

## 6. Stress assignment at the interface of phonology with morphology

### 6.1. Introduction

In this chapter I discuss how stress is assigned in morphologically complex forms in child speech. My aim is to investigate whether children behave differently with respect to morphologically complex words compared to monomorphemic words. In other words, I wish to investigate whether morphology plays a role in the produced forms. The importance of this chapter lies in the fact that it is crucial to find out how morphology shows its effects in a language which is highly morphologized. It would be interesting to see whether the subtle distinctions of the morphological levels found in adult speech are attested in child speech as well.

The focus in this chapter is placed on derived and compound forms. The reason why data from inflected (nouns) and conjugated forms (verbs) are not examined is twofold; on the one hand, inflection is considered to be more transparent as a process compared to derivation and compounding; consequently, I assume that data from inflection would not be more informative than data from derivation and compounding. Nominal and verbal stress in Greek, on the other hand, is characterized by different properties, which cannot be dealt with in this thesis. This is a topic with important implications for the theory of Greek stress that goes beyond the scope of this study. Here, I only want to have an idea of the degree to which morphology is involved in child speech, and, even, if it is acquired at all. This chapter provides further support for the model of multiple parallel grammars. To be more specific, the fact that polymorphemic words exhibit the same truncation patterns as monomorphemic words, namely that they are truncated to monosyllabic, and disyllabic forms (both trochaic and iambic forms), before being accurately produced, implies that children follow distinct developmental paths in the acquisition of morphologically complex words too.

One of the aims of this chapter is to investigate the degree to which *Headedness Theory* or *Theory of Head Dominance* (hereafter HT or HD, respectively), as proposed by Revithiadou (1999) for Greek adult language, also holds for Greek child language. The effects of HT are more obvious in derivation, compounding and nominal inflection. Before I present the data, I review the notion of *Prosodic Bootstrapping* (in section

6.2), then focus on the properties of derivation and compounding and their differences from inflection (6.3.1), address the basic principles of HT (6.3.2), and, finally, review the literature on the acquisition of Morphology (6.3.3). The concluding remarks are presented in section 6.4.

## 6.2. Prosodic bootstrapping

The notion that clues to morphological, syntactic or semantic structure may be discovered in speech by applying prosodic principles is known as the '*prosodic bootstrapping hypothesis*'. The term was introduced by Pinker (1984).<sup>95</sup> A compelling reason for considering the hypothesis of Prosodic Bootstrapping is that it has the potential to significantly alter the dialectic of the debate on what determines language acquisition. However, another factor that must be considered in evaluating hypotheses of Prosodic Bootstrapping is that the plausibility of any such hypothesis cannot be judged except with reference to a theory of the Grammar that is being acquired.

The special role that prosody may play in the acquisition process was already recognized in the so-called *motherese language* (cf. Gleitman, Newport and Gleitman 1984, Fernald 1989, Fernald et al. 1989). Motherese consists of very short utterances, which almost never contain a true grammatical error. What differs between motherese and adult language is the restriction of the choices among the allowable structures and contents. Hirsh-Pasek et al. (1987) showed that infants aged 0;7-0;10 are sensitive to prosodic cues that would help them to segment the speech stream into perceptual units that correspond to clauses. Furthermore, Kemler-Nelson et al. (1989) show that infants' sensitivity to segment-marking cues in ongoing speech holds for motherese only; infants orient longer to speech that has been interrupted at clausal boundaries than to matched speech that has been interrupted at within-clause locations. The prosodic qualities of motherese therefore provide infants with cues to units of speech that correspond to grammatical units. In another study, Grieser and Kuhl (1988) demonstrate that tonal languages, such as Mandarin, suggest that motherese may exhibit universal prosodic features.

What is common in most acquisition studies is that children start acquiring a language by perceiving the stressed syllable. Acoustic salience

---

<sup>95</sup> For a general discussion of bootstrapping, see also Karmiloff and Karmiloff-Smith (2001).

is an important cue for speech segmentation. Stress is a property of the speech stream that infants are sensitive to at a very young age (Morgan and Saffran 1995, Jusczyk 1997); between one and four months infants are sensitive to changes in stress patterns (Jusczyk and Thompson 1978, Hirsch-Pasek et al. 1987, Jusczyk 1993, 2001, Jusczyk et al. 1992, Jusczyk et al. 1993, Harford and Demuth 1999, Nazzi et al. 2001).

These findings are further supported by studies on children learning English, who use stress rhythm in segmentation<sup>96</sup>, children learning French and other languages with syllable rhythm (Alegria et al. 1982, Content et al. 1986, Wauquier-Gravelines to appear), and children learning Japanese, who use moras for purposes of speech segmentation.<sup>97</sup> According to Cutler (1996), an ability to process rhythm is inborn. By using this ability, infants are able to overcome the segmentation problem and hence take their first step towards compilation of their own lexicon.<sup>98</sup>

Demuth (1996a,b) contends that the varying shapes of children's early productions reflect sensitivity to the prosodic word structure of languages, conforming to linguistically specified notions, which are defined in terms of the prosodic hierarchy (see also Drescher 1996). Demuth assumes that limitations of children's early word shapes reflect neither perceptual nor representational deficiencies but rather systematic phonological constraints on output forms.<sup>99</sup> Children achieve accurate representations of words in their languages very early in acquisition.

An alternative possibility is that young children might exploit low-level phonetic and distributional properties of words and syllables in input speech to assign these elements to basic grammatical categories. Morgan, Shi and Allopena (1986) suggest that the statistical, syntactic and semantic characteristics of content words and function words universally tend to result in these words having constellations of distinctive phonological and hence perceptual characteristics.

---

<sup>96</sup> See Peters (1985), Gerken et al. (1990), Gerken (1991), (1994a), (1994b), Bortfeld and Morgan (1995), Newsome and Jusczyk (1995), Shady, Gerken and Jusczyk (1995), Cutler (1996), Cutler and Otake (1996), Mehler et al. (1996), Sebastián-Gallés (1996).

<sup>97</sup> Ramus (2002) conducted an experiment where he tested the influence of rhythm on language discrimination. More specifically, Dutch and Japanese newborn children exposed to resynthesized stimuli with artificially monotonized intonation patterns were able to discriminate between the two languages, but the effect was weaker than when intonation was present. This may be evidence for the fact that the correlation between intonation and rhythm facilitates speech processing.

<sup>98</sup> See also Christophe and Dupoux (1996) and Keller and Alexopoulou (1999) for comparable accounts.

<sup>99</sup> See a comparable account by Goad and White (2003) on L2 inflection.

The studies by Morgan et al. (1986) and Selkirk (1996) concern the question how children start to represent lexical and functional items as members of distinct grammatical classes, given that it is difficult to account for the appearance of functional items in children's productions. Selkirk (1996) provides a novel theoretical treatment of grammatical function morphology in terms of prosodic words. She shows how the prosodic distinction between weak and strong forms of grammatical function words in English can be handled by appealing to three different types of morpho-syntactic input structures, all with the same ranking of prosodic constraints. It has long been known, however, that functional items do not appear as a class in children's repertoire, but rather emerge one by one, in orders that vary across languages but that tend to be stable within languages (Brown 1973, Slobin 1982).

Karmiloff and Karmiloff-Smith (2001) claim that this dispreference for producing function morphemes may be due to the fact that children have processing limitations and, consequently, drop parts of the sentence when it becomes too long. In this case, it is function words that are omitted from children's speech. Perhaps this happens because unbound grammatical markers demand deeper processing than content words.

Generally speaking, word and phrase segmentation makes particular use of prosody, labelling words as members of lexical categories. Segmentation depends on the recognition of function morphemes, and hierarchical structuring of utterances. Gerken (1996) notes that early acquisition of syntax proceeds contemporaneously with the acquisition of native language phonology. As emphasized here, learners will not only need some knowledge of native language phonology but will also need to be able to integrate diverse forms of phonological and other linguistic information to bootstrap into grammar. In the same line of argumentation, Guasti and Nespor (1996) argue that the phonological shape of an utterance conveys information about its syntactic structure.<sup>100</sup>

Carpenter (2003) examines whether function words and unstressed syllables that would be described as being part of the same prosodic context, i.e. have the same metrical pattern, are deleted or preserved at the same rate. The results of her study give comparable results as that of Gerken (1996), in the sense that children are indeed sensitive to whether

---

<sup>100</sup> Crisma and Tomasutti (2000) arrive at the same results regarding article omission in Italian child language but from a different point of view. More specifically, even though Crisma and Tomasutti start out with a syntactic analysis of the phenomenon under investigation, they conclude that article omission is a surface phenomenon, which can completely be accounted for by a set of phonological constraints.

an unstressed syllable is a function word or part of a lexical word. However, the results of individual children show that some children omit the function word at a higher rate, some omit the lexical syllable more often, while others show varying patterns of partial acquisition.

Lléo and Demuth (1999) arrive at similar results in a comparative account of Germanic and Romance languages. Their study shows that, despite the fact that grammatical function morphemes appear at a different stage for Germanic and Romance languages, they occur only as long as they meet the prosodic constraints of the child's grammar at a given point in development.<sup>101</sup>

Additional evidence for the role of prosody in speech segmentation comes from tonal languages. Hua and Dodd (2000) showed that in the speech of 129 children (between 1;06-4;06) acquiring Mandarin Chinese, tones were acquired first. Tone errors were rare, possibly due to the fact that tone has the capacity to differentiate lexical meaning.

To sum up, the studies mentioned above underline the fact that prosody plays a fundamental role as well as facilitates the acquisition of other grammatical modules of the target language.

