Diminutive verbs in German: Semantic analysis and theoretical implications

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Wo er eine Kamera wittert,
da optimistelt er hinein.
'Wherever he scents a camera,
he puts on an optimisticish face.'
(The late German political satirist
Dieter Hildebrandt on former
German chancellor Helmut Kohl)

Abstract

German verbs ending in -eln *are often described as having a diminutive or iterative meaning. While this rather vague and general observation is widely agreed upon, hardly any research has been done to examine these verbs in a systematic way. In this paper, we try to close this gap by examining morphological, semantic and pragmatic aspects of these verbs as well as discussing the potential of various theoretical models to explain these results.*

Based on Jurafsky's (1996) model of diminutives, we extend the notion of verbal attenuation to cover concepts like iterativity, low intensity and small pieces, which are part of the semantics of many -eln *verbs. In addition to these semantic means of attenuation, many* -eln *verbs also trigger pragmatic types of attenuation such as contempt, trivialization or affection. We discuss possible relations between these different concepts and also show that some of them are more relevant for* -eln *verbs than others.*

As a corpus-based analysis shows, these various types of verbal attenuation can not only be observed with verbs like tänzeln*, where -l- appears as the result of a semantically motivated process of derivation, but, surprisingly, also quite frequently with verbs like* fiedeln *(<* Fiedel*) or non-derived verbs like* nörgeln*, where the presence of* -l- *cannot be accounted for in this way. This complex situation calls for an explanation which traditional rule-based approaches fail to provide. As a consequence, schema-based and exemplar-based models are*

discussed. We argue that output-oriented exemplar-based accounts promise to provide the best model of -eln *verbs, since they allow for recognition of the importance of as well as the interaction between phonological, morphological, semantic and pragmatic similarities between* -eln *verbs, even when these verbs result from entirely different types of derivation or are not derived at all.*

Keywords: German verbal word-formation, diminutive, schema-based morphology, exemplar-based morphology

1. Introduction

The German lexicon contains a sizable number of verbs ending in *-eln*, including the three examples *tänzeln*, *fiedeln* and *nörgeln* mentioned in the abstract of this paper. The formal identity of the endings of these verbs hides the fact that the presence of *-l-* is actually due to a variety of reasons. Firstly, *-eln* verbs can be the result of a derivation from nominal, adjectival and verbal bases that do not contain the letter <l>. This type (henceforth *Type I*) is illustrated by the verb *tänzeln* ('to mince, to step delicately'), derived from *tanzen* ('to dance'). Secondly (*Type II*), *-eln* verbs can be derived from nominal bases that already include the letter <l>, as is the case in *fiedeln* ('to fiddle, to scrape on the fiddle'), which is derived from the noun *Fiedel* ('fiddle'). Thirdly (*Type III*), there is a set of verbs ending in *-eln*, among them *nörgeln* ('to moan, to carp'), which are not derived, but monomorphemic.[1]

An obvious explanation for this tripartite division seems to be that we are essentially dealing with a complex case of homonymy here: Type I verbs (*tänzeln*) manifest a derivational word-formation process working with a suffix or suffix-like element, *-l*; Type II verbs (*fiedeln*) can also be considered to be the product of a derivation, but here *-l-* is not the result of an overt suffix derivation, but remains after the conversion from noun to verb; finally, the stems of simplex Type III verbs (*nörgeln*) just happen to end in *-eln* more or less by chance, and thus resemble the others only superficially.

As we will show in this paper, this homonymy approach falls short of doing justice to a number of empirical facts. The most striking one is the observation that a sizable proportion of *-eln* verbs of Type II and Type III, i.e. those in which *-l-* is present in the base and the non-derived ones, respectively, share key semantic properties with Type I verbs, in fact, precisely those properties that appear to motivate *l*-derivations like *tanzen* > *tänzeln*. *Tänzeln* can be considered to denote a less intense form of what is denoted by *tanzen*, and the same relation can be observed for many other pairs involving verbs belonging to this group, for instance *hüsteln* ('to cough slightly and repetitively') and *husten* ('to cough') or *spötteln* ('to mock in a playful manner, to poke gentle fun') and *spotten* ('to mock'). In addition, an iterative element can often be identified in the *-eln* verbs when they are compared to their bases. As has been noted by previous researchers (see Section 2.1 for a survey), it seems plausible in all these cases to assume that it is the *l*-element that brings about the diminutive and iterative meanings. The problem is that *mäkeln* and *nörgeln*, which are representatives of Types II and III respectively, also exhibit these semantic aspects of 'low intensity' and/or 'iterativity', even though the letter <l> has not been added by means of a derivational process, and the same is true for many more of these types of verbs. How can this be explained?

