

Morphological blind-alley developments as a theoretical challenge to both usage-based and nativist acquisition models

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In this paper we want to challenge two leading acquisitionist approaches or model types, namely usage-based and nativist models, and argue in favour of a constructivist model of autopoiesis. Our area of investigation is morphology in its major components inflection, derivation and compounding. The data are longitudinal production data of everyday mother-child interactions. First, we formulate a general challenge to usage-based approaches. We then sketch our general account in terms of Natural Morphology and claim that this account cannot be transformed into, or be substituted by, an existing nativist account based on published claims about Universal Grammar. We end by discussing in detail the nine phenomena observed in early Greek, German, French and Russian acquisition data and give an account in terms of self-organisation and Natural Morphology.

KEYWORDS: constructivist self-organisation, Natural Morphology, usage-based models, acquisition of Greek, German, French and Russian, reduplication, interfixation, /r/-insertion, repetitive hypocoristics.

1. Introduction

Input-dependency of children's output is a basic tenet of usage-based models, much more so than in any other model of language acquisition so far (cf. Tomasello 2003; Lieven 2008; 2014; Bybee 2010). Children take up child-directed caretakers' utterances and parts of them (including morphological constructions) either as such in their actual forms or in an impoverished fashion, to then arrive at schematic generalisations which may be analogically modified. For example, in auxiliary

constructions of analytical morphology children may leave out the (non-salient) auxiliary (omission errors: cf. Lieven 2008). Schemas may also only be partially represented, i.e. “partial representations occur when the child regularly produces a correct form for some items but not for others which are probably closely related in adult grammars” (Lieven 2008: 65). Moreover, children may make errors in terms of overgeneralisations or other analogical substitutions (commission errors: cf. Lieven 2008: 78-86).

Undoubtedly, the vast majority of children’s output deviations from actual input constructions is compatible with, but maybe not always best explained by, this view. However, there is a set of deviations in some children’s course of development which cannot be accounted for in this way. We call them Blind-Alley Developments (henceforth **BADs**) insofar as they either have no relation to the input or lead away from it in a way which lies outside current models of accounting for toddler’s errors. With both these developments children enter blind alleys which they must soon give up.

We exclude another, but well-known type of development which leads nowhere and has to be given up by a child, i.e. the development of fillers as placeholders for an impoverished input, explainable as prosodic compensation and an impact of distributional learning (cf. Peters & Menn 1993; Feldman & Menn 2003; Taelman *et al.* 2009 among many others). Fillers also never survive (cf. Dressler & Kilani-Schoch 2001).

In contrast to fillers, BADs pose a theoretical challenge to both usage-based and nativist acquisition models.

2. Proposal

We have called these short-timed developments in the acquisition course BADs (Bittner *et al.* 2003: viii-ix, xviii), because they are *culs-de-sac* (as called in French, cf. German *Sackgassen*), which lead nowhere close to the adult target language and definitely have to be given up. As already outlined above, there are two types of BADs:

- (A) blind-alley developments in the strong sense: in these there is nothing in the child’s input which could explain what the child constructs. See the Russian and Greek examples of reduplication below, where there are no reduplications in the Russian or Greek input;
- (B) blind-alley developments in the weak sense: these developments are based on an impoverished intake of the input but develop in the

children's output (and, hence, in their uptakes that the analyst postulates) not in the direction of the input targets, but away from the input targets, as in the French and German examples below. In both the A-type and B-type, a child soon gives the BAD up and starts a fresh approach.

In our view, BADs, although only few children have them, deliver the best ontogenetic evidence for a constructivist self-organisation model of language acquisition (cf. Karpf 1990; Karmiloff-Smith 1992; Dressler & Karpf 1995) which is based on the biological (cf. Maturana & Varela 1980) and neurological (cf. Singer 1989) models of autopoiesis. Self-organisation is based on the interaction between an actual system and its environment, and in the case of language acquisition, on the interaction between children's stages of representation and processing and their language input, from which they select entities and patterns according to principles of saliency, frequency, entrenchment and, in our view, also of semiotically and cognitively based preferences of Natural Morphology (henceforth **NM**), such as iconicity (especially between form and meaning), morphosemantic and morphotactic transparency, optimal size of words according to their morphological status, and (bi)uniqueness (cf. Dressler 1995; Kilani-Schoch & Dressler 2005; Dressler *et al.* 2014; Dressler & Kilani-Schoch 2016).

Specifically, for A-type BADs we claim that if children construct a morphological pattern which has no model in their linguistic input (child-directed speech, henceforth **CDS**), such a construction must be explained by a cognitively based universal preference for such constructions which occur in other languages than the input language. And for B-type BADs we claim that their course of development is also based on such universal preferences. In order to provide an example for such preferences, we can cite the iconic preference for using a shorter form for basic, i.e. unmarked categories, such as nominative, singular in nouns, 3rd person singular in verbs, and a longer one for corresponding marked categories, such as oblique cases, plural, 2nd person (except in the imperative), as exemplified in Dressler (1995; 2010).

A first precursor of BADs is found in Munson & Ingram's (1985: 681) paper which reports the development of a reduplication rule expressing request by an English-speaking child. The rule is hypothesised to be triggered by a misanalysis of the input-structure *more milk*: [mə mək]. However, the vowel quality of the reduplicated sequence, which is unpredictable, the precise function of the rule and the development of this BAD remain unclear.

An antecedent of our view on BADs are Clark's (2001) false exten-

sions of patterns by children as examples of emergent categories, such as her syntactic example (Clark 2001: 394-5; cf. Kirjavainen *et al.* 2009) of English-speaking children using *me* for intentional actions in contrast to *I* in actions where the child is not in control.

Similar instances were published after our first introduction of the concept of BADs in Bittner *et al.* (2003: viii-ix, xviii), such as Pater *et al.*'s (2004) interpretation of children's phonological false steps in perceptual development. A possible, but isolated instance is the temporary preference for using the Spanish indefinite pronoun *uno* instead of the masculine indefinite article *un*. This is easily explainable by analogy to most masculine adjectives and nouns ending in *-o* in the singular (Mariscal 2009: 168). Thus, even now, our study is the first systematic study of morphological BADs.

3. Research questions

1. What types of blind-alley developments are attested?
2. What are typical pre-levels of development, i.e. properties of impoverished inputs which precede a blind-alley development? If they are not attested in the child's input, can they then be reconstructed with some probability? Hypothesis for A-type BADs: no other acquired pattern for the same morphological category, because Clark's (1993; 2001) principles of conventionality and contrast should rule out the construction of a synonymous BAD.
3. At which phase of development (especially phase of morphology acquisition or acquisition course of the specific category) does a blind-alley development take place? Do they occur both in pre-morphology, i.e. the stage before a child detects morphology, and in protomorphology, when and after the child detects morphology (cf. Dressler & Karpf 1995; Dressler *et al.* 2003; Bittner *et al.* 2003)? Hypothesis: in late pre-morphology (when certain morphological forms have already emerged, but not yet segmented) and especially early protomorphology, because of the same principles postulated by Clark (2001).
4. How long does a child maintain a blind-alley development? Hypothesis: shorter than other transitional acquisition phases (except production of fillers), because BADs are in stronger contradiction with input targets than overgeneralisations and other analogical developments.
5. How much variation with another strategy is there at the beginning, in the central period and at the end of the blind-alley

development? I.e. how much systematicity is there in a BAD? Hypothesis: the contrasting input patterns should soon limit the use of BAD patterns (Clark 2001: 382).

6. How do fresh starts look like afterwards? Hypothesis: the child should avoid starting a similar BAD after having found out the futility of the abandoned BAD.
7. In B-type BADs, how far-fetched can analogies be? Here we must try to do better than, for example, Pinker's (1999) discussion of analogical factors which have an impact on pattern extensions of English subregular verbs. This is because his picture is neither complete nor does it weigh the relative importance of the factors discussed (for example, the riming model in Kilani-Schoch & Dressler 2005, focusing on French subregular verbs, is clearly more elaborated).
8. "Does everything go?" (in the sense of Feyerabend 1975) or are there constraints on blind-alley developments? And if they exist, how can these constraints be explained? By Universal Grammar? By some learning mechanisms within a usage-based model of language acquisition? Or so far only by universal preferences of NM? We claim that, within a usage-based account, the course of development of BADs is also based on such universal preferences. This allows us to solve the problem of what gets treated as chunks faced by usage-based theories (Ibbotson 2013: 11).

