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On the emergence of reduplication in German morphophonology¹

Abstract

This paper discusses reduplication as a technique of word formation in German within the framework of Optimality Theory. In contrast to previous approaches, the proposed taxonomy identifies rhyme and ablaut reduplication as the only productive, truly reduplicative processes in the morphology of German. All other conceivable cases of reduplicative structures are properly treated as either phonological doubling, lexical sequencing or (special cases of) compounding. An OT analysis is offered which suggests that both rhyme and ablaut reduplication may emerge when a segmentally and prosodically unspecified expressive morpheme is attached to a base – given that the base strictly obeys certain word prosodic requirements. The present approach eschews constraints that make explicit reference to base-reduplicant correspondence. The OT grammar successfully models the emergence of the fixed bipedal structure, the obligatory segmental deviance of the reduplicant, non-exponence of the expressive morpheme in the case of non-trochaic bases, the variable linearization of base and reduplicant in ablaut reduplication, and the interaction of reduplication with i) segmental alternations and ii) onset complexity. Certain (cross-linguistic) correlations regarding constraints on reduplicative word formation and poetic devices, such as rhyme and meter, are discussed.

¹**Acknowledgements ...**

1 Introduction

This paper discusses reduplication as a technique of word formation in German within the framework of Optimality Theory. The central morphological devices for the creation of new words in German, viz. derivation via affixation and compounding, generally concatenate pre-existing bound or free morphs. In contrast to the segmentally specified morphs, the reduplicative exponent is a chameleon – its segmental realization is variable and determined by the stem to which it is attached. As an example, in the word *Hinkepinke* (“hopscotch”) < *hinken* (“to hobble”), the suffixed reduplicant² is disyllabic [pɪŋkə] while in the case of *Quitschquatsch* (“Fiddelsticks!”) < *Quatsch* (“nonsense”), the reduplicant is the prefixed monosyllable [kvɪtʃ]. The apparently flexible anchoring in addition to the variable segmental and syllabic structure of the reduplicant, and the playful and facetious connotation of these words suggest that this process is “extragrammatical” (Dressler, 2000). Nevertheless, in line with recent research on this topic (Saba Kirchner, 2010; Wiese, 2001), I will argue that reduplication is in fact the result of quite regular derivational affixation with the unusual proviso that the affix be segmentally underspecified. As a consequence, the chameleonesque behavior must be rooted in the phonology. The treatise of German reduplication to be presented here accords with this stance and aims at proposing a coherent analysis of this phenomenon.

The diversity of reduplicative word forms was documented by Bzdęga (1965) who presents an impressive collection of approximately 1880 reduplicative tokens gleaned from a broad range of dialectal and historical strata of German. Bzdęga (1965) distinguishes ten classes of reduplication which he organizes according to the identity of base and reduplicant, the relation of the vowel in the base and the reduplicant (harmonic vs. ablauting), the size (full vs. partial reduplication) and, where applicable, direction of affixation (prefixal, infixal, suffixal reduplication); Bzdęga’s classification is reproduced in (1).

- (1) Bzdegas classification of reduplications in German
 - a. vowel-harmonic total reduplication: *Pinkepinke*, *Mama*
 - b. vowel-harmonic prefixal *momorgen* < *morgen*(?)
 - c. vowel-harmonic infixal *Kuckuck*
 - d. vowel-harmonic suffixal *papperlapapp*
 - e. vowel-harmonic total reduplication, heterogeneous (rhyme): *Kuddelmuddel*
 - f. vowel-harmonic infixal, heterogeneous: *rumpumpeln*

²I use the terms *base* and *reduplicant* in a pre-theoretic, merely descriptive way: the base is the part of the reduplication most faithful to the stem’s canonical realization while the reduplicant is the (partial) copy, which may deviate from the stem w.r.t. its segmental makeup; the identification of base and reduplicant is not possible in cases of identical reduplication.

- g. vowel-alternating total reduplication (ablaut): *Wirrwarr*
- h. vowel-alternating prefixal reduplication: *Lulatsch* < *latschen*(?)
- i. vowel-alternating infixal reduplication: *Poppappel* (?) < *Pappel*
- j. vowel-alternating suffixal: *Wullewa* (?) < *Wulle* (?)

However, only a subset of the patterns identified by Bzdęga (1965) are actually attested in modern standard German. Of the 1880 different tokens collected by Bzdęga (1965), only about 100 are in general use. As Wiese (1990) notes, there are no examples of the classes in (1-b), (1-i), (1-j) in the lexicon of modern standard German, and whether the cases of (1-h) are really reduplicative in nature is at least questionable (even more so as the above example constitutes the only token of that class in my lexicon). Furthermore, whether the reduplicant in (1-c) is to be treated as an infix remains open to argument. Note that, in Bzdęga's collection, these doubtful cases are by far outnumbered by the types in (1-e) (rhyme reduplication) and (1-g) (ablaut reduplication).

The diversity of the phenomenon notwithstanding, the sparse literature on reduplication in German (Bzdęga, 1965; Schindler, 1991; Wiese, 1990) assumes that this process of word formation is marginal and unproductive. Specifically, it appears that there is no uniform analysis available for the various patterns of reduplication found in German.

In contrast to previous work on reduplication in German, I suggest that the great diversity of seemingly or effectively reduplicating patterns, their use in mainly non-standard registers, and their unpredictability, have obscured the morphophonological regularity and productivity of two kinds of reduplication, namely rhyme reduplication and ablaut reduplication. On the basis of an informal search for reduplicated word forms on the internet, I will argue that these types of reduplication in German are in fact productive albeit not fully predictable.

In order to unveil the grammar of reduplication, it is necessary to isolate those patterns from the diverse set that are unambiguous instances of reduplication, and to assign the dubious cases a proper place in the lexicon and/or grammar of German. As a first approach towards the morphophonology of reduplication, I propose a taxonomy of this diverse phenomenon, one that takes its cue from the degree of lexicality of the reduplicated form. It thus differs substantially from Bzdęga's classification, which is based upon the phonological makeup. The proposed classification is depicted in (2).

(2) Reduplicating structures

- a. not lexicalized, restricted to paralinguistic use, violating word phonotactic principles ([ts.ts.ts], sound marking disapproval, *hahaha*, *hihi*, laughter, *rattattattatta*, imitation of machine gun)
- b. phonotactically legal (onomatopoeic) interjections (*dingdong*, *palimpalim*,

- imitation of doorbell, *piffpaff*, imitation of gun)
- c. lexical sequence *sehr sehr schön* “very very nice”, *schnell schnell* “quick quick”
- d. reduplicating forms used as lexical items
 - (i) lexicalized purely phonological reduplication, onomatopoetic words (no morphological base identifiable): *Mama*, *Kuckuck*
 - (ii) reduplicative words without synchronically transparent base (*Kud-delmuddel*, *Techtelmechtel*)
 - (iii) lexicalized items with morphological base: Rhyme and ablaut reduplication *Schickimicki*, *Krimskrams*
 - (iv) *ad-hoc* formations: contrastive focus reduplication *Salat-Salat* (Ghameshi et al., 2004; Hohenhaus, 2004)

For the following characterization of reduplication, I will center upon those tokens that are used as lexical items (2-d) and ignore the many cases that are exclusively used as interjections and do not relate to any lexicalized word. I will furthermore disregard reduplications with linking elements (*klapperdiklapp* < *klappern*, *Edepopede* < *Ede*, proper name) and exceptional cases like triplication (*pipapo* < ?, *rirarutsch* < *Rutsche*, “slide”).

In Section 2, I will provide a delineation of the various types of reduplicating structures. Presenting the results of the internet search, I will then attest the productivity of rhyme and ablaut reduplication (Section 3). These will be discussed vis-à-vis related phenomena like -i-truncations and binomial constructions. I will furthermore hint at two interesting correlations concerning i) the grammar of reduplication in German(ic) on the one hand and Italian and French on the other and the use of poetic devices like rhyme and meter in these languages, and ii) the lexical status of various reduplicating structures and their phonological makeup. The delineation and the data pave the way for an optimality theoretic analysis of reduplication in the spirit of “minimal reduplication” (Saba Kirchner, 2010) that will be presented in Section 4). Section 5 concludes the paper with a summary of the arguments in favor of the productivity and regularity of reduplication in German and with some directions for further research.