In this paper we aim to provide a detailed, data-based discussion of the meanings of *-eln* verbs and show that output-oriented exemplar-based theories of morphology, which go

[1] An obvious parallel can be drawn with pairs of English verbs like *to suck* - *to suckle*, *to tick* - *to tickle*, or *to crack* - *to crackle*. However, English verbs ending in *-le* are much rarer than German verbs ending in *-eln*.

beyond formally identifiable meaning-bearing elements, promise to provide the most adequate model of the empirical data available on German *-eln* verbs. In order to do this, we will first briefly review previous research on these verbs and on the notions of the ITERATIVE, the INTENSIVE and the DIMINUTIVE, which are central to their semantic description, and give an overview of the differences between three types of theories of derivational morphology (Section 2). Next, in Section 3, we will define the research questions arising from the mixed nature of *-eln* verbs: What is the morphological status of *-l-*? What is the meaning of *l-* derivation, and can one unified meaning of *-l-* be identified? How can the role of *-l-* in all three groups of *-eln* verbs be modelled most adequately considering the meanings of all types of *-eln* verbs? In Section 4, we will introduce our database of 273 *-eln* verbs and explain the parameters with regard to which we have analysed this material in order to reveal the distribution of their formal and semantic properties. All 273 verbs are listed in the Appendix with information on their bases, the word class of the bases and English translation equivalents. Section 5 will present the results of an in-depth semantic analysis of the verbs in our data. These will be summarized in Section 5. In Section 6, we will discuss the implications of these results for our research questions. These findings will then be taken up for a more detailed theoretical discussion in Section 7, in which we argue that exemplar-based theories seem best equipped to provide an adequate model of the data.

2. Previous research

2.1 Previous research on *-eln*

It is no exaggeration to say that *-eln* verbs are the Cinderella of German word-formation studies. Recent textbooks covering this field (e.g. Altmann 2011, Donalies 2005, Eichinger 2000, Erben 2006, Fleischer and Barz 2012 and Motsch 2004) devote no more than one page on average to *-eln* verbs, and this despite the fact that *-eln* is one of a very small number of verb-forming suffixes in German.

While most authors agree that the element under consideration here functions as a verbal suffix, they differ with regard to how they describe its form. Fleischer and Barz (2012: 429) resort to the maximally variable description "*-el(n)/-l(n)*", which is similar to the form "*-(e)l-(n)*" given by Altmann (2011: 133) and Erben (2006: 81). Dressler and Merlini Barbaresi (1994: 107-108) talk about the suffix "*-(e)l*" and mention Viennese "*-erl*" as a "regional colloquial" alternative (e.g. "*tratscherln*", 'to chatter'). Donalies (2005: 122), Eichinger (2000: 155) and Motsch (2004: 154) simply talk about the suffix "*-el*". Remarkably, Kühnhold and Wellmann (1973: 115–116) regard "*-l-*" as an "Infix". The decision as to whether one postulates a suffix "*-el*" or an infix "*-l-*" hinges upon the more fundamental decision whether verbal *-en* is regarded as an inflectional or a derivational morpheme (cf. Eichinger 2000: 154–155, Altmann 2011: 132). The divergence between the descriptions proposed by different authors, on the one hand, and the reluctance to name the nature of the beast in unequivocal terms, on the other, are both tell-tale signs of the somewhat elusive nature of *-eln* verbs, which may at least partly be responsible for their Cinderella existence. In the present paper, we will use the term "*-eln* verbs" in contexts where the precise status of *-l-* can remain open, and the shorthand descriptor "*-el*" for the suffix itself.

Accounts of the etymology of *-el* point to Old High German *-ilōn* and *-alōn* as the most likely source (e.g. Henzen 1957: 223; Erben 2006: 82). Henzen (1957: 223) attributes an iterative meaning to both elements; in addition, according to him, *-ilōn* verbs tend to have diminutive meanings, while *-alōn* verbs express tendencies. The presence of *-i-* in *-ilōn* triggers the *i*-umlaut effect illustrated, for example by *tanzen* > *tänzeln* or *husten* > *hüsteln* (Erben 2006: 82). The online edition of the *Oxford English Dictionary* (OED3, s.v. *-le*,

suffix)[2] traces related English verbs such as *nestle, twinkle* and *wrestle* to the "Old Germanic type *-ilôjan*, with a frequentative or sometimes a diminutive sense". While the online version of Grimms' *Deutsches Wörterbuch* (1854–1961)[3] does not have a separate entry for the verbal suffix *-el*, the dictionary contains a large number of verbs ending in *-eln* which are explained as deverbal derivations. Dressler and Merlini Barbaresi (1994: 108) claim that "at the origin of many diminutive verbs, there seem to be diminutive nominal bases", but do not give systematic evidence to support their claim. The semantic labels given to different types of verbs range from the simple "iterativ" ('iterative') and "diminutiv" ('diminutive') to "iterativ- und intensivbildung" (sic!; 'iterative and intensive formation'), "verkleinernde (iterativ)bildung" ('down-scaling/ minimizing (iterative-)formation') and "diminutiv oder frequentativ" ('diminutive or frequentative'). Failing to clarify whether he is arguing from a diachronic or synchronic perspective, Altmann (2011: 133) states that the starting-point of *-eln* verbs are nominal bases ending in *-el* such as *Kugel* ('ball'), *Zügel* ('rein') and *Hagel* ('hail') and claims that the productive denominal verb-forming suffix emerged from a morphological missegmentation of the corresponding verbs *kugeln* ('to roll'), *zügeln* ('to rein in') and *hageln* ('to hail').[4] Due to the existence of occasional derivations ("okkasionelle Derivate") like *warten* > *warteln*, Donalies considers "-el" to be productive (Donalies 2005: 122). Dressler and Merlini Barbaresi (1994: 108) also claim that "[p]roductivity is ascertained by neologisms" and illustrate this by means of the verb *dahinköcheln* (< *kochen*, 'to cook'), which apparently came up with reference to problems that are left to "gently boil[…] along" at their time of writing.[5]