The basis of our acquisitionist approach is partially usage-based on the one hand, and on the other hand the preference theory of NM (cf. Kilani-Schoch & Dressler 2005; Dressler *et al.* 2014) combined with the constructivist assumption that children themselves construct their course of language acquisition according to principles of pattern selection (cf. Dressler & Karpf 1995).

4. Database

The child data used for this paper are longitudinal and come from the international "Cross-linguistic Project on Pre- and Protomorphology in Language Acquisition", organised and coordinated by the first author in behalf of the Austrian Academy of Sciences (cf. Bittner, *et al.* 2003; Savickienė & Dressler 2007; Stephany & Voeikova 2009; Dressler *et al.* 2017). This project is devoted to a comparative, longitudinal study of spontaneous speech corpora (input and output) in early acquisition phases. Within this project the data for this paper comes from the authors' languages French, German, Greek and Russian. The child corpora come from:

- French: Sophie, single child, female, Lausanne: 1;6 – 3;0
Emma, single child, female, Lausanne: 1;4 – 2;11
- German: Bernd, first child, male, Vienna: 1;9 – 3;9
Jan, second child, male, Vienna: 1;3 – 6;0
Lena, single child, female, Vienna: 1;7 – 4;3
- Greek: Christos, first child, male, Athens: 1;7 – 4;0
Stephanos, second child, male, Athens: diary data (0;10.15 – 4;8)
- Russian: Varja, first child, female, Moscow: 0 – 2;6
Vanja, single child, male, St. Petersburg: 1;5 – 4;2
Filip, single child, male, St. Petersburg: 1;4 – 2;6
Liza, single child, female, St. Petersburg: 1;2 – 3;0

plus selected data from 15 further Russian-speaking children.

5. Case studies

5.1. *Blind-alley developments in the strong sense*

BADs in the strong sense are cases where nothing in the child's input could explain what the child constructs.

5.1.1. *Russian reduplication*

A first case of a blind-alley development in the strong sense is total root reduplication, which is apparently used by several Russian children for expressing perceived iterativity or ongoingness, instead of using adult secondary imperfectivisation devices or imperfective verbs which conventionally express iterativity and ongoingness. These reduplications can be divided into two types. One type does not exist in either the input or in Russian grammar – in this type one part of a word is repeated, such as *gom-gom* from the adverb *begom* 'running' or *pik-pik* from the verb *prygat* 'to jump'.

The other type is rather onomatopoetic, such as *kap-kap* from *kapat* 'to drop' which exists in the target language but is extremely rare in children's input. Our empirical evidence for the child-directed speech to seven children from 1;6 to 4;0 containing about 420,000 tokens revealed six occurrences of *kap-kap* (cf. Gagarina 1997; 2000). We therefore did not include the occurrences of duplicated *kap-kap* or triplicated *kap-kap-kap* into our analysis. None of the other types of reduplication analyzed below occurred in any of the seven inputs.

Examples where this iconic meaning is clearly proven by the context, including those where the child exhibits an opposition between imperfective reduplicated and perfective simple forms, are given below. Interestingly, these examples of contrastive use of reduplication extend from early premorphology into protomorphology, which shows the sta-

Maxim, in reference to the boy Sasha's running:

- (5) 1;4 *gom-gom* from *begom*
ADV
'running'.

Protomorphology:

Vanja, while he is jumping (iterative action):

- (6) 2;4 *pik-pik* from *prygat'*
'to jump',

in contrast to the CDS root form *pryg*, which refers to a momentary action, cf. in premorphology Vanja (1;6), while imitating how a rabbit is jumping.

Anja,

- (7) 2;5 *oj, kak bežit, tak: beg-beg* [from *begat'*]
Oh how run.PRS.3SG so run-run 'to run'
'Oh, how it (a puddle) is running',

i.e. when the child already uses the rather opaque form of the 3rd singular indicative.

Anton, in response to the question 'what are you doing?', which demands an answer in the imperfective aspect:

- (8) 2;6 *tuk-tuk, stuču* from *stučat'* (cf. quasi-synonymous *stuknut'*)
'tuk-tuk' 'to knock'
'I'm hammering'.

The examples above show that during the stage of premorphology children iconically mark the ongoingness of action with non-target devices, namely, by repetition of the parts of word roots or sound-imitations. During the stage of protomorphology, when the first verbs occur, the number of reduplications dramatically decreases (e.g. in Liza's data from 6,9% out of all analyzed utterances at 1;9 to 0,5% one month later, in Vanja's data from 54,6% at 1;11 towards 5,1% two months later – cf. Gagarina 2008), but children still use them optionally for the denotation of the ongoing perceived actions. There are some cases, when parallel to a target verb in the imperfective present form children use reduplication, probably for denoting an action more iconically or explicitly, e.g.

the target verb *begat* ‘run’ and non-target reduplicated (a child-specific form) *beg-beg*.

In sum, paradigmatic iconicity, in terms of reduplication, is used to iconically express the repetition or extension (in time) of events. These are, admittedly, rare examples of extragrammatical reduplication, which are not governed by grammar and violate grammatical principles such as requiring a finite form with a thematic vowel and an inflectional ending (cf. Dressler 2000). Note that all examples show total reduplication. This fits the crosslinguistic tendency (cf. Dressler 1968; Inkelas & Zoll 2005) of total reduplication being not only syntagmatically but also paradigmatically more iconic than partial reduplication, a case of second-order iconicity.

The examples of triplication as instances of recursive reduplication are just two (including *kap-kap-kap*: Vanja at 1;10), but relatively early (1;10), plus a single German example.

Within the corpora of all Austrian children in our project this isolated example was found in the Viennese boy Bernd at 2;7 (cf. Vollmann *et al.* 1997) (example (9)).

- (9) *der Papa bau-bau-bau* for *bau-t* [bauen.PRS.3SG]
‘the daddy is building a lot’.

Here, triplication of the ending-less root appears to iconically express continuity of the activity in extended time. This isolated example alone cannot, however, provide any useful evidence, other than showing that this case, such as the Russian triplications, are instances of extragrammatical morphology. In fact, triplications occur also within adult languages in extragrammatical reduplications and echo-words (as in German *bimbambum* of a bell) whereas grammatical reduplications follow the preference for binary relations (cf. Dressler 1995; 2000).

If the English reduplication reported by Munson & Ingram (1985) represents really a BAD, then the meaning constructed by the child would represent the meaning of intensification that one often finds in reduplications of languages in the world (cf. already Dressler 1968).

5.1.2. *Greek Subjunctive*

5.1.2.1. *The development of Greek Subjunctive in Christos’ speech: the first BAD*

The Modern Standard Greek subjunctive, which is the marked category, in contrast to the unmarked indicative mood, is much more relevant for acquisition in Greek than in most other languages. This is

due to the fact that Greek has no infinitive (therefore, the citation form is the first person singular present) and uses subjunctive constructions instead, and because the subjunctive appears in both the imperfective and perfective aspect. It is formed with the proclitic particle *na* plus verb either in the imperfective aspect (henceforth **IMPFV**), i.e. the indicative present, or in the perfective aspect (henceforth **PFV**), which has the same verb form as the perfective future (when preceded by the proclitic particle *tha*). The subjunctive first emerges in the perfective aspect, whereas the indicative emerges first in the imperfective present and in the perfective past (cf. Christofidou & Stephany 2003, with the exception of the form *koóni* for *na sikóni* discussed below). All early subjunctives that appear in Christos' blind alleys have a regulative meaning competing with the imperative and are either perfective (with the exception of the one token of *ta toi* for *na troi* 'in order to eat') or have a perfective meaning (*koóni* meaning '(I want mummy) to get up' and formally ambiguous *kakáni/o* meaning '(I want mummy) to do (something)').

The first blind alley that Christos engaged in for two to three weeks (end of 1;10 and beginning of 1;11 according to first only diary notes, then also recordings), was to omit the unstressed proclitic particle *na* and to lengthen the stressed stem vowel to a two-peak long vowel, resembling a sequence of two identical vowels in the two following verb types:

- (10) a. *koóni* for *na sikón-i* instead of *na sikoth-í*
 IMPFV.3sg PFV.3SG
 '(I want mummy) to get up'

using it intransitively instead of transitively ('take up') and in a perfective sense in 1;11 (2 tokens recorded and transcribed and 10 in diary notes);

- b. *koópi* for *na kóp-s-i*
 PFV.3SG
 '(I want mummy) to cut (something)'

in the same recording session (5 repetitive tokens, the first one prompted by the mother by providing an appropriate context for the child to produce this expected form which she had overheard before: all in all, more than five times overheard). No other subjunctive or future was produced during that period. Monomorphemic consonant groups were simplified without vowel lengthening.