2 Delineation

Obviously, not all of the types of reduplication documented by Bzdęga (1965) conform to the generalizations and constraints that are valid in the two most frequent types, viz. rhyme and ablaut reduplication. However, in order to warrant a uniform treatment of reduplication, it is necessary to delineate the different kinds of pattern and to relegate them to their proper place in the grammar or lexicon of

German. As noted above, I will disregard in the following sorting exercise those forms that have no transparent relation to any lexical item and/or are clearly onomatopoeic in nature (e.g. *piffpaff* ~ imitation of gun, *Kuckuck* - “peekaboo, cuckoo”). For any classification task, it is customary to base oneself upon a widely accepted definition. Ideally, this definition provides the constituting features that are characteristic for the type in question and allows to cull non-matching items.

Reduplication is commonly understood as a repetition of phonological material within a word for grammatical or semantic purposes (Rubino, 2011). Generally, the base for reduplication is a segmentally specified string and a morphologically complex word is formed by adding a copy of (some part of) the base.

2.1 Phonological doubling and lexical sequencing

This definition, in making explicit reference to a morphologically defined base, thus justifies a distinction between reduplication of an (or part of an) identifiable morph on the one hand and what we will call ‘phonological doubling’ (3), where no morphological base can be identified.

- (3) Mama, Papa, Pipi, Kaka
 “Mum, Dad, pee, poo-poo”

Conceivably, the segmental specification for these words consists in just a consonant and a short vowel, e.g. [ma] in the case of *Mama*. In order to become a legitimate word, the segmental structure needs to be augmented to form at least a bimoraic foot; reduplication might serve this need. In that sense, words like those in (3) do not iterate a morph; instead, the whole word becomes the morphological stem that is then open to morphological processes such as inflection or compounding. According to Saba Kirchner (2010), the kind of purely phonological doubling might be characterized as a repair mechanism that becomes necessary when the segmental specification of the morpheme is too sparse to form a minimal word on its own.³

It is interesting to note that phonological doubling generally preserves segmental identity between base and reduplicant while the prototypical cases of morphological reduplication, i.e. rhyme and ablaut reduplication (*Hinkepinke*, *Quitschquatsch*), generally foster non-identity of base and reduplicant. The issue of segmental (non-)identity in reduplication will be discussed further in the Sections 3.2, 3.3, and 4.

³Note that, in German, the unreduplicated forms *Ma* [ma:] and *Pa* [pa:] are not uncommon. They are, however, clearly perceived as anglicisms or americanisms. Therefore, I assume that these forms are the result of hypochoristic truncation that is common in English (e.g. Lappe, 2008) rather than bases for reduplication themselves.

There are several cases in which the base is clearly a word (*hopp*, “lollop, get a move on”) yet appears to reduplicate without alternation (*hopp hopp*, “Get a move on!”).

- (4) Lexical sequences
- a. *dalli dalli, hopp hopp, los los*⁴
hurry up, get a move on, go

The great majority of these cases has to be distinguished from proper reduplication as they fail to abide by the imperative of lexical integrity. Remember that, according to the above definition, the product of reduplication be a word. Schindler (1991) provides compelling reasons to question the lexical integrity of structures like *hopp hopp* or *dalli dalli*. Any sequence of identical morphs that is open to violations of lexical integrity (compare *dalli dalli* vs. *dalli, los, dalli*) qualifies as a lexical sequence rather than a word formed by means of reduplication in the strict sense. A correlate of the separability is the possibility to unboundedly iterate the base, as in *sehr sehr sehr sehr schön* (engl.: “very very very very nice”). As Schindler (1991) notes, neither is characteristic of reduplication as a word formation technique (*Schnickschnack*, **Dieser Schnick*, *verdammt*, *(dieser) Schnack*, **Schnickschnackschnick*). I will conclude that, whenever the lexical integrity of the reiterated forms are compromised, we can safely relegate these cases to the syntax.

A couple of stray forms listed in (5) cannot easily be subsumed under the rubric of phonological doubling or lexical sequencing, nor are they contrastive focus reduplications (c.f. Section 2.2.1). Clearly, these forms are reduplicative in nature, but they are neither ablaut nor rhyme reduplications. Suffice it to say that these patterns do not appear to be productive.

- (5)
- a. *Kleinklein* < *klein* (adjective or noun) (“details” < “small”, “giblets”)
 - b. *Pinkepinke* < *Pinke* (“money, dough”) - semantic/pragmatic contribution of reduplication unclear

2.2 Reduplication vs. compounding

If more than one base can be identified, the resulting word may be considered a (special kind of) compound or blend – irrespective of the segmental similarity between the bases (c.f. Bzdęga, 1965; Schindler, 1991). This holds especially for paronomastic words like *Schnippschnapp* (‘snap’ < *schnippe(l)n*, ‘to flick’ and

⁴The orthographic representation of these sequences is quite variable. *Dallidalli*, *dalli-dalli*, and *dalli dalli* are all attested

schnappen, ‘snap’).⁵ Often, however, in these cases, we cannot definitely exclude reduplication proper as the responsible process of word formation - it is at least conceivable that the reduplicant is accidentally homophonous to a stem that is not actually part of the word formation. As a case in point, consider the nickname *Sillepille* derived from *Sille* (which in turn is a hypochoristic version of the proper female name *Silke*): the rhyming counterpart to *Sille* may be used as a noun (*Pille*, engl.: “pill” or “ball”), but there is no obvious way to interpret *Sillepille* as a compound of the stems *Sille* and *Pille*; there is simply no semantic trace of *Pille* as denoting “ball” or “pill” in *Sillepille*. Moreover, according to the rules of compound formation in German, *Pille* would be assigned the role of head, and thus this compound would typically denote some kind of pill or ball. In contrast, *Sillepille* is exclusively used as a (facetious) reference to a person with the real name *Sille*. I therefore treat cases of this kind as reduplications with segmental alternations (see below).

Krimskrams (< *Kram(s)*, engl.: “stuff”) represents another problematic case:

**Krim(s)* is most likely diachronically related to *Krümel* (engl.: “crumb”); however, there is no synchronically available stem **Krim(s)* that would permit a transparent analysis as compound. I therefore treat *Krimskrams* as a reduplication. A conceivable alternative would be to analyze **Krim(s)* as a “cranberry morpheme” that attaches uniquely to *Krams*. This analysis however would beg the question of why the two stems are identical except for the ablauting vowel, a fact that would straightforwardly be explained under the reduplication analysis (see Section 4). Several similar items exist in which only one of two diachronically identifiable stems are synchronically used.

A further case of doubtfulness concerns the verbs *schlampampen* < *schlampen*, *rumpumpeln* < *rumpeln*, , *klimpimpern* < *klimpern* (“to be sloppy, to rumble, to clink”). Wiese (1990) treats these cases as reduplications that come about due to the affixation of an underspecified syllable, segmental copying, and subsequent resyllabification. However, these verbs also allow for an analysis as blends where two phonologically similar stems are interleaved (cf. *schlampen* + *pampen*, *rumpeln* + [?]*pumpe(l)n*, *klimpern* + *pimpern*). Whichever analysis is to be chosen as the correct one depends on the synchronic availability of the stems involved. In any case, this pattern does not appear to be productive and I am not aware of other tokens of this kind.

As these examples show, it is necessary to closely inspect the word under consideration in order to distinguish between reduplication and paronomastic compounding or blending. Whenever two synchronically transparent stems can be identified as constituting the word, the more conservative approach would suggest

⁵The question of whether *Schnippschnapp* is a blend or a compound and whether blending is just a special form of compounding is beyond the scope of this paper.

(a special form of) compounding - as long as there is no compelling morphosyntactic or semantic evidence against it (cf. *Sillepille*).

2.2.1 Recursive compounds and contrastive focus reduplication (CFR)

Recursive compounds like *Kindeskind* (lit.: “child of the child”, grandson/granddaughter), while presenting iterating phonological material, are not considered reduplications in the strict sense. The semantic transparency of these words suggests that they have to be treated as regular compounds made up of two stems which happen to be identical. Note that the interpretation of *Kindeskind* is entirely analogous to other endocentric compounds like *Arbeiterkind* (lit.: “child of a worker”, “working-class child”). The linking element, which is often found in German compounds, is independent evidence for the compound analysis of these cases. Recursive compounds are restricted to only a few relational nouns like *Kind*, *Helfer*, *Freund* (“child, helper, friend”).