### 6.3. The Phonology-Morphology interface

#### 6.3.1. *Derivation, compounding, inflection: definitions*

According to Booij (2000), derivation involves the formation of new forms by means of affixation, that is, the attachment of bound morphemes to stems. The word classes that can be extended by derivation are the open or lexical classes of a language: nouns, verbs, adjectives, and adverbs. Booij includes conversion in the broader process of derivation because conversion is functionally similar to derivation. The defining criterion for compounding – as opposed to derivation – is that in compounding two different free forms are combined to form a new form. Headedness plays a role in compounding. For example, Dutch compounds are mainly right-headed. The rightward constituent is the head and hence it determines the semantic class, the syntactic category, and - in the case of nouns - the gender of the compound. To sum up, the difference between

---

<sup>101</sup> There are researchers who argue that phonology does not mirror syntactic structure, as seen in various cases of non-isomorphism between the two reported in the literature (cf. Selkirk 1984, Nespov and Vogel 1986). Rather, phonology has been commonly assumed not to determine the syntax of a sentence (Zwicky and Pullum 1986)<sup>101</sup> except for some cases (Zec and Inkelas 1990, Golston 1995). However, the studies discussed above do not assume that phonology and syntax are isomorphic.

derivation and compounding, at least for Greek, is that the first involves the combination of bound and free forms, whereas the latter involves the combination of free forms.<sup>102</sup>

Inflection, on the other hand, is of two types; inherent and contextual. Inherent is the kind of inflection that adds morphosyntactic properties with an independent semantic value to the stem of the word, whereas contextual inflection is required by the syntactic context but does not add information.

Even though there are researchers such as Bybee (1985) and Plank (1994), who argue that there is no sharp distinction between derivation and inflection, or Dressler (1989), who argues that inflection and derivation should be seen as the opposing endpoints of a continuum<sup>103</sup>, ranging from prototypical inflection to prototypical derivation, I follow Booij (2002) who draws a clear-cut non-continuous distinction between derivation and inflection.

According to Booij (2002) the formal base for derivation is normally (but not always) the stem of a word, i.e. the word minus its inflectional affixes. Derivation may change syntactic category, unlike inflection. Moreover, inflection is obligatory, unlike derivation. Furthermore, full productivity has also been claimed to be characteristic for inflection. This is also the reason why inflection is considered to be more transparent (semantically) than derivation.

Finally, it has been assumed that there are psycholinguistic differences between inflection and derivation: outputs of derivational properties will be readily stored in the lexicon, whereas inflectional forms need not be stored and can be computed on line because they are transparent and formed by productive processes. However, other researchers hypothesize that speakers also store regularly inflected forms as separate entries in the lexicon, especially in the case of high-frequency forms (Stemberger and MacWhinney 1986). If this hypothesis is true, high-frequency lexical items should have lower error rates on inflections than low-frequency lexical items will (Stemberger and MacWhinney 1986). This is shown to be the case for errors on irregular inflected forms in naturally occurring speech errors. Internal linguistic evidence for storage of certain types of inflectional forms is also found in plural nouns and different stems of the irregular verbs. Another hypothesis with respect to the differences be-

---

<sup>102</sup> However, Booij (2000) claims that it is not only free forms that participate in compounding.

<sup>103</sup> See also Anastasiadi-Simeonidi (2004) for an account supporting the morphological continuum based on Greek data.

tween inflection and derivation is that inflection is peripheral to derivation (as suggested by the framework of Split Morphology. For further information, see Perlmutter 1988, Anderson 1992).

### **6.3.2. Morphological headedness and its relation to the Greek child data**

The question that constitutes the core of the theory of *Morphological Headedness* (Revithiadou 1999) is whether it is the rich morphology of fusional languages, such as Greek, that brings the inherent accentual properties of morphemes and eventually the dependence of prosody on morphological structure to light. Related to this issue is the question how correct accentuation is derived in more intricate metrical constructions as well as what happens when two or three marked morphemes are present in the word. The above questions underline the fact that lexical accent, morphological structure and, particularly, the notion '*head of the word*' are vital components for the accentuation of head-dependent systems, like Greek and Russian (Revithiadou 1999:171-172).<sup>104</sup>

According to Revithiadou (1999), when a conflict arises among lexical accents for prominence, the accent of the 'morphological head' of the word wins. When such conflicts arise, prosody is determined by morphology: the head(most) accent wins, i.e. prominence is assigned to the lexical accent carried by the head of the morphological structure.<sup>105</sup> Researchers such as Dresher and van der Hulst (1998) point out that the notion 'head' is a central linguistic concept, given that it is the element that shows the greatest degree of complexity allowed by the grammar. The interface of Phonology with Morphology in Greek is then expressed by means of a theory of head dominance, which is translated into the ranking in (297) below.<sup>106</sup>

<sup>104</sup> A comparable fusional system is Hebrew. For an account, see Graf (2000).

<sup>105</sup> Another theory on stress assignment at the interface of Phonology with Morphology is the Theory of Antifaithfulness (TAF) (Alderete 1999, 2001).

<sup>106</sup> Booij (2000) doubts whether the notion of headedness, which is necessary in syntax and seems to have some role in compounding, is an insightful notion for the analysis of derivation. In syntax, the notion of 'head' is defined quite differently; not in terms of location (left or right), but in terms of structure: the head of an XP is the X<sup>0</sup> of that XP. In the analysis of compounds, the most syntax-like kind of word formation, the notion 'head' has the advantage that a substantial set of properties of the whole compound is predicted on the basis of the independently determinable properties of one of its constituents, its head, which also occurs as an independent word. Booij (2000) argues, however, that in the case of affixes there is no independently given specification of its categorial value, and hence we first have to encode the categorial properties that affix, which are then percolated to the dominating node of the whole complex word. DiSciullo

## (297) Head dominance

## HEADFAITH &gt;&gt; FAITH

Accents provided by morphological heads must be given priority over other accents in the word.<sup>107</sup> Headedness refers to the ability of a morpheme to determine the word's syntactic category. A derivational suffix that changes the base it is attached to from nominal to adjectival is considered to be a head. However, roots rather than inflectional suffixes are heads in inflected words because they determine the syntactic category of the whole form (Zwicky 1985, Scalise 1988b, among others). In the acquisition literature, inflectional affixes are considered to never serve as heads of feet (Bernhardt and Stemberger 1998). Assigning primary stress to the morphological head means that the inherent accentual properties of roots outrank the inherent properties of inflectional suffixes in inflectional constructions, but submit to the inherent metrical information of derivational suffixes in derived constructions.

According to Revithiadou (1999), one of the advantages of HT is that it restates and redefines McCarthy and Prince's (1995b) metaconstraint ROOTFAITH >> SUFFIXFAITH as a positional faithfulness ranking, where the more specific HEADFAITH is ranked above the general FAITH. This approach offers a uniform account for the accentuation of inflected and derived words. Crucially for the theory, when the root is the head of the word, both head dominance and McCarthy and Prince's metaconstraint make the same predictions, but when derivational suffixes are involved, only the former approach proves to be empirically correct. When deriva-

---

and Williams (1987), on the other hand, substitute the notion of head with that of *relativized head* (head<sub>F</sub>), according to which the head of the word is the rightmost element marked for the feature F. This new notion of head permits the possibility that words may have two heads, a head<sub>F1</sub> and a head<sub>F2</sub>, where F1 and F2 are different features. Inflected structures, for instance involving inflectional suffixes do not determine the syntactic category of the word. Consequently, the head of the grammatical class must be the root, while the inflectional suffix will still be the head of inflectional features such as case, number and so on.

<sup>107</sup> Crosswhite et al. (2003) provide a psycholinguistic account of the morphological effects found in default stress patterns of Russian, thus giving additional support to the Headedness theory.

tional suffixes have head status, they are expected to preserve their inherent accent.<sup>108</sup>

Interestingly, in head-dependent systems, and, when the head is accentless, prosodic principles and inherent accentual properties of other constituents take control of accentuation and determine stress. In head stress systems, the prosody-morphology interface is expressed in a more direct way; heads are always prominent, even when they lack inherent accentual properties (Revithiadou 1999:24). In other words, it is the head accent that outweighs all other accents in a word and not just the accent of the root. Inflectional suffixes succumb to a constituent that is stronger and more important in the morphological structure, namely the root. This further implies that when two accents occur in a word, the accent introduced by the morphological head is prosodically prominent.

A second merit of the theory of head dominance is that it justifies to some extent the existence of lexical accentuation. Lexical accentuation is the tool by which the prosody-morphology mapping is performed and not an accidental property of these languages. Only accented morphological heads are visible to prosody. Lexical accentuation has a specific purpose in lexical accent systems: it gives parsing cues for the morphological organization of the word (Revithiadou 1999: 210).<sup>109</sup>

Ralli (1988), Ralli and Touradzidis (1992) and Nespors and Ralli (1996) first proposed for Greek that roots as well as suffixes, inflectional and derivational, have stress properties, but it is the head of the word that determines word stress.<sup>110</sup> However, it is not clear in these analyses what the head of the word is. The head is defined only by the location of stress in a word. With respect to derivational suffixes, Revithiadou assumes that most of them are either stressed or determine stress location on some preceding or following syllable, respectively. Contra Malikouti-Drachman and Drachman (1989) who consider stems to be deprived of any stress

---

<sup>108</sup> Scalise (1986) makes an even stronger claim; derivational suffixes always change the syntactic category of the base.

<sup>109</sup> Another account of Greek stress within Optimality, specifically Correspondence Theory, is made by Appousidou (2003), who tries to show that no reference to the morphological class of 'word' is needed for the Greek data to be explained. This account is not without problems, though. She proposes a MAX(HEAD/TAIL) constraint according to which a specification for a foot head/tail in the input surfaces as a foot head/tail in the output, and an INPUTHEAD#OUTPUTHEAD constraint, according to which a foot head in the input may not become a tail in the output. Nevertheless, in the evaluation of the candidate forms, one needs to assume morphological categories in order to get the correct output.

<sup>110</sup> See also Ralli and Tourantzidis (1992) and Nespors and Ralli (1996).

properties, with some exceptions, Revithiadou proposes stems to be inherently marked for certain stress properties.

In HT, prosodic faithfulness and structural constraints take charge of accentuation only when the head of the word is unmarked. But heads are not obligatorily stressed. This is the reason why Greek is considered a head-dependent system with lexical accents.<sup>111</sup> A welcome result of head dominance is the accentual stability within the paradigm. If marked heads prevail, inflected words with marked roots have immobile stress, as opposed to words of unmarked heads, which display accentual alternations. Another important aspect of head dominance is that prosodic structure provides cues for the morphological organization of the word and not for word boundaries, as is in the case of fixed stress systems.