Neither the target language nor the input contains long vowels or a sequence of identical vowels, except for learned words of katharevousa

origin (an older ‘purist’ variety of Modern Greek) actually not used in child-directed speech, such as *ighi-inós*, adjective derived from *ighía* ‘health’ or *i-ikós*, adjective derived from *iós* ‘virus’.

(Non-adult) lengthened vowels are produced by Christos more than 40 times until his second year, in a period starting earlier and also afterwards. Nearly all of the examples are word-final however, and more than half of them concern the word *neró*: ‘water’. With the exception of isolated *portokáli* ‘orange’, *tré:no* ‘train’, *tró:n* ‘they are eating’, *tró:na* (instead of the adult variant *tróne*) and *bá:lia* ‘ball’. However, these lengthened vowels are neither two-peak long vowels nor a sequence of two identical vowels. Moreover, the developmental extension in time differs greatly. The perhaps only structurally comparable form is *voóta* (either a one-peak or a two-peak long vowel) instead of *i fóc’a* ‘the seal’ (just one token in 1;11).

Both this token and the many more tokens of the two subjunctive types might be interpreted as prosodic compensation for the omitted unstressed definite article or subjunctive particle. However, such compensation does not occur with all the other omitted unstressed and monosyllabic function words or omitted unaccented vowels in lexical words. Our explanation will be given immediately after the section on Christos’ second blind alley below. Note that this first blind alley coincides with Christos’ detection of morphology by producing the first miniparadigms both in verbs and nouns (cf. Christofidou & Stephany 2003; Stephany & Christofidou 2009 for the miniparadigm criterion in general cf. Kilani-Schoch & Dressler 2002; Dressler *et al.* 2003; Bittner *et al.* 2003).

5.1.2.2. The development of Greek Subjunctive in Christos’ speech: the second BAD

After giving up the blind alley of vowel lengthening, Christos indulges after a few days in another and longer one, already mentioned in Kilani-Schoch *et al.* (1997) and Christofidou & Stephany (2003), who described the blind alley of reduplication under the general notion of ‘protomorphological fillers’ in a broader sense (cf. Christofidou & Kappa 1998).

After a few unclear examples of reduplication, which could also simply represent vowel or consonant harmony, see examples (11a-c) (some more from 1;11 onwards),

This is a far cry from the subjunctive patterns we are describing, both in quality and quantity.

From 1;11.13 onwards, he uses word-initial reduplication for expressing the subjunctive (in 1 type/2 tokens either the subjunctive or the future), always in competition with unreduplicated verb forms without the particle and, from 2;0.7 onwards, also in competition with the truncated form *a* of the particle *na* and, from 2;0.15 onwards, also in competition with the full form of the particle *na*.

VERB	VERB ONLY	REDUPLICATION
<i>pezo</i> 'I play'	<i>petsume</i> 1 1;11.10 <i>petsiume</i> 1 1;11.10 <i>peciume</i> 1 1;11.19	
<i>kano</i> 'I do'	<i>kani</i> 2 1;11.13 1;11.27	<i>kakani</i> 3 1;11.13 <i>kakani</i> 4 1;11.27
<i>kaθome</i> 'I sit'		<i>kakatsi</i> 1 1;11.27
<i>aniyo</i> 'I open'	<i>n'ic'o</i> 1 1;11.27	(<i>n'an'ico</i>) 3 1;11.27
<i>troo</i> 'I eat'		<i>papame</i> 1 1;11.27
LEMMAS/TOKENS	3 / 6	3(4) / 9(12)

Table 1. The subjunctive in Christos' speech from 1;11.10 to 2;0.4¹

The cases of reduplication and particle omission are identical in a number of lemmas (3 vs 3(4)), but the tokens of reduplication (9(12)) outweigh those of particle omission (6). Similar to the first examples of lexical reduplication (see above), these examples can also be identified as cases of consonant harmony under the condition of having vocalic identity between the particle *na* and the stem-initial syllable, in complementary distribution with particle omission when this condition of vowel identity is not fulfilled. The only exceptions are *kani* (once) with particle omission despite vowel identity and *n'an'ico* (twice, the only verb with vocalic onset, i.e. *a-*) with consonant harmony despite vowel non-identity. Thus, both in lexical and in subjunctive reduplication, reduplication is difficult to separate from phoneme harmony. An explanation via consonant harmony is weakened due to (a) the absence of the subjunctive particle (*n*)*a* at the same period and (b) by the examples

of unambiguous reduplication occurring at the same time as the emergence of the particle *n(a)* in Table 2. Later examples are unambiguous cases of reduplication, at least in the first field to the right (Table 2):

VERB	<i>na</i> + VERB	<i>a</i> + VERB	VERB ONLY	REDUPLICATION
<i>pezo</i> 'I play'	<i>peciume</i> 6 2;1.9 2;1.14 2;1.22	<i>patume</i> 1 2;0.7 <i>pociume</i> 2 2;0.7 <i>peciome</i> 1 2;0.15 <i>peciume</i> 1 2;1.14 <i>pecio</i> 1 2;1.14	<i>petsume</i> 1 2;0.7 <i>peciume</i> 2 2;1.2	<i>pepetsume</i> 1 2;0.16 <i>pepeciume</i> 6 2;0.16 2;1.2 2;1.14
<i>kaθome</i> 'I sit'			<i>kacici</i> 2 2;0.16 <i>katsi</i> 2 2;1.2 2;1.23	<i>pipiti</i> 1 2;1.23
<i>aniyo</i> 'I open'				(<i>n'an'ici</i>) 1 2;1.2
<i>kano</i> 'I do'	<i>kani</i> 1 2;1.9	<i>kani</i> 2 2;0.15 2;1.14	<i>kani</i> 1 2;0.15	<i>kakani</i> 1 2;1.9
<i>vazo</i> 'I put'	<i>valo</i> 1 2;0.15 <i>vali</i> 2 2;1.14	<i>valo</i> 1 2;0.15	<i>vlal(d)ume</i> 3 2;1.23	
<i>perno</i> 'I take' subj. <i>na pari</i>	<i>pali</i> 1 2;1.14		<i>pali</i> 1 2;1.14 <i>palo</i> 1 2;1.23	<i>papali</i> 2 2;1.14
<i>pao</i> 'I go'	<i>pai</i> 1 2;1.14 <i>pame</i> 1 2;1.22		<i>pai</i> 2 2;0.15	
<i>troo</i> 'I eat' subj. <i>na fai/na troi</i>		<i>fame</i> 1 2;1.22	<i>fai</i> 1 2;1.23	(<i>tatoi</i>) 1 2;1.14 <i>fafai</i> 1 2;1.23
<i>kimame</i> 'I sleep', subj. <i>na kimithume</i>			<i>cufume</i> 2 2;0.7	
LEMMAS/TOKENS	5/13	4/10	8/18	5(7)/12(14)

Table 2. The subjunctive in Christos' speech from 2;0.7 to 2;1.23

Clear vowel harmony occurs only in *cufume*, consonant harmony maybe in *n'an'ici* (perhaps affected by the possible elided adult form *n'aniksi*). At 2;0.7 the truncated form of the particle *na* emerges (*a*), at 2;0.15 the full particle *na*. For a few months these two forms compete with each other and with particle omission and reduplication. In the period from 2;07 to 2;1.23 particle omission has the highest frequency in lemmas (8) and tokens (18). The other variants do not differ much among themselves (the possible cases of consonant harmony are in parentheses).

It is unclear when the future emerges. There are ambiguous examples (future or subjunctive) of reduplication at 1;11.27 *kakani* (Christofidou & Stephany 2003: 103), an imitated reduplicated future at 2;04 (mother's *tha bi* 'will get into' is repeated as *pipi*), in 2;07, the first rather certain future form *a peci* for *tha pesi* 'will fall' occurs at 2;1.2. It is worth noting that this period of abandoning reduplication, rather than functioning as a sort of imperative, instead coincides with the emergence of some clear cases of future and of the use of subjunctive in secondary clauses (see below).

In a pause from 2;1.26 until 2;3.26, no subjunctive reduplication occurs, and only twice does the truncated particle *a* occur. From 2;3.5 onwards the particle *na* appears to get established, i.e, within almost a month, *na* has been used in 59 subjunctive tokens (20 types) out of 85 tokens (30 types). In the rest of these tokens Christos uses either the future particle *tha* or nothing.

But in the 20 days from 2;3.27 to 2;4.19 Christos again uses the following reduplications before abandoning subjunctive reduplication (examples (14a-d)).

