SMG.

The respective roles of transparency and frequency of occurrence in the acquisition of compound nouns may be illustrated by a comparison of the development of *asti-fílakas* (lit. (AG) city-guard) 'policeman', a compound with a [+learned] dependent constituent and a [-learned] word as its head, vs. the neoclassical compound *astinómos* 'policeman'. At 1;11, Anna uses the simple noun *fílakas* 'guardian' in a context in which the hyponym *astifílakas* would have been appropriate. *Fílakas* 'guardian' is related both morphologically and semantically to *filakí* 'prison', which is attested in Anna's speech from 1;10 on. The nouns *fílakas* and *filakí* often occur within the same speech situation, especially around the age of 2;5 years, when the child uses the compound *astifílakas* 'policeman' for the first time in 5 tokens. The first constituent *asti-* of *astifílakas* represents the AG word for 'city' which also occurs in neoclassical compounds with two [+learned] constituents, namely *astinómos* 'policeman', *astinomikós* 'policeman, police-person', and *astinomía* 'police'. In these three compounds, the constituent *asti-* is combined with the bound [+learned] stem *–nom–* with various endings (*-os*, *-ia*, *-ikos*). Anna produces the compound *astinómos* 'policeman' in its standard form from 2;1 on (after the two amalgams *astinimokos* and *stitimomos* at 2;0). She renders the formation *astinomía* 'police' as *tinomía* at 1;11 and uses it in a stabilized variant *stinomía* from 2;0 through 2;11. The feminine form *stinomikí* of *astinomikós* is only found at 2;9. Thus, at 2;5, when *astifílakas* first appears in the data, the two neoclassical compounds with a first constituent *asti-* in the child's lexicon are *astinómos* and *stinomía*. Although it is doubtful whether Anna has understood that the two neoclassical compounds and *astifílakas* begin with the same constituent, this possibility cannot be excluded because the deletion of the first syllable of *astinomía* in *stinomía* may be explained by metrics. Unlike *astinomía*, the constructions *astifílakas* and *astinómos* both begin by a trochee or consist of two of them, a metric pattern also present in the child's variant *stinomía*. Another possibility is that the deletion of the initial syllable of these forms is caused by the affinity of *stinomía* and *stinomikí* to prepositional phrases introduced by *s-tin* (PREP-DEF.ART) (*sti*(*n*) **nomia, *nomiki*).

It must therefore be admitted that the partial transparency of the compound *astifílakas*, with a [+learned] first constituent and a [-learned] head which also occurs as a free form, does not seem to promote its acquisition in comparison to the totally opaque neoclassical compounds with the same first constituent *asti-*. What seems to be decisive here is frequency of occurrence in CDS and CS and a correspondingly different degree of entrenchment. Taken together, the three neoclassical compounds, which differ by their ending (*astinóm-os/-ía/-ikós*) occur more than twice as often as the forms of *astifílakas* in both CDS (47 vs. 20 tokens) and CS (23 vs. 12 tokens).

Neoclassical compounds such as *asti-nómos* 'policeman', *trox-o-nómos* 'traffic policeman', *peδ-o-nómos* 'children's superintendent' pattern due to their formal similarity because of their shared second constituent *-nomos*. In contrast to endocentric subordinative compounds such as *kak-ó-peδo* 'bad child', *palj-ó-peδo* 'naughty child' and *kol-ó-peδo* 'little bastard' (see Section 4.2.2), the similarity of the three neoclassical compounds is only formal since it is not paralleled by a specific meaning of the head. However, a negative connotation of constructions ending in *-nomos* may be created for the child because her mother uses them in reference to persons disciplining children or threatening to punish them. Actually, the development of such a connotation may even distract attention from the different meanings of the first constituents of these compounds.

A rather promising approach to the way in which Anna gradually comes to grips with the structure of neoclassical compounds is to trace the phonological variants which she produces in the course of development. The four-syllable formations *tiléfono* 'telephone' and *raδiófono* 'radio' as well as the five-syllable constructions *kasetófono* 'cassette recorder' and *maγnitófono* 'tape recorder' referring to the same recording device in Anna's data share the second constituent *-fono*. It may therefore be hypothesized that these compounds will finally form a pattern so that an item-based schema ___ *fono* with a possible meaning related to transmitting or storing speech sound may emerge and generalize their structure although the development of their variants differs considerably.[54] These four neoclassical compounds occurring in CDS and CS play a different role in speech situations documented in the data and are not modeled for the child by her caretakers to the same extent (Table 7). The child's phonological variants are presented in examples (26).

Table 7. Occurrence of 4 neoclassical compounds in CDS and CS from 1;8 to 3;0 (tokens)

	maγnitófono 'tape recorder'	*kasetófono* 'cassette recorder'	*tiléfono* 'telephone'	*raδiófono* 'radio'
CDS	164	22	70	3
CS	87	8	31	5

(26) Anna's variants of 4 neoclassical compounds sharing the constituent *–fono*

a. *tiléfono* 'telephone'

1;9 – 1;10 *tiléfono*, (less often) *teléfono*

[54] In the speech of other Greek children or adults this schema may also cover the lexemes *mikrófono* 'microphone' and *meγáfono* 'loudspeaker' and be related to lexemes such as *símfono* 'consonant', *simfonó* 'to agree', *tilefonó* 'to telephone', *foní* 'voice' or even *fonolojía* 'phonology'.

2;0 *tile*(*fono*) (1 token)

2;0 – 2;11 *tiléfono*

b. *raδiófono* ‘radio’

2;7 *jajófono*

2;9 *jeliófono, jejófono, jajófono*

c. *maγnitófono/kasetófono* ‘recorder’

1;9 – 2;2 *totófono; nononotono; atófono, tatófono, padófono, totósono, detófono; tófono*

2;0 – 2;2 *tonotófono, datatófono*

d. *kasetófono* ‘cassette recorder’

1;10 *kaseto*(*fono*)

2;1 *katosotofono* (amalgam of /kasetofono/, /maγnitofono/?)

2;3 – 2;9 *kasetófono/a*

e. *maγnitófono* ‘tape recorder’

2;0 *manistófono, anitófono*

2;2 – 2;7 *maγnitófono, majitófono, naitófono*

2;4 – 2;10 *nintófono, manitono*

2;4 – 3;0 *manitófono*

The list of phonological variants shows that the standard form of the four-syllable word *tiléfono* ‘telephone’ is acquired almost immediately, with vowel harmony only operating in a few tokens until 1;10. In contrast to this, the other four-syllable word *raδiófono* ‘radio’ is subject to significant segmental changes of its first constituent. The reasons for the different treatment of these two opaque compounds of equal length by the child may not only be sought in the big difference of the number of models available for *tiléfono* and *raδiófono* and the low number of the child’s trials in pronouncing the word *raδiófono* as compared to *tiléfono* (see Table 7), but also in the difficult liquid and interdental fricative occurring in the first constituent of the former as compared to the latter word, which is segmentally more accessible to the child.

As far as the two five-syllable words *kasetófono* and *maγnitófono* are concerned, the first is pronounced in its standard form from 2;3 on, three months later than *tiléfono*, but earlier than *maγnitófono*, for which the child nearly reaches the standard form only by 2;4, in spite of a very large number of models occurring in CDS. One explanation for this difference may be that *kasetófono* is more transparent because its first constituent also occurs in the simple noun

kaséta ‘cassette’, which is found in 33 tokens in CDS and 15 tokens in CS until 2;1. Since only 8 tokens of *kasetófono* or its variants can be clearly associated with this compound and the mother usually introduces the term *maγnitófono* after any of the simplified child forms, it is the latter compound which is finally established in the child’s lexicon as the main term referring to the recording device used. It is not always possible to determine the target word of the child’s earliest renderings of *maγnitófono* or *kasetófono*, also because the most frequent of these simplified forms, *totófono*, is often mimicked by the mother.

Anna’s effort to reach the near-standard form *manitófono* of *maγnitófono* includes the following processes: The earliest prosodic strategy for coping with both of the five-syllable words *maγnitófono* and *kasetófono* is syllable reduction, resulting most frequently in a construction consisting of a reduplicated initial syllable followed by −*fono* (*toto+fono*). In this first period (1;9 - 2;2), the number of syllables of the prototypes is mostly reduced to 4 (*totófono*) and once even to 3 (*tófono*) and is more rarely kept at the number of 5 (*nononotono*). The most prominent and most frequent vowel /o/ of the prototypes *maγnitófono* and *kasetófono* is either the only one figuring in the child’s renderings of one of these words (*nononotono*) or it is accompanied by one exemplar of the back vowel /a/ (*tatófono*). From 2;2 on, the three types of vowels of the prototype *maγnitófono* are reproduced in the child’s variants and the consonants also become more similar to those of the prototype. At 2;2, *maγnitófono* is for the first time correctly pronounced, but the variant *manitófono* with the consonant cluster /γn/ reduced to the nasal predominates up to age 3;0. The child’s two main variants of *maγnitófono* or *kasetófono* are thus the early *totófono* with syllable reduction, complete vowel harmony and a reduplicated first syllable and for *maγnitófono* it is the later *manitófono* characterized by a correct number of syllables, standard vocalism and consonantism, but cluster reduction.