Of course the key semantic features mentioned in the etymological treatments of *-eln* – ITERATIVE (or FREQUENTATIVE) and DIMINUTIVE – also play a role in synchronic descriptions. We devote a more detailed discussion to these features in Section 2.2.2. Opinions as to further semantic components shared by *-el* derivations are divided. Fleischer and Barz (2012: 429) provide different semantic descriptions depending on the base of the derivation. Firstly, the derivation from verbal bases is said to encode the "Wortbildungsbedeutung 'diminutiv-iterativ'" ('the word-formation meaning 'diminutive-iterative''), cf. *lachen* ('to laugh') > *lächeln* ('to smile') or *spotten* ('to mock') > *spötteln* ('to mock, in a playful, light-hearted way'). Secondly, for the derivation from nominal bases, they postulate the same meaning and, in addition, the sense "etw. in eine bestimmte Form bringen" ('to give sth. a certain shape') (Fleischer and Barz 2012: 430). The former is illustrated by *frösteln* ('to shiver') < *Frost* ('frost') as well as *sächseln* < *Sachse* (glossed as "ein wenig in der Art eines [Sachsen] sprechen", 'to speak a little bit like a Saxon'), the latter by *fälteln* ('to fold, to pleat') < *Falte* ('fold'). And thirdly, de-adjectival formations are illustrated by *frömmeln* ('to act piously, to affect piety') < *fromm* ('pious') and *blödeln* ('to fool about') < *blöd* ('silly'). Concerning the meanings of the adjectival formations, Fleischer and Barz (2012: 430) state: "Sie haben die Bedeutungen 'fromm, blöd sein' oder 'sich so benehmen, als sei man fromm, blöd' usw. und werden – außer *kränkeln* – meist ironisierend gebraucht". ('They have the meanings 'be pious, silly' or 'behave as if one were pious, silly', etc. and – with the exception of *kränkeln* – are mostly used with some degree of irony'.) Motsch (2004: 154) tries to be more

[2] Available at http://www.oed.com/.

[3] Available at http://dwb.uni-trier.de/de/.

[4] Altmann (2011: 133) also mentions Bavarian diminutive-forms ending in *-el/-erl* (e.g. *Bändel, Fischerl*) as an alternative source.

[5] This claim is in accord with our native speaker intuition. While the productivity of *-eln* was not systematically tested within the scope of this paper, *-eln* nonce-formations appear to be an everyday phenomenon of both spoken and written German. One such example is the non-lexicalized verb *optimisteln* in the initial quotation by Dieter Hildebrandt. Further examples are the verbs *frickeln, daddeln* and *merkeln*, which are used in an article in the online edition of the German newspaper *Die Welt* on June 04, 2005. (http://www.welt.de/print-welt/article674365/Frickeln-daddeln-oder-merkeln.html, accessed 19 August 2014)

parsimonious and lists only two meanings, or functions, of *-el*: "wie ein N tätig sein" ('to act in the way of an N'), illustrated by *sächseln* ('to talk with a Saxonian accent') and *schwäbeln* ('to talk with a Swabian accent'), and "in geringem Maße" ('to a low degree'), exemplified by *hüsteln* ('to cough slightly and repetitively') and *lächeln* ('to smile'). Kühnhold and Wellmann (1973: 115–116; cf. Erben 2006: 81) attribute an iterative meaning to *hüsteln* and *werkeln* ('to potter about') and claim that the term "iterative" is frequently used as a cover term for the features "ein wenig" ('a little'), "etwas" ('somewhat') and "den Ausdruck der mehrfachen oder wiederholten Tätigkeit" ('the expression of multiple or repeated actions'). Dressler and Merlini Barbaresi (1994: 107) observe that *-el* "reappears in verbs with iterative, attenuative, and pejorative" or "iterative-delimitative" meanings, which they illustrate by verbs like *hüsteln* (< *husten*, 'to cough', glossed as "to cough slightly, clear one's throat" by the authors) and *eifersüchteln* (< *Eifersucht*, 'jealousy', glossed as "to be petty jealous"). Donalies (2005: 122) does not choose to comment on the semantics of *-el* in general,[6] but only glosses the meaning of *spötteln* as "spotten, und zwar scherzhaft, leichthin" ('to mock, in a playful, light-hearted way'). Altmann (2011: 133) does not offer a semantic description either. Weinrich (1993: 1071) describes *-el-* as a verbal diminutive suffix ("ein verbales Diminutiv-Suffix") and makes the following brief but highly observant remark:

> [*-el*] weist den Hörer an, die Erwartung hinsichtlich der Grundform-Bedeutung nach unten oder auch zum Kleineren, Unverbindlicheren hin zu korrigieren. Je nach Grundform und dem Kontext läßt sich damit auch die ziellose und unplanmäßige Ausführung einer Handlung bezeichnen, was auch eine leicht negative Konnotation auslösen kann […]
>
> ([*-el*] tells the hearer to lower their expectation regarding the basic meaning or to expect a less binding meaning. Depending on the basic form and the context, these verbs can also denote actions that are carried out without a real aim or not according to a plan, which can also trigger negative connotations […])

In the only publication exclusively devoted to *-eln* verbs that we are aware of, Böttger (1982) gives a two-page treatment of the phenomenon. He distinguishes three semantic types: verbs like *handwerkeln* ('to potter about'), *künsteln* ('to behave in an affected manner', also 'to feign') or *witzeln* ('to joke, to crack silly jokes') are grouped together as sharing a derogatory or reproving meaning ("mit abwertendem oder tadelndem Sinn"; Böttger 1982: 9). The members of the second group, which includes the verbs *drängeln* ('to jostle'), *gruseln* ('to give s.o. the creeps)' and *kritzeln* ('to scribble, to scrawl'), are credited with an iterative and intensifying sense ("Iterativ- und Intensivbildungen"). In the last group, described as conveying a feeling of confidentiality and familiarity ("vertraulich-familiären Charakter"; Böttger 1982: 9), the *-l-* is claimed to have an onomatopoetic function. This aspect is also mentioned in other sources, e.g. Altmann (2011: 133) and Fleischer and Barz (2012: 430). Examples of verbs claimed to belong to this group are *bimmeln* ('to ring, typically with a light and soft tone'), *brutzeln* ('to sizzle') and *mauscheln* ('to spread rumours, to fiddle', also 'to cheat'). Our impression for these cases is that the onomatopoetic quality resides in the parts preceding *-eln*, i.e. *bimm-, brutz-* and *mausch-* rather than *-eln* itself.

Summarizing this survey of semantic descriptions found in the literature, we can conclude that, on the one hand, there is considerable agreement that many *-eln* verbs can be associated with the features DIMINUTIVE and ITERATIVE. The combination of these two features is also used by the authors of the *Dudenredaktion* (2005: 718), who state that most *-eln* verbs have a diminutive-iterative meaning. On the other hand, further aspects mentioned in various sources include 'acting as if' and 'feigning', 'playful', 'intensifying', 'derogatory', 'ironical', and 'familiar', which makes for a rather motley collection of seemingly unrelated notions. Interestingly, a number of authors remain silent on the meaning(s) of *-el*. It is also

[6] In fact, Donalies (2005: 122) claims that the suffixes "-el" and "-er" are semantically equivalent ("[s]emantisch gleich bedeutend").

remarkable that none of the authors cited here express any concern about the apparent incoherence of the meanings of the verbal ending *-eln*, presumably precisely because they regard *-eln* verbs as a mixed set of items which converge only in their forms, but differ semantically as a consequence of the fact that *-l-* owes its existence to different sources and motivations. As we will show, however, this view is not correct.

2.2 Terminology

2.2.1 *-eln* as an expressive/evaluative affix?

In view of the semantic properties of *-eln* summarized in the previous section, it seems attractive to consider this element as belonging to the field known as "expressive" or "evaluative morphology" (e.g. Scalise 1984, Stump 1993, Fortin 2011, Grandi and Kortvelyessy forthc.). And indeed, *-eln* meets a number of the key criteria of expressive affixes (Scalise 1984: 32–33), among them the types of semantic changes resulting from their addition, their position vis-à-vis prototypical derivational and inflectional affixes and their potential to be combined with further affixes of the same type. However, *-eln* also clearly violates two key requirements laid down by Scalise and not questioned in later work by Stump (1993) and Fortin (2011), namely that the syntactic category and the morphosyntactic features of the subcategorization frame of the base remain intact. Verbs ending in *-eln* can be derived from nouns and adjectives as well as verbs, and in verbal affixation the addition of *-eln* often changes the valency structure of the base verb, compare e.g. *drängen* ('to urge', monotransitive) > *drängeln* ('to jostle', intransitive). The element *-eln* thus defies attempts to place it squarely within the field of expressive morphology and should, to our mind, be regarded as straddling the boundary between typical evaluative and typical derivational affixes.