- (14) a. 2;3.27 *c'uc'úme* for *na pjúme*
'let's drink!'
- b. 2;4.9 *papái* for *na pái*
'he/she should go'
- c. 2;4.9 *kakátsi* for *na kátsi* (twice)
'he/she should sit'.
- d. 2;4.19 *kakáno* for *na káno*
'let me do / I'll do'.

In this period (2;3.27 – 2;4.19) the particles *a/Ø/tha* are also used for subjunctive. In 60 tokens (23 types) out of 90 subjunctive tokens (28 types) the target particle *na* occurs. However, it should be noted

that although reduplication for subjunctive recurs, this does not seem to apply to subjunctives in subordinate clauses, depending on a main verb.

The subjunctive in a typical subordinate clause emerges at 2;1 (e.g. *theli na peksoume* ‘I (still using 3rd person for himself) want to play’). Until 2;2.14 *na/tha/Ø* (but not reduplication) are used interchangeably for the subordinate subjunctive, which occurs again at 2;3.18. The absence period of the subordinate subjunctive (2;2.18 – 2;3.14) almost coincides with the absence period of the reduplicative subjunctive (see above). From 2;3.18 to 2;4.19 – the period of reduplication recurrence 7 tokens (6 types) of subordinate subjunctive also occur with the particle *na* and only one token with no particle (bare subjunctive). Christos’ overall marking pattern of the subordinate vs non-subordinate subjunctive indicates a possible tendency to use reduplication for non-subordinate subjunctive only (in parallel with *na/tha/Ø*). Moreover, the use of *na* seems to be almost ‘a must’ for the subordinate subjunctive, where *na* functions as a kind of conjunction.

5.1.2.3. Subjunctive vs lexical reduplication

A first difference between subjunctive reduplication and lexical reduplication is that subjunctive reduplication is phonologically much more transparent: as in the case of adult morphological reduplication, the verb-initial consonant is preserved as such (cf. also Dressler *et al.* 2005), with the exception of the minimal change of mode of articulation in *papame* for *na fame* ‘let’s eat!’, cf. *pipiti* for *na kathisi* ‘to sit’ and *c’uc’ume* for *na pjume* ‘let’s drink!’ (only 1 token each), whereas multiple segmental and prosodic changes take place in nearly all cases of lexical reduplication (see above). Lexical reduplication serves to avoid, or compensate for, difficult consonant clusters, which is not the case with subjunctive reduplication.

Second, lexical reduplication also serves to compensate for two pre-tonic unstressed syllables (see above and cf. Christofidou & Kappa 1998), whereas subjunctive reduplication never substitutes both the particle and the first unstressed syllable of the verb (except in *pipiti* for *na kathisi*, a variant of *na katsi* ‘that he sits’). Moreover, there is no tendency to use only the verb without the particle or reduplication more in the case of trisyllabic than of disyllabic verb forms: until 2;1.23, for example, the trisyllabic prosodic verb *petsoume* for *na peksoume* ‘to play’ occurs in 6 tokens, and disyllabic *kani* occurs in 3 tokens. This stands in contrast to the type *(n)a peciume/pepeciume* for *na peksoume* ‘to play’ which occurs in 19 tokens vs *kakani* for *na kani* ‘to do’ which occurs in 8 tokens.

A third difference lies in the different time course of lexical redupli-

cation and subjunctive reduplication: lexical reduplication starts at least with 1;7 in premorphology, in contrast to both blind alleys at the beginning of protomorphology, i.e. subjunctive lengthening at 1;11.0, subjunctive reduplication at 1;11.13. Lexical reduplication continues during the subjunctive reduplication pause (2;1.26 – 2;3.26). Finally, sporadic lexical reduplication continues until the end of transcription at 2;8.25, whereas subjunctive reduplication ends already at 2;4.19.

Fourth, the distribution of each type of reduplication differs (in regard to ambiguous vs unambiguous status) greatly in type and token frequency (types/tokens) as well. In premorphology, only 2/5 unambiguous reduplications contrast with 12/27 ambiguous cases, which could be cases of either reduplication or consonant harmony. During the first period of blind alleys (1;11 – 2;0.4) there are already 7/13 unambiguous vs 2/25 ambiguous cases of reduplication (22 tokens of *lilío* for *vivlío* ‘book’), whereas subjunctive reduplication has only ambiguous cases (although reduplicative interpretation is more probable, see above). But in the period from 2;0.7 to 2;1.23 there are again only 2 (lexemes)/14 tokens (with *kikíne/i/ato/a* for *aftokínito* 3/57) unambiguous vs 5/24 (with *Bebé* for *Beemvé* 6/42) ambiguous examples of lexical reduplication, whereas there are already 2/8 unambiguous vs 3/4 ambiguous examples of subjunctive reduplication.

Note that the use of ambiguous lexical reduplication/consonant harmony has its peak before the similarly ambiguous subjunctive reduplication/consonant harmony does. Similarly, the use of unambiguous lexical reduplication has its peak before the use of unambiguous subjunctive reduplication. This points to reduplication starting as a phonological process, of which morphologised subjunctive is an offspring (cf. also Christofidou & Kappa 1998).

Fifth, if reduplication were simply a phonological means of replacing pretonic unstressed syllables, then one would expect it to occur in the same way with other pretonic unstressed function words. However, there are just three cases where reduplication replaces a definite article: *popota* ‘the seal’ (1;11.0), occurring earlier than subjunctive reduplications and simultaneously with vowel lengthening, *Popos* ‘the Spot’ (1;11.10), cf. above *voota* ‘the seal’ (1;10.0) which occurs simultaneously with vowel lengthening, and *vivivio* for *to vivlío* ‘the book’. Moreover, reduplication was never found to replace proclitic pronouns.

5.1.2.4. The development of Greek Subjunctive in Stephanos’ speech (diary notes 0;10-4;8)

Stephanos’ data (only diary notes: 0;10 – 4;8) seem to have inter-

esting parallels with Christos' data, concerning the development of the Greek subjunctive, i.e. the use of reduplication for signalling the subjunctive from 2;3 onwards (see examples (15a-b)).

- (15) a. *tado* for *na dho*
 'let me see'
 b. *babo* for *na bo*
 'let me get in'.

The lack of systematicity in our diary notes, however, does not allow for a further meaningful analysis. Therefore, the explanation that follows will be based on Christos' data only.

5.1.2.5. Explanation

Our own explanation of the Greek BADs is the following: both vowel lengthening or vowel doubling and reduplication are iconic means of signalling marked morphological categories (cf. Dressler 1995; Kilani-Schoch & Dressler 2005). Furthermore, in Modern Greek the subjunctive is a marked category in opposition to the unmarked verb category of indicative. Thus, Christos replaced the analytic iconic addition of the particle *na* with the weaker iconic and synthetic devices of vowel lengthening or doubling and reduplication. This fits the earlier emergence of synthetic morphology better than that of analytic morphology (cf. Dressler *et al.* 2003). Note that morphological reduplication has the same source as, but differs from, syntactic doubling of a noun for expressing nominal plurality (as briefly mentioned in Clark & Nikitina 2009).

Coincidentally, Ancient Greek (albeit formally in a slightly different way) also used vowel lengthening for marking the subjunctive: the linking vowel is lengthened in the subjunctive, e.g. *paideú-ō-men* 'let us educate' vs indicative *paideú-o-men*. And reduplication signals the marked tenses perfect (e.g. *pe-paideú-ka-men*) and the strong aorist in the Homeric subtype *pe-píth-o-men* vs present indicative *peíth-o-men* 'we convince' (the vowel of the reduplicating syllable in these reduplicative subtypes is always /e/).

Thus, the analytic (not formulaic) child Christos has, so to say, (partially) reinvented two natural Greek techniques. His reduplication (including cases which can also be interpreted as consonant harmony) started as a partial syllabic compensation or replacement of prestressed lexical syllables. He soon morphologised it though, (cf. Christofidou & Kappa 1998) by focusing it on subjunctive formation (two days after producing the first, particle-less subjunctives), and he later extended

it rarely to future formation. Whereas the first blind alley lasted only two weeks, subjunctive reduplication had its heyday for one month. Afterwards, he greatly decreased and finally gave up its use. But after a pause of 2 months he gave it a second try for only 20 days (see above). Slobin (1994) has also noticed some parallels in the use of the English Present Perfect between diachronic and ontogenetic developments, stating that they seem to result from different processes (cf. Tomasello, 2003: 13; cf. also 9-14).

5.1.3. Greek repetition of a hypocoristic suffix

The Greek diminutive and hypocoristic suffixes (henceforth **DIM**) can be combined but not repeated (cf. Thomadaki & Stephany 2007), e.g. examples (16).