Although the child’s truncations and other prosodic simplifications further diminish the morphotactic transparency of such compounds (see Dressler 2006: 43), one of the reasons for their application in the first place may be the opaqueness of such compounds for the young child. Interestingly, the second bound constituent *–fono* is correctly reproduced in almost all of the child’s variants of these four neoclassical compounds. This indicates the child’s familiarity with this element recurring in different lexical types and its entrenchment achieved by the large number of tokens of some of these words (especially *maγnitófono* and *tiléfono*). Since the boundary between the two constituents of these compounds is preserved in almost

all of their variants these deformations do not constitute amalgams.[55] Once a schema ___*fono* is developing in the child's speech, more work is required for getting the slot filled by acceptable lexical elements. The development of the phonological forms of the above four opaque compounds sharing the second stem shows that the child may indeed reach a partial transparency of neoclassical compounds.

4.2.4 Minor classes of nominal compounds

Besides the major classes of endocentric subordinative nominal compounds and neoclassical ones, minor classes occurring in Anna's speech and her CDS are coordinative and exocentric nominal compounds (examples 27).[56] Although these two classes are found in CS and CDS from early on, their numbers are very low both type- and tokenwise (see Tables 5 and 6 above).

(27) Coordinative and exocentric nominal compounds in Anna's speech and CDS

a. Coordinative compounds
Anna, 1;10
kamil-o-párδali (lit. camel-CM-(leo)pard.F) 'giraffe'[57]

b. Exocentric bahuvrihi compounds
Anna, 1;10
kokin-o-skuf-ítsa (lit. red-CM-cap-F.DIM)
'Little Red Riding Hood'
Anna, 1;11
kod-o-reviθ-úli-s (lit. short-CM-chickpea-DIM-Isuf)
'Tom Thumb'

[55] There are a few early compounds occurring as amalgams such as *çibúta* (1;9, for *staxt-o-búta* 'Cinderella'), *pálali* (1;10, for *kamil-o-párδali* 'giraffe'), *paluljés* (2;0, for *palj-o-δuljés* 'mischief'), but some may persist until a later phase (e.g. *kuskufítsa* for *kokin-o-skufítsa* 'Little Red Riding Hood' until 2;8).
[56] For coordinative and exocentric compounds see Sections (2.4) and (2.5).
[57] Note that *kamilopárδali* can be described as a [+learned] lexical item since its second constituent is based on AG *párδalis* (F), mainly used in zoological terminology, while its first constituent occurs in the [+learned] phonological shape in opposition to [-learned] *gamíla* 'camel'.

c. Other formations

Anna, 1;9

kunja-béla (lit. swing-bela.F)[58] 'swing'

Anna, 1;8

staxt-o-púta/staxt-o-búta (lit. ash-CM-puttel)[59] 'Cinderella'

There is one lexicalized and one innovative coordinative compound attested in the child's speech, namely *kamilopárδali* 'giraffe' and *fiδínama*(*ma*) 'snake-mommy' (on the latter see below). Up to 2;6, the six-syllable formation *kamilopárδali* and its seven-syllable diminutive forms *kamiloparδal-ítsa* and *kamiloparδal-ína* are subject to a number of simplifying strategies.[60] In all of these, the accented second constituent of the compound is more or less rendered in its standard form but is usually shortened in the diminutive forms in order to cope with the extra syllable of these suffixes, which is always preserved. The reason why the second constituent of *kamilopárδali* reaches the target earlier than the first is that it carries the main stress and is placed at the end of the word. The fact that the diminutive endings are preserved even in these overlong word formations indicates the child's familiarity with diminutive derivation due to the frequent use of diminutives in Anna's speech and her CDS (Thomadaki and Stephany 2007).

Since the exocentric compound *kodoreviθúlis* 'Tom Thumb' only occurs early (until 2;2) in the child's speech, it appears in truncated two- or three-syllable variants such as *ditúli/viθúli/θúli* (1;10 – 1;11) and finally in the four-syllable variant *deviθúli*. Although the internal structure of this 'long word' will certainly have remained obscure for the child, all of her seven variants preserve the accented diminutive ending *–úli* OBL.SG (or *–úlis* NOM.SG) in each of their tokens. This shows that this 'long word' also ends in a way familiar to the child.[61]

The other six-syllable exocentric compound *kokinoskufítsa/kokinoskufína* 'Little Red Riding Hood' develops from *finana* and *fina* at 1;8 to *kokina* at 1;10, passing by *ku-skuf-ítsa* (lit.

[58] It may be hypothesized that *kúnja béla* originates from the distortion and pseudoetymological connection with It. *bella* from Lt. *cunabula* 'child's cradle', given that *kúnja* derives etymologically from lt. *cunae* 'child age' which developed into Medieval *kúna* (plural *kúne*), whence Modern Greek *kúnja* (G. Babiniotis, p.c.).

[59] *Staxtopúta/-búta* is a translation of the German synthetic compound *Aschenputtel* (or *Aschenbrödel*, 'the one who digs in the ashes' (from *brodeln* or *buddeln*); Kluge 1995: 56). Probably its second constituent is related to *búti* 'thigh' in Greek folk etymology so that it is turned into a fully transparent exocentric bahuvrihi compound paraphrasable as 'a girl who has cinders on her thighs'.

[60] For instance, *pálali* (1;10), *kilopárδali*, *naropárδali*, *sidopáδalis* (GEN.SG) (2;2), *kalopráδalis* (GEN.SG) (2;5) and the seven-syllable diminutive forms, also used by the caretakers, rendered as *laitopabalítsa*, *toδapalítsa* (2;4) for *kamiloparδal-ítsa*, and *stevoparδalína* (2;2), *taδapalína*, *toδapanína* (2;4) for *kamiloparδal-ína*.

[61] Although the diminutive suffixes *–ína*, *-ítsa* and *–úlis*/*-úla* occur less frequently than *–áki*, they are nevertheless well established in Anna's speech studied until 3;0 and also frequently occur in CDS (Thomadaki and Stephany 2007).

ku-cap-DIM) (and some minor variants) at 2;8/2;9 to *ku-skuf-ína* (lit. *ku*-cap-DIM) at 2;11. While the child relies on the stem of the adjective *kókin-os* 'red-Isuf' of the first constituent of the compound for one of her first replicas, she thereafter switches to the second constituent *skufítsa* or *skufína* 'little cap' bearing the accent, with her replicas enlarged by the stem in comparison with her first two attempts at 1;8. From 2;8 onwards, Anna uses a formation in which the second constituent of the target occurs with a kind of 'prefix' *ku-/ko-/gu-/sku-* based on the first constituent of the compound, but subject to vowel harmony with the second constituent in most tokens. Although there seems to be no doubt that Anna has recognized the diminutive noun occurring as the head of the compound, her personal form *kuskufítsa/kuskufína* for 'Little Red Riding Hood' is certainly not a compound. Interestingly, her mother's models vary between the compounds *kokinoskufítsa/kokinoskufína* (4 tokens) and the noun phrases *kókini skufína/kókini skufítsa* (3 tokens) when referring to the major character of the fairy tale in question. At 1;10, the mother alternates four times between the compound *kokinoskufína* and one of the two noun phrases. In spite of the fact that no uniform Greek name for Little Red Riding Hood is offered to her, Anna uses the variants at hand to create a noun with a derivational suffix and a kind of obscure 'prefix'.[62] The compound *kokinoskufítsa* is treated quite differently by the girl Mairi when it is first introduced to her at the age of 2;9 years (see Section 4.3).

The construction *kunjabéla* 'swing' (example 27c), which occurs in a rhyme ritually accompanying children's play on the swings (*kúnja béla, épes(e) i kopéla* 'swing bela, has.fallen the girl') is not a compound in the real sense, since its second constituent juxtaposed to the first is not a Greek word, is semantically obscure and etymologically unclear (but see fn. 58). Furthermore, *kunjabéla* is left-headed and uninflected in SMG carrying level stress when being sung. There is no doubt that Anna understands that this formation is associated with the simple noun *kúnja* from early on. In nearly all of her 7 tokens of the form occurring from 1;10 to 2;3 she preserves the constituent *kúnja* 'swing'. She also uses the simple noun *kúnja* 13 times as a synonym of *kunjabéla* in the singular und 31 times in the plural (*kúnjes*), partially with the meaning 'children's playground' (see Section 5.4). Since *bela* does not occur as a free form and Anna even pluralizes *kunjabéla* (*kunjabel*.F-*es*.PL) in one token at 2;0, she seems to consider it as a normal Greek word, either a simple noun or some derivational formation with a feminine inflectional ending *–a*. It is therefore rather doubtful whether this form may contribute to the acquisition of compounding.