As English and several other languages, modern standard German exhibits identical constituent compounding (Hohenhaus, 2004) a.k.a. contrastive focus reduplication (CFR) (Ghomeshi et al., 2004). Like recursive compounds, German CFR inherently involves doubling of a word, but CFR are not confined to nouns (6-a) but also used with adverbs (6-b) or (predicative) adjectives (6-c). Freywald (2012), who reports on a large-scale corpus search, did not find any verbs as bases for German CFR.

- (6)
- a. *Nimmst Du Basmatireis oder einfach Reis-Reis?*
“Do you take basmati rice or just rice-rice (i.e. prototypical rice, standard variety rice)?”
 - b. *Was meinst Du mit ‘jetzt’ - jetzt-jetzt oder in zwei Minuten?*
“What do you mean by ‘now’ - now-now or in two minutes?”
 - c. *Der Typ ist echt schlau - nicht nur gewieft, sondern schlau-schlau.*
“This guy is really smart - not just slick, but smart-smart.”

As the term suggests, contrastive focus reduplications are used exclusively in contrastive contexts to denote the stem’s prototypical features vis-à-vis less prototypical but contextually available alternatives. I will follow Hohenhaus (2004) and argue that CFR are best analyzed as a special form of endocentric compound: as in endocentric compounds, the first, accented, part restricts the meaning of the (identical) head - in this case by emphasizing the head’s prototypical or ideal properties. Ghomeshi et al. (2004) explicitly discard the compound analysis as CFR may involve parts-of-speech not typically used in compounding. In fact, it may be that this type of word formation is more promiscuous than canonical compounds w.r.t. to the stem that is used: CFR may target adverbs that are not typically used as stems in compounds. In contrast to canonical compounds, linking elements are

banned in CFR. However, the promiscuity regarding the stems involved and the lack of linking elements are by no means compelling arguments against the compound analysis. Note that German makes productive use of phrasal compounds (Meibauer, 2007), which generally lack linking elements. Furthermore, (phrasal) compounds may involve parts of speech in head or modifier position that are not typically found in canonical compounds (e.g. pronouns: *Über-Ich*; *Ich-AG*, *Wir-Gefühl*, “superego”, “You Inc.”, “group identity”).⁶

A cross-linguistic comparison buttresses the hypothesis that CFR are properly treated as compounds: While German speakers find that the left part of CFR modifies the meaning of the right part (the head), Italian and French speakers – to the extent that they use CFR in their native languages – identify the left part as head and the right part as modifier (Emanuela Sanfelici and Fatima Ham-laoui, p.c.). This correlates perfectly with the head-modifier ordering in canonical compounds in these languages.

Furthermore, again in parallel to phrasal compounds but in contrast to rhyme and ablaut reduplication, CFR are generally not lexicalized – instead, they are created *ad hoc* as they are bound to a salient contrastive context in order to be used.

On the basis of these arguments, both recursive compounds and CFR may be distinguished from proper reduplication and assigned a place in the realm of German compounding (c.f. discussions in Freywald, 2012; Hohenhaus, 2004).

3 Rhyme reduplication and ablaut reduplication

The two biggest classes of reduplication identified by Bzdęga (1965) are rhyme reduplication and ablaut reduplication. These are the only kinds of proper reduplication (as identified in the above section) that appear to be productive. An online search of these types of reduplication unearthed a wealth (>100) of forms that have not previously been reported. Most but not all of these forms are derived from proper names; they may regularly be found in online platforms. Apparently, the obligation to create a unique username in internet forums leads to various kinds of augmentation (e.g. *vera123*, *Vera1982* < *Vera* etc.), and reduplication serves the same purpose (*Veramera*), while adding a hypochoristic or facetious connotation. Consequently, when used as username or hypochoristic formation, reduplication results in nouns or, more specifically, proper names. In significantly rarer cases, bare verb stems may reduplicate, too. These may be used as proper names (*Schwippschwapp* < *schwappen*, “to slosh”, brand name for a lemonade), as interjections, e.g. in chat conversations (*mogelpogel* < *mogel*, “to cheat”), but

⁶Admittedly, in head position, those pronouns are certainly converted to nouns that may take a determiner.

are also used frequently as modifiers within compounds (*Flitterflutter-Seidenband* < *flattern*, “flittering silk ribbon”). In general, apart from the use in online platforms, reduplications are commonly found in substandard registers of oral language, e.g. in playful conversation, not only with children.

3.1 Morphophonological features of rhyme and ablaut reduplication

The examples in (7) and (8) illustrate the productivity of the two kinds of reduplication. Many of the forms listed are documented here for the first time.

- (7) Rhyme reduplications
- a. suffixing reduplikation
 - (i) monosyllabic base
Heinzpeinz, Ralfpalf, Matzpatz
 - (ii) disyllabic base
Doppelmoppel, Hasemase, Kallepalle, Kuschelmuschel, Popelmopel, Schorlemorle, Nickipicki, Michipichi, Rikepike, Silkepilke, Sillepille, Andimandi, Meikepeike, Sebimebi, Haukepauke, Achimpachim, Veramera, Mannipanni, Larsiparsi, Ralfipalfi, Ulfipulfi, Udopudo, Susipusi, Susepuse, Klausipausi, Heinzipeinzi, Idapida, Piamia, Annipanni, Annapanna, Pepemepe, Binepine, Binemine, mogelpogel, müffelpüffel, popelmopel, daddelpaddel, superduper, Schickimicki, okidoki
 - b. prefixing reduplications not attested
- (8) Ablaut reduplications
- a. suffixing reduplication
 - (i) monosyllabic base
Mischmasch, Singsang, Trinktrank, Schwingschwang, Ticktack, Wirrwarr
 - (ii) disyllabic base
Sillesalle, Wiebkewabke, Rikerake, Flügelflagel, kitzelkratzel, giggelgaggel, tippeltappel
 - b. prefixing reduplications
 - (i) monosyllabic base
Krimskrams, Frinzfranz, Quitschquatsch, Zickzack, Mitzmatz, Mitschmatsch, schwippschwapp, Schnickschnack, pitschpatsch, plitschplatsch
 - (ii) disyllabic base
Indiandi, Minnimanni, nigelnagel(neu), schwibbelschwabbel, pipelpopel, rischelraschel, pickepacke(voll), flitterflutter, kikelkrakel

On the basis of the data, several generalization w.r.t. the morphophonological behavior of rhyme and ablaut reduplication can be formulated:

- (9)
 - a. Reduplication results in strictly bipedal words⁷
 - b. The foot structure is strictly trochaic (bimoraic monosyllable or disyllabic trochee)
 - c. Base and reduplicant display the same number of syllables
 - d. The segmental makeup of base and reduplicant must not be fully identical → rhyme or ablaut
 - e. The sequencing of base and reduplicant is co-determined by phonological constraints in ablaut reduplication

These generalization are in line with the fact that trisyllabic or quadrisyllabic bases (*?Nataliepatalie* < *Natalie*⁸; **Kunigundepunigunde* < *Kunigunde*, proper name) or iambic bases (**Ivonnepivonne* < *Ivonne* [ʔi'vɔn]) cannot undergo reduplication without previous truncation to a trochaic foot via i-formation (*Ivipivi* < *Ivi* < *Ivonne*) (c.f. Féry, 1997; Grüter, 2003; Itô and Mester, 1997; Wiese, 2001, on the grammar of i-truncations). Likewise, disyllabic words that superficially display a trochaic strong-weak syllabic pattern, yet consist of two feet, cannot become reduplicated. This ban holds for compounds (**Bahnhofpahnhof* < [*Bahn*]_F[*hof*]_F, “train station”) and for synchronically unanalysable yet prosodically complex proper names (**Gerhardperhard* < [*Ger*]_F[*hard*]_F, **Manfredpanfred* < [*Man*]_F[*fred*]_F).

3.1.1 Rhyme reduplication

The sequencing of base and reduplicant is fixed in rhyme reduplications but not in ablaut reduplications. As for rhyme reduplications, the reduplicant invariably follows the base.⁹ The initial segment of the reduplicant is generally a labial, mostly [p], sometimes [m]. Koronal [d] is attested in loans from English (*okidoki*, *superduper*).