2.2.2 'Iterative', 'intensive' and 'diminutive'

As the reference to Kühnhold and Wellmann's (1973: 115–116) explanation of the term *iterative* in Section 2.1 has shown, the significance of this notion is far from clear. The same is true of the second term frequently found in semantic descriptions of *-eln* verbs, the feature DIMINUTIVE. In fact, the first two components that are claimed to be associated with the feature ITERATIVE by Kühnhold and Wellmann, 'a little' and 'somewhat', are certainly at least as valid for the DIMINUTIVE as they are for the ITERATIVE. What confounds the situation still further is that iterativity is often linked to an intensifying component, for example in the Grimms' term "iterativ- und intensivbildung". Bußmann (2008: 359; s.v. *Iterativ vs. Semelfaktiv*) thus rightly remarks: "Die Abgrenzung der I. [Iterativa] gegenüber den [...] Intensiva […] und [...] Diminutiva […] ist schwierig." ('The demarcation of iteratives from intensives and diminutives is difficult'). A consequence of this difficulty is that the significance of the terms *iterative, diminutive* and *intensive* is usually taken for granted rather than explained. As these three concepts are of key importance to this paper, we will have a brief look at them.

Firstly, the feature ITERATIVE forms part of the system of *aktionsarten* and aspect distinctions. As is indicated by its Latin root *iterare* ('to do a thing a second time, to repeat'; Lewis 1991, s.v. *iterare*), the notion of iterativity signifies the idea that an action is carried out again, i.e. a second time, or repeated several times.

Secondly, like the iterative, the feature INTENSIVE belongs to the framework of *aktionsarten* and types of aspects, but of course it also plays a prominent role in syntax (cf. intensifying adverbs) and word-formation (cf. intensifying affixes). The meaning of this feature is typically glossed in a somewhat circular fashion as "durch einen besonderen Grad

von Intensität gekennzeichnet" ('characterized by a high degree of intensity') (Bußmann 2008: 300, s.v. *Intensiv*). Intensification can denote a higher degree of force exerted by the agent when carrying out an action, which we do not find in our database of *-eln* verbs, or it can refer to repeated performances of an action – and here we come full circle to the ITERATIVE, of course.[7]

Thirdly, the feature DIMINUTIVE has a firm place in derivational morphology. Thanks to the wide-ranging paper on "[U]niversal tendencies in the semantics of the diminutive" by Jurafsky (1996), we find ourselves in a more fortunate position when describing the meaning of this feature.[8] Jurafsky's explicit aim is to provide a diachronically and cognitively coherent account of the seemingly unrelated meanings attributed to the diminutive. Framing his analysis of the diminutive in over 60 languages in the form of a radial category of related meanings à la Lakoff (1987), Jurafsky proposes a "universal structure for the semantics of the diminutive" (1996: 542), a simplified version of which is rendered in Figure 1.[9]

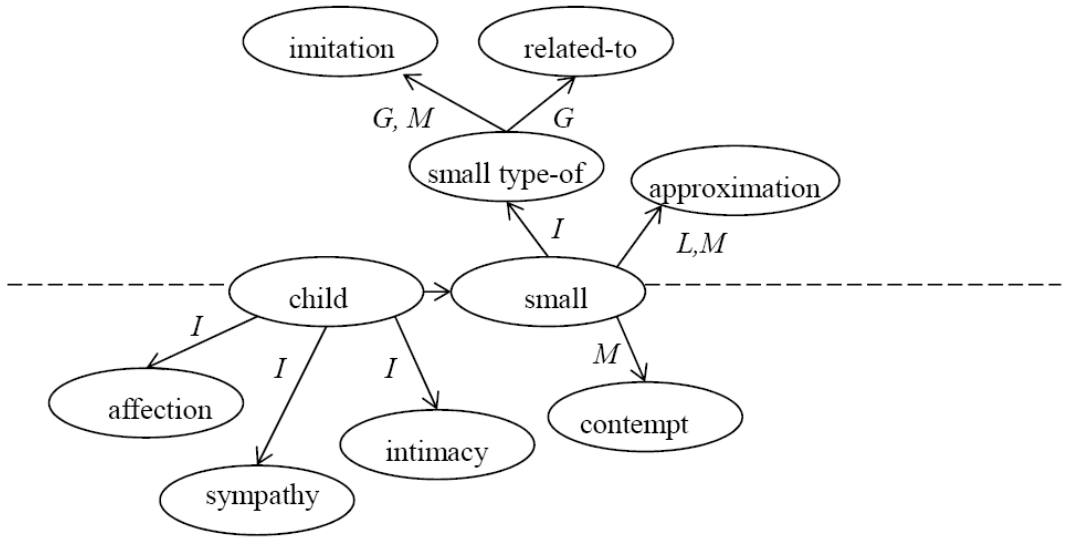

Figure 1: Simplified representation of Jurafsky's (1996: 542) "universal structure for the semantics of the diminutive" (irrelevant nodes are not rendered)