- (16) a. *jaj-ak-úla*
 'granny-DIM-DIM'
 b. *vark-ul-áki*
 'boat-DIM-DIM'
 c. *adherf-úl-akas*
 'brother-DIM-DIM'

Only in the dialect of the island Kythera (see Katsouda 2016: 182) is there repetition of the neuter suffix *-áki* attested (not identical with the gender-preserving suffix masc. *-ákas*, fem. *-áka*) (examples 17).

- (17) a. *skil-ak-áki*
 'dog-DIM-DIM'
 b. *pedh-ak-áki*
 'child-DIM-DIM'.

forms which the Athenian child cannot have heard.

In the diary notes of Stephanos' language acquisition (0;10.15 – 4;8.0) we find at 1;11 several instances of repetition of the hypocoristic suffixes masc. *-ákas*, fem. *-áka* as a means of pragmatic intensification (emphasising affection and enthusiasm) in the vocatives *bab-ák-aka* 'dad-DIM-DIM!', *mam-ák-aka* 'mum-DIM-DIM!', analogically extended to the existing vocatives *papú* 'grandfather', *papú-li* (with the masc. *-úlis* suffix) resulting in the non-existing analogical diminutive form **papú-ka* 'grandpa-DIM' and *papú-k-aka* 'grandpa-DIM-DIM'. All these forms are used by the child in addressing his closest caregivers and show an intensification of pragmatic meaning.

The fact that hypocoristic and diminutive suffixes must not be repeated in Standard Greek and in most of its dialects is a language-specific feature. In many languages (e.g. Italian, Spanish, Slavic languages) diminutive and particularly hypocoristic suffixes can be repeated recursively, especially for pragmatic purposes (cf. Savickienė & Dressler 2007), an instance of the preference for iconicity (cf. Dressler 1995). This is again a BAD without a model in the input, based on the iconicity preference of expressing intensification through doubling.

5.2. *Blind-alley developments in the weak sense*

BADs in the weak sense are characterised by a development from an impoverished intake of the input, which instead of going in the direction of the input target, goes away from it.

5.2.1. *French /r/-insertion*

This French BAD consists in an extended non-targetlike insertion of an additional segment /r/ at word boundary in the production of the (Swiss) French-speaking child Sophie. /r/ insertion lasted five months (2;2 – 2;7), while the peak of the phenomenon was between 2;4 and 2;6.

The data displayed 53 instances, predominantly between two words forming an intervocalic context (examples (19-23)), occasionally after a consonant (example (24)):

- (18) 2;2 [sase]-[r]-on bonbon for chercher [=ʃɛʀʃe] un bonbon
'look for a candy'.
- (19) 2;3 pas [truve]-[r]-ochon for pas trouvé le cochon
not find.INF pig '(we) have not found the pig'.
- (20) 2;3 e donner [=dɔne]-[r]-une bavette for [dɔneyn] bavette
'FILLER give a bib'.
- (21) 2;4 là-[r]-une vache
'there a cow'.
- (22) 2;4 pris [=pri]-[r]-une tasse
'taken a glass'.
- (23) 2;6 et [=ɛ]-[r]-une pour moi
'and one for me'.
- (24) 2;7 avec-[r]-un [plats]
'with a [childish word]'.
- (25) 2;4 ben... [r]-une vache
'well, a cow'.

Although examples (18) and (20) are potential contexts of liaison with /r/, they are in fact contexts of loose syntactic cohesion where liaison is optional and realised only in highly formal styles. This type of liaison is impossible in CDS.

However, in the adult language, if an infinitive form ends with a phonetic /r/ as in several verb classes, e.g.

- (26) a. *partir*
 'to go'
- b. *voir*
 'see'
- c. *faire*
 'make'
- d. *lire*
 'read'

there is an automatic linking (*enchaînement*) of the final consonant with the initial vowel of the following word, i.e. the final consonant of the left word is resyllabified with the initial vowel of the right word and they form a syllable across the word boundary:

- (27) a. *partir_en France*
 'go to France'
- b. *voir_un oiseau*
 'see a bird'
- c. *faire_un tour*
 'take a look around'
- d. *lire_un livre*
 'read a book'.

Similarly, in example (24) there should be a linking of the left coda [k] with the initial vowel of the right word *un* [avɛkœ̃].

Excluding a phonological account of the phenomenon (cf. Kilani-Schoch 2013), we can characterise the morphosyntactic context of /r/-insertion as the position before the indefinite feminine or masculine article *une* and *un* (examples (18), (20-25)), as well as before the preposition *à* 'at' (example (28)) and the adverb *aussi* 'too' (example (29)), systematic at 2;5 according to the report of Sophie's mother:

- (31) *lire_un livre*
'read a book' (CDS :17 tokens = 18% - CS: 8 tokens = 10%).
- (32) *venir_un moment*
'stay for a while' (CDS: 7 tokens = 9% - CS: 12 tokens = 15%).

This strongly suggests that the intake of these utterances in CS is pragmatically motivated: all three utterances are used to convey indirect requests related to critical situations and to activities highly desired by the child, as shown by their recurrence throughout the corpus (cf. Levy & Nelson 1994).²

One might ask oneself how the phenomenon of /r/-insertion differs from the classical errors in the acquisition of liaison, i.e. why it should be analyzed as a blind alley whereas false prefixations of liaison consonants such as Sophie 2;5 *petits-n-ours* for *petits-z-ours* 'small bears' should not.

According to the most recent analysis, development of liaison is hypothesised to consist first of various lexical forms or allomorphs with a prefixed onset resulting from false segmentation of the liaison consonant that the children learn to associate with a specific left word: *n-avion* 'plane' with *un*, *t-avion* with *petit* 'small', *z-avions* with *les* [DEF. PL.ART] 'the' or *des* [INDEF.PL.ART], etc. and specific consonant as a function of the class of the left word (cf. Morin 2005; Chevrot *et al.* 2009).

/r/-insertion also involves false segmentation. But the syntactic and phonological contexts of occurrence are different. In the case of /r/, it is impossible for the child to build a hypothesis of the classes of the left word that appears before the determiner *un/une*, since virtually any kind of word ending in a consonant can occur in this position in the input. It seems rather that on the basis of statistical distribution in CDS ('distributional learning', cf. Taelman *et al.* 2009) and pragmatic salience, Sophie has built an allomorph *r-un/une* of the indefinite article.

Hence, in the case of /r/-insertion, the child has to learn that she must dissociate the consonant from the functional word, i.e. suppress or block the production of the additional consonant in each occurrence of *un/une*. The pattern itself must be suppressed, even in the contexts of optional liaison, for the realisation of which the child has no model in the input. Another difference is that, in spite of the unconstrained syntactic context, the child's insertion is morphosyntactically conditioned: /r/ is added to certain functional words only, specifically to *un/une*, adverbial *aussi* 'too' and preposition *à* 'at'.³ In a way /r/-insertion looks like a morphological use of a phonological segment resulting

from resegmentation/false segmentation and thus appears to be a case of morphologisation. This case appears to be the reverse of the cases discussed by Peters & Menn (1993), Vihman (1996) and Taelman *et al.* (2009) showing phonologisation of a morpheme. The linking of /r/ with the initial vowel of the morphemes *un/une*, much less frequently with *à* and *aussi*, i.e. nearly always with monosyllabic function words, seems to have led the child to reanalyze /r/ as the onset of these grammatical morphemes.⁴ This reanalysis explains that /r/ may appear after a word ending in a consonant, as in example (24).

The fact that the occurrence of /r/ takes place in the specific context of consonant linking may be accounted for by a ‘conspiracy’ of phonological and grammatical factors (besides the just mentioned pragmatic one). At the time when the feminine indefinite article emerges, i.e. at about 2;2 (cf. Table 3), the child has just mastered the realisation of /r/, which is well-known for its phonetic complexity (Jakobson 1941; Demuth & McCullough 2009: 434). This achievement may have resulted in an over-extension of the newly controlled segment to the category of determiners which is consolidating by grammaticisation of fillers (from 2;2 on). As we have seen, the over-extension especially occurs with the late-emerging feminine indefinite article. The principle of iconicity, which consists in formally marking semantically marked categories, might be a motivation for the change, insofar as *r-une* is even more distinct from the unmarked masculine *un* than the target form *une*. However, this account neglects the cases of intrusive /r/ with the masculine article. What can be hypothesised is that, in the current protomorphological period, the indefinite articles tend to align on the syllabic structure of definite articles (*le, la*) and more generally of determiners which all have an initial consonant. This tendency is plausibly backed up by the correspondence of the determiner schema with the preferred syllabic structure CV and with the equally preferred morphoprosodic CVC structure of monosyllables. It is an instance of the parameter of preferred size of morphological units.