[62] At 1;10, the exocentric compound *sarada-poδar-úsa* (lit. forty-foot-Dsuf.Isuf) 'centipede' is prompted by the mother by the two fragments /sarada/ and /ru/ which the child repeats as /sara/ and /rusa/ in turn. No conclusions on the compound acquisition can be drawn from this example.

Another problematic compound is *staxtopúta/staxtobúta* ‘Cinderella’ (see examples 27c), which occurs in 12 tokens in Anna’s speech from 1;8 to 2;0. It is only at 2;0 that the girl produces both of its constituents (*staxtobúta*, *ta(x)tobúta*), while in her earlier variants the first constituent is either omitted (*buta*) or reduced to a single syllable (*çibúta/tsibúta/tibúta*). Reasons why Anna retains the constituent *-búta* in all her reproductions are the place of the accent and her use of the free form *búti* ‘thigh’ in its standard form 6 times at 1;11 and 2;0. Furthermore, there are 26 models of the simple noun *búti* in CDS, accompanied by 15 tokens of the variant *staxtobúta* and another 5 of *staxtopúta*. The variant *staxtobúta* indicates an adult exocentric reading (‘a girl having cinders on her thighs’) and may increase the transparency of the compound for the child since the simple noun *búti* has become well entrenched at the age of 2;0 years. The first constituent of *staxtopúta*/*staxtobúta* is probably nontransparent for Anna because the simple noun *stáxti* ‘ashes’ does not occur in the data. In contrast to *kunjabéla*, which is not treated as a compound by the child, the head of the construction in *staxtopúta/staxtobúta* seems to render this compound at least partially transparent.

There are three innovative nominal compounds to be found in Anna’s data (examples 28), one of which (example 28a) may offer insight into compounding strategies likely to be used productively in the second half of her third year.

(28) Innovative formations

a. Anna 2;5
fiδ-ína-ma(*ma*) (lit. snake-F.DIM-mommy) ‘snake-mommy’

b. Anna, 2;8
xon-o-míti-s (lit. poke-CM-nose-Isuf) ‘nose-pecker’

c. Anna, 2;10
peδil-o-pul-ío (lit. sandal-CM-sell-Dsuf.Isuf) ‘sandal store’

The compound *fiδínama*(*ma*) formed by juxtaposing the diminutive *fiδína* ‘female snake’ and a truncated form of *mamá* ‘mommy’ may be classified as a coordinative compound in which it remains unclear whether the first or second constituent functions as the head, something which is typical of such constructions. The formation is used twice by Anna in the same speech situation (example 29). Although the simple noun *fíδi/fíδja* ‘snake.SG/PL’ is found in many tokens from 1;10 on either referring to snakes or a certain kind of noodles, it is used with the meaning ‘snake’ in the same speech situation in which the child also forms the in-

novating diminutive *fiδína* 'female snake'.[63] Since the expressions *fiδomamá* or *fiδinamamá* do not occur in CDS, it may be hypothesized that *fiδínama* is a spontaneous occasional formation by the child. The exact grammatical status of the expression *fiδínama mamá* is unclear. It may either be interpreted as a compound in which the child corrects the latter truncated part by repeating the second constituent (*fiδínama* [//] *mamá*) or as a phrasal (or 'loose') compound (see Section 2.8). While there is no way to decide between these two alternatives, it seems certain that the child is trying to unite the referent's two features of being simultaneously a snake and a mother by forming a single name and using the simplest strategy available, namely that of juxtaposing both labels.

(29) 2;5

ANN: *kíta ti θa káni to fíδi to* [/] *to mikró*.
look what FUT.PTL do.3SG the snake.NEUT the small
'Look what the small snake will do.'
káni xxx *na xorési*.
does xxx that fit.in
'It does xxx to fit in.'
étsi káθise líγo na (*v*)*lépi ti mamá tu*
so sat.3SG a.while that see.3SG the mommy of.him
ti fiδína, ti fiδínama mamá.
the snake.F, the snake-mommy
'It sat there for a while to see its mommy,
the female snake, the snake-mommy.'

MOT: *annúla, páme na plínis ta çerákja tóra*.
'Ann dear (lit. Ann.DIM), let's go and wash your hands now.'

ANN: *ti fiδínama*(*ma*).
'The snake-mom(my).'

In the construction *ti fiδínama mamá* 'the female snake mom mommy', which immediately follows the appositive phrase *ti mamá tu, ti fiδína* 'his mommy, the female snake', word order is reversed. This may indicate that the head of the appositive phrase, *mamá*, also remains the head in the compound. As is typical in apposition, both constituents of the compound and the appositive phrase have the same referent and (in contrast to attribution) there is no clear

[63] Diminutives ending in *–ína* are quite extensively used by Anna as well as her mother (Thomadaki and Stephany 2007: 115-117).

tendency of one element to qualify the other (the referent is a snake that is a mommy or a mommy that is a snake). The question which remains is whether Anna's formation *fiðínama* is indeed a compound. Since she repeats it without the repair *mamá* in the last utterance of the interaction, she seems to consider it as a complete construction. This is all we can say.

The other two non-standard compounds occurring in the data, *xonomítis* 'nose pecker' and *peðilopulío* 'sandal store' (examples 28b, c) are first used by the child's caretakers and have thus not been invented by the child. The compound *xonomítis* 'nose pecker' is the name of a character from a children's book, while *peðilopulío* 'sandal store' is an occasional creation by the mother (D. Katis, p.c.), related to her innovative recursive compound *vatrax-o-peðil-o-puléi* (lit. [[frog-CM-sandal]$_{NStem}$-CM-sell(er).PL]$_N$) 'flipper-sellers'. The innovative compound *peðilopulío/peðilopolío* 'sandal store', which is used once each by the child's mother and father, is an analogy to standard compounds such as *vivli-o-pol-ío* (lit. book-CM-sell-Dsuf.Isuf) 'book store'. It may be analyzed as a subordinating endocentric compound with the bound stem *–polío* as its second constituent or as a secondary compound formation (cf. *vivli-o-pol-ío* 'bookstore' > *vivli-o-pólis* 'book-seller'). The mother's variant *peðilopulío* is taken up by Anna, possibly because it is more closely related to the verb *puláo* 'sell', which the child uses once at the same age. The dependent constituent of the compound occurs a month earlier in the girl's speech (1;11, *péðila* 'sandals') and her father isolates it when mentioning *peðilopolío* (2;10, FAT: *píγate sto peðilopolío ke ðe rotísate pjos éftjakse ta péðila?* 'you went to the sandal store and did not ask who made the sandals?'). All this will contribute to the transparency and analyzability of the compound *peðilopolío* for the child, but the compounding pattern underlying this formation will take more exemplars and tokens to be stored in the child's mind.

The compound *xonomítis* 'nose pecker' (example 28b) belongs to the rare type of exocentric formations with a verb stem as the left-hand head and a noun stem as the dependent constituent (see Section 2.6). At 2;8, it occurs in 10 and 13 tokens in CS and CDS respectively, while mother and child are looking at a picture book. Whether the mother's explanation *jatí o xonomítis ólo éxone ti míti tu* 'because the nose-pecker always poked his nose (into things)' may help to make the compound transparent for the child is an open question.

4.2.5 Verbal and adjectival compounds

Although noun compounds are much more frequent in Anna's speech and in CDS than adjectival and verbal ones, a number of particularly productive MG verbal compounds as well as a few adjectival ones emerge in the child's speech from 1;8 to 3;0 years. As is to be expected, both categories are more frequent type- and tokenwise in CDS than in CS.