The ban of segmental identity of base and reduplicant is reflected by the fact that bases with an initial labial invariably harness a different labial for the reduplicant (*Matzepatze* < *Matze*, **Matzematze*; *Pepemepe* < *Pepe*, **Pepepepe*).

⁷Reduplication with an unparsed linking element, e.g. [*Ede*]_F*po*[*pede*]_F*PWd* are attested but I treat them as exceptional.

⁸*Nataliepatalie* is only once attested on a German website; interestingly, it seems to be more commonly found on English-speaking websites although it is by far outnumbered by the reduplicated truncation *Nattipatti*. In general, it seems that English speakers find it easier to reduplicate trisyllabic bases. This fact may possibly buttress approaches to English metrical phonology that assume a greater variety of licit feet, e.g. including dactyls (Burzio, 1994).

⁹Compare this ordering to English reduplications like *helterskelter* < *skelte* (*Old English*) “to hasten”, *humblejumble* < *jumble* in which the meaningful base follows the reduplicant (Benczes, 2012).

The question of why the suffixed reduplicant starts in a labial sound cannot be answered with certainty. However, it is worth noting that, firstly, frozen co-ordinations exhibit the same tendency regarding the sequencing of foot-initial segments (*hegen und pflegen*, “to nourish and cherish”, *schalten und walten*, “to have carte blanche”, *mit Sack und Pack*, “with bag and baggage”) (Müller, 1997) and this tendency appears to hold for other languages as well (Cooper and Ross, 1975). Secondly, there is a general tendency for labials to occupy a foot-initial position (Torre, 2003), and speakers may comply with this preference when given the occasion vis-à-vis a segmentally underspecified morpheme. The same tendency is reflected in children’s and adult’s productions when asked to provide a rhyme to a nonce word (Fikkert et al., 2005).

Rhyme reduplications exhibit a strong bias towards disyllabic trochees as the constituting feet. Monosyllabic bases are only rarely attested (e.g. *Ralfpalf/ Ralfmalf* < *Ralf*, *Heinzpeinz* < *Heinz*). These names are more readily used in rhyme reduplication when augmented with the hypocoristic -i-suffix, resulting in disyllabic trochees *Ralfpalfi/ Ralfimalfi* < *Ralf*, *Heinzipeinzi* < *Heinz*.

The rhyme reduplication described here has to be distinguished from another case of reduplicative rhyming, viz. shm-reduplication (e.g. Nevins and Vaux, 2003), that is found in Yiddish, in certain English registers and also, but only very marginally, in German (there are a couple of google hits for *Liebe Schmiebe* < *Liebe*, “love and such”). In contrast to rhyme and ablaut reduplication, shm-reduplication may apply irrespective of the prosodic shape of the stem, at least in English (Saba Kirchner, 2010).

3.1.2 Ablaut reduplication

The curious fact about ablaut reduplication is the variable ordering of base and reduplicant. Both prefixing and suffixing reduplicants are well attested. That is, any (morphological) constraint responsible for the ordering of base and reduplicant must be distinctly weaker than the phonological constraint regulating the ablaut order of the vowels [i], [ɪ] — [a], or more rarely [o], [ɔ]. In this respect, ablaut reduplication differs from other means of word formation in which the morph order is fixed.¹⁰ While monosyllabic and disyllabic bases are equally attested, ablaut reduplication requires strict segmental restrictions w.r.t. the base in order to apply. Ablaut reduplication is prohibited if the stem vowel of the base cannot undergo ablaut, i.e. ablaut reduplication is restricted to bases with [i], [ɪ] or [a],

¹⁰In certain types of blends (“*Konturkreuzung*”, Ronneberger-Sibold (2006)), the fashion in which the morphs are interleaved or linearized is probably motivated by segmental or word prosodic features of the involved stems.

[o], [ɔ].¹¹

This ban consequently excludes bases with diphthongs and also those that exhibit more than one stem vowel (not counting schwa). Names like *Ina*, *Karlo*, *Tilo*, *Anna* have corresponding rhyme reduplications, but it is impossible to form ablaut reduplications like **Inaana*, **Kirlokarlo*, **Tilotalo*, **Innaanna*. Importantly, however, as an apparent exception to this generalization, stems that end in the i-suffix, which is productively used in truncations, can undergo ablaut reduplication *Mischimaschi* < ?? *mischi* < *mischen*, *Indiandi* < *Andi* < *Andreas*, *Minnimanni* < *Manni* < *Manfred*, *Manuel*. That is, it appears that the hypocoristic i-suffix is invisible to this constraint on ablaut reduplication. I will leave to future research the question of how this fact is to be treated properly in the morphology/phonology interface of grammar.

Ablaut reduplication is blocked when it would entail further segmental alternations in the base or the reduplicant. A case in point is the [ç]-[x] alternation in standard German, which demands that back vowels must not be followed by tautomorphemic [ç]. Consider the conceivable ablaut reduplication #*Michimachi* < *Michi* < *Michael*. While attested in German internet domains, the places of discovery suggest that this reduplication is restricted to Upper German dialectal areas, likely those in which [x] may be used in the context of front vowels. The reason for the unacceptability of #*Michimachi* in standard German is most probably due to the alternation of the dorsal fricative triggered by the low back vowel ablaut [a] in the reduplicant, resulting in [mɪçimaxi]. While both feet are phonotactically well-formed, [mɪçimaxi] is not a licit reduplication in standard German. This fact documents that base and reduplicant may only minimally diverge. A stronger correspondence between base and reduplicant would be warranted by the form [miximaxi], that is illicit in standard German.¹²

As in the case of rhyme reduplication, ablaut reduplication exhibits the same phonological tendencies w.r.t. morph sequencing as frozen coordinations, as witnessed by *dies und das*, *Fix und Foxi*. In fact, the ablaut ordering constraint requiring precedence of [i], [ɪ] over [a], [o], [ɔ] appears to be universal (e.g. Cooper and Ross, 1975).

¹¹The only counterexample I am aware of is Christian Morgenstern's fictuous character *Flügelflagel* [fly:gøfla:gəl] < *Flügel*, "wing".

¹²The same holds for *Krichkrach* < *Krach*, which is attested but does not seem to be felicitous in standard German.

3.2 Reduplication and stem correspondence beyond the word – lexicalization versus *ad hoc* construction

Aside from the cases of lexical sequencing (cf. Section 2.1), two constructions with corresponding stems that are not part of the same word are related to reduplication and therefore deserve at least brief discussion here.

First, frozen coordinations (“Paarformeln” Müller, 1997; Cooper and Ross, 1975) also involve two phonologically corresponding, yet non-identical, stems as conjuncts (10).

- (10) a. *hegen und pflegen*, to nourish and cherish
 schalten und walten, to have carte blanche
 b. *fix und foxi*, to be tuckered out
 dies und das, this and that

These constructions are generally lexicalized and idiomatic. Furthermore, these binomials appear to be prosodically constrained, that is, the conjuncts are usually confined to the size of a prosodic foot. Many, but not all, of these frozen coordinations display a rhyme or ablaut relationship of the conjuncts involved.¹³ In these respects, they resemble the canonical cases of reduplication discussed above. In contrast to reduplication, however, the rhyming or ablauting conjuncts are generally both lexical words – but the meaning of the coordination phrases is not necessarily compositionally transparent.¹⁴

As a counterpart to frozen coordinations, the “X-and-X-construction” (11) is a coordination of two identical (lexical) words (Finkbeiner, 2012, for German).

- (11) X-and-X-construction (example taken from Finkbeiner, 2012)
 A: *Schade dass die so teuer sind.*
 It’s a shame they are so expensive.
 B: *Naja, **teuer und teuer** – wenn die Qualität stimmt, dann finde ich den Preis okay.*
 Well, expensive and expensive – if the quality is good, the price is fine with me.

The coordinative construction contributes a contrastive reading of the two instances of the same word. As the core lexical meaning of the two conjuncts is trivially identical, the contrast is only valid when the specific situational context and the relevant pragmatic meaning are taken into account. That is, the X-and-

¹³*Kaffee und Kuchen*, lit.: “coffee and cake”, “five o’ clock tea” makes use of alliteration to establish correspondence between the conjoined stems.