In his criticism of HT, Ussishkin (2000) claims that the theory does not hold for Hebrew verbal paradigms.<sup>112</sup> In Hebrew, verbs suffixed with vowel-initial suffixes undergo vowel deletion. He points out cases of inflectional paradigms in which inflectional affixes appear to be heads in the HT, exactly as one would expect. Ussishkin further argues that the FAITH-AFFIX approach targets morphology as a whole, not only derivational morphology. The most critical constraint for his analysis is the MAX-AFFIX constraint (Ussishkin 2000:114ff). Rather than resulting from templatic requirements, Ussishkin argues that templatic effects in Modern Hebrew are a case of fixed prosody, a term which refers to the disyllabic nature of surface forms in the verbal paradigm of the language. Nevertheless, Ussishkin seems to forget Revithiadou's claim that prosodic structure provides cues for the morphological organization of the word and not for word boundaries, as in the case of fixed stress systems, like Hebrew.

Irrespective of this criticism, one of the most important contributions of HT is that it enriches Universal Grammar with a family of head constraints, which are part of a broader family of interface constraints. Another crucial claim made by Revithiadou, relevant to the analysis of the Greek child data that follows, is that given the fact that prosodic structure is built on morphological information, we expect that the acquisition of morphological information provides sufficient clues to the Greek learner to construct prosodic structure (Revithiadou 1999:175). We will account

---

<sup>111</sup> See Nespor and Ralli (1996) for a relevant account.

<sup>112</sup> It is worth mentioning that HT is applied to the nominal system of Greek. As in Hebrew, the picture seems to be different for verbs.

for such and comparable facts in Greek child language in the rest of this chapter.

### ***6.3.3. Morphology in the acquisition literature***

In his innovative work on the initial stages of a child's first language, Brown (1973) points out that children do not generalize across morpheme or sentence boundaries. While there can be large variation in the incidence of a particular morpheme in its non-obligatory contexts, variation is limited to the obligatory contexts. Children do not supply new morphemes at random. Also, by the age of three, children have scanned productive control of inflectional morphology (Brown 1973). Smith's (1973) subject, Amahl, on the other hand, had no contrast at all between singular and plural even at the age of 2;2. Some morphology seems to be learned considerably later than this age.

In the remainder of this section I review the cross-linguistic studies that investigate the role of morphology in acquisition and the degree to which morphology seems to play an influential role.

Additional evidence comes from Berko's (1958) study, in which children were asked to inflect words; for example, children were asked to say the nonsense word *wug* in the plural, but even four-year-olds did particularly poorly on the *Wug* test. Apparently, many of the children around this age do not possess full, active command over the patterns of alternation in English inflectional suffixes; Inflectional morphology is expected to develop even more slowly in languages like Greek, which have a very rich morphological system compared to that of English.<sup>113</sup>

With respect to the formation of adjectives, Berko (1958) shows that although the adults were uniform in their application of *-er* and *-est* to form the comparative and superlative, children did not seem to have these patterns under control unless they were given both the adjective and the comparative form. Likewise, derivation is a process little used by children at this period when the derivational endings would compete with the inflectional suffixes they are in the process of acquiring. Instead, they combine words, using the primary-tertiary accent pattern commonly found in words like '*blackboard*'. Cazden (1968) has demonstrated that plurals appear before possessives, and each appears first in particular linguistic contexts. Present progressives appear before pasts and present indicatives.

---

<sup>113</sup> Studies with the same findings are those of Baker and Derwing (1982) and Derwing and Baker (1986).

In Hebrew, Berman and Armon-Lotem (1997) found that 75% of 120 verbs they tested have no suffix, or as the authors phrase it, they are stem-like forms. Thus, the high percentage of suffixless verbs in the children's early productions does not reflect their frequency in adult language use. The 25% occurrence of suffixed forms are rote-learned unanalysed forms, that is, the use of suffixes is not productive; these tokens do not constitute morphological paradigms.

Pye (1983) argues that syllable structure and stress rules are of primary importance in morphological development. This is a clear instance of prosodic bootstrapping. The children he studied always observed the syllable divisions (boundaries) in their words, not the morpheme boundaries.<sup>114</sup>

The precedence of phonology over morphology was also displayed in an experiment by Smith-Lock and Rubin (1993) where it was shown that children perform significantly better on phonological than on morphological tasks when identifying errors. The researchers proposed that the results can be attributed to the differences in the type and location of linguistic information to be analysed and to differences in memory demands in the task.

Stemberger and Bernhardt (1996) further show how phonological factors can affect the shape and even the presence of inflectional affixes. Phonological effects of this type on morphology arise spontaneously within connectionist models (cf. Rumelhart and McClelland 1986). When the child cannot produce a sequence in an adult-like fashion, the sequences can be avoided in a number of ways; first, the sequence may be reduced (by deletion of one or more segments), second, it may be augmented (generally via insertion of a vowel), or, third, one or both segments within the sequence may undergo substitution, with alteration of one or more syllables.

Demuth (2001) argues that Spanish children's early awareness of different levels of prosodic structure is reflected in the shape of the child's early polymorphemic utterances.<sup>115</sup> This is due to the different prosodifi-

---

<sup>114</sup> For a more detailed discussion concerning the influence of phonology in the acquisition of morphology, see section 6.1 above on Prosodic Bootstrapping.

<sup>115</sup> In the same line of argumentation, Matthei (1989) shows that word-level phonological constraints operate in multi-word utterances. Selection and avoidance patterns as well as the child's modifications of adult forms indicate the presence of a syllable sequencing constraint in the child's grammar: an initial syllable must begin with a consonant the sonority value of which is not less than that of the following syllable. The same constraint governs the form of the child's early word combinations.

cation of different types of grammatical categories. For example, when the pronoun is stressed, it functions as an independent PW that would combine with a verb at the level of the phonological phrase.

Adam (2002:100) argues for Hebrew that phonological knowledge reflected in the child's production suggests access to some morphological knowledge, even before this knowledge has a surface manifestation. This is in line with the argumentation used by some syntacticians (Demuth 1992, 1994, Hyams 1992). The absence of inflectional suffixes can be understood as the consequence of an initial ranking in which the morphological constraints referring to the suffixes are ranked below the phonological constraints. She further argues, based on the acquisition of alternating paradigms, that the prosodic and morphological paths are interwoven all along the course of acquisition.

However, Adam does not provide further evidence as to why and how children acquire the morphology of their language before it is phonetically manifested. Production data only do not provide enough evidence for claims on the acquisition of morphology or its influential role. Berman's (1985) study, on the other hand, shows that children learning Modern Hebrew fail to achieve productive command over some parts of the non-concatenative morphology before they reach the age of four to five.

The above findings from normal speech are supported by data from children with specific language impairment (SLI). Owen, Dromi and Leonard (2001, and references therein) studied a group of children with SLI who acquired Hebrew as their mother tongue. What was exhibited in these children's data is that children with SLI were more likely to make phonological errors that neutralized important morphological distinctions in Hebrew than non-impaired children.

The subjects in a study by Snow et al. (1980) were tested on their knowledge of morphophonological rules, not on their knowledge of which contexts required the provision of certain morphological markers. The findings suggest that the frequency and the semantic role of the morphological marker in question may help to determine the speed with which it is acquired, such that the basic means for marking plural was learned before those for the less frequent and less obligatory agentive or diminutive, and the rather frequent diminutive was learned before the less frequent agentive.

Stemberger and Bernhardt (1996) argue that in slips of the tongue by adult native speakers of English affixes<sup>116</sup> are more likely to be lost than

---

<sup>116</sup> Without making a distinction between prefixes and affixes, though.

equivalent material in base-final position, suggesting a general weakness of affixes. However, if the affix is present, it is less likely to be mispronounced than the same base-final segments. Stemberger (1984) attributes this to the high frequency of affixes, which lead to a greater accuracy of phonological encoding.

With respect to compounding, Dalalakis and Gopnik (1995) reported that Greek subjects suffering from Developmental Language Impairment (DLI) often fail to produce compounds. Their DLI subjects could not reliably find bound roots in the experimental tasks and, consequently, could not construct morphologically complex words. This led the researchers to claim that their patients could only store polymorphemic lexical items as unanalyzed chunks, i.e. without the internal word structure hypothesized for normal subjects. In other words, impaired subjects could not extract bound morphemes and represented them as abstract entities.

English and Chinese normally developing children, on the other hand, understand and produced novel compounds quite early in development, that is, around their second year of life. Compounds are easier to acquire and produce when they are morphologically simple, as was shown in an experimental task conducted by Nicoladis and Hui Yin (2002).

Tzakosta and van de Weijer (to appear) observe that children do pay attention to heads, phonological, morphological, semantic at different phases of language development. More specifically, before the stage of faithful production and during the stages of extensive truncation, forms are subject to truncation taking phonological or prosodic headedness into account. Attention to phonological edges is also crucial. Morphological and semantic headedness seem to play less of a role during initial stages, but they take over in the acquisition process in later stages.

To sum up, the findings of the studies reviewed above highlight the precedence of phonology over morphology in acquisition and the rather limited role of morphology at least before the age of 3;5.

#### ***6.3.4. Morphophonological interactions in Greek child speech***

In the following sections of this chapter I deal with the acquisition of derived and compound forms found in Greek. In other words, I examine how derived and compound forms surface in child speech. What I am primarily interested in is the type of affixes and compounds most frequently reported and the degree of interaction between phonology and morphology. Put differently, I am concerned with the influence of phonology and/or morphology on the produced forms and, consequently, the

extent to which certain heads, phonological and/or morphological, are more dominant over others in the forms that children produce.

#### *6.3.4.1. Derived forms*

In order to facilitate the study of derived forms I provide a list of affixes found in Greek child language (table 1). The list includes only suffixes since, as mentioned above, cases of prefixation and/or infixation do not occur in the database at all. This suffixation-prefixation and suffixation-infixation asymmetry is also reported in my work on clitics (Tzakosta 2003b, 2004a,b).