Verbal compounds most frequently found in Anna's speech are [ADV V] constructions, in particular combinations of the adverb *ksaná* 'again' with a verb (examples 30). Since the adverb *ksaná* occurs very frequently as a free form in both CS and CDS and the verbal compounds which contain it are also used as simple verbs constructed with this adverb (e.g., *ksana-xáni* (lit. again-loses) 'he/she loses again' versus *xáni ksaná* 'he/she loses (once) again'), it can be safely concluded that *ksana*-compounds are fully transparent for the child and represent one of the most productive and early acquired compounding patterns in Greek child language. The fact that adverb-verb compounds consist of two juxtaposed words without an intervening compound marker will assist the child in realizing the internal structure of such constructions and help her with acquiring this pattern.[64]

(30) Verbal compounds

a. Anna, 2;2
ksaná-rθ-i (lit. again-come.PFV-NONPAST.3SG)
'he/she (will) come again'

b. Anna, 2;6
ksana-éxi (lit. again-has) 'he/she has again'
ksana-xás-i (lit. again-lose.PFV-NONPAST.3SG)
'he/she (will) lose again'

c. Anna, 2;7
ksan-arxíz-une (lit. again-begin.IPFV-NONPAST.3PL)
'they begin again'

d. Anna, 2;8
ksana-ð-í (lit. again-see.PFV-NONPAST.3SG)
'he/she (will) see again'
ksana-kit-úse (lit. again-look-IPFV.PAST.3SG)
'he/she looked again'

[64] The process of juxtaposition is also found in the child's innovative formations *skilo-spíti* 'dog house' and *fiðina-ma(ma)* 'snake-mommy' (see Sections 4.2.2 and 4.2.4).

Another pattern of verbal compounds are coordinative constructions, a small number of which is found in CDS, but not in CS (e.g., *xor-o-piδó* (lit. dance-CM-I.jump) 'jump, caper'[65], *aniɣ-o-klíno* (lit. open-CM-I.close) 'open and close (repeatedly)', *anav-o-zvíno* (lit. switch.on-CM-I.switch.off) 'switch on and off (repeatedly)'). There are also a few compounds with a bound second constituent (e.g., *vrom-o-kopó* (lit. stink-CM-I.do.heavily) 'have an unpleasant smell, stink').[66]

Three of the four adjectival compounds used by the child in the second half of her third year are lexicalized items belonging to the standard vocabulary (examples 31). All of them are subordinative formations consisting of a modifying quantifier or adjectival stem combined with an adjective (31c, d), a past participle (31b) or a noun stem (31a). They are mainly endocentric constructions (examples 31b - d). The exocentric compound *kakómiros* is used as an adjective in example (31a), but, in colloquial Greek, it may also function as a noun taking a different inflection (*kak-o-míri-s* (lit. bad-CM-fate-Isuf) 'unfortunate person'). Subordinative noun-adjective or coordinative adjective-adjective compounds do not occur in our data.

(31) Adjectival compounds

a. Anna, 2;8
kak-ó-mir-o arkuδ-áki
(lit. bad-CM-fate-NEUT.Isuf bear-NEUT.DIM)
'unfortunate little bear'

b. Anna, 2;11
kal-o-raména (*papútsia*)
(lit. good-CM-sewn.NEUT.PL (shoe.NEUT.PL))
'well-sewn (shoes)'

c. Anna, 2;4, 2;8
(*i*) *pedá-morfi* (lit. (the) five.times-beautiful.F)
'(the) very/most beautiful'

d. Anna, 2;11
íse palj-o-xaz-úla (lit. are.2SG bad-CM-stupid-F.DIM)
'you are silly foolish'

[65] It is unclear whether the first constituent should be interpreted as the stem of the noun *xorós* 'dance' or the verb *xorévo* 'dance'.
[66] Bound elements carrying an intensifying meaning such as *–kopó* in this example can also be described as suffixoids (Thomadaki 1988: 85-86) or confixes (Clairis and Babiniotis 2005: 330).

4.2.6 The development of compounding patterns in Anna's speech

Anna's acquisition of compounding patterns from 1;8 to 3;0 primarily concerns endocentric subordinative [ADJ N] and [N N] constructions. Although both of these categories occur in a considerable number of types and tokens during the entire period studied, it takes until the second half of Anna's third year for the first productively used compounding pattern to be found. Productive use is mainly confined to the item-based schema *palj-(o)*-N by which nominal compounds are formed with the adjectival stem *palj-(o)*- 'old, bad' as their first constituent, attesting the usage-based view that generalizations in language acquisition are based on specific lexical items (see Section 4.2.2). The emergence of this compounding pattern seems to be furthered not only by input type frequency, but also by the strong context-bound affective connotations of its exemplars which may facilitate access to their meaning for the child.

The development of the morphotactic and semantic transparency of [N N] compounds on the one hand largely depends on the recurrence of one of the constituents in a given compound family and on the other on the relation of at least one of the constituents to a simple word occurring as a free form in the child's own speech or her input. Indications that both the structure and meaning of some noun-noun compounds have been grasped by the child come from occasional examples from the second half of her third year in which she either forms a noun phrase paraphrasing the compound which contains both of its constituents or uses a subordinative compound noun and its superordinate simple noun in the same situation.

Evidence for productivity in the domain of [N N] compounds is scarce, however. Anna's spontaneous creation of the subordinative, non-standard compound noun *skilo-spíti* (for *skil-ó-spit-o*, lit. dog-CM-house-Isuf) 'dog kennel' at 2;8 shows that, in the second half of her third year, she is not yet familiar with the Greek N_{stem}-CM-N_{stem}-Isuf compounding pattern and forms a compound by merely juxtaposing a head-noun (*spíti* 'house') with a familiar dependent N_{stem}–o– element (*skílo*) to create a hyponym. In the coordinative [N N] compound *fiδína-mama* 'snake-mommy' created at the end of the first half of her third year, the girl juxtaposes two nouns. Although these two examples of creatively formed nominal compounds are insufficient to postulate anything resembling a "stage of N N juxtaposition" (see Berman 2009: 314) in the acquisition of compounding, further evidence for the operation of juxtaposition comes from verbal compounds consisting of the adverb *ksana*- and a verb (e.g., *ksana-kléi* (lit. again-cries) 'he/she cries again'). In spite of the fact that no clear examples of spontaneous creations of such constructions are found in Anna's data, the relatively high type frequency of these verbal compounds indicates the child's familiarity with this item-based com-

pounding pattern. The preference for stem-word compounding patterns as opposed to stem-stem patterns in both CDS and CS will also help to render compounds morphotactically transparent. As is to be expected, no evidence for creativity concerning the much less frequently used types of exocentric or synthetic compound nouns can be found in Anna's data.

As far as the acquisition of the pervasive Greek compound marker /o/ is concerned, there is not a single example of its absence or overgeneralization. Due to the frequent homophony of the combination of stem+CM with an inflected form of the stem (e.g. *skil-o-* and *skilo-* (dog.ACC.SG) in *skilo-spíti* 'dog house'), it is uncertain whether the child has recognized that there is any such element as a CM in many Greek compounds. While the child's phonological variants of standard compound forms may include the compound marker or not, once the standard pronunciation of standard lexical items has been achieved, it does not differ from the forms occurring in CDS including a compound marker where appropriate.

Despite their relatively high type and very high token frequency, neoclassical compounds, most of which are at first rendered by amalgamated variants in Anna's speech, must remain at least partially opaque for the child even after their standard pronunciation has been achieved. The reason is that these compounds consist of high-register constituents inaccessible to young children. Their entrenchment caused by their high token frequency and their partial phonological similarity may nevertheless lead to item-based schemas with a vague meaning (e.g., ___*fono* 'object relating to sound'). In contrast to item-based schemas formed within the category of [ADJ N] (and [ADV V]) compounding patterns which contain a common lexical item or its stem, schemas emerging from neoclassical compounds are unlikely to be used productively by children or their caretakers.

Type frequency in the input seems to relate to Anna's early productive use of noun compounds of the subordinative endocentric type, while input token frequency is reflected in the entrenchment of neoclassical formations in the child's speech.

As far as the relation between the development of compounding on the one hand and derivation or inflection on the other is concerned, there is evidence that all three domains of lexical and grammatical development have emerged in Anna's speech from the age of 1;8 years on. There is a rich inventory of diminutives developing from 1;8 to 3;0 (Thomadaki and Stephany 2007). Although Anna's inflectional development has not yet been studied, the number contrast of diminutive forms proves that inflection has begun to emerge by 1;8 (Thomadaki and Stephany 2007: 117). Also, Anna inflects nominal compounds so that they

occur in 1.4 different grammatical forms on average including both number and case contrasts.[67]

4.3 Compounds in Mairi's CS and CDS

As pointed out in Section (3), the data samples of Mairi's CS and CDS (Stephany Corpus) are considerably smaller than those of Anna's (Katis Corpus) just described. Since, in the entire period of observation, Mairi's CS only contains a total of 11 types of nominal compounds with 38 tokens, the emergence of compounding patterns cannot be tracked in this child's language development. The total number of types and tokens in CDS is similar to that of CS (13 compound nouns, 60 tokens). Verbal compounds are represented even less frequently in both data samples. In Mairi's speech, a single token of a verbal compound occurs at 2;3 and there are no more than 5 verbal compounds (9 tokens) in CDS at 2;3 and 2;9. The category of adjectival compounds is totally missing from Mairi's data while her mother uses one such formation at 2;3.