As can be seen, the core of Jurafsky's network, which is divided into semantic and pragmatic meanings, is formed by the closely connected concepts 'child' and 'small'. Meaning relations to other senses associated with the diminutive are explained in terms of four types of diachronic and cognitive linking mechanisms: metaphor (M), generalization (G), inference (I),

[7] Interestingly, Bußmann (2008: 301, s.v. *Intensivbildung*) links the intensive not only to the iterative but also, without further comments, to the concept of weariness or annoyance: "Solche [...] Affixe verleihen oft den verbalen aber auch substantivischen Ableitungen die zusätzliche Bedeutungskomponente der Wiederholung (→ Iterativ) bzw. des Überdrusses, vgl. *-el* in *spotten* vs. *spötteln* […]". ('Such […] affixes often supply the verbal and also nominal derivations with the additional meaning component of repetition ((→ Iterativ) or weariness, cf. *-el* in *spotten* vs. *spötteln*.')

[8] We are aware of Fortin's (2011) arguments against polysemy accounts of expressive affixes, notably also Jurafsky's (1996). However, we think that his way of explaining the descriptive and connotative meanings of expressive affixes as emerging compositionally from the interaction of the meanings of the affix and the base cannot be transferred to German *-eln* verbs because of the uncertain morphological status of what remains when *-eln* is split apart in the three types of verbs and because of the borderline position of *-eln* between derivational and expressive morphology (cf. Section 2.2.1).

[9] See Mutz (forthcoming) for a recent discussion of why "this picture […] might not be valid in all respects for all languages".

and lambda-abstraction (L), a concept which derives second-order predicates whose domains include a variable which itself ranges over predicates.[10] "For the diminutive, this process takes the original concept 'small*(x)*', which has the meaning 'smaller than the prototypical exemplar *x* on the scale of size', and lambda-abstracting it to 'lambda(y)(smaller than the prototypical exemplar *x* on the scale *y*)" (Jurafsky 1996: 555). We will discuss the concept of lambda-abstraction in greater detail below (5.1.1.1).

In the semantic part of the network, lambda-abstraction and metaphor link the concept 'small' to the notion of 'approximation'. In addition, the concept 'small' is connected to the notion 'small type-of' by the linking type of inference, further reaching out via metaphorical links and generalization towards 'imitation' and 'related-to'. In the pragmatic part of the network, the dominant relations are metaphors and inferences. These link the concept of 'child' to 'affection', 'sympathy' and 'intimacy' (all three by means of inference) and to 'contempt' (by means of metaphor).

Jurafsky's paper is heavily criticized by Dressler and Merlini Barbaresi (2001: 43), who try to "defend pragmatic priority against […] proposals for a semantic basis of the meaning of diminutives and augmentatives" like Jurafsky's concept of 'child'. The main reason for this criticism has to do with their general "claim that pragmatics is a superordinate of semantics" (Dressler and Merlini Barbaresi 2001: 43).[11] In line with this argument, Dressler and Merlini Barbaresi (2001: 43-44) suppose that "[i]n addition to the semantic features [small] of diminutives and [big] of augmentatives" there must be "a still more basic pragmatic feature [fictive] for both (specified as [non-serious] for diminutives)".[12] According to this view, pragmatic uses of diminutives are not derived from a basic semantic feature like 'child' or 'small', but directly from the presumed feature 'fictive'. However, in Dressler and Merlini Barbaresi's (1994: 147) earlier monumental chapter on diminutives, this claim is weakened as it is conceded that pragmatic meanings can be derived from semantic concepts. With respect to the "*diminutivum puerile* […], that is, when a child is the speaker or the addressee or a participant […] of the speech situation or is the referent of the speech among adults", which they consider to be a "pragmatic application of diminutive formation", it is stated: "This type of occurrence can be understood as either a pragmatic application of the denotative feature [small] or as a realization of the pragmatic feature [non-serious]. In the first case the denotative feature is transformed into a pragmatic feature of the speech situation." It is certainly telling that it is with respect to child-related speech situations that this concession is made. As far as our own analysis of *-eln* verbs is concerned, Jurafsky's basic concept 'child' offers the most convincing explanation for the verb-specific concepts required to explain the specific patterns of attenuation found in our data. This concerns both the semantic domain (e.g. 'playful-pretentive') and the pragmatic domain (e.g. 'proximity') (cf. Section 5.1). It seems particularly difficult to conceive of a convincing way to relate this latter concept of 'proximity' to the pragmatic concept 'fictive' proposed by Dressler and Merlini Barbaresi.[13] Our analysis of *-eln* verbs also revealed that the seemingly clear theoretical dichotomy

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[10] See Schwarz and Chur (1993: 152–157) for an earlier discussion of this concept.