In the same table, the unmarked form/case of the suffix is provided in the leftmost column. I assume a suffix to be unmarked on the basis of segmental and prosodic unmarkedness as well as frequency effects. In other words, certain suffixes are considered to be unmarked if they are more frequently targeted or produced. In an experimental task that Berko-Gleason (1978) conducted, children tended to derive words applying suffixes that are more frequently used by adults. The same seems to be the case in Greek child speech. That is, Greek children tend to produce forms they are more frequently exposed to. In general, the nominative case of neutral suffixes tends to be more unmarked. The second and third columns provide the genitive singular and the nominative plural respectively. The genitive and nominative forms constitute separate allomorphs of the unmarked form and, consequently, distinct percentages are provided for each allomorph.

In total, seventy-five allomorphs are listed, seven of which are excluded from being studied separately, given the fact that they overlap structurally with other allomorphs. As a result, I will consider 68 different suffixes. Finally, the rightmost column presents the gender and function of the target suffix. Crucially, the gender of the suffix determines the gender of the derivation as a whole. Suffixes are presented alphabetically, given that there is no list of affix frequency for Greek adult language (Ralli p.c.).

Table 22: affixes investigated for Greek child speech.

Affixes/ nom. sg.	Gen.sg.	Nom. Pl.	Gender/function
[a.ci]	[-]	[a.ca]	Neutral/diminutive
[a.ða]	[a.ðas]	[a.ðes]	Feminine
[a.ra]	[a.ras]	[a.res]	Feminine
[a.'ra.ci]	[-]	[a.'ra.ca]	Neutral
[a.ri.ci]	[a.ri.cis]	[a.ri.ces]	Feminine
[a.ri.ko]	[a.ri.ku]	[a.ri.ca]	Neutral
[a.ri.kos]	[a.ri.ku]	[a.ri.ci]	Masculine
[a.ris]	[a.ri]	[a.ri.ðes]	Masculine
[dzis]	[dzi]	[dzi.ðes]	Masculine
[dzu]	[dzus]	[dzu.ðes]	Feminine
[ja.ris]	[ja.ri]	[ja.ri.ðes]	Masculine
[i.ci]	[i.cis]	[i.ces]	Feminine
[i.ko]	[i.ku]	[i'ka]	Neutral
[i.kos]	[i.ku]	[i.ci]	Masculine
[i.tsa]	[i.tsas]	[i.tses]	Feminine
[o.la]	[o.las]	[o.les]	Feminine
[tis]	[ti]	[ti.ðes] or [ta.ðes]	Masculine
[tu]	[tus]	[tu.ðes]	Feminine
[u.la]	[u.las]	[u.les]	feminine/diminutive
[u.'la.ci]	[-]	[u.'la.ca]	Neutral
[u.li]	[-]	[u.ɣa]	neutral/diminutive
[u.lis]	[u.li]	[u.li.ðes]	masculine/diminutive
[u.li.ko]	[u.li.ku]	[u.li.ka]	Neutral
[u.li.tsa]	[u.li.tsas]	[u.li.tses]	Feminine

Note that the list in table 22 is not exhaustive. For instance, I do not include (families of) affixes longer than those provided in the list, or recursive ones, since these types are not expected to occur before the simpler ones I examine here. I expect that recursive suffixes, for example suffixes such as /**u.li.ko**/, which consist of the combination of two suffixes, i.e. /**u.la**/ and /**i.ko**/, will exhibit extremely low percentages.

It is also crucial to define the properties of suffixes included in the corpus of suffixes under investigation. In nominals, derivational suffixes are always stressed, while inflectional suffixes are by definition unstressed, unless otherwise required by the base (see discussion on HT in section 6.3.2). For example, the word /**ba.lo.ma.'tis**/-‘cobbler’, in which ‘**tis**’ is stressed, is derived, while the word /**pse.ftis**/-‘liar’, in which stress does not fall on ‘**tis**’, is not derived, i.e. it is monomorphemic. It should also be kept in mind that for ease of analysis I consider inflected words to be monomorphemic and derived/compound words to be polymorphemic. Moreover, I consider only trisyllabic and longer words to be derived. Di-

syllabic words ending in what seems to be a stressed suffix, are *not* derived forms, because this disyllabic template is filled in only by the derivational suffix. This implies that there is no base to which the suffix attaches. Consequently, I consider these disyllabic words to be monomorphemic and to consist of only a stem.

From (298) to (308) below, I provide cases of derived forms produced by each child. Morphological boundaries are indicated in the input form. As in the previous chapter, all examples from each child are presented chronologically starting with the youngest child, Melitini, ending with the oldest child, Marilia, at the point when data started being collected. As shown in (298), Melitini exhibits very few cases of derived forms. Melitini tends to produce only monomorphemic words, even if they are polysyllabic.

Most children produce diminutive suffixes, since they are exposed to diminutive forms adults also produce. Interestingly, the very few cases of derived forms that Melitini produces are not diminutives. The suffix that is actually found in her data is the suffix [dzis], which assigns active mood. This suffix is faithfully realized, even at the cost of the base, as shown in (298a), and stress is correctly assigned to the suffix and the last syllable when the output form is more faithful to the input in terms of the number of syllables, as demonstrated in (298b). Melitini realizes this specific suffix after the age of 2;0, but, given that her data are very sparse, she does not provide enough evidence as to whether morphological factors play a crucial role in her productions. In other words, it is not clear whether morphology is really acquired or, if acquired, plays an influential role.<sup>117</sup>

Peters (1997) argues that phonological units such as the syllable and the foot can act as a stepping-stone to working out the structure and placement of morphemes. However, she admits that her data are not enough to draw on firm conclusions.

Moreover, Aksu-Koç and Slobin (1985) in their work on the acquisition of Turkish report that sometimes children tend to retain the rhythmic picture of a complex verb by inserting morphemes which sound like passive or causative particles but which are, in fact, meaningless. They point out that this 'unmotivated analysis of words into combinable syllables (is) an obvious prerequisite to the discovery of productive morphology'

---

<sup>117</sup> A common assumption in acquisition is that a young child directly stores perceived forms in her lexicon, without taking into account any morphologically related forms (cf. Boersma and Levelt to appear for discussion, and also Goad 1998, for adult SLI data).

(Aksu-Koç and Slobin 1985:848). If ‘unmotivated’ is taken to mean that certain parts of child productions have no meaning but their presence is prosodically driven, it is not clear to me how prosody contributes to the acquisition of morphology. Aksu-Koç and Slobin’s ideas seem to be contradicting, since they should develop their claims as to how meaning is activated by prior prosodic identification and Morphology emerges where child speech is meaningless.

(298) Melitini

- a. /pa.ʎa.#dzis/ → [ʎiç] ‘scrap dealer’ (2;1.24)  
 b. /pa.ʎa.#dzis / → [o.i.ʎiç], [pa.ʎa.ʎiç] ‘scrap dealer’ (2;2.3)

Bebis M, on the other hand, produces basically diminutive forms, except for the cases exhibited in (299j), (299k), and (299m) where he produces augmentatives. He displays extensive use of diminutive suffixes, the [ʎa.ci] suffix in particular, both in the singular and the plural. He starts producing derived forms at the age of 1;9.22 and he realizes the derivational suffixes almost always correctly.

Derivational suffixes are produced even in the case of disyllabic truncations of longer words. That is, the derivational suffix he produces is the material the disyllabic template, trochaic or iambic, is filled with. In (299b), (299c), for instance, the suffix is realized as a disyllabic minimal prosodic word, since the main word stress falls on the penultimate syllable of the target form. This behavior is expected given that the main stress of the word falls on one of the syllables of the suffix. As a result, the suffix is preserved even at the expense of (part of) the base. However, there are also instances in which the suffix is produced not fully with respect to its segmental content, as shown in (299a), (299c), (299g). In these cases, marked segments are substituted by less marked ones. Velars, for example, are typically substituted by coronals, even if the former are more marked with respect to their manner of articulation.

(299) Bebis M

- a. /pa.p#a.ca/ → [a.ʎa.θa] ‘duck-PL.DIM’ (1;9.22)  
 b. /e.le.n#i.tsa/ → [i.ta], [ni.ca], [ni.ça] ‘PR.NM’ (1;9.22)  
 c. /ko.ri.ts#a.ca/ → [ta.ta] ‘girl-PL.DIM’ (1;9.29)  
 d. /pa.p#a.ci/ → [ba.ʎa.ti] ‘duck-SG.DIM’ (1;11.21)  
 e. /ka.ra.me.ʎ#i.tses/ → [a.me.ʎi.ce] ‘sweet-PL.DIM’ (2;0.6)  
 f. /a.lo.ʎ#a.ci/ → [a.çi] ‘horse-DIM’ (2;0.6)

g.	/ci.'l#i.tsa/ → [ci.'li.ta]	'belly-DIM'	(2;2.18)
h.	/ku.'kl#i.tsa/ → [ku.'ci.ca]	'doll-DIM'	(2;5.7)
i.	/ka.ra.'v#a.ci/ → [ka:.'va.ci]	'boat-DIM'	(2;7)
j.	/pi.'st#o.la/ → [bi.'to.la]	'pistol-AUGM'	(2;7)
k.	/ka.la.bur.#dzis/ → [ka.la.bu.'jiç]	'wag'	(2;7.9)
l.	/kal.'ts#u.les/ → [ka.'tu.le]	'sock- PL.DIM'	(2;7.21)
m.	/kar.'ð#u.la/ → [ka:.'ðu.la]	'heart-DIM'	(2;9.12)
n.	/pa.pa.ɣa.'l#a.ci/ → [pa.pa.ka.'la.ci]	'parrot-DIM'	(2;9.12)

The same observations hold for the data of *Bebis T*. *Bebis T* also produces basically diminutive forms, by attaching primarily the [a.ci] suffix and secondarily the [u.la], [u.lis] suffixes to the base. *Bebis T* produces derived forms before the age of 2;0. Most of these forms, with the exception of the example in (300k), are truncated to a disyllabic trochaic minimum, a template which is essentially filled in by the disyllabic derivational suffix, given that it carries the main stress of the word. Consequently, in many cases the base is almost completely deleted (examples in 300a-f, 300h-i, 300l).