¹⁴There are several frozen coordinations, in which one stem is synchronically not in use, e.g. *holtern und poltern*, lit.: “to ? and to rumble.”

	word level	phrasal level
lexicalized	heterogeneous reduplication	frozen coordination
(segmental non-identity, prosodically constrained)	<i>Schickimicki</i> , <i>Mischmasch</i>	<i>hegen und pflegen</i> <i>fix und foxi</i>
ad hoc	CFR	X-and-X-construction
(segmental identity, prosodically unconstrained)	<i>Ausbildung-Ausbildung</i> <i>Reis-Reis</i>	<i>gerecht und gerecht</i> <i>teuer und teuer</i>

Table 1: Correlation of segmental identity and lexicalization in word-like and phrase-like reduplicative constructions.

X-construction is used to “negotiate the situational meaning of a previously used lexical item” (Finkbeiner, 2012, and references therein). Interestingly, the X-and-X-construction is a syntactically and prosodically autonomous entity. It cannot form a syntactic argument unless in existential constructions. Correspondingly, X-and-X-constructions are intimately bound to a context in which the lexical item X has previously been used. As such, they are used productively and are generally *ad-hoc* constructions that rarely become lexicalized.

Comparing, on the one hand, rhyme and ablaut reduplication with contrastive focus reduplication (CFR, cf. Section 2.2.1), and, on the other hand, frozen coordination with the X-and-X-construction, an interesting correlation arises concerning the segmental (non-)identity and the ability to become lexicalized (see Table 2). This correlation appears to hold on the word level and on the phrasal level: Both CFR and the X-and-X-constructions are characterized by segmental identity of the stems involved. These types of construction are generally unconstrained by prosodic factors, that is, non-trochaic or polysyllabic bases can easily undergo CFR or may be used in X-and-X constructions. In contrast, rhyme/ablaut reduplication and frozen coordinations necessitate segmental alternation of the constituting feet/stems. At the same time these non-alternating constructions are usually contextually bound *ad-hoc* formations which rarely become lexicalized. In contrast, rhyme and ablaut reduplication and frozen co-ordinations display non-identical stems; they are generally lexical items or at least lexicalizable (the latter in spite of their phrasal nature) and, furthermore, prosodically constrained. At this point it is not clear to me what may cause this correlation of lexical status and phonological identity or whether it is merely accidental.

3.3 Reduplication reflects versification and poetic rhyme

The fact that reduplication is mainly used for expressive purposes in playful registers and the term ‘rhyme reduplication’ are suggestive of the poetic dimension

of language. It may not come as a surprise then, that we find certain relations between reduplicative word formation and poetry. In this context, it is interesting to note that, while rhyme and ablaut reduplication in German(ic) are based on the prosodic foot, resulting in either disyllabic or quadrisyllabic reduplications, reduplication in French is strictly syllable-based, resulting in disyllabic words (e.g. *dodo* < *dormir*, “to sleep”, *gaga* < *gateux*, “crazy”) (Scullen, 2002; Lambert, 2004). Likewise, Italian reduplications, which may be found in reduplicating truncations (Alber, 2010), always result in disyllables (*Gigi* < *Luigi*, *Lele* < *Elena*). This cross-linguistic difference is reflected in the versification of the respective languages: While German poetry counts stresses i.e. feet, leaving some freedom regarding the number of syllables in a verse, French and Italian poetry are more strictly based on the number of syllables. Any deviance from the syllable number determined by the poetic meter is considered infelicitous in the poetry of these languages.

The cross-linguistic correspondence concerning the prosody of poetry and reduplication is enhanced by a segmental correspondence between these domains. That is, French and Italian reduplications often preserve the identity of base and reduplicant and, at the same time, these languages allow identical rhymes in poetry (e.g. Aroui, 2005). In contrast, German(ic) generally disallows identical reduplication and, coincidentally, identical rhymes in poetry are clearly considered unsatisfactory. A correspondence of this kind is most probably not accidental. As Lehiste notes, “the prosody of a language is crystallized in the prosody of poetry created in that language” (Lehiste, 1985).

However, the observation of the prosodic and segmental correspondence in word formation and poetry does not explain why there is identity avoidance between corresponding feet (Germanic) and identity observance between corresponding syllables (French, Italian). I will leave this issue open at this point. Note however that, to the marginal extent that syllabic reduplication is active in German (cf. the cases of phonological doubling in (3) and a couple of nicknames: *Vivi* < *Viola*, *Kiki* < *Kirsten*), the identity of the syllables is observed, too.

Summarizing so far, the morphophonological regularity and productivity of rhyme and ablaut reduplication suggests that reduplication is synchronically available in the morphology of German speakers. Therefore, any approach to relegate reduplication in general into the realm of diachrony should be regarded as futile. Furthermore, reduplication has to be distinguished from compounding. The semantic transparency of recursive compounds and CFR suggests that both exhibit two independent albeit identical morphemes to form the word (which, consequently results in iteration of phonological material). In contrast, only one segmentally specified morpheme can be identified in the case of proper reduplication.

In the following section, I will put forward an OT-account that tackles the

grammar of rhyme and ablaut reduplication in German.

4 Emergent reduplication in OT

The optimality theoretic analysis entertained here follows the spirit of Saba Kirchner (2010) and eschews constraints that are specifically geared towards reduplication. Instead, reduplication is shown to emerge from general morphophonological constraints that hold whenever a segmentally underspecified morpheme is attached to a base. The ranking of the constraint DEP (banning epenthetic material) over INTEGRITY (banning the re-use of morphs) ensures that underspecified morphemes surface as copies of the base. The trochaic template of reduplication is the result of constraints on foot structure that are active elsewhere in the grammar, e.g. for the expression of plural (Wegener, 2004; Wiese, 2009), hypochoristics (Féry, 1997; Itô and Mester, 1997; Wiese, 2001), diminutives (Fanselow and Féry, 2002).

The grammar of reduplication thus dispenses with constraints that are specifically geared towards reduplication. The general scenario can be summarized as an interaction of the constraints in (12) and the ranking in (12-d).

- (12)
- a. REALIZEMORPHEME: every input morpheme has an phonetically realized output exponent.¹⁵
 - b. DEP: Every element in the output has a correspondent in the input (no epenthesis).
 - c. INTEGRITY: No morpheme in the input has multiple correspondents in the output.
 - d. REALIZEMORPHEME (RM) >> DEP >> INTEGRITY (INT)

As discussed above, reduplication in German is mainly used for expressive purposes. Following Saba Kirchner's (2010) approach, I assume that a segmentally unspecified, expressive morpheme (denoted here as EXPR) attaches to a base. The following tableau depicts the emergence of reduplicative morphology in such a case (for ease of exposition, the factors determining the prosodic size of the reduplicant and leading to segmental alternation between base and reduplicant are ignored in this Tableau; see below for more details).

- (13) Tableau 1: The grammar of reduplication:

Non-exponence of the expressive morpheme is infelicitous as it induces a fatal

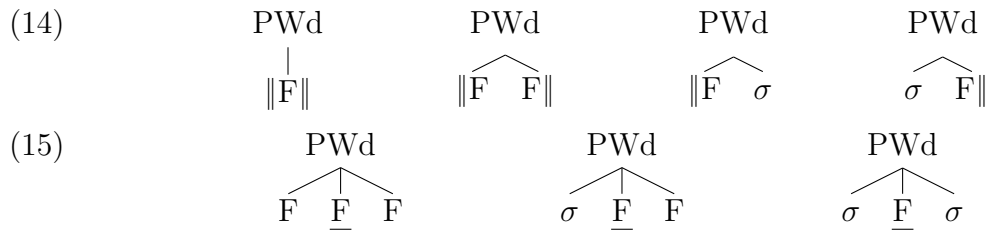
¹⁵also known as MPARSE, Prince and Smolensky (2008)

	/Matze/ + EXPR	RM	DEP	INT
a.	Matze	!*		
b.	Matze-bla		!*	
c.	☞ Matzepatze			*

violation of **REALIZE MORPHEME**. The affixation of epenthetic material *bla* (candidate b.) is not an option due to **DEP**. The violation of low-ranking **INTEGRITY**, however, is acceptable, as witnessed by the grammaticality of the reduplicated *Matzepatze*.