No similar blind alley has been documented in Emma’s speech. Nevertheless, sporadic intrusions of /r/ also occurred between 1;8 and 3;0 (13 occurrences). They are mainly found in noun phrases after (or before, cf. example (34)) the determiner or the preposition *à* ‘at’ (including the portmanteau *au* corresponding to *à* + definite masculine article *le*) before a noun beginning with a consonant, examples (33-34):

(33) 1;8 *un-[r]-nounours* for *un nounours*
‘a teddy’.

(34) 1;9 *Mamy est au-[r]-tavail* for *Mamy est au travail*
‘mum is at work’ (2 tokens).

and in the multilexical unit *brosse à dents* ‘toothbrush’:

- (35) 1;10 *la brosse à-[r]-dents* (3 tokens)
‘the toothbrush’.

A unique example occurs before the indefinite determiner:

- (36) 2;9 *j’ai fait-[r]-un rond*
‘I made a circle’.

In contrast to Sophie’s BAD, all of these examples can be analyzed as involving errors in the phonological course production, as they either perseverate or anticipate a segment /r/ of a preceding (example (35)) or following word (examples (33), (36)) or change position (example (34)). To that extent, in spite of the fact that they appear in similar contexts (between a functor and the lexical head), they differ from intrusive /r/ in Sophie’s data.

The same phonological motivation can be seen in

- (37) 2;7 *peux-[r]-attendre* for *tu peux attendre*
‘(you) can wait’

whereas

- (38) 2;5 *c’est pas-[r]-comme ça*
‘it’s not like that’

is isolated.

The difference between the two children, i.e. the absence of the BA in Emma’s data, may be attributed to the latter child’s much greater tendency and ability to accurately imitate CDS sequences.

5.2.2. German compound (non)interfixation

German compounding consists of many directly or indirectly competing patterns (cf. Ortner & Müller-Bollhagen 1991; Dressler *et al.* 2001; Krott *et al.* 2007). In acquisition (cf. Korecky-Kröll *et al.* 2017), in accordance with their respective productivity and frequency, noun-noun compounds emerge before other compounds and, among them, first the transparent ones with pure concatenation (i.e. without interfixation), then, among those with opacifying interfixation, first those with the

interfix *-n-* after stem-final schwa (written <e>) of the first compound member, as in *Blume-n-topf* ‘flower pot’ (cf. Dressler *et al.* 2010). Noun-noun compounds with an interfix *-e-* are unproductive and infrequent and thus should and usually do emerge much later.

However, from 2;2 onwards Lena produced incorrect *-e-*interfixes (examples (39a-c,e)), and only later and always more frequently, she correctly produced target forms with and without *-e-*interfix (examples (39d,f)).

- (39) a. 2;2 **Kinn + e + sette* for *Kind + er + kassette*
‘child-cassette’
- b. 2;3 *(*Mine*)*ral + e + wasser* for *Mineral + Wasser*
‘mineral water’
- c. 2;7 **Zähn + e + weh* for *Zahn + weh*
‘tooth ache’
- vs d. 2;11 *Zahn + pasta* (correct)
‘toothpaste’.
- e. 2;11 **Luft + e + bon-e* for PL *Luft + ballon-e*
‘air balloons’
- vs f. 2;10 *Hund + e + wüerstel* (correct)
‘dog shit’.

Incorrect lack of *-n-*interfix first occurred at 2;1 and 2;3 (example (40)),

- (40) **Lippe + stift*
‘lip stick’

at 2;5 (examples (41a-b)),

- (41) a. **Platte + spieler*
‘record-player’
- b. *Ente + schule* (neologistic)
‘duck school’ (2;10: 4 tokens),

alongside correctly interfixed (example (41c)) and correctly non-interfixed (example (41d)):

- c. *Ente + n + schule* (2 tokens)
‘duck school’
- d. *Käse + semmel* (cf. at 2;6 *Käse + wurst* ‘cheese sausage’)
‘cheese roll’

- e. 3;0 **Ameise + buch* (neologistic without the necessary interfix)
'ant-book'.

Lena produced no *-n*-interfix.

Jan produced much fewer non-targetlike compounds: incorrect *-e*-interfixes in example (42a-b), after two earlier correct *-e*-interfixations.

(42) Neologisms

- a. 2;4 **Bank + e + sache*
'bank thing'
- b. 2;9 **Zwerg + e + spiel*
'dwarf play'.

Dubious examples are (43a-b):

- (43) a. 2;3 *Mäus + e + baby*
'mice-baby'
- b. 2;4 *Mickey + mäus + e + baby*.

Later on, alongside 10 correct *-e*-interfixations, the only incorrect one was the neologism **Luft + e + spiele* 'air-plays' (3;8).

The *-n*-interfix was lacking in example (44a) and in the neologistic example (44b) (1 token) alongside example (44c) (3 tokens) and 6 more correct *-n*-interfixations.

- (44) a. 1;9 **Hase + mama*
'rabbit mum'
- b. 2;2 **Ente + auto* (neologism)
'duck-car'
- vs c. 2;2 *Ente + n + auto* (3 tokens).

Afterwards, all targetlike compounds produced had maintained their *-n*-interfixes.

Thus, in a sort of conspiracy, Lena and, to much less extent, Jan had a period of favouring compounds with an internal *-e*-schwa at the end of the first compound member, either by non-interfixing *-n*- after word-final schwa or by wrongly introducing a wrong schwa pseudo-interfix after a word-final consonant, in both synthetic compounds and

in other types of compounds.

This BAD (in the weak sense) can be related to the naturalness parameter of (bi)uniqueness, in that a schwa at the boundary between the compound constituents functions as a unique sign of compounding, in competition both with the earliest emerging interfix (-*n*-) and the morphotactically most transparent pattern of simply concatenating the compound constituents. This BAD could also be interpreted as a derivational correspondent of Slobin's (1985: 1216) inflectional imperialism, and therefore not incompatible with a usage-based approach. However, it is still a development which is in contrast to the rarity of unproductive -*e*-interfixes in the input.

6. Conclusion

BADs in the strong sense are on the one hand incompatible with current usage-based acquisition models insofar as these insist that children's language acquisition is always based on children's input from child-directed speech.

On the other hand, current nativist acquisition models cannot explain such BADs either, because there is nothing in Universal Grammar, i.e. no principle or parameter (including parameter setting principles) which could be the base for them or restrict conceivable BAD developments. Not even in the most recent morphology-theoretical publications of Yang (2002; 2018; cf. Lignos & Young 2016; Gorman & Yang 2019) is there an explanation, where, despite his critique of usage-based models, his tolerance principle and his sufficiency principle depend on sufficient input. And if a BAD, without support in the input, should have miraculously emerged, it should be immediately knocked out by these two input-based principles, which is not the case in our examples. As such, Yang's two principles may hold only for later acquisition phases.

NM can explain such BADs by cognitively based preferences which emerge as a natural outcome of cognitive development. To have a cognitive, in our case, semiotic base is the only constraint assumed for possible BADs. As a consequence, the constructions created by BADs should occur in some other languages. Thus, Feyerabendian "everything goes" is not allowed for potential BADs (answer to the last research question of section 3).

As to the first research question of section 3, the A-type BADs (those in the strong sense) that we found so far, are all based on the iconicity preference by expressing a marked partner through reduplication, doubling or lengthening. This also holds for the case of syntactic doubling of a noun for expressing nominal plural, as mentioned in

Clark & Nikitina (2009). Our two BADs in the weak sense refer to the preference parameters of the optimal size of morphological units and of (bi)uniqueness.

B-type BADs (those in the weak sense) could be construed as analogical developments, but all analogical developments in the course of language acquisition assumed both in dual-route models (cf. Marcus 2000; Eddington 2000) and in single-route models, including our own work (cf. Laaha *et al.* 2006; Ravid *et al.* 2008: 30; Dressler & Laaha 2012), show a much closer link between model and outcome of analogy. Furthermore, such drastic developments away from the input targets have not been assumed in studies on the acquisition of morphology (except in those cited as forerunners or parallels in section 2).

As to the second research question, the impoverished inputs in the case of A-type BADs is simply the absence of the marked correspondent (e.g. Greek subjunctive) of an already emerged unmarked category (e.g. Greek indicative). On the amount of impoverishment of B-type BADs we can say only that impoverishment is smaller than in the case of fillers (see section 1).

As to research question 3, our hypothesis that BADs start in late premorphology (Russian reduplication) or early protomorphology is supported.