It seems that *Bebis T*, and most children between the age of 2;0 and 3;6, pursue the realization of accentual heads of the target word rather than morphological or, even less often, semantic heads. In other words, children tend to 'build' their production upon or around the stressed syllable, which is maintained, rather than the morphological or semantic components of the target word. As a result, *Bebis T* has the same output for words with different meaning, as the examples in (300a), (300b) and (300c), (300d) demonstrate. This further supports the claim made by Tzakosta and van de Weijer (to appear) that children pay attention first to phonological heads, then to morphological heads and finally to semantic heads.<sup>118</sup>

(300) *Bebis T*

a.	/pa.'p#a.ci/ → [pa.ci]	'duck-DIM'	(1;10)
b.	/pu.'l#a.ci/ → [pa.ci]	'bird-DIM'	(1;10)
c.	/a.lo.'ɣ#a.ci/ → [a.ci]	'horse-DIM'	(1;11.07)
d.	/po.do.'k#a.ci/ → [a.ci]	'mouse-DIM'	(1;11.07)
e.	/a.fto.ci.ni.'t#a.ra/ → [ta.ra]	'car-AUGM'	(1;11.10)
f.	/a.fto.ci.ni.'t#a.ra/ → [a.'ta.ra]	'car-AUGM'	(1;11.10)

<sup>118</sup> The database has not been coded for phonological and/or morphological heads.

g.	/kar.'t#u.la/ → [tu.la]	'card-DIM'	(1;11.29)
h.	/xri.'st#u.li/ → [tu.li]	'Christ-DIM'	(1;11.29)
i.	/ksi.la.'t#a.ci/ → [a.ci]	'stick-DIM'	(2;1.5)
j.	/ya.'t#u.la/ → [ya.'tu.la]	'kitten'	(2;1.5)
k.	/pe.'ð#a.ca/ → [ða.ca]	'child- PL.DIM'	(2;1.5)

The examples from Melitini, Bebis M and Bebis T further demonstrate that, since most of the produced suffixes are disyllabic and stressed on the prefinal syllable, the realized template is essentially trochaic.<sup>119</sup>

Explaining the data in an OT account implies that a phonological constraint demanding faithfulness to the stressed syllable has to be highly ranked throughout the children's morphophonological development, irrespective of what position the rest of the constraints have in the hierarchy (tableaux 56, 57, 58). It is important to keep in mind that if morphology were to play any role, it would require the employment of specific morphological constraints. However, the fact that we can account for the Greek facts on purely phonological grounds supports the claim that morphology is not influential.<sup>120</sup>

The constraints that are necessary for the account of the data discussed above are drawn from the pool of the markedness, faithfulness and alignment constraint families. They are introduced in (301) below:

(301) Set of constraints

**FTBIN:** Feet are binary at any level of analysis (Prince and Smolensky 1993). This constraint is violated by monosyllabic forms.

**ALIGN- $\sigma$ -L/R:** The stressed syllable is aligned with the left/ right edge of a word. This constraint is split up into two constraints, namely:

**ALIGN- $\sigma$ -L** and **ALIGN-R:** Especially in the case of disyllabic truncations or fully produced forms, the ranking of one of these

<sup>119</sup> Such facts do not support the trochaic bias, given the trochaic stress pattern of the target form. A trochaic bias should hold even with forms characterized by an iambic pattern.

<sup>120</sup> Data from inflected forms produced by Greek children further support this claim (Stephany 1997).

constraints higher than the other results in iambic or trochaic forms.

**STRESS FAITH:** An input stressed element must have as its output correspondent a stressed element (Pater 1998, also adopted by Kehoe 1999/2000). This constraint is violated when a syllable other than the stressed one in the input attracts stress in the output.

**ANCHOR-RIGHT I-O:** Elements at the right edge of the input word and the output word stand in correspondence (Pater 1998, also adopted by Kehoe 1999/2000).

**I-O CONTIGUITY:** Elements that stand in correspondence in the input must also stand in correspondence in the output. In other words, no elements should be ‘skipped’ (McCarthy and Prince 1994).

**MAX:** Elements of the input must be preserved in the output. In other words, deletion is disallowed (McCarthy and Prince 1995b)

The occurrence of monosyllabic output forms given a trisyllabic morphologically complex input form is illustrated in tableau 56 below.

Tableau 56<sup>121</sup>

/pa.ʎa.'dzis/

	STRESSFAITH	ALIGN-R	ALIGN-L	FTBIN	MAX-IO
[i.'jiç]			*!		*
∅ [jiç]				*	**
[pa.ʎa.'dzis]			**!		
[pa.'ʎa.dzis]	*!	*!	*!		

As shown in tableau 56, when monosyllabic truncations emerge, STRESSFAITH is indeterminately ranked with both alignment constraints, since, as long as the stressed syllable is preserved, alignment is vacuously satisfied. The ranking between alignment constraints becomes relevant in disyllabic and longer truncations.

For Melitini, *Bebis M* and *Bebis T* MAX-IO is promoted in advanced stages (tableaux 57, 58) when their output forms are more faithful to the

<sup>121</sup> FTBIN is satisfied as long as child productions are not monosyllabic.

input, but STRESSFAITH always remains high ranked. As shown in the tableaux, phonological constraints are enough to account for the data, that is, there is no need to recruit constraints referring to morphological categories as well. This implies that morphology is not ‘visible’.

Tableau 57

/ko.ri.'tsa.ca/

	STRESSFAITH	ALIGN-L	FTBIN	ALIGN-R	MAX-IO
[ko.ri.'tsa.ca]		**!		*	
[ko.'ri]	*!	*			**
☞ ['ta.ta]				*	**
[ri.ta]		*!			**

Tableau 58

/ya.'tu.la/

	STRESSFAITH	FTBIN	MAX-IO	ALIGN-L	ALIGN-R
☞ [ya.'tu.la]				*	*
['tu.la]			*!		*
[ya.tu]			*!	*	
['ya.tu]	*!	*!	*!		*
[ya]	*!		*!*		

Konstadinos provides the same findings as Bebis T (see examples in (302)). For instance, derivational suffixes are correctly realized and stress is correctly assigned, irrespective of whether Konstadinos' forms are truncated or faithfully produced. It is worth mentioning that Konstadinos has full and truncated forms in his inventory at the same period of time. His data argue against the establishment of developmental stages and the need for a stage-like progression during phonological development.

## (302) Konstadinos

- a. /por.to.ka.l#a.ci/ → [po.to.po.ta.'la.ci] ‘orange-DIM’ (1;11)  
 b. /mi.xa.n#a.ra/ → [mi.xa.'na.ra] ‘motorbike-AUGM’ (2;0.1)  
 c. /e.le.n#i.tsa/ → [vi.'vli.ca] ‘proper name-DIM’ (2;0.9)  
 d. /a.fto.ci.ni.t#a.ra/ → ['a.ra] ‘car-AUGM’ (2;0.15)  
 e. /for.ti.'ɣ#a.ra/ → [fə.ti.'ya.ra] ‘lorry-AUGM’ (2;0.22)  
 f. /pa.ra.mi.'θ#a.ca/ → [fa.i.'fa.ca] ‘fairy tales-DIM’ (2;1.6)  
 g. /sci.l#a.res/ → [či.'la.res] ‘dog-PL’ (2;0.6)

Generally, Felina exhibits variable data, as the examples in (303) demonstrate. She displays trochaic as well as iambic patterns, monosyllabic truncations preserving the stressed syllable, and, finally, monosyllabic truncations preserving a syllable other than the stressed one. It is crucial to keep in mind that Felina is one of the children that produce iambic forms extensively. In other words, Felina is one of the children that follow both developmental paths, namely the one that demands preservation of the trochaic template and the other that allows the retention of an iambic form.

Felina gives no hints as far as the acquisition of morphology is concerned for one more reason; if the data discussed above gave the impression that stress was preserved because the derivational suffix was preserved, Felina's data come to undermine this hypothesis. She produces both iambic and trochaic forms in which the derivational suffix may be preserved but is not necessarily preserved. Consequently, Felina's data gives us important information about the acquisition of morphology and the preservation of stress. The stressed syllable is preserved at the cost of the base or the derivational suffix. Apparently, what counts as important is the retainment of phonological headedness rather than any other type of headedness.

## (303) Felina

a.	/pa.p#a.ci/ → [pa.'pa.ci]	'duck-DIM'	(1;11.7)
b.	/a.'ft#a.ci/ → ['pa.ci]	'ear-DIM'	(1;11.15)
c.	/pça.'t#a.ci/ → ['ta]	'plate-DIM'	(1;11.28)
d.	/pa.p#a.ci/ → [pa.'pa]	'duck-DIM'	(1;11.28, (2;0.4)
e.	/sci.'l#a.ci/ → ['la]	'dog-DIM'	(2;0.4)
f.	/pro.va.'t#a.ci/ → [bo.'ta.ci]	'sheep-DIM'	(2;0.20)
g.	/ko.'t#u.la/ → ['tu.la]	'hen-DIM'	(2;0.27)
h.	/pe.'ð#a.ci/ → [pe]	'child-DIM'	(2;4.15)
i.	/kar.'ð#u.la/ → [ka.'ðu]	'heart-DIM'	(2;5.9)
j.	/mi.xa.'n#a.ci/ → [fix], [xa.'na]	'motorbike-DIM'	(2;5.9)
k.	/po.'ð#a.ra/ → [po.'ða.ra]	'leg-AUGM'	(2;6.24)
l.	/vro.'mp#a.ri.kos/ → [vo.'mpe.ri.ko]	'dirty'	(2;8.15)
m.	/var.'k#u.la/ → [vra.'ku]	'boat-DIM'	(3;0.12)
n.	/a.lo.'y#a.ci/ → [a.lu.'rats]	'horse-DIM'	(3;0.19)
o.	/a.vy#u.'la.ca/ → [a.'vya.ca]/ [a.vu.'la.ca]	'egg- PL.DIM'	(3;1.19)

The observations one can make in more detail with respect to Felina's data are the following; first, the stressed syllable, which is part of the derivational suffix, is preserved. Interestingly, it is not always the derivational suffix that is produced intact. As a result, we have disyllabic trochaic productions where the derivational suffix is faithfully maintained, as shown in (303b), (303g), but also disyllabic iambic truncations where the base and the suffix are only partly realized, as demonstrated in (303d), (303i-j), and (303n).