Further conditions on reduplication in German will be discussed in turn. Remember that the most important constraints on the output in the case of rhyme and ablaut reduplication are the following:

First, the output prosodic word is strictly bipedal, and no unfooted syllables are allowed, otherwise reduplication is impossible; non-trochaic polysyllabic bases cannot reduplicate. This state of affairs suggests that **REALIZEMORPHEME** – and by transitivity: **DEP** and **INTEGRITY** are dominated by constraints that regulate the prosodic structure of the reduplication. For this purpose, we adopt here the familiar constraints on foot structure (**FOOTFORM=TROCHEE**, requiring feet to be trochaic, i.e. surfacing as bimoraic monosyllable or a disyllable with strong-weak pattern), parsing of syllables (**PARSE- σ** , militating against unfooted syllables), and the notion of **HIERARCHICAL ALIGNMENT** (discussed in Itô et al. (1996) and elaborated on in Ussishkin (2000)). Hierarchical Alignment requires each prosodic constituent to be edge-aligned with some prosodic constituent containing it. In the examples in (14), the edges of prosodic words (PWd) to which the feet are properly aligned are marked with “||” to the left or right, respectively. These structures thus obey **HIERARCHICAL ALIGNMENT**. In contrast, (15) lists several structures, in which the underlined feet fail to align to an edge of a prosodic word, incurring a violation of **HIERARCHICAL ALIGNMENT**.



Alignment to the edge (left or right) of some larger constituent amounts to the expression of prominence within that larger constituent (compare Féry’s notion of “Focus as prosodic alignment” (Féry, 2013)), and, more importantly, obeying this requirement gives rise to maximally binarily branching prosodic words – without

the stipulation of a binary maximum. Specifically, HIERARCHICAL ALIGNMENT ensures that polypedal bases cannot reduplicate even if the involved feet do not violate the trochaic requirement: in (16), the failure of the innermost feet (underlined) to align to an edge of the prosodic word leads to non-existence of the expressive reduplicant in the case of *Kunigunde*.

- (16) **Kunigundepunigunde* < *Kunigunde* (proper name)
 *[[ku:ni]_F[gʊn.də]_F[pu:ni]_F[gʊn.də]_F]_{PWd} < [[ku:ni]_F[gʊn.də]_F]_{PWd}.

For ease of exposition, we assume a prosodic meta-constraint PROSODY dominating REALIZE MORPHEME. This meta-constraint entails the above constraints, namely PARSE-σ, TROCHEE and HIERARCHICAL ALIGNMENT and, lacking the relevant evidence, we remain agnostic as to their exact intrinsic ordering.

Apart from the strict prosodic requirements, it was shown that the two feet must not be fully identical. Non-identity is achieved by rhyme or ablaut, depending on the segmental makeup of the base. Bases with more than one full vowel or vowels other than /i/, /a/, or /o/ can only be reduplicated via rhyme reduplication. However, which technique is used is not fully predictable, as some bases allow both rhyme or ablaut reduplication (*Sillepille*, *Sillesalle* < *Sille*). To cover the non-identity requirement, I will make use of two constraints proposed for the analysis of haplology in German and English (Plag, 1998) and extend their use to the foot level. These constraints guarantee that adjacent feet be distinct in either the onset or the nucleus of the head syllable.

- (17) a. OCP_{nucleus}: the nuclei of (the head syllables of) adjacent feet must not be identical.
 b. OCP_{onset}: the onsets of (the head syllables of) adjacent feet must not be identical.

The position of the OCP constraint (henceforth the coverterm for the constraints in (17)) within the hierarchy cannot be determined with certainty. However, since all rhyme and ablaut reduplications obey the non-identity requirement, I assume a rank on a par with PROSODY, which is likewise unviolated by these kinds of reduplication. Note that the OCP constraint is generally violated in CFR and recursive compounds (see Section 2.2.1), while a violation of OCP is unacceptable in the case of rhyme and ablaut reduplication. The reason for this discrepancy lies in the nature of the input. Take, for example, a recursive compound like *Kindeskind*, lit.: “child of the child”, “grandson;” given the compositional transparency of this compound, we assume the input /*Kind* + *Kind*/. Consequently, a high-ranking constraint IDENT-IO (requiring the identity of featural specification for input and output segments) will prohibit OCP to make any change to the onset or stem vowel (**Kindespind*, **Kindeskand*). However, in the case of the unspecified expressive

morpheme in rhyme and ablaut reduplication, IDENT-IO has no say about the realization of the reduplicant, so OCP will decide about its surface appearance.

(18) Tableau 2: The grammar of reduplication:


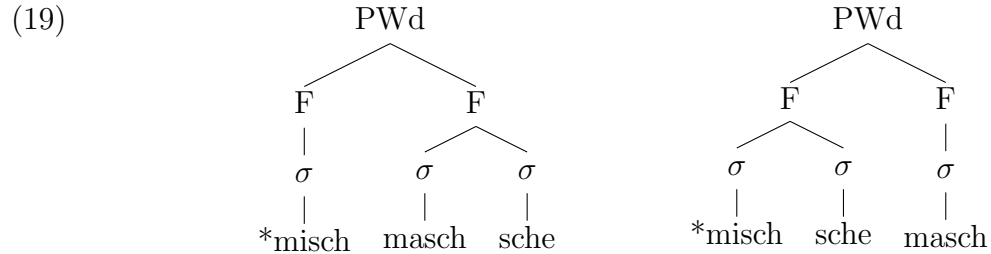
	/Matze/ + EXPR	PROSODY	OCP	RM	DEP	INT
a.	$[[\text{mats}\partial]_F \text{ma}]_{PWd}$!*				*
b.	$[[\text{mats}\partial]_F [\text{mats}\partial]_F]_{PWd}$!*			*
c.	$[[\text{mats}\partial]_F]_{PWd}$!*		
d. 	$[[\text{mats}\partial]_F [\text{pats}\partial]_F]_{PWd}$					*

Tableau 2 depicts the workings of PROSODY and OCP. These constraints prevent reduplication resulting in words with unparsed syllables (candidate a.) and total, i.e. identical reduplication (candidate b.), while candidate c. fails for not realizing the expressive exponent.

A conceivable alternative to segmental variation (rhyme or ablaut) as guarantor of non-identity is certainly excluded in reduplication: that is, a difference between base and reduplicant concerning the prosodic shape is prohibited. As a case in point, bipedal forms like (19) with one branching and one non-branching foot are illegitimate as reduplications.

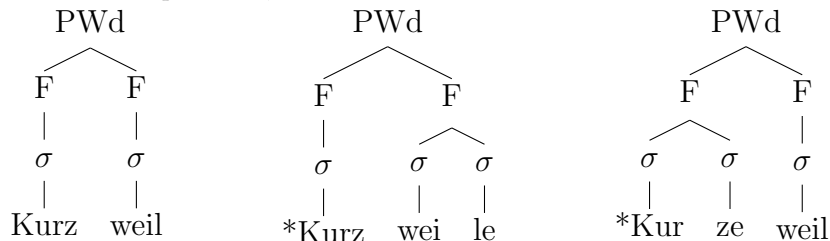


The facts in (19) can be related to a constraint on prosodic parallelism that was recently proposed by Wiese and Speyer (to appear). Prosodic parallelism calls for a symmetric makeup of adjacent prosodic subconstituents (e.g. prosodic words within a prosodic phrase). The evidence comes from various instances of schwa-alternation in German morphophonology. A case in point is the contrast in (20) featuring compounds including the head noun *Weil(e)* (engl.: while).¹⁶ As depicted, the schwa-appearance on the head of the respective compound correlates with schwa-appearance on the modifier. The resulting compound thus obeys

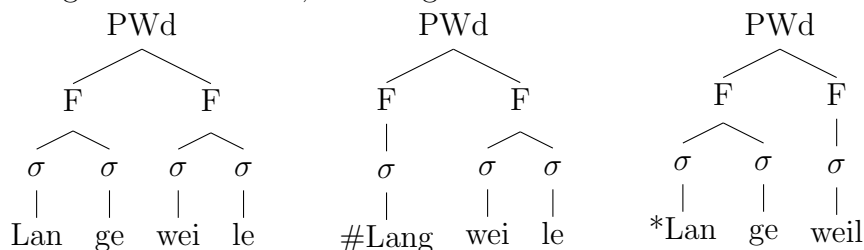
¹⁶I thank Birgit Nutz, to whom I owe these examples.

prosodic parallelism. Numerous examples of this sort are listed in Wiese and Speyer (to appear).