As in Anna's CS and CDS, the nominal compounds used by Mairi (examples 32) and her mother mainly belong to the categories of endocentric subordinative compounds (including a few appositive ones) and neoclassical ones (see Table 4 in Section 4.1). Neoclassical compounds (examples 32a) occur from 1;9 on and represent the largest class of compounds in the child's speech and her input, foremost tokenwise. There is furthermore a single exocentric subordinative nominal compound, which is theoretically interesting (example 32d; see below).

(32) Mairi's compound nouns

a. Neoclassical compounds
tiléfono 'telephone', *mikrófono* 'microphone',
maɣnitófono 'tape recorder', *aeropláno* 'airplane',
aftokínito (calque, cf. French *automobile*) 'car'

b. endocentric subordinative compounds
anem-ó-milos (lit. wind-CM-mill) 'windmill'
kal-o-kér-i (lit. good-CM-weather-Isuf) 'summer'

[67] Tokens of frequently occurring compounds in Anna's speech seem to represent different inflectional forms more often than tokens of less frequent compounds.

c. appositive nominal compounds
papa-níkos (lit. priest-Nicholas) 'Father Nicholas'
mastr-o-xalas-tí-s (lit. master-CM-ruin-Dsuf-Isuf) 'masterly destroyer'

d. exocentric subordinative nominal compounds
kokin-o-skuf-ítsa (lit. red-CM-cap-F.DIM) 'Little Red Riding Hood'

e. coordinative endocentric nominal compounds
kamil-o-párδali (lit. camel-CM-(leo)pard) 'giraffe'

As far as neoclassical compounds are concerned, some of them are rendered in their standard form or with few phonetic changes in at least some of the child's tokens (e.g., *tiléfono* 'telephone', *aftokínito* 'car') while phonetically more complex ones continue to be distorted until 2;9 (*maynitófono* 'tape recorder', *mikrófono* 'microphone'). As with Anna, the bound constituent *–fono* is preserved in Mairi's renderings of the respective formations, but in view of the paucity of data available it would be inappropriate to claim that they are partially transparent for the child.

Some of the constituents of the remaining six nominal compounds occur as free forms in the girl's speech, e.g., the modifying constituents *kalós* 'good' of *kalokéri* 'summer' and *kókinos* 'red' of *kokinoskufítsa* 'Little Red Riding Hood' as well as the 'relative head' *skufí* 'cap' of this exocentric compound. With the exception of the compound *kokinoskufítsa* (see below), there is no indication that the child relates the constituents of the compounds to the respective free lexemes turning them into at least partially transparent complex word formations.

As far as Mairi's input is concerned, neoclassical compounds occur much more frequently tokenwise than the other types of nominal compounds and largely correspond to those found in the child's speech typewise. Subordinative nominal compounds are mainly stem-word formations in Mairi's speech as well as her input.

Interesting evidence for Mairi's incipient ability to discern the complex structure of compounds is provided by her alternating realizations of the exocentric compound *kokinoskufítsa* 'Little Red Riding Hood' (example 32d). While reading the story of Little Red Riding Hood in two consecutive sessions at the age of 2;9.15 and 2;9.16, her mother and the investigator present this compound to Mairi for the first time in 8 tokens on the first day and 11 on the second. The child herself names the referent 22 times. Only two tokens are imitations, *kufísta* as a first try on the first day and *kokinoskufítsa* on the next. The child's 20 spontaneous variants are shown in examples (33).

(33) Mairi's spontaneous variants of the nominal compound *kokinoskufítsa* 'Little Red Riding Hood'

a. 2;9.15
kokinoskufítsa (2 tokens)

b. 2;9.16
kokinoskufítsa (5 tokens)
kokini [=? *kokino/kokinØ*] *skufítsa* (6 tokens)
kókini skufítsa (7 tokens)

c. Sequence of unambiguous spontaneous variants at 2;9.16
kokinoskufitsa > *kokini skufitsa* > *kokinoskufitsa* > *kokini skufitsa* > *kokini skufitsa* > *kokinoskufitsa* > *kokini skufitsa* > *kokini skufitsa* > *kokinoskufitsa* > *kokini skufitsa* > *kokini skufitsa* > *kokini skufitsa*

While sticking to the model of the compound *kokinoskufítsa* on the first day (2 tokens), the next day Mairi starts to transform it into the noun phrase *kókin-i skuf-ítsa* (lit. red-F.NOM/ACC.SG cap-F.DIM.NOM/ACC.SG) 'red little cap', in which the adjective agrees with the head noun in gender, case and number. After alternating between the compound and the noun phrase for a while, the child finally switches to the endocentric noun phrase in the three final tokens (examples 33c). The girl's behavior can be explained by postulating that although, at 2;9, she is still unfamiliar with the productive Greek compounding pattern [stem-CM-word], the compound *kokinoskufítsa* must be morphotactically as well as semantically transparent for her since, otherwise, she could not have replaced it by a noun phrase.

As far as verbal compounds are concerned, only the most frequent type, namely [ADV V] word-word formations, is documented in Mairi's CS and CDS. The five lemmas occurring in CDS as well as the one found in CS all comprise the adverb *ksaná* 'again, once more' as a modifying first constituent (Mairi, 2;3, (*k*)*sana-káno* (lit. again-I.do) 'do again').

Mairi's development shows that acquisition of different domains of grammatical structure may follow a different pace. Thus, her inflectional development of both verbs and nouns is quite advanced already at the age of 1;9 years (Stephany 1985, 1997a) and by 2;9 she has acquired gender distinctions of adjectives so that agreement errors in noun phrases are rare (Stephany 2015: 375). In contrast, productive compound formation does not seem to have started to develop until the last third of her third year, although the relation of compound constituents to the respective simple words may have become transparent for the child in certain isolated items (e.g., *kokinoskufítsa* 'Little Red Riding Hood').

5. German compounds and their Greek equivalents – an onomasiological approach to lexical typology

5.1 Introduction

Another language well-known for its richness in nominal compounding besides MG is German (see Korecky-Kröll, Sommer-Lolei and Dressler, to appear). In spite of this parallel between the two languages, the amount of nominal compounds occurring in early Greek CS is much more limited than in early German CS. When comparing Greek and German CS, it must be kept in mind that formal speech as well as most written genres (with the exception of fairy tales) are inaccessible to young children. Thus, rather than drawing comparisons between the lexical structures of German and Greek by taking all types of oral and written genres as well as colloquial and formal (low and high) registers into consideration, a more promising way of explaining the differences in the use of nominal compounds between German and Greek CS is to compare German and Greek onomasiology and lexical structure typical of speech used in child-centered situations.

Lexical typology is concerned with "the characteristic ways in which language […] packages semantic material into words" (Lehrer 1992: 249). Languages "can diverge in that one of them uses a particular, single lexeme where the other uses a more complex word, a lexeme belonging to another part of speech, a sequence of lexemes, etc." (Koch 2001: 1143). An onomasiological perspective of lexical typology starts "from an extralinguistic entity (a concept) and looks for forms that denote or may denote this concept" (Grzega 2009: 217-218) focusing "on the issue of what meanings can or cannot be expressed by a single word in different languages" (Koptjevskaja-Tamm 2012: 374). In order to ensure cross-linguistic comparability, lexical typologists make ample use of translational equivalents (Koptjevskaja-Tamm 2012: 387). Swadesh (1952: 457, 1955: 124) used 100 test items which matched unambiguously in the languages studied. For the present contrastive study of Greek and German lexical typology a list of 130 German nominal compounds occurring in early German CS and their Greek translational equivalents were chosen.

5.2 Frequency of nominal compounds in German and Greek child speech

Besides the data of two Greek children analyzed in Section (4) nominal compounds used in natural speech situations by three monolingual children acquiring Standard Austrian German (referred to as German in this study) have been taken into consideration from their emergence between the end of the second or the beginning of the third year to its end (see Korecky-Kröll, Sommer-Lolei and Dressler, to appear).

The amount of nominal compounds occurring in Greek CS during this period is much more limited than that of German CS both type- and tokenwise (Tables 8 and 9).[68] The discrepancy is especially pronounced between Jan's 319 and Anna's 78 compound lemmas which amount to 35.96 percent and 7.11 percent of noun lemmas respectively. A similar difference between the German-speaking and the Greek child is found in compound use: While compound tokens come to 23.19 percent of all nouns in Jan's speech, the percentage only reaches 4.78 percent in Anna's. Also, compounds play a much smaller part in the Greek girl's speech overall (0.89%) than in the German-speaking boy's (4.48%). Although the use of compounds in the speech of the Austrian girl Lena is even lower than in that of the Greek girl Anna (0.77% as compared to 0.89%; see Table 9), it must be noted that Anna's percentage is high, but Lena's is low in comparison to that of the other children speaking the same language. Finally, Tables (8) and (9) show that there are important individual differences of compound use among the three German-speaking as well as between the two Greek children.