There are also cases, where only the stressed syllable of the word is retained, as in (303c), and (303e). Additionally, there are cases (see also section 5.6.2) where an unstressed syllable is preserved (examples in (303h), and (303j)). These data show that the preserved unstressed syllable occupies an edge position in the input form, exhibiting positional faithfulness. However, unstressed syllables surfacing in monosyllabic truncations are inherently stressed. Some of the developmental paths Felina follows are exhibited in tableaux 59 and 60A and B.

Tableau 59

/sci.'la.ci/

	STRESSFAITH	ALIGN-L	ALIGN-R	FTBIN	MAX-IO
☞ ['la]				*	**
['la.ci]			*!		*
[la.'ci]	*!	*!			*
[sci.'la.ci]		*!	*!		

Tableau 60

A. /ko.'tu.la/

	STRESSFAITH	ALIGN-L	FTBIN	ALIGN-R	MAX-IO
[ko.'tu.la]		*!		*	
[ko.'tu]		*!			*
☞ ['tu.la]				*	*
[ko]	*!		*!		**

B. /kar.'ðu.la/

	STRESSFAITH	ALIGN-R	FTBIN	ALIGN-L	MAX-IO
[kar.'ðu.la]		*!		*	
['ðu.la]		*!			*
☞ [ka.'ðu]				*	*
[la]	*!		*!		**

Clearly, Felina does not display a stage-like progression in her development. In other words, while she produces disyllabic words at the age of 1;11.7, she tracks back to earlier stages (in particular, the so-called sub-minimal one) with the production of monosyllabic forms at the age of 2;0.4, 2;4.15, and 2;5.9. If we assume a stage-like acquisition process, such forms are not expected to appear out of the context of the specific stage that demands monosyllabic truncations of longer words. In general, the emergence of monosyllabic, disyllabic and longer truncations of polysyllabic input words requires an account of the acquisition process in terms of developmental paths rather than a stage-like progression. This topic was extensively discussed in the previous chapter.

In Dionisakis' speech the derivational suffix is retained under all circumstances, that is, when he truncates to disyllables (304d, 304f, 304h, 304l, 304n) or trisyllables (304b, 304c), or when he faithfully produces the target forms (304a, 304c, 304e, 304g, 304i-k, 304m, 304o-s). The main stress of the word, which is carried by the suffix, is always correctly realized. Dionisakis, like all other children, does not provide evidence for any morphological principles that define or govern his productions. It seems that Dionisakis, like all children dealt with, stores polymorphemic words as whole unanalyzed chunks and produces them under the influence of phonological principles only.

## (304) Dionisakis

a.	/sku.p#a.ci/ → [ku.'pa.ni]	'mop-DIM'	(2;1)
b.	/pa.na.'j#i.tsa/ → [e.'i.ta]	'virgin Mary-DIM'	(2;1)
c.	/mi.xa.'n#a.ci/ → ['la.ci]/ [i.li.'la.ci]	'machine-DIM'	(2;1)
d.	/mi.xa.'n#u.la/ → ['ku.la]	'motorbike-DIM'	(2;1.16)
e.	/a.ðer.'f#u.la/ → [e.i.'fu.la]	'sister-DIM'	(2;1.23)
f.	/ko.ko.'r#a.ca/ → [ko.'va.ca]	'roster-DIM.PL'	(2;2)
g.	/e.la.'f#a.ca/ → [u.fo.'ra.ca]	'deer-DIM'	(2;2.6)
h.	/sci.'l#a.ca/ → ['na.ca]	'dog-DIM.PL'	(2;2.6)
i.	/θe.'#u.li/ → [e.'u.li]	'god-DIM.ACC'	(2;2.24)
j.	/xri.'st#u.lis/ → [xa.'tu.liθ]	'Christ-DIM'	(2;2.24)
k.	/e.kli.'s#u.la/ → [e.çi.'θu.la]	'church-DIM'	(2;2.24)
l.	/fri.ɣa.'n#u.la/ → ['fu.la]	'biscuit-DIM'	(2;3.7)
m.	/stra.ti.o.'t#a.ci/ → [ta.ci.a.'ta.ci]	'soldier-DIM'	(2;3.7)
n.	/ɣu.ru.'n#a.ci/ → ['ɣa.ci]	'pig-DIM'	(2;3.14)
o.	/ma.ska.'r#a.ðes/ → [ɣa.ɣa.'ra.ðes], [ka.ka.'ra.ðes]	'disguised man-PL'	(2;3.28)

p.	/ðu.'l#i.tsa/ → [ðu.'li.tsa]	'job-DIM'	(2;5.8)
q.	/a.fto.ci.ni.'t#a.ra/ → [a.fo.ci.ni.'ta.ra]	'car-AUGM'	(2;7.27)
r.	/kli.'ð#a.ci/ → [cið:], [ci.'ða.ci]	'key-DIM'	(2;7.27)
s.	/mi.'kr#u.li.ko/ → [mi.'ku.li.ko]	'small-DIM'	(2;8.11)

The data from Sofia and Stefanos (examples in (305) and (306), respectively) do not change the picture until now, namely that derivational suffixes are fully realized and part of the base is deleted. Stress is correctly assigned, but there is no evidence for the acquisition or conscious use of derivation. Both children start producing derived forms relatively late: Sofia after the age of 2;2 and Stefanos after the age of 2;4, and their data are very few. Stefanoulis, on the other hand, does not have data of derived forms in his corpus.

## (305) Sofia

a.	/ko.ri.'ts#a.ci/ → [ko.'ko.ci]	'girl-DIM'	(2;2.28)
b.	/kal.'ts#a.ci/ → ['ka.ci]	'sock-DIM'	(2;5.10)

## (306) Stefanos

a.	/a.fto.ci.ni.'t#a.ra/ → [a.'ta.la]	'car-AUGM'	(2;4.3)
b.	/fe.ga.'r#a.ci/ → [e.'ga.ci]	'moon-DIM'	(2;5.16)

Ioanna, on the other hand, provides data comparable to Felina's; she realizes both iambic and trochaic forms, but the stressed syllables are always faithfully preserved (examples in (307)). Finally, Marilia provides very few instances of derived forms. This is rather strange, especially if I assume a morphology-based account. Given that Marilia was the oldest child when we started collecting her data, one would expect her to produce morphologically complex words. This does not happen, though (examples in 308). Like all other children, none of these two girls' data need to be accounted for in terms of morphological constraints.

## (307) Ioanna

a.	/ðo.'d#a.ci/ → ['da.ti]	'tooth-DIM'	(2;4.3)
b.	/u.'r#i.tsa/ → [u.'ri.ta]	'tail-DIM'	(2;4.3)
c.	/pe.'ð#a.ci/ → ['ða.ti]	'child-DIM'	(2;5.19)
d.	/ɣa.la.'t#a.ci/ → [a.la.'ta:]	'milk-DIM'	(2;5.24)
e.	/ka.za.'n#a.ca/ → [ma.ðe.pu.'na.ca]	'toilet cistern'	(2;9.22)
f.	/pi.'ð#a.ros/ → ['pi.ða.ros]	'jump-AUGM'	(2;11)

- g. /pu.'l#a.ci/ → [bu.'la.ti] 'bird-DIM' (2;11.10)
- h. /ar.ku.'ð#i.nos/ → [ku.'ði.no] 'bear' (2;11.10)

(308) Marilia

- a. /ksi.la.'r#a.ca/ → [kla.'ra] 'stick-DIM.PL' (3;1.24)
- b. /ka.re.'kl#a.ci/ → [va.ra.'pla.ti] 'chair-DIM' (3;5.18)

Percentages of derived and compound forms attested in Greek child language are provided in the following tables. The data and the theoretical claims discussed above are verified by the percentages presented in tables 23 to 26. Table 23 is a crosstabulation of the full and truncated derived forms attested in the database. The order in which the suffixes and their percentages are listed is arbitrary. The first row, 'no suffix', provides the percentage of the simplex forms found in the database. It becomes obvious that monomorphemic forms are far more frequent compared to polymorphemic forms; this is one more piece of evidence for my claim that morphology does not play a capital role in the acquisition process at least before the age of 3;6.

**Table 23:** Affix Crosstabulation of truncated outputs.

Suffixes	full form	truncated	Total
No_suffix	79503	19516	99019
	80.3%	19.7%	100%
'a.ci	1443	704	2147
	67.2%	32.8%	100%
'a.ca	626	236	862
	72.6%	27.4%	100%
'u.lis	32	14	46
	69.6%	30.4%	100%
'u.li	25	10	35
	71.4%	28.6%	100%
'u.la	348	111	459
	75.8%	24.2%	100%
'u.las	3	2	5
	60.0%	40.0%	100%
'u.les	32	3	35
	91.4%	8.6%	100%
'u.ʎa	1		1
	100.0%		100%
'u.li.ci	2		2
	100.0%		100%
'u.li.ko	3	2	5
	60.0%	40.0%	100%

Table 23: continued

Suffixes	full form	truncated	Total
'u.li.ka		1	1
		100%	100%
u.la.ci	8	9	17
	47.1%	52.9%	100%
u.la.ca	6	53	59
	10.2%	89.8%	100%
'i.tsa	77	179	256
	30.1%	69.9%	100%
'i.tsas	4	3	7
	57.1%	42.9%	100%
'i.tses	14	7	21
	66.7%	33.3%	100%
'o.la	13	6	19
	68.4%	31.6%	100%
'o.las	14	1	15
	93.3%	6.7%	100%
'o.lēs	4	1	5
	80.0%	20.0%	100%
'a.ra	35	18	53
	66.0%	34.0%	100%
'a.res	6		6
	100.0%		100%
'a.ris	4	3	7
	57.1%	42.9%	100%
'a.ri	113	35	148
	76.4%	23.6%	100%
'ja.ris	2	2	4
	50.0%	50.0%	100%
'a.ri.kos	1		1
	100.0%		100%
'a.ri.ka		1	1
		100.0%	100%
a.ra.ci	30	16	46
	65.2%	34.8%	100%
a.ra.ca	14	8	22
	63.6%	36.4%	100%
'tis	12	2	14
	85.7%	14.3%	100%
'ti	1022	209	1231
	83.0%	17.0%	100%
'tu	12	1	13
	92.3%	7.7%	100%
'tus	1		1
	100.0%		100%
'tu.ōes		1	1
		100.0%	100%
'dzis	1	2	3
	33.3%	66.7%	100%
a.ōas	1	1	2
	50.0%	50.0%	100%

Table 23: continued

Suffixes	full form	truncated	Total
'a.ðes	14 73.7%	5 26.3%	19 100%
i.'kos		2 100.0%	2 100%
i.'ci	31 77.5%	9 22.5%	40 100%
i.'ko	14 87.5%	2 12.5%	16 100%
i.'ka	5 55.6%	4 44.4%	9 100%
<b>Total</b>	83476 79.8%	21179 20.2%	104655 100%

Table 24 is a crosstabulation of the truncation percentages of derived forms presented in descending order of susceptibility to truncation. Out of the 68 allomorphs defined in the study, only 40 allomorphs are attested, i.e. 28 allomorphs of the intended forms never occurred even once. Clearly, some suffixes are highly prone to truncation, whilst others are resistant to or never lead to any kind of truncations. Interestingly, for many suffixed forms the likelihood of getting truncated does not differ from that of non-suffixed forms. This further supports the idea that the data under discussion need not be accounted for by resorting to morphological constraints.