Our hypothesis on research question 4 is not supported, insofar as that BADs may last for a long time, in competition with target-dependent and target-directed 'normal' developments. In contrast, the first BAD of Greek subjunctive acquisition, which had no competitor, lasted for only less than three full weeks. Note, however, that Christos' strategy contrasted not only with the morphological but also with the phonological input. This may mean that children hesitate to disband their own, most autonomous constructions.

We have too few examples of BADs in order to answer research question 5. In the competitions we could not detect typical trends other than targetlike competitors taking over more and more in the later phases of BADs, which is compatible with our hypothesis.

As to research question 6, the fresh start after the first Greek subjunctive BAD, in support of our hypothesis consisted in another A-type BAD, which is quite different. Otherwise there is no fresh start after the end of a BAD, because usually the number and percentage of BAD productions simply decreases in comparison with more targetlike developments.

A reasonable answer to research question 7 is again impeded by us having found only two examples of B-type BADs.

Although NM can account for BADs, which nativist and usage-based models cannot so far, our challenge to these two main trends in child

language acquisition studies does not pretend that only NM can account for BADs in principle. Our challenge should instead be understood as an invitation to proponents of other approaches to try to fill a lacuna in their own model and either to take over (parts of) our analysis or to come up with a new competing analysis. For example, a proponent of a nativist approach might postulate and justify an iconicity parameter in Universal Grammar. Usage-based approaches may exploit their claims on the “interaction between cognition and use” and the “pressure for iconicity of form and function” (Ibbotson 2013: 1, 7, respectively), provided that they allow and justify some sort of a non-linguistic input.

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Notes

¹ The type of the reduplicated form *pipi* (for *na bi*) ‘to get into’ (2;0.4) is an imitation and it seems to have future meaning. See also below.

² Examples (30-31) express the want to extend the interaction with the mother, example (32) expresses the desire to stay with the mother instead of going to bed.

³ Notice that the intrusive or linking-/r/ documented in so-called non-rhotic dialects of English (Lass 1984: 71-72) is strictly phonologically conditioned, whereas our case is limited to free grammatical morphemes.

⁴ Such reanalysis of /r/, which does not exist in the input, also seems excluded in the adult language.

Bibliographical References

- Bittner, Dagmar; Dressler, Wolfgang U. & Kilani-Schoch, Marianne (eds.) 2003. *Development of Verb Inflection in First Language Acquisition: A Cross-Linguistic Perspective*. Berlin: Mouton de Gruyter.
- Bybee, Joan 2010. *Language, usage and cognition*. Cambridge: Cambridge University Press.
- Chevrot, Jean-Pierre; Dugua, Céline & Fayol, Michel 2009. Liaison acquisition, word segmentation and construction in French: a usage-based account.

- Journal of Child Language* 36. 557-596.
- Christofidou, Anastasia & Kappa, Ioanna 1998. Pre- and protomorphological fillers in Greek language acquisition. In Gillis, Steven (ed.), *Studies in the Acquisition of Number and Diminutive Marking, Antwerp Papers in Linguistics* 95. 193-214.
- Christofidou, Anastasia & Stephany, Ursula 2003. Early phases in the development of Greek verb inflection. In Bittner, Dagmar; Dressler, Wolfgang U. & Kilani-Schoch, Marianne (eds.), *Development of Verb Inflection in First Language Acquisition: A Cross-Linguistic Perspective*. Berlin: Mouton de Gruyter. 89-129.
- Clark, Eve V. 1993. *The Lexicon in Acquisition*. Cambridge: Cambridge University Press.
- Clark, Eve V. 2001. Emergent categories in first language acquisition. In Bowerman, Melissa & Levinson, Stephen C. (eds.), *Language Acquisition and Conceptual Development*. Cambridge: Cambridge University Press. 379-405.
- Clark, Eve V. & Nikitina, Tatiana V. 2009. One vs. more than one: Antecedents to plurality in early language acquisition. *Linguistics* 47. 103-139.
- Demuth Katherine & McCullough, Elizabeth 2009. The longitudinal development of clusters in French. *Journal of Child Language* 36. 425-448.
- Dressler, Wolfgang U. 1968. *Studien zur verbalen Pluralität*. Vienna: Böhlau.
- Dressler, Wolfgang U. 1995. Interactions between iconicity and other semiotic parameters in language. In Simone, Raffaele (ed.), *Iconicity in Language*. Amsterdam: John Benjamins. 21-37.
- Dressler, Wolfgang U. 2010. A typological approach to first language acquisition. In Kail, Michèle & Hickmann, Maya (eds.), *Language Acquisition Across Linguistic and Cognitive Systems*. Amsterdam: John Benjamins. 109-124.
- Dressler, Wolfgang U.; Libben, Gary; Stark, Jacqueline; Pons, Christine & Jarema, Gonia 2001. The processing of interfixed German compounds. *Yearbook of Morphology 1999*. 185-220.
- Dressler, Wolfgang U. 2000. Extragrammatical vs. marginal morphology. In Doleschal, Ursula & Thornton, Anna (eds.), *Extragrammatical and Marginal Morphology*. München: Lincom Europa. 1-10.
- Dressler, Wolfgang U.; Dziubalska-Kolaczyk, Katarzyna; Gagarina, Natalia & Kilani-Schoch, Marianne 2005. Reduplication in Child Language. In Hurch, Bernhard (ed.), *Studies on Reduplication*. Berlin / New York: Mouton de Gruyter. 455-474.
- Dressler, Wolfgang U. & Karpf, Annemarie 1995. The theoretical relevance of pre- and protomorphology in language acquisition. *Yearbook of Morphology 1994*. 99-122.
- Dressler, Wolfgang U. & Kilani-Schoch, Marianne 2001. On the possible rise and inevitable fall of fillers. *Journal of Child Language* 28. 250-253.
- Dressler, Wolfgang U.; Ketrez, Nihan F. & Kilani-Schoch, Marianne (eds.) 2017. *Nominal Compound Acquisition*. Amsterdam: John Benjamins.
- Dressler, Wolfgang U.; Kilani-Schoch, Marianne & Klampfer, Sabine 2003. How does a child detect morphology? Evidence from production. In Baayen, R. Harald & Schreuder, Robert (eds.), *Morphological Structure in Language Processing*. Berlin: Mouton de Gruyter. 391-425.
- Dressler, Wolfgang U. & Kilani-Schoch, Marianne 2016. Natural Morphology. In Hippisley, Andrew & Stump, Gregory (eds.), *The Cambridge Handbook of*

- Morphology*. Cambridge: Cambridge University Press. 356-389.
- Dressler, Wolfgang U. & Laaha, Sabine 2012. The impact of types of analogy on first language acquisition. *Lingue e Linguaggio* 1. 107-121.
- Dressler, Wolfgang U.; Libben, Gary & Korecky-Kröll, Katharina 2014. Conflicting vs. convergent vs. interdependent motivations in morphology. In MacWhinney, Brian; Malchukov, Andrej & Moravcsik Edith (eds.), *Competing Motivations in Grammar and Usage*. Oxford: Oxford University Press. 181-196.
- Dressler, Wolfgang U.; Lettner, Laura E. & Korecky-Kröll, Katharina 2010. First language acquisition of compounds with special emphasis on early German child language. In Scalise, Sergio & Vogel, Irene (eds.), *Cross-Disciplinary Issues in Compounding*. Amsterdam: John Benjamins. 323-344.
- Eddington, David 2000. Analogy and the dual route model of morphology. *Lingua* 110. 281-298.
- Feldman, Andrea & Menn, Lise 2003. Up close and personal: a case study of the development of three English fillers. *Journal of Child Language* 30. 735-768.
- Feyerabend, Paul 1975. *Against Method: Outline of an Anarchistic Theory of Knowledge*. London: NLB.
- Gagarina, Natalia 1997. Aspektual'naja semantika i funkcionirovanije vidov russkogo glagola v detskoj rechi [Aspectual semantic functioning of aspects of the Russian word in child speech]. PhD dissertation. Herzen State Pedagogical University, St. Petersburg.
- Gagarina, Natalia 2000. The acquisition of aspectuality by Russian children: the early stages. *ZAS Papers in Linguistics* 15. 232-246.
- Gagarina, Natalia 2008. Ošibki v upotreblenii glagolnyx form pri usvornii det'mi russkogo jazyka [Errors in the use of verbal forms when children learn Russian]. *Bulletin of the Leningrad State University*. 1-16.
- Gorman, Kyle & Yang, Charles 2019. When nobody wins. In Gardani, Francesco; Rainer, Franz; Luschützky, Hans Christian & Dressler, Wolfgang U. (eds.) *Competition in Inflection and Word-formation*. Berlin: Springer.
- Ibbotson, Paul 2013. The scope of usage-based theory. *Frontiers in Psychology* 4, 255. 1-15.
- Inkelas, Sharon & Zoll, Cheryl 2005. *Reduplication: Doubling in Morphology*. Cambridge: Cambridge University Press.
- Jakobson, Roman 1941. *Kindersprache, Aphasie und allgemeine Lautgesetze*. Uppsala: Almqvist & Wiksel.
- Karmiloff-Smith, Annette 1992. *Beyond Modularity: A Developmental Perspective on Cognitive Science*. Cambridge / London: MIT Press / Bradford Books.
- Karpf, Annemarie 1990. *Selbstorganisationsprozesse in der sprachlichen Ontogenese: Erst- und Fremdsprachen*. Tübingen: Narr.
- Katsouda, Georgia 2016. *To idioma ton Kithiron. Perigrifi ke analysi*. Athens: Eteria Kythiraikon Meleton.
- Kilani-Schoch, Marianne 2013. Énigme (mor)phonologique dans un corpus d'acquisition en français. In Prikhodkine, Alexei & Xanthos, Aris (eds.) *Mélanges offerts en hommage à Remi Jolivet. Cahiers de l'ILSL* 36. 69-87.
- Kilani-Schoch, Marianne; de Marco, Anna; Christofidou, Anastasia; Vassilakou, Maria; Vollmann, Ralf & Dressler, Wolfgang U. 1997. On the demarcation of phases in early morphology acquisition in four languages. *Papers and Studies in Contrastive Linguistics* 33. 15-32.