Table 8. Frequency of lexical types of nominal compounds (N COMP) in relation to noun (N) lemmas in German and Greek child speech

	German			**Greek**	
	Jan	***Kathi***	***Lena***	***Anna***	***Mairi***
Age	1;8-3;0	2;1-3;0	1;8-3;0	1;8-3;0	1;9, 2;3, 2;9
N types	887	365	316	1,097	272
N COMP types	319	94	48	78	11
% N COMP/N types	35.96	25.75	15.19	7.11	4.04

The distribution of compounds in German and Greek CS (with the exception of the Austrian girl Lena) corresponds to what is found in CDS of the two languages. In German CDS, the relative inventories of nominal compounds (compound types in relation to noun total) vary

[68] The data of the Austrian children in Tables (8) and (9) have been provided by Katharina Korecky-Kröll and Sabine Sommer-Lolei (see also Korecky-Kröll, Sommer-Lolei and Dressler, to appear).

between 28 percent and 41 percent and their relative use (compound tokens in relation to noun total) amounts to 11, 15, or 21 percent (Korecky-Kröll, Sommer-Lolei and Dressler, to appear). In contrast, Greek types of compounds only reach between 4 and 7 percent of the total number of noun lemmas and tokens amount to almost 3 percent in CDS (see Tables 2 and 3 in Section 3).

Table 9. Frequency of nominal compound tokens (N COMP) in relation to noun (N) and word tokens in German and Greek child speech

	German			**Greek**	
	Jan	***Kathi***	***Lena***	***Anna***	***Mairi***
Age	1;8-3;0	2;1-3;0	1;8-3;0	1;8-3;0	1;9, 2;3, 2;9
N tokens	7,443	1,150	1,826	13,150	1,844
N COMP tokens	1,726	162	105	629	38
% N COMP/N tokens	23.19	14.09	5.75	4.78	2.06
% N COMP/word tokens	4.48	2.43	0.77	0.89	0.38
Total of word tokens	38,498	6,654	13,617	70,204	9,913

5.3 Quantitative lexical analysis of German and Greek

As mentioned above, a list of 130 early emerging and rather transparent German compounds with meanings likely to play a role in child-centered situations cross-culturally was assembled on the basis of the overall inventory of 440 nominal compounds occurring in the data of the Austrian children up to age 3;0 and was translated into Greek. Since some German compounds have more than one translational equivalent (examples 34a) while for a few others no translation is available because of the absence of the corresponding referents in Greece (example 34b), this list resulted in 147 Greek translational equivalents.

(34) a. German *Eisen-bahn* (lit. iron-track) ‘train’
Greek *siδiró-δromos* (lit. iron-track), *tréno* ‘train’

b. German *Post-auto* (lit. post-car) ‘mail van’

In spite of the fact that the number of Standard Greek lexical equivalents is larger than that of the German originals (German, *N* = 130; Greek, *N* = 147), only 48 percent of the Greek

lexical equivalents occur in Anna's CS and 55 percent of them in her CDS.[69] Since only 61 German nominal compounds had at least one Greek equivalent occurring in Anna's CS or her mother's CDS, less than half of the original 130 German compounds chosen for cross-linguistic comparison could be included in the contrastive analysis.

A comparison of the use of compounds in Greek CS (and CDS) and German CS[70] may first of all contribute to uncovering socioeconomic and cultural differences between mother-child interaction in the two countries. It should, however, be noted that the data of the Austrian and Greek children, growing up in Vienna and Athens respectively, were collected during the last decades of the 20th century. An important difference between the nominals occurring in the boy Jan's and the girl Anna's list is due to gender distinction. While names for different types of cars abound in the boy's speech, they are rarely found in the girl's data. Infrastructure and traffic, household machines and other utensils as well as eating and drinking habits lead to further differences in names for objects occurring in the Austrian and Greek children's speech.

What is of utmost importance in the present study, is that besides socioeconomic and cultural differences between German and Greek mother-child interaction, the analysis of the Greek translational equivalents of German nominal compounds brings to light onomasiological and structural differences between the two languages. The Greek expressions corresponding to the mostly endocentric subordinative nominal compounds of German split into morphosemantically transparent endocentric (mostly) subordinative nominal compounds (example 35a), neoclassical compounds (example 35b), simple nouns (35c), derivational formations (35d), and noun phrases (examples 35e).

(35) a. *oδod-íatros* (lit. tooth-physician) 'dentist'
(German *Zahn-arzt* 'dentist')
b. *tiléfono* 'telephone' (German *Telefon* 'telephone')
c. *tréno* 'train' (German *Eisen-bahn* 'railway')
d. *vark-úla* (lit. rowboat-F.DIM) 'little rowboat'
(German *Ruder-boot* 'rowboat')
e. *ilektrikí skúpa* (lit. electric broom) 'vacuum cleaner'
(German *Staub-sauger* 'vacuum cleaner')

[69] It must be noted that the SMG equivalents of German compounds do not necessarily correspond to what is found in Greek ADS, on which unfortunately no data of this kind exist.
[70] German CDS data have not been taken into consideration.

The percentages of the different grammatical categories of Greek expressions corresponding to German nominal compounds are presented in Figure (1) and Table (10).

Figure 1. Greek expressions corresponding to German nominal compounds

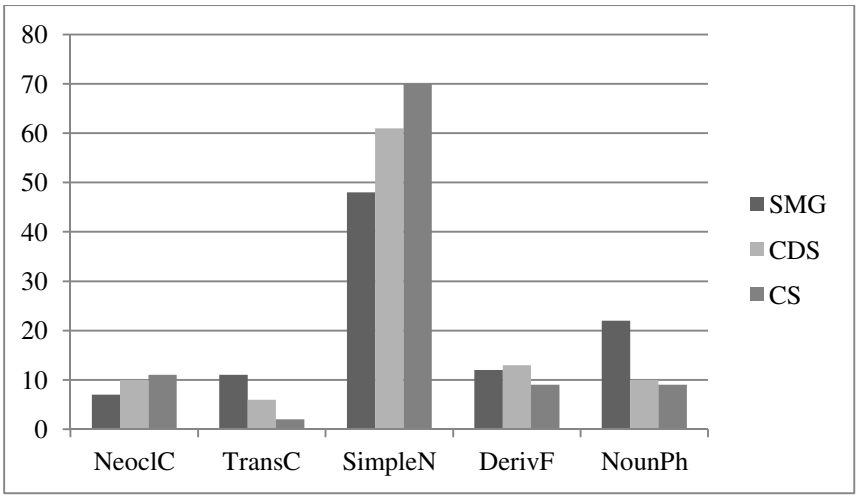

Table 10. Greek expressions corresponding to German nominal compounds

Greek expressions	**SMG**	**CDS**	**CS**
(transparent) compounds	11%	6%	2%
neoclassical compounds	7%	10%	11%
simple nouns	48%	61%	70%
derivational formations	12%	13%	9%
noun phrases	22%	10%	9%
N (types)	82	61	56

The most striking observations concerning the distribution of different grammatical categories of Greek lexical expressions are that simple nouns (SimpleN) by far predominate in the three registers of Greek ADS (SMG), CDS, and CS while transparent (typically) endocentric subordinative compounds (TransC) score lowest. Both of these tendencies are most pronounced in Greek CS and clearly contrast with German CS, where endocentric subordinative nominal compounds constitute the prototypical type of nominal compounds. Neoclassical compounds (NeoclC), derivational formations (DerivF), and noun phrases (NounPh) vary around 10 percent in Greek CS as well as CDS. While neoclassical compounds are a little more frequent in Greek CS and CDS than in SMG, noun phrases are less numerous in child-centered situations. This is first of all due to the predominance of simple nouns in the two

registers of CS and CDS. It is interesting to see that the frequency of simple nouns in CDS occupies a median position between CS and SMG.