**Table 24:** Suffixes attested in the corpus in descending order of susceptibility to truncation in the child's output.

Suffix	%-Trunc	%-Full	N
'u.li.ka	100.0	.0	1
'a.ri.ka	100.0	.0	1
'tu.ðes	100.0	.0	1
i.'kos	100.0	.0	2
u.'la.ca	89.8	10.2	59
'i.tsa	69.9	30.1	256
'dzis	66.7	33.3	3
u.'la.ci	52.9	47.1	17
'ja.ris	50.0	50.0	4
'a.ðas	50.0	50.0	2
i.'ka	44.4	55.6	9
'i.tsas	42.9	57.1	7
'a.ris	42.9	57.1	7
'u.las	40.0	60.0	5
'u.li.ko	40.0	60.0	5
a.'ra.ca	36.4	63.6	22
a.'ra.ci	34.8	65.2	46
'a.ra	34.0	66.0	53
'i.tses	33.3	66.7	21
'a.ci	32.8	67.2	2147
'o.la	31.6	68.4	19
'u.lis	30.4	69.6	46
'u.li	28.6	71.4	35
'a.ca	27.4	72.6	862
'a.ðes	26.3	73.7	19
'u.la	24.2	75.8	459
'a.ri	23.6	76.4	148
'i.ci	22.5	77.5	40
'o.les	20.0	80.0	5
No_suffix	19.7	80.3	99019
'ti	17.0	83.0	1231
'tis	14.3	85.7	14
i.'ko	12.5	87.5	16
'u.les	8.6	91.4	35
'tu	7.7	92.3	13
'o.las	6.7	93.3	15
'u.ka	.0	100.0	1
'u.li.ci	.0	100.0	2
'a.res	.0	100.0	6
'a.ri.kos	.0	100.0	1
'tus	.0	100.0	1

Table 25 provides the relative frequencies in percent of suffix families. Each family includes at least one unmarked suffix as well as its allomorphs, i.e. three allomorphs in total. For instance, the 'u.la' family includes the unmarked suffixes (a) 'u.lis', 'u.la', 'u.li', (b) 'u.li.kos', 'u.li.ci', 'u.li.ko', (c) 'u.'la.ci', (d) 'u.'li.tsa' and their allomorphs. The

'a.ris' family includes the 'a.ris' and 'ja.ris' suffixes and their allomorphs. The percentages are presented in ascending order. The row *'no suffix'* lists the percentage of non-affixed forms found in the database, which is much higher than that of polymorphemic forms.<sup>122</sup>

**Table 25:** Percentage of truncated and full realizations, plus total number of occurrences, per suffix family.

Suffix family	%-Trunc	%-Full	N
'DZIS	66.7	33.33	3
'I.TSA	66.5	33.45	284
A.'RA.CI	35.3	64.71	68
'A.CI	31.2	68.76	3009
'U.LA	30.8	69.17	665
'A.RA	30.5	69.49	59
'A.DA	28.6	71.43	21
'A.RIS	25.5	74.53	161
I.'KOS	25.4	74.63	67
'O.LA	20.5	79.49	39
No suffix	19.7	80.29	99019
'TIS	16.9	83.10	1260

Finally, in table 26 I have counted the number of suffixed versus non-suffixed input (adult) forms, and cross-tabulated these against the output forms. I have done this for all eight time-intervals.

<sup>122</sup> See Dalalakis (1997) for a relevant account of Diminutive Formation in Developmental Language Impairment data.

**Table 26:** Absolute and relative frequency of adult forms with and without suffix, crosstabulated against child forms with and without suffix, at each of eight developmental time intervals.

Stage	Adult form	Child form		Total
		no suffix	suffix	
1	no suffix	13453	75	13528
		99.4%	.6%	100%
	suffix	284	500	784
		36.2%	63.8%	100%
	Total	13737	575	14312
		96.0%	4.0%	100%
2	no suffix	13277	79	13356
		99.4%	.6%	100%
	suffix	292	503	795
		36.7%	63.3%	100%
	Total	13569	582	14151
		95.9%	4.1%	100%
3	no suffix	13455	121	13576
		99.1%	.9%	100%
	suffix	279	481	760
		36.7%	63.3%	100%
	Total	13734	602	14336
		95.8%	4.2%	100%
4	no suffix	13151	94	13245
		99.3%	.7%	100%
	suffix	229	464	693
		33.0%	67.0%	100%
	Total	13380	558	13938
		96.0%	4.0%	100%
5	no suffix	13463	91	13554
		99.3%	.7%	100%
	suffix	222	472	694
		32.0%	68.0%	100%
	Total	13685	563	14248
		96.0%	4.0%	100%
6	no suffix	13606	71	13677
		99.5%	.5%	100%
	suffix	306	426	732
		41.8%	58.2%	100%
	Total	13912	497	14409
		96.6%	3.4%	100%
7	no suffix	13468	112	13580
		99.2%	.8%	100%
	suffix	235	465	700
		33.6%	66.4%	100%
	Total	13703	577	14280
		96.0%	4.0%	100%
8	no suffix	13552	63	13615
		99.5%	.5%	100%
	suffix	188	468	656
		28.7%	71.3%	100%
	Total	13740	531	14271
		96.3%	3.7%	100%

When the adult input form contains no suffix, the output form erroneously contains a suffix (as automatically recognized by the algorithm, but also checked by me) in between 0,5 and 1 percent of the cases. However, when the input form does contain a suffix, it fails to show up in the children's output form in between 29 and 41 percent of the cases. It seems to be the case that the incidence of suffixed forms increases somewhat with time, as quantized into the consecutive eight 'stages', but the effect is rather irregular. In the first three periods nothing interesting seems to happen. From then onwards, the incidence of suffixed forms increases more or less steadily, which does not necessarily imply increasing awareness of morphology on the part of the child, but there is a curious momentary relapse, that is, regression to previous stages as evidenced in period 6.

To sum up, a general but very important observation, which was already made for purely phonologically conditioned truncations, seems to hold; children adopt different learning paths in their morphophonological development. Regressions can hardly be accounted for in terms of an approach based purely on stages. In other words, the acquisition process of Greek children does not seem to be fully compatible with a stage-like progression.

#### 6.3.4.2. Compound forms

Nespor and Ralli (1996) and Nespor (1999) recognize three types of compounds in Greek adult language:

a) **[stem + stem] compounds**, for example, *anthó#kipos* 'flower garden', consisting of *ánthos* 'flower' and *kípos* 'garden', *tiró#pita* 'cheese pie', consisting of *tirí* 'cheese' and *píta* 'pie', *kukló#spito* 'doll's house', consisting of *kúkla* 'doll' and *spíti* 'house'. Compounds of this type have a thematic vowel, usually [o], which links the first and the second member of the compound, and which also carries the stress of the word.

b) **[stem + word] compounds**, for example, *kreat#agorá*<sup>123</sup> 'meat market', consisted of *kréas* 'meat' and *agorá* 'market', *taramo#saláta* 'fish roe salad', consisted of *taramás* 'fish roe' and *saláta* 'salad'. In this type

---

<sup>123</sup> The [t] of *kreat#agorá* is part of the stem, which in Greek is extracted from the genitive of the singular, if the inflectional suffix is omitted. [t] acts in this case as a linking consonant.

of compounds of this type stress falls on the '*strong*' part of the compound, namely the word.

c) **[word + word] compounds**, for instance, *nómos plésio* 'law', *atomikí vómva* 'atomic bomb'. In [word + word] compounds each part of the compound carries its own stress.

Nespor (1999) argues that the lack of inflection in the first type of compounds shows that the compounds' first members are not words, but rather stems; additionally, the vowel [o] at the end of the first member is the so-called 'linking vowel', which is inserted in many languages after a compound initial stem when the latter ends with a consonant. The different stress patterns exemplified in the three compound types correlate with the fact that in the first two types of compound, the two members are mapped onto just one phonological word; compounds of the third type, instead, each member forms a separate constituent. In compounds of the second type primary stress is assigned where stress of the second constituent falls.

From (309) to (315) I provide data on compounds found in the speech of the eleven Greek children under investigation. In general, we find compounds of the first two types as defined by Nespor and Ralli (1996) and Nespor (1999). However, compounds of the third type are the least frequently attested in the Greek database which underlines the difficulty that children have in acquiring their language. Compounds of the third type are the least frequently attested in adult Greek too.

Table 27 is a list of the types of compounds found in the database (leftmost column) and their token frequency (rightmost column) with the percentage of the compound type relative to the total number of compound tokens in the database (N=57). Compound constituents are separated by slashes and linking vowels are put in parentheses. Compound members are coded in the input in the same way as derived forms.





In general, the stressed and rightmost syllables tend to be preserved in Dionisakis' data, confirming Echols and Newport's hypothesis that children tend to produce stressed and rightmost syllables (1992) (see section 3.2 for a more detailed discussion). Dionisakis provides evidence that Greek children preserve not only rightmost but also leftmost syllables.<sup>124</sup> Syllables seem to be preserved as long as they are stressed or occupy edge positions in case they are unstressed, irrespective of which edge.