- Kilani-Schoch, Marianne & Dressler, Wolfgang U. 2002. The emergence of inflectional paradigms in two French corpora: An illustration of general problems of pre- and protomorphology. In Voeikova, Maria D. & Dressler, Wolfgang U. (eds.), *Pre- and Protomorphology*. München: Lincom. 45-59.
- Kilani-Schoch, Marianne & Dressler, Wolfgang U. 2005. *Morphologie naturelle et flexion du verbe français*. Tübingen: Narr.
- Kirjavainen, Minna; Theakston, Anna L. & Lieven, Elena V. 2009. Can input explain children's me-for-I errors? *Journal of Child Language* 36. 1091-1114.
- Korecky-Kröll, Katharina; Sommer-Lolei, Sabine & Dressler, Wolfgang U. 2017. Emergence and early development of German compounds. In Dressler, Wolfgang U.; Ketrez, F. Nihan & Kilani-Schoch, Marianne (eds.), *Nominal Compound Acquisition*. Amsterdam: John Benjamins. 19-37.
- Krott, Andrea; Schreuder, Robert; Baayen, Harald R. & Dressler, Wolfgang U. 2007. Analogical effects on linking elements in German compound words. *Language and Cognitive Processes* 22. 25-57.
- Laaha, Sabine; Ravid, Dorit; Korecky-Kröll, Katharina; Laaha, Gregor & Dressler, Wolfgang U. 2006. Early noun plurals in German: regularity, productivity or default? *Journal of Child Language* 33. 271-302.
- Lass, Roger 1984. *Phonology*. Cambridge: Cambridge University Press.
- Levy, Elena T. & Nelson, Katherine 1994. Words in discourse: a dialectical approach to the acquisition of meaning and use. *Journal of Child Language* 21. 367-389.
- Lieven, Elena 2008. Learning the English auxiliary: A usage-based approach. In Behrens, Heike (ed.), *Corpora in Language Acquisition Research. History, Methods, Perspectives*. Amsterdam: John Benjamins. 25-60.
- Lieven, Elena 2014. First language development: A usage-based perspective on past and current research. *Journal of Child Language* 41, Supplement 1. 48-63.
- Lignos, Constantine & Yang, Charles 2016. Morphology and language acquisition. In Hippisley, Andrew & Stump, Gregory (eds.), *The Cambridge Handbook of Morphology*. Cambridge: Cambridge University Press. 765-791.
- Marcus, Gary F. 2000. Children's overregularization and its implications for cognition. In Broeder, Peter & Murre, Jaap (eds.), *Models of Language Acquisition: Inductive and Deductive Approaches*. Oxford: Oxford University Press. 154-176.
- Mariscal, Sonia 2009. Early acquisition of gender agreement in the Spanish noun phrase: starting small. *Journal of Child Language* 36. 143-171.
- Maturana, Humberto & Varela, Francisco J. 1980. *Autopoiesis and Cognition*. Dordrecht: Reidel.
- Morin, Yves Charles 2005. La liaison relève-t-elle d'une tendance à éviter les hiatus? *Langages*, 158. 8-23.
- Munson, Joy & Ingram, David 1985. Morphology before syntax: A case study from language acquisition. *Journal of Child Language* 12, 681-684.
- Ortner, Lorelies & Müller-Bollhagen, Elgin 1991. *Substantivkomposita*. Berlin: de Gruyter.
- Pater, Joe; Stager, Christine & Werker, Janet 2004. The perceptual acquisition of phonological contrasts. *Language* 80. 384-402.
- Peters, Anne M. & Menn, Lise 1993. False starts and filler syllables: ways to learn grammatical morphemes. *Language* 69. 742-777.
- Pinker, Steven 1999. *Words and Rules: The Ingredients of Language*. London: Weidenfeld & Nicolson.
- Ravid, Dorit; Dressler, Wolfgang U.; Nir-Sagiv, Bracha; Korecky-Kröll, Katharina;

- Souman, Agnita; Rehfeldt, Katja; Laaha, Sabine; Bertl, Johannes; Basbøll, Hans & Gillis, Steven 2008. Core morphology in child-directed speech. Crosslinguistic corpus analyses of noun plurals. In Behrens, Heike (ed.), *Corpora in Language Acquisition Research. History, methods, perspectives*. Amsterdam: John Benjamins. 61-96.
- Savickienė, Ineta & Dressler, Wolfgang U. (eds.) 2007. *The Acquisition of Diminutives*. Amsterdam: John Benjamins.
- Singer, Wolf 1989. Ontogenetic self-organization and learning. In McGaugh, James L.; Weinberger, Norman M. & Lynch, Gary (eds.), *Brain Organization and Memory: Cells, Systems and Circuits*. Oxford: Oxford University Press. 211-233.
- Slobin, Dan I. 1994. Talking perfectly: Discourse origins of the present perfect. In Pagliuca, William (ed.), *Perspectives on Grammaticalization*. Amsterdam: John Benjamins. 119-133.
- Slobin, Dan I. 1985. Crosslinguistic evidence for the language-making capacity. In Slobin, Dan I. (ed.), *The Crosslinguistic Study of Language Acquisition*, Vol. 2. Hillsdale, NJ: Erlbaum. 1157-1256.
- Stephany, Ursula & Christofidou, Anastasia 2009. The emergence of nominal inflection in Greek. In Stephany, Ursula & Voeikova, Maria D. (eds.), *Development of Nominal Inflection in First Language Acquisition: A Cross-linguistic Perspective*. Berlin: Mouton de Gruyter. 217-264.
- Stephany, Ursula & Voeikova, Maria D. (eds.) 2009. *Development of Nominal Inflection in First Language Acquisition: A Cross-linguistic Perspective*. Berlin: Mouton de Gruyter.
- Taelman, Helena; Durieux, Gert & Gillis, Steven 2009. Fillers as signs of distributional learning. *Journal of Child Language* 35. 323-353.
- Thomadaki, Evangelia & Stephany, Ursula 2007. Diminutives in Greek child language. In Savickienė, Ineta & Dressler, Wolfgang U. (eds), *The Acquisition of Diminutives: A Cross-Linguistic Perspective*. Amsterdam / Philadelphia: John Benjamins. 89-123.
- Tomasello, Michael 2003. *Constructing a Language: A Usage-Based Theory of Language Acquisition*. Cambridge: Harvard University Press.
- Vihman, Marilyn M. 1996. *Phonological Development: The Origins of Language in the Child*. Oxford: Blackwell.
- Vollmann, Ralf; Sedlak, Maria; Müller, Brigitta & Vassilakou, Maria 1997. Early verb inflection and noun plural formation in four Austrian children: The demarcation of phases and interindividual variation. *Papers and Studies in Contrastive Linguistics* 33. 59-78.
- Yang, Charles 2002. *Knowledge and Learning in Natural Language*. Oxford: Oxford University Press.
- Yang, Charles 2018. A formalist perspective on language acquisition. *Linguistic Approaches to Bilingualism* 8. 665-706.