5.4 Qualitative lexical analysis of German and Greek

A detailed analysis of the nominal expressions in the speech of the Greek girl Anna corresponding to German nominal compounds shows that, out of the list of 61 transparent German compounds studied, only a single translational equivalent belongs to the same type of endocentric subordinative noun-noun compounds as German *Zahn-arzt* (lit. tooth-physician) 'dentist', namely *οδοd-íatros* (lit. tooth-physician) 'dentist' (see example 35a). There is evidence that this compound occurring at age 2;7 is transparent for Anna, since, on the one hand, both of its constituents also occur in isolation (*δódi* 'tooth', *jatrós* '(medical) doctor') and, on the other, she replaces the first constituent of the compound by the free form *δódi* (*δodíatros*) (example 36). Examples of transparent endocentric subordinative compounds in Anna's CDS are few (e.g., *maksilar-o-θíki* (lit. pillow-CM-case) 'pillow case', *podik-o-vivlío* (lit. mouse-CM-book) 'mouse book', *xart-o-mádilo* (lit. paper-CM-cloth) 'paper hanky').

(36) Anna 2;7
ke metá o δodíatros [: *οδodíatros*] *ípe óti θa pas* [: *fas*] (*e*)*na psomí na perási*
and later the dentist said that you will eat a (piece of) bread so.that will.pass
to vavá mu <ke éleje> [/] *ke éleje óti θa páo ton οδodíatro na ft(j)á(k)so*
the ache of.me and he.said that I will go (to) the dentist that I.fix
to δódi xxx *ke na me δi o famakíos* [: *farmakopjós*] *jatí íme kalá*.
the tooth and that me will.see the pharmacist because I.am well
'And later on the dentist said that you shall eat a piece of bread so that my ache will pass, and he said that I will go to the dentist in order to fix my tooth and that the pharmacist will see me because I am well.'

Diminutives such as *vark-úla* 'little rowboat' (see example 35d) or *aeroplan-áki* (lit. airplane-NEUT.DIM) 'little airplane' (German *Flug-zeug*) are by far the most frequently found derivational formations because diminutive suffixes such as *–aki* and *–ula* are much more productive than derivational suffixes such as *–áδa* (e.g., *portokal-áδa* 'orange juice') or

–(*j*)*éra* (e.g., *banj-éra* ‘bath tub’) and the prefix or preverb *para-* (e.g., *para-míθi* ‘fairytale’).[71]

The main reason why simple nouns are so frequent in Greek CS and CDS (see Table 10 and Fig. 1) is that official terms expressed by noun phrases in SMG are replaced by simple nouns (or derivational formations) in colloquial speech for pragmatic reasons. Thus, *skúpa* ‘broom’ is used for *ilektrikí skúpa* ‘vacuum cleaner’ (example 35e) or *plidírio* ‘washer’ for both ‘dishwasher’ (SMG *plidíro pjáton* ‘washer dishes.GEN.PL’) and ‘washing machine’ (SMG *plidírio rúxon* ‘washer laundry.GEN.PL’). In contrast to this, the corresponding referents are usually denoted by compounds in German, namely *Geschirr-spüler*, *Wasch-maschine* and *Staub-sauger*, even at the level of colloquial use. There seems to be a general tendency in colloquial Greek, as in other languages as well, to replace more specific and linguistically more complex expressions by more general and simpler ones (e.g., noun phrases by simple nouns), if the meaning is clear from the linguistic context (examples 37). However, in German, compounds are preferred in such circumstances. Even in cases where Greek commonly employs a complex expression such as the noun phrase *peδikí xará* (lit. [child]$_{ADJ}$ pleasure) ‘playground’, the *pars pro toto* expression *kúnjes* ‘swings’, a simple noun, is mostly preferred by Anna and her mother.

(37) a. *staθmós* ‘station’ for *peδikós staθmós*
(lit. [child]$_{ADJ}$ station) ‘kindergarten’ (German *Kinder-garten*)
and for *siδiroδromikós staθmós*
(lit. [railroad]$_{ADJ}$ station) ‘railroad station’ (German *Bahn-hof*)

b. *kreváti* ‘bed’, *káθizma* ‘seat’, *δomátio* ‘bedroom’ for *peδikó kreváti/káθizma/δomátio*
‘children’s bed/seat/bedroom’
(German *Kinder-bett, Kinder-sitz, Kinder-zimmer*)

c. *mixaní* for *fotoɣrafikí mixaní* (lit. photographical machine) ‘camera’
(German *Foto-apparat*)

To sum up, simple nouns and, by some distance, derivational formations and neoclassical compounds stand out in Greek CS (and CDS) for referents named by endocentric subordinative compounds in German CS.

[71] On the development of diminutives in Anna’s CS and CDS see Thomadaki and Stephany (2007) and Thomadaki (2007). For an overview of derivational processes of Greek nouns see Clairis and Babiniotis (2005: 76-94).

In order to provide a more balanced view of Greek onomasiology and its relation to German in child-centered situations, the perspective will be changed from lexical expressions corresponding to German compounds to nominal compounds occurring in Greek CS irrespective of whether there are equivalents to be found in German CS (or adult German).

Endocentric subordinative compounds (including a few appositive ones) and neoclassical compounds constitute the two most important types of nominal compounds in Anna's speech and amount to about 85 percent typewise and 79 percent tokenwise, while exocentric subordinative and coordinative compounds are rare (see Table 4 in Section 4.1). Anna's endocentric subordinative nominal compounds are either [ADJ N] or [N N] formations, in which the first constituent modifies the head (e.g., *palj-ó-γata* (lit. old-CM-cat) 'bad/damn cat', *frut-ó-krema* (lit. fruit-CM-cream) 'fruit cream'; see examples (15) in Section 4.2.2). Most of Anna's endocentric subordinative [N N] compounds may be rendered by German compounds of the same category (examples 38). The presence or absence of such compounds in the Greek or German child data studied in this article must be considered to be accidental.

(38) Greek and German endocentric subordinative [N N] compounds

Greek	German	
frutó-krema	*Obst-krem*	'fruit cream'
nixo-kóptis	*Nagel-schere*	'nail clippers'
mesi-méri[72]	*Mit-tag*	'midday'
skiló-spito[73]	*Hunde-hütte*	'dog kennel'

In contrast to noun-noun compounds, adjective-noun compounds occur more frequently in Anna's data than in German (Table 11). Most of these Greek non-lexicalized, productive formations are rendered by noun phrases in German. In substandard German, certain derogatory expressions may be expressed by noun-noun compounds such as *Mist-köter* (lit. rubbish-damn.dog), *Sau-hund* (lit. bastard-dog) 'bastard' or even *Scheiß-köter* (lit. shit-damn.dog) for 'nasty dog'. Greek lexicalized [ADJ N] formations may be equivalent to German simple nouns (e.g., Greek *kal-o-kéri* (lit. good-CM-weather), German *Sommer* 'summer') or noun phrases (Greek *asximó-papo*, German *das hässliche Entlein* (lit. the ugly duck.DIM) 'the

[72] Another possible analysis of *mesiméri* 'noon' is *mes-imér-i* half-day-Isuf.
[73] Anna creates non-standard **skilo-spíti* (lit. dog-house) for *skilóspito* 'dog kennel' (see examples 21(1) in Section 4.2.2).

Ugly Duckling'). In the domain of adjective-noun constructions, endocentric subordinative [ADJ N] compounds dominate in Greek, while noun phrases or simple nouns are found in German besides [N N] and [ADJ N] compounds.[74]

Table 11. Greek [ADJ N] compounds and their German translational equivalents

Greek	**Category**	**German**	**Category**
kaló-peδo 'good child'	ADJ N compound	*gutes Kind* 'good child'	NP
kakó-peδo 'bad child'		*böses Kind* 'bad child' sl. *Mistfink* 'son of a bitch'	NP N N compound
paljó-skilo 'nasty dog'		*böser Hund* 'bad dog' sl. *Sauhund* 'bastard'	NP N N compound
asximó-papo 'Ugly Duck-ling'		*das hässliche Entlein* 'the Ugly Duckling'	NP
kali-méra 'good morning'		*guten Morgen*[75] 'good morning'	NP
kalo-kéri 'summer'		*Sommer* 'summer'	N
kaló-γria 'nun'		*Nonne* 'nun' *Ordensfrau* (li. order woman) 'nun'	N N N compound

A major difference between the stock of compounds of Greek and German CS is the important number of neoclassical compounds used in Greek (see Table 4 in Section 4.1 and Section 4.2.3). The reason why only a few neoclassical compounds are found among the Greek translational equivalents of German compounds is that only transparent German compounds were included in the list, leaving expressions such as German *Telefon* 'telephone', *Bibliothek* 'library', *Mikrofon* 'microphone' out of consideration.

6. Discussion and conclusion

In spite of the fact that nominal compounds are found much less frequently in Greek than in German CS and CDS, they also emerge early in Greek and represent an essential aspect not only of the acquisition of German, but also of Greek word formation.

[74] Although German [ADJ N] compounds do not occur in this comparison, they are quite common (e.g., *Altpapier* 'waste-paper', *Klein-stadt* 'small town', *Groß-stadt* '(big) city').