- (20) a. Kurzweil - *pastime*, lit.: short while



- b. Langeweile - *boredom*, lit.: long while



A constraint PROSODIC PARALLELISM is obviously suitable to prohibit ungrammatical reduplications like (19) and, as it has been shown to be effective beyond reduplication, it seems specifically preferable within an account that renounces reduplication-specific constraints that would explicitly call for base-reduplicant correspondence (cf. arguments in Saba Kirchner, 2010). As the exact rank of PROSODIC PARALLELISM in the constraint hierarchy cannot be determined here, we may subsume it under the meta-constraint PROSODY.

Two other constraints are active in the grammar of rhyme reduplication. A ban on marked syllable structure (e.g. NOCODA) ensures that the underspecified morpheme does not surface as an epenthetic non-syllabic suffix that is attached to the coda of the base. I further stipulate a constraint LINEAR ORDER which demands that the exponent most faithful to the stem precedes the exponent of the expressive morpheme.

- (21) Tableau 3: The grammar of rhyme reduplication:

As an example demonstration, consider the tableau (21). The grammatical candidate *Idapida* [ʔi:dapiɾda] has to accept a violation of INTEGRITY due to its reduplicative nature. Furthermore, to fulfill the (presumably undominated) ONSET-requirement for words (Alber et al., 2001), two violations of DEP are unavoidable.

/Ida/ + EXPR		PROSODY	OCP ^{foot}	NOCODA	RM	LINORDER	DEP	INT
a.	$[[\text{?i:da}]_F[\text{pi:da}]_F]_{PWd}$? ,p	*
b.	$[[\text{p-i:da}]_F]_{PWd}$					*!	p	
c.	$[[\text{?i:da}]_F]_{PWd}$				*!		?	
d.	$[[\text{?i:da-t}]_F]_{PWd}$			*!			? ,t	
e.	$[[\text{?i:da}]_F[\text{?i:da}]_F]_{PWd}$		*!				? ,?	*
f.	$[[\text{?i:da}]_F[\text{pi:}]_F]_{PWd}$	*!PARALLELISM					? ,p	*
g.	$[\text{?i:}[\text{pi:da}]_F]_{PWd}$	*!PARSE- σ				*	? ,p	*

The conceivable competitors fare worse with respect to more important constraints: realizing the exponent of the expressive morpheme as onset (candidate b.) spares one violation of DEP and the violation of INTEGRITY, but LINEAR ORDER, requiring the suffixation of the expressive morph, is not adhered to. Not realizing the expressive morph at all (candidate c.) leads to a fatal violation of REALIZE MORPHEME. Realizing the expressive exponent in coda position (candidate d.) avoids the violation of LINEAR ORDER at the fatal cost of the NOCODA requirement. Candidate e., featuring two adjacent identical feet, incurs a violation of OCP and is therefore ungrammatical. Candidate f. and candidate g. are not viable on prosodic grounds: bipedal **Idapi* [?i:dapi:] (candidate f.) fails to obey to the PARALLELISM constraint, while **Ipida* [?ipi:da] displays an initial unfooted syllable and a gratuitous violation of LINEAR ORDER.

How is the fact to be captured that the order base before reduplicant is observed in all rhyme reduplications but not necessarily in ablaut reduplication? Arguably, the constraint LINEAR ORDER, requiring that the exponent most faithful to the base precedes the (deviant) exponent of the underspecified morpheme, is dominated by the ABLAUT constraint (22) which ensures the order of /i/ before /a/ among the stem vowels.


- (22) ABLAUT: If two feet, one with the stem vowel /i/ and one with the stem vowel /a/, are conjoined within a prosodic word, the foot with /i/ precedes the one with /a/.

That is, if the base features /a/ as stem vowel, the reduplicant with /i/ will be prefixed (*zick(e)zack(e)* < *Zacke*), incurring an acceptable violation of LINEAR ORDER while, in the case of bases with /i/, the reduplicant will be suffixed without violation of either ABLAUT or LINEAR ORDER. Note that the violation of ABLAUT is only crucial in the case of underspecified input. High-ranking faithfulness constraints concerning the linearization of the segmental input (LINEARITY (McCarthy and Prince, 1995)) will spare bipedal stems like [hara]/[kiri] from re-ordering to **hirikara* or **kiri-hara*. As LINEARITY has no say regarding segmentally

empty morphemes, ABLAUT may decide about the order of feet in these cases.

As for rhyme reduplications, the order of faithful and deviant exponent is fixed by LINEAR ORDER, since ABLAUT is irrelevant in the case of two feet with identical stem vowels.

(23) Tableau 4: The grammar of ablaut reduplication:

/Zacke/ + EXPR		OCP	RM	ABLAUT	LINEAR ORDER	INT
a.	 $[[tsikə]_F [tsakə]_F]_{PWd}$				*	*
b.	$[[tsakə]_F [tsikə]_F]_{PWd}$			*!		*
c.	$[[tsakə]_F]_{PWd}$		*!			
d.	$[[tsakə]_F [tsakə]_F]_{PWd}$	*!				*

The findings of the internet search suggest the generalization that non-trochaic bases cannot reduplicate. That is, the underspecified expressive morpheme does not surface when the base does not satisfy PROSODY, hence the ungrammaticality of **Ivonnepivonne* < *Ivonne*. As the ungrammaticality of trochaified **'Ivonne'pivonne* (cf. candidate c. in Tableau 5) shows, it is impossible to alter the lexical prosodic specification of the stem in order to make it trochaic and thus reduplicable. Presumably, a high-ranking faithfulness constraint (IDENT STRESS) prevents the deviance from word stress specified in the input. This contrasts with another case of hypocoristic formation, viz. -i-truncation in German (Féry, 1997; Grüter, 2003; Itô and Mester, 1997; Wiese, 2001). For i-truncations, the prosody of non-trochaic stems may be tweaked to fit a trochaic template. A case in point is the nickname *Ivi* ['ɪvi] < *Ivonne*. Interestingly, the output of i-truncation may well become the input of reduplication, as witnessed by *Ivipivi* < *Ivi* < *Ivonne*. Apparently, the faithfulness constraints that dominate constraints on prosodic structure in the case of reduplication are themselves dominated by prosodic constraints in the case of -i-truncation.

(24) Tableau 5: Non-exponence of EXPR with non-trochaic bases:

As discussed above, ablaut reduplication is blocked when the ablaut would trigger further segmental alternation in the reduplicant (**Michimachi* [mɨçimaxi] < *Michi* [mɨçi]). Within a framework that assumes reduplication-specific constraints evaluating the correspondence between base and reduplicant (McCarthy

/Ivonne/ + EXPR		IDSTRESS	PROSODY	OCP _{foot}	NoCODA	RM	DEP	INT
a.	[ʔi'vɔn] _F pi[ʔvɔn] _F _{PWd}		* * !PARSE-σ	n,n			ʔ,p	*
b.	[[ʔi'vɔn] _F [pi'vɔn] _F] _{PWd}		* * !TROCHEE	n,n			ʔ,p	*
c.	[ʔ'ivɔn] _F [ʔ'ivɔn] _F _{PWd}	* !		n,n			ʔ,p	*
d.	[ʔi'vɔn] _F ʔi[ʔvɔn] _F _{PWd}		* * !PARSE-σ	*	n,n		ʔ,ʔ	*
e.	☞ [ʔi'vɔn] _F _{PWd}		* PARSE-σ	n	*		ʔ	
f.	[ʔi'vɔn-t] _F _{PWd}		* PARSE-σ	n,t!			ʔ,t	

Table 2: The grammar of rhyme reduplication - non-exponence of expressive morpheme in the case of non-trochaic bases.

and Prince, 1995), such a ban could be modeled as an interaction of OCP and a constraint IDENTBR militating against non-identity of base and reduplicant. The ranking OCP >> IDENTBR guarantees only minimal divergence of base and reduplicant. At the same time, a high-ranking markedness constraint AGREE_[back] prohibits the tautomorphemic realization of a [+back] vowel followed by the [-back] dorsal fricative. This model would rightly predict non-exponence of an ablauting expressive morpheme in these cases. However, a model of this type has a serious drawback in that it assumes a constraint that is specific to reduplication. Correspondingly, reduplication would be conceived of as a given morphological process rather than an emergent phenomenon; the assumption of an additional morphological process would place a high burden on the morphology of German, especially considering that reduplication is relatively marginal in this language. In contrast, in the framework adopted here, reduplication is seen as an emergent phenomenon which is due to the ranking DEP >> INTEGRITY; in contrast to IDENTBR these two constraints are needed irrespective of reduplication and it is therefore more economical to do without IDENTBR. The question is, how the apparent ungrammaticality of **Michimachi* is explained without recourse to base-reduplicant correspondence. In the following, I will discuss a possible solution to this problem.