[11] Dressler and Merlini Barbaresi (2001: 45-49) find further "flaws" in Jurafsky's model, which concern, among other things, the relation between synchrony and diachrony, first language acquisition and the question of feature-linking and which they criticize in order to defend their own "model of morphopragmatics". The discussion above focusses on those aspects which are most crucial for the analysis of *-eln* verbs.

[12] The square brackets with "[fictive]" and "[non-serious]" in this quote are used in the original to mark features.

[13] Mutz (forthcoming) is less categorical in her criticism of Jurafsky's. She discusses additional paths that lead to the development of diminutives in various languages (e.g. adjectives with the meaning 'small' or "suffixes deriving denominal adjectives or nouns with the meaning 'related-to' or 'similar-to' or 'origin-of'") and proposes a "simplified and revisited model *à la* Jurafsky", in which, importantly, "synchronic links between the senses only partially correspond to unidirectional diachronic paths".

between semantic and pragmatic meanings turns into a continuum with referential, denotative features on one end, pragmatic features on the other, and connotative and associative features somewhere in between. This observation casts doubt on another key argument mounted by Dressler and Merlini Barbaresi (2001: 44), namely that "a purely semantic representation of the evaluative character of diminutives […] leads to unacceptable reductionism". Weighing Dressler and Merlini Barbaresi's criticism against the potential promised by Jurafsky's model, we come to the conclusion that the problems should not prevent us from using Jurafsky as a starting-point for our analyis of *-eln* verbs.

2.2.3 The concept of attenuation

As the discussions in 2.1 and 2.2.2 have shown, terminological confusion is rampant in the field of *-eln* verbs. In order to avoid constant terminological quibbles forced upon us by the need to differentiate the traditional terms *iterative, intensive* and *diminutive*, we suggest using the term *attenuation* to cover the whole network of meanings potentially denoted by these notions.[14] Following Jurafsky's lead, the notion of *attenuation* will be defined as encompassing both semantic and pragmatic aspects. On the semantic side, the notion of attenuation is defined as capturing various means of depicting conceptual content as being less intense than a norm. This norm can be identified by reference to a morphological base or – if no such base exists – to a formally distinct verb which is semantically more or less identical but does not show the component of attenuation. For example, in the same way that *spötteln* can be regarded as encoding an attenuated variant of the meaning of *spotten*, *nörgeln* ('to moan, to carp') can be considered to denote an attenuated quasi-synonym of *sich beschweren* ('to complain'). This semantic component is, as Fortin (2011: 107 *et passim*) argues, comparable to the degree relation expressed by gradable adjectives. On the pragmatic side, attenuation encompasses different interpersonal or emotive aspects brought in by the speaker's choice of verb. Taking the example *nörgeln* once more, this verb not only encodes a weaker form of complaining and criticizing, but is typically used to express the speaker's annoyance or contempt for the event and actions reported on. While semantic aspects of attenuation are considered to be part of the systematic, context-independent meanings of *-eln* verbs, pragmatic aspects are related to the typical ways in which these verbs are used, not only with regard to levels of style (colloquial, dialectal) and different types of register (e.g. the language of proximity), but also with regard to speakers' evaluations. In practice this distinction between semantic and pragmatic meaning components is not always quite as clear as it is presented here. As will be shown in Section 7, some morphological theories are better equipped to explain this phenomenon than others.

The purpose of adding yet another term to the already confused field is not to lump together meanings in an undifferentiated manner, but to do justice to the obvious demarcation problems that researchers are confronted with in this field. It is our explicit aim to identify and discriminate the various ways in which the general concept of attenuation is manifested in *-eln* verbs and to show, very much in Jurafsky's spirit, that *-eln* verbs of all three types share meanings that are linked by various types of attenuation in a coherent way.

[14] Note that Fortin (2011: 139) also uses the term *attenuation* but limits its scope to the more specific feature 'a little' or 'a bit'. The term *attenuative* is used by Dressler and Merlini Barbaresi (1994: 107) in their discussion of *-eln* verbs but not specified any further.

2.2.4 Survey of morphological theories

For the purpose of this paper, the morphological theories we discuss to explain *-eln* verbs will be divided into three groups: rule-based models, schema-based models and exemplar-based models. The characteristics of these types of models and the similarities and differences between them will be explained in this section and taken up again in the application of these theories to *-eln* verbs in Section 7 (see Schmid forthc. for a more detailed survey).

Rule-based models focus on the morphological form of complex lexemes and aim to explain their internal structures and, more importantly, the principles underlying their formation by formulating rules and restrictions concerning their input and, much less prominently, output. Ideally, rules are designed in such a way that they do not leave room for exceptions whilst being maximally general and thus parsimonious. Notably, frequency information, e.g. on the number of types formed on the basis of a given rule, is considered irrelevant. Well-known representatives of rule-based models are the different variants of generative theories of word-formation, both word-based ones (e.g. Aronoff 1976, Scalise 1984) and morpheme-based ones (Lieber 1980, Williams 1981, Selkirk 1982). While descriptions of word-formation rules include both formal and semantic information, it is emphasized that the two levels of description correspond to two separate modules.