[75] German *guten Tag* (lit. good day) 'good morning/afternoon' does not exactly correspond to SMG *kaliméra* since the German greeting may be used from morning to late afternoon (or beyond), while *kaliméra* is appropriate only until lunchtime.

The main results of the study of the development of compounding in the speech of two monolingual Greek girls up to the end of their third year are the following. The most important class of nominal compounds, namely endocentric subordinative ones, start to develop with [ADJ N] and [N N] subtypes in Anna's speech, while for Mairi, for whom a much smaller amount of data is available, no evidence for familiarity with even one of the most common Greek compounding patterns, namely [[modifier]$_{ADJ, N}$ - CM - [head]$_N$]$_N$ (e.g., *palj-o-skilí* 'bad dog', *frut-ó-krema* 'fruit cream') can be found. In the second half of Anna's third year, also [ADV V]$_V$ compounds (e.g., *ksana-éxo* (lit. again-I.have) 'have again') provide evidence for a certain productivity.

Another main finding is that the second most important class of nominal compounds are neoclassical ones (e.g., *tilé-fono* 'telephone'), which by far exceed endocentric subordinative ones tokenwise, but not typewise (see Table 4 in Section 4.1). Accordingly, they provide evidence for entrenchment rather than productivity.

Due to the preliminary stage of Mairi's development of compounding through the age of 2;9 years, the following more general conclusions concerning the emergence of Greek compounds and compounding patterns as well as their development mainly rely on Anna's data.

In the first stage of Greek compound development, these lexicalized constructions are treated as "unanalysed monolexemic labels" (Berman 2009: 317), just as has been found for other genetically and structurally different languages, such as English and Hebrew. As evidenced by the children's phonological variants occurring in different periods of development many of these opaque 'long words' gradually develop into at least partially transparent lexemes.

While two of Anna's [N N] compounds provide slight evidence for juxtaposition, Berman's (2009: 314) second stage of compounding development, more evidence is found with [ADV V] compounds, an especially productive Greek compounding pattern. However, the role of juxtaposition in Greek compounding development is not even remotely comparable to the highly productive way of juxtaposing two nouns in compounds expressing all kinds of standard or non-standard semantic relations typical of English and German CS (e.g., English *fire-dog* for a dog found near a fire, *lion-box* for a box with a lion's head on the cover (Clark, Gelman and Lane 1985); German *Mama-katze* for *Katzen-mutter* 'mother cat', *Kopf-aua* for *Kopf-weh* 'headache', *Enten-auto* 'duck car' for a car resembling or belonging to a duck, *Bauern-tiere* 'farmer's animals' for livestock[76]). In spite of such spontaneous formations, the

[76] Examples from the Korecky-Kröll Corpus (see Korecky-Kröll, Sommer-Lolei and Dressler, to appear).

great majority of German nominal compounds occurring in the three Austrian children's speech are lexicalized items rather than spontaneous creations. The same is true for Greek.

The third and fourth stages of compound acquisition postulated by Berman (2009: 314) for Hebrew are characterized by [N N] combinations with appropriate morphological adjustments and finally a command of the formal structure of such compounds by 7 or even 12 years. In spite of the fact that nominal compounds exhibiting a number of rather complex internal structures already appear in Anna's speech by the end of the second year, there is little indication that the child perceives them as complex constructs (with a possible exception of a few exemplars of *paljo*-N ('old/nasty'-N) compounds). Until 2;0 years, compounds used by the girl mainly help to enlarge her lexical stock since they also occur in CDS. During her third year though, compounds exhibiting a relatively high type frequency may facilitate the development of morphotactic transparency (e.g., N_{stem}-CM-N_{word}, *frut-ó-krema* (lit. fruit-CM-cream) 'fruit cream'). These (partially) transparent compounds become privileged and form the bases of gradually emerging compounding patterns, while non-transparent compounds continue to be acquired holistically. As pointed out by Berman (2009: 318), structural difficulties do not seem to be crucial for children's use of such constructions. This has also been substantiated for Greek, where children use compounds as lexical items irrespective of their opaqueness or transparency.

In Hebrew, the fifth and last stage of productive compounding is finally reached by high-school students (Berman 2009: 316). Although our Greek data have only been studied until 3;0 years, productivity in the domain of compounding seems to develop gradually from early on and does so at a different pace with different Greek compounding patterns (and children). Thus, there is a considerable number of both [ADJ N] and [N N] compound types to be found in Anna's data already before the turn to her third year. While the number of [N N] compounds stays almost constant during the second half of her third year, [ADJ N] compounds increase considerably. [ADV V] compounds only emerge at 2;2, but become nearly as frequent as [ADJ N] compounds typewise during the second half of Anna's third year. Evidence for productivity in the sense of creativity is slight in Anna's data and is provided by only two compounds formed by juxtaposing two nouns at 2;5 (*fiðína-mama* 'snake-mommy') and 2;8 (*skilo-spíti* 'dog-house' for standard *skilóspito*).

Although type frequency of compounds sharing one of their constituents as well as a growing stock of simple words which may also appear in compounds will assist children in recognizing "smaller units inside larger ones" (Clark 1993: 109), it must be noted that the structure of most Greek compounds is not directly morphotactically transparent since their constituents

typically involve stems rather than full words. It is therefore no coincidence that both of Anna's spontaneous creations of noun-noun compounds consist of two juxtaposed words rather than stems or a combination of a stem and a word. This may count as indirect evidence for the greater transparency of word-word as compared to stem-word constructions. In addition, support for the opaqueness or transparency of compounds may not only be gained from the development of their phonological variants, but from the child's use of at least one of their constituents in isolation once a more or less standard pronunciation of the compounds has been achieved.

As pointed out by Berman (2009: 317), what it important for compound acquisition in contrast to derivational or phrasal formations in languages such as Hebrew and English is "the impact of target-language typology on form–function relations" (see also Berman 2009: 319-321). This is also found when nominal compounds, simple nouns, derivational formations, and noun phrases in the speech of the Greek girl Anna are compared to nominal compounds used by a German-speaking boy. Thus, labeling needs tend to be served by [ADJ N] compounds in early Greek CS (and CDS), while [N N] compounds are preferred for this purpose in German. Another difference between the two languages is that neoclassical compounds play an important role in early Greek CS, but probably much less so in German (see Section 5.4). Also, in contexts in which compounds are used quite naturally in colloquial German, Greek tends to replace more specific and linguistically more complex expressions by more general and structurally simpler ones if the meaning is clear from the extralinguistic context.

Although Berman's conclusion (2009: 318) that "increasingly with age and the development of a larger lexicon, features of target-language typology and frequency of usage in the ambient language outweigh structural difficulties that young children may initially encounter in constructing wellformed compounds" seems plausible, the present study on the development of nominal lexical items in the speech of the Greek girl Anna and a comparison with the compounds used by an Austrian boy until the end of their third year has produced evidence that typological features of the language acquired will influence lexical development from early on.

Transparency and typological factors should be expected to play a major role in innovative word formation, not only in compounding, but also in derivation. Most Greek compounds are formally rather complex and productivity of compounding is foremost found in formal registers and genres such as scientific or technical texts, inaccessible to CS and irrelevant to CDS. This situation differs from German, where nominal compounds also abound in colloquial adult-directed speech and child-centered situations. Just as in Hebrew language development

(see Berman 2009: 314), also in Greek, more formal means of expression typical of high-register compounding in scientific and technical terminology will be acquired from school age into adulthood.

There seems to be no doubt that "typological and usage-based factors intersect with level of usage and linguistic register to explain developments in acquisition of compound constructions" (Berman 2009: 320). However, our study has shown that a mere comparison of the lexical structures of two languages such as MG and German, both of which are rich in compounding, is insufficient for explaining differences in the acquisition of word formation patterns. Rather, every-day usage in child-centered situations bringing to light differences in onomasiology and lexical structure must be taken into consideration.

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Abbreviations

ACC	accusative	M	masculine
ADJ	adjective	MG	Modern Greek
ADS	adult-directed speech	MOT	mother
ADV	adverb	N	noun
AG	Ancient Greek	NEUT	neuter
CDS	child-directed speech	NOM	nominative
CM	compound marker	NP	noun phrase
COMP	compound	OBL	oblique case-form
CS	child speech	PAST.PART	past participle
DIM	diminutive	PFV	perfective
Dsuf	derivational suffix	PL	plural
F	feminine	PRO	pronoun
FAT	father	QUANT	quantifier
FUT.PTL	future particle	SG	singular
GEN	genitive	SLI	specific language impairment
IPFV	imperfective	SMG	Standard Modern Greek
Isuf	inflectional suffix	V	verb