First, note that if ablaut reduplication is not viable, rhyme reduplication is an option. In fact, *Michipichi* < *Michi* is an attested reduplication and it would be derived in the same way as other rhyme reduplications (cf. *Idapida* < *Ida*, Tableau 3), i.e. without the need for constraints making explicit reference to base-reduplicant correspondence. However, the viability of rhyme reduplication does not yet explain why ablaut reduplication is blocked in the case of **Michimachi* < *Michi*. It is at least conceivable that the generally higher frequency of rhyme reduplications as compared to ablaut reduplication explains why **Michimachi* is not realized. That is, *#Michimachi* would not be considered ungrammatical but is simply inactive for reasons of usage frequency (compare other cases of blocking). The usage-based explanation, however, would beg the question of why ablaut reduplication is oth-

erwise used productively even when rhyme reduplication is an option (*Sillesalle* and *Sillepille* < *Sille* are both attested). To escape this dilemma, I will propose an additional constraint fostering the parallelism between neighboring feet. As an extension to Wiese & Speyer’s (2013) constraint on prosodic parallelism in German morphophonology, this constraint requires parallelism on the segmental level, i.e. segmental identity of corresponding feet. There is, in fact, independent evidence for assuming such a constraint. Zuraw (2002) discusses many cases in which already similar contiguous phonological constituents are made more similar by adjusting segmental material (e.g. the misspelling of *Orangutan* as **Orangutang*). Another case in point is my son’s (3.10 years old) realization of the folktale’s title *Bremer Stadtmusikanten* (“The town musicians of Bremen”) as *Bremuser Stadtmusikanten* [’bʁeː,muzɐ ’ʃtat,muzi,kantən], entailing the anticipation of the string [muz] that is interleaved with *Bremer* such that it’s prosodic position parallels the one in *Stadtmusikanten* (if parsed from left to right). Note that *Bremuser Stadtmusikanten* does not only enhance the prosodic parallelism of the original title, this realization also increases the segmental similarity of the corresponding strings. To assume a reduplicative morpheme in the input as the driver of this process would certainly miss the point – there is simply no morphological (morphosyntactic, semantic) grounding for an additional RED-morpheme in this case. Therefore, I assume that the reduplicative output is driven by a low-ranking markedness constraint, call it SEGMENTAL PARALLELISM (SEGPARG). (25).

- (25) SEGMENTAL PARALLELISM (SEGPARG): Neighboring feet have identical segmental specifications.

The following Tableau illustrates the workings of SEGPARG in the case of reduplication.

- (26) Tableau 6: Interaction of reduplication and segmental alternation – blocking of ablaut reduplication for /mɪçi/ due to SEGPARG.

/Michi/ + EXPR		AGREE ^[back]	OCP	RM	SEGPARG
a.	[[mɪçi] _F [maçi] _F] _{PWd}	*!			a
b.	[[mɪçi] _F [mɪçi] _F] _{PWd}		*!		
c.	[[mɪçi] _F] _{PWd}			*!	
d.	[[mɪçi] _F [maxi] _F] _{PWd}				a,x!
e.	 [[mɪçi] _F [piçi] _F] _{PWd}				p

The influence of SEGPAR can also take responsibility for a tendency concerning the distribution of bases with complex onsets. Although rhyme reduplication is not impossible in these cases, stems with complex onsets preferably take an ablauting reduplicant. This is most likely due to the fact that the reduplicant in rhyme reduplications provides just a single onset position ($Franz(i)p(^{*}r)anz(i) < Franz(i)$). As a consequence, SEGMENTAL PARALLELISM is violated twice in these cases, once for the divergent [p], once for the complexity reduction in the second member. Correspondingly, the likewise attested, ablauting competitor candidate *Frinzfranz* < *Franz* that preserves the complex onset in the reduplicant fares better w.r.t. SEGPAR and may therefore be preferred. Note that *Frinzfranz* < *Franz* has to accept a violation of LINEAR ORDER, suggesting that SEGPAR dominates LINEAR ORDER.

The previous overview provides an OT-approach to the grammar of German rhyme and ablaut reduplication. The analysis treats reduplication as an emergent phenomenon. Accordingly, reduplication surfaces in the face of segmentally underspecified morphemes without assuming a specific reduplicative morpheme or morphological process calling for segmental copying.

Summarizing the most important points, REALIZE MORPHEME is dominated by a bundle of constraints (PROSODY for short) which govern the prosodic makeup of the reduplication. This ranking prohibits reduplication of non-trochaic stems and leads to non-exponence of the expressive morpheme in these cases (as evidenced by the ungrammaticality of **Ivonnepivonne*). The ranking in (27-a) leads to strictly bipedal, trochaic reduplications, ensuring the non-identity of base and reduplicant. (27-b) covers the variable ordering of faithful and deviant exponent in ablaut reduplication while ensuring fixed order in rhyme reduplications. Finally, the ranking in (27-c) explains the non-viability of ablaut reduplication with additional segmental alternations (**Michimachi*) and the avoidance of rhyme reduplications of bases with complex onset.

- (27) a. PROSODY, OCP >> RM >> DEP >> INTEGRITY
 b. RM >> ABLAUT >> LINEAR ORDER
 c. OCP >> RM >> SEGPAR >> LINEAR ORDER

Eventually, the various constraints and sub-hierarchies should be integrated into a coherent hierarchy. It has to be noted though that there are dialectal variations in terms of acceptability that I have not monitored given the merely anecdotal evidence from the internet search.

5 Conclusion

The perspective on reduplicative word formation offered here provides new insights into German morphophonology. The proposed taxonomy of this diverse phenomenon takes its cue from the lexicality of the form and leads to a delineation which identifies rhyme and ablaut reduplication as the only productive, truly reduplicative processes in the morphology of German. All other contemplable cases are properly treated as either phonological doubling, lexical sequencing or (special cases of) compounding.

The OT analysis demonstrates that both rhyme and ablaut reduplication may emerge when a segmentally and prosodically unspecified expressive morpheme is attached to a base – given that the base strictly obeys certain prosodic requirements, esp. concerning its foot structure. The present approach to reduplication eschews constraints that make explicit reference to base-reduplicant correspondence. Rather, reduplication is shown to be a special case of affixal derivation, where the affix is a plagiarist that avails itself of the segmental material of the base, making only slight changes to the original.

The OT grammar submitted here successfully models the emergence of the fixed bipedal structure, the obligatory but minimal segmental deviance of the reduplicant, the non-exponence of the expressive morpheme in the case of non-trochaic bases, the variable ordering of base and reduplicant in ablaut reduplication, and the interaction of reduplication with i) segmental alternations ([ç-x] avoidance in ablaut reduplication) and ii) onset complexity (in rhyme reduplication).

The crosslinguistic observations of the parallelisms regarding versification and word formation confirm the important role of grammar in poetry. It is especially interesting to note the crosslinguistic correlation between meter and rhyme that is reflected in reduplication. The current state of affairs, based on the very little evidence presented here, invites a bold generalization that needs to be tested: languages with syllable counting meter make use of identical rhyme (in poetry and in reduplications) while stress-counting languages avoid full segmental identity. The basis for this generalization, let alone its validity, remain open to argument.

I also leave for future work the interaction of i-truncation and reduplication that poses several problems. Wiese (2001) has emphasized the kinship of these two instances of prosodic morphology. However, the kinship is a complicated one: How is it that the same grammar that blocks reduplications of non-trochaic bases (**Nataliepatalie* < *Natalie*) is able to trochaify exactly those bases to build i-truncations (*Natti* < *Natalie*)? And, given that the i-truncations derived from non-trochaic bases can then serve as the input to reduplication (*Nittinatti* < *Natti*), why doesn't the i-suffix block ablaut reduplication as in other bases with two stem vowels (*Karloparlo*, **Kirlokarlo* < *Karlo*)?

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