## (312) Dionisakis

- |    |                           |                                 |                 |          |
|----|---------------------------|---------------------------------|-----------------|----------|
| a. | /o.ðo.'d-(o)-vur.tsa/     | → [o.vo.'vo.vu.ta]              | 'toothbrush'    | (2;3.21) |
| b. | /tra.pe.z-(o)-.'ma.di.lo/ | → [ðo.'ma.lo], [ter.'ma.di.lo]  | 'table cloth'   | (2;4.27) |
| c. | /ka.se.'t-(o)-fo.no/      | → ['to.ro]                      | 'tape recorder' | (2;6.15) |
| d. | /za.xa.r-(o)-.pla.'sti.o/ | → [pa.'θti.o], [ta.la.ta.'ti.o] | 'sweet shop'    | (2;7.27) |

The rest of the children, Sofia, Ioanna and Marilia, also produce compounds of the first and the second type but not of the third type (see examples in 313, 314 and 315, respectively). Stefanos and Stefanoulis do not exhibit compounds in their data. In Sofia's, Ioanna's and Marilia's productions the stressed syllable is correctly realized, edgemoost syllables are preserved, and, generally, the member of the compound that carries the main stress of the word is retained. In cases such as (315a) (from Marilia's data), stress errors occur due to extensive truncation, but again stress lands on an edge syllable. This type of error is driven by the phonological principle that demands edges to be strong positions in a word and, consequently, attract stress. This principle is supported by phonetic evidence and psycholinguistic experimentation (cf. Smith 2002, and more references therein).

## (313) Sofia

- |    |                           |                 |                |           |
|----|---------------------------|-----------------|----------------|-----------|
| a. | /xar.t-(o)-.pe.'tse.ta/   | → [pe.'pe.ti]   | 'napkin'       | (2;10.15) |
| b. | /ço.'n-an.θro.pos/        | → [xa.'a.ko.mo] | 'snow man'     | (2;10.15) |
| c. | /xar.t-(o)-.'ma.di.lo/    | → [ma.di.lo]    | 'handkerchief' | (3;5)     |
| d. | /tra.pe.z-(o)-.'ma.di.lo/ | → [ma.ti.o]     | 'table cloth'  | (3;5.29)  |

<sup>124</sup> See Revithiadou and Tzakosta (2004a,b) for comparable results.



sufficient evidence as to whether morphology plays an influential role or whether morphological constituents are consciously produced.<sup>125</sup>

**Table 28:** Number of compounds per child. Token frequency and output forms are listed, plus frequency relative to compound tokens.

Name	Compounds	N	Percent
Melitini	/xar.to.pe.'tse.ta/ → [pe], [ka.çə.pe.'çe.ta]	2	3.5
	/xar.to.pe.'tse.tes/ → [pe.'ce.te]	1	1.6
	/ka.se.'to.fo.no/ → [o.xo.'fo.fo.no] [ka.θe.'to.fo], [fto.vo.vo], [ka.'ce.fo.no]	4	7.0
	/xar.to.'ma.di.lo/ → [ba.'ba.di.lo]	1	1.6
Bebis M	/ka.se.'to.fo.no/ → [a.'to.fo.no], [ə.'to.fo.no]	2	3.5
	/tra.pe.zo.'ma.di.lo/ → [a.to.'ba.di.lo], [to.'ma.di.lo]	2	3.5
	/xar.to.'ma.di.la/ → [a.to.'ma.di.la]	1	1.6
Bebis T	/xar.to.pe.'tse.ta/ → [pe.ta]	3	5.3
Konstadinos	none		
Felina	/psa.ro.su.pa/ → [psa.'ro.su.pa]	1	1.6
Dionisakis	/o.ðo.'do.vur.tsa/ → [o.vo.'vo.vu.ta]	1	1.6
	/tra.pe.zo.'ma.di.lo/ → [ðo.'ma.lo], [ter.'ma.di.lo]	2	3.5
	/ka.se.'to.fo.no/ → [to.ro]	1	1.6
	/za.xa.ro.pla.'sti.o/ → [pa.'θti.o], [ta.la.ta.'ti.o]	2	3.5
	/ra.ði.'o.fo.no/ → [a.ði.'o.fo.no]	1	1.6
Stefanos	none		
Stefanouli	none		
Sophia	/xar.to.pe.'tse.ta/ → [pe.'pe.ti], [pe]	3	5.3
	/ço.'nan.θro.pos/ → [xa.'a.ko.mo]	1	1.6
	/xar.to.'ma.di.lo/ → [ma.di.lo]	1	1.6
	/tra.pe.zo.'ma.di.lo/ → [ma.ti.o]	3	5.3
Ioanna	/tra.pe.zo.'ma.di.lo/ → [ka.'ta.ði.lo], [a.ði.lo], [ti.ma.di.'na.li]	3	5.3
	/xar.to.'ma.di.lo/ → [a.'da.di.lo], [a.ði.'da.ði.lo], [a.to.'ma.di.lo]	4	7.0
	/psa.ro.su.pa/ → [pa.'ro.pu.la]	1	1.6
	/te.'tra.ço.no/ → [ka.xo.no], [ta.ço.no], [e.'ta.ço.no], [te.'ta.ço.no]	5	8.8
Marilia	/ku.klo.'θe.a.tro/ → [ku.ko.'θe.a.to], [ko.'θe.a.to], [ku.kos]	11	19.3
	/ka.se.'to.fo.no/ → [ka.çe.'to.fo.no]	1	1.6
<b>Total</b>		57	100.0

<sup>125</sup> Gathercole et al. (1999) provide ways of ascertaining knowledge of morphology without using experimental paradigms or perception studies.

As far as derived forms are concerned, children tend to produce diminutive forms at a high rate. This is not random, given that children are frequently exposed to diminutive forms during the acquisition process. Theoretically speaking, Ralli (1998) has claimed that diminutive suffixes are very transparent and, generally, behave like inflectional suffixes. Put differently, Ralli argues that in lexical phonology diminutive suffixes have a position at the same level as inflectional suffixes and, therefore, they are as productive as inflectional suffixes.<sup>126</sup> Compound forms with the prefix '*ksana-*' as their first constituent, for example, behave exactly the same way (Ralli 2002). However, given that phonology determines children's productions extensively even when polymorphemic words are attempted, this does not explain why other derivational suffixes having the same prosodic structure, as diminutive suffixes do not behave in the same way.

Compound forms, on the other hand, are infrequently produced. My main explanation of that fact is that compounds are longer in terms of their prosodic shape and the number of syllables they consist of; consequently, they are difficult targets. Table 5 of appendix 2 displays input frequency rates where the types of words the children under examination tend to mostly listen to during their interaction with adults are presented. In this table it is demonstrated that children are never exposed to five-syllable target forms and very rarely to tetrasyllabic forms. This implies that they are not exposed to compound forms, which are essentially longer than monomorphemic words, due to their morphological complexity. This further induces the poor production on the children's part.<sup>127</sup> Diminutives, on the other hand, are usually trisyllabic and are, as a result, easier targets.

In her study of the emergence of plurals in the speech of adults with SLI, Goad (1998) showed that plurals seem to resemble compounds both morphologically and prosodically. Such forms are stored as unanalysed

---

<sup>126</sup> See Anastasiadi-Simeonidi (2004) for an interesting account of the status of diminutive suffixes.

<sup>127</sup> Fikkert (2001), on the other hand, argues that compounds enter her stage 3 (the stage of the S(W)SW template) a bit earlier than monomorphemic words with a similar prosodic pattern. The fast progress of compounds is caused by the fact that children analyze compound words as two separate (prosodic) words, each of which may consist of maximally one foot, whereas monomorphemic words with a similar prosodic pattern are analysed as one prosodic word, with a length limitation of one foot. However, Fikkert does not provide an explanation as to why this happens for compounds and not for monomorphemic words, since both word types have the same prosodic shape.

chunks or they are more frequently found than other grammatical forms, because they resemble compounds.

Data from inflected (nouns) and conjugated forms (verbs) are not considered in this study. The examination of nominal and verbal inflection is a topic with important implications for Greek stress that goes beyond the scope of this thesis. Moreover, following Ralli (1988), I assume that inflected forms are more transparent than derived or compound forms. Consequently, data from inflection would not provide different insights from derivation and compounding regarding the role of morphology in child speech. Inflectional transparency may also be the reason why inflected forms may appear earlier or on a more frequent basis. However, this is an issue that awaits further research.

Additional support for my claims is provided by work by Kehayia (1997). Kehayia (1997) showed that on-line processing experiments with English-, French- and Greek-speaking normal and SLI individuals that regularly inflected words do not contain internal morphological structure. Generally, production data cannot provide clear indications as to the point in time when morphology becomes really productive and is acquired. Prosody seems to dominate children's productions. Perception and production experiments with older children will make it possible to account for these facts as well the order of acquisition of morphological constituents or categories. This issue also awaits further research.

Moreover, given the claims of HT, Greek children are expected to build their productions on the morphological heads of the targeted words. This does not seem to be the case at least for the type of the data used in this study. HT makes subtle distinctions at the morphological level that Greek children do not seem to be able to distinguish. For example, children do not seem to be able to segment target forms into their morphological constituents.<sup>128</sup> Here, it was shown that purely phonological constraints, for example, constraints referring to phonological heads, were enough to account for the data. However, more refined experimental studies might be able to demonstrate whether and, if so, the degree to which morphology influences children's productions. Such experiments would further show the point in time morphology becomes clearly or actively influential and productive in child speech.

Finally, the OT analysis of chapter 6 provides further support for the above claims as well as the model of multiple parallel grammars. More specifically, polymorphemic words are truncated in the same way as

---

<sup>128</sup> See Taelman (2004) for a comparable conclusion regarding the Dutch child data.

monomorphemic words and are governed solely by prosodic principles. As was shown in this chapter, polymorphemic forms may be truncated to the same patterns monomorphemic forms are. This points to the fact that children follow distinct but parallel developmental paths in the acquisition of morphologically complex words, too.