The modularity postulate is one of the key differences to the schema-based approach. Models of this type share the idea that speakers' knowledge about word-formation patterns and restrictions on their productivity is stored in the form of symbolic constructional schemas or templates. These are essentially form-meaning pairings which unite formal and semantic information very much in the way that traditional models of the linguistic sign do. Schema-based models connect related construction-schemas by inheritance links, thus regarding them as being embedded in large networks, and aim to assess the relative salience of schemas vis-à-vis each other in the network. In doing so, they take information about the number of existing types and their frequency of use in terms of tokens into consideration. One group of researchers who represent this type of approach come from the field of Cognitive Grammar (e.g. Ryder 1994, Kemmer 2003, Tuggy 2005); another group (e.g. Booij 2010) base their theories on the key ideas of Construction Grammar.[15]

Exemplar-based models (e.g. Bybee 1985, 2010: 14-33, 165-193, Eddington 2004: 71-98, Bybee and Beckner 2010, Arndt-Lappe 2011) share with schema-based ones the idea that morphological knowledge is represented in the form of complex networks. The main difference between the two approaches lies in the conception of the elements and relations making up the network. For schema-based models, the nodes in the network are constructional schemas, and the links between them are mainly of a hierarchical, i.e. largely taxonomic, nature. In contrast, exemplar-based models consist of (clusters) of individual word exemplars which are related to each other by similarity and analogy (Arndt-Lappe 2014, forthc.). While productive schemas or templates licensing new formations can emerge from analogies based on similarities between previously processed exemplars, representatives of exemplar-based models disagree on whether or not these schemas are actually represented as an additional level of knowledge. Connectionist exemplar-based models (e.g. Skousen 1992, Skousen et al. 2002, Bybee and McClelland 2005) deny the existence of symbolic representations, while models combining exemplar and schema representations (e.g. Bybee 2010) termed exemplar-cum-schema models in Schmid (forthc.), acknowledge it. In both types of models, previous exposure to exemplars – and thus frequency of processing – is a key factor influencing the structures and change of networks. Depending on exposure and output, the network is thus subject to constant reorganization. While exemplar-based approaches have

[15] Adopting Bybee's (1985) approach to inflectional morphology, Köpcke (1993) proposes an early schema-based analysis of German nominal plural morphology.

so far mainly focussed on formal, mainly phonological similarities in the network which are much easier to operationalize, the links in the network are also based on semantic as well as pragmatic similarities between individual words.

3. Aims and research questions

This paper combines the descriptive and analytical goal of providing a coherent and empirically founded account of the structures and meanings of *-eln* verbs with the theoretical aim of discussing the implications of the results of such an analysis for various morphological theories. The following questions will be investigated:

1. What is the status of the *-el* element in *-eln* verbs? What kind of morphological unit is it?
2. Can meanings related to the wider notion of attenuation be identified for *-eln* verbs across all three types, i.e. also those that do not have an overt suffix?
3. To what extent can Jurafsky's notion of diminutives and our concept of attenuation be applied to the analysis of meanings of *-eln* verbs?
4. Which theoretical framework promises the most adequate explanation for these findings?

4. Material and method

4.1 Data acquisition

Existing treatments of *-eln* verbs have not been based on larger lists of lexical items, but instead have essentially relied on exemplary illustrations selected by means of opportunistic sampling. In order to place our argument on a firmer empirical basis which allows for quantitative analyses, we have collected material in a systematic fashion from the online platform of the *Rückläufiges Wörterbuch der Deutschen Gegenwartssprache* (Mater 2001). In a first step, all lexical items ending in *-eln* were retrieved from the dictionary database. Next, all verbs ending in *-eln* were selected, forms belonging to other word classes were rejected. The verbs were then divided into non-prefixed and prefixed groups. In order not to confound the analysis by additional factors, only the non-prefixed verbs were selected for the present study.[16] Overall, the material amounts to 273 verbs ending in *-eln*. While this is clearly not an exhaustive list of all German *-eln* verbs, especially if dialectal forms are taken into consideration, the reliance on the dictionary database has the advantage that the material for our study is selected in an objective way and that the study is thus fully replicable.

In the next analytical step, the distribution of the 273 verbs across the three types explained in the introduction was determined. This was done on the basis of the information provided by the *Duden* (Dudenreaktion 2012), or, for cases where this information was missing, by recourse to our native speaker competence. Table 1 provides the results of this analysis, cross-tabulated with information on the grammatical categories of the derivational bases for derived *-eln* verbs.

[16] Among those prefixes that work particularly well with the concept of attenuation are *herum-* (e.g. *herumwursteln* ('to muddle along'), *herumfummeln* ('to fumble around'); 37 verbs in total) and *durch-* (e.g. *durchmogeln* ('to cheat one's way through'), *durchwursteln* ('to bumble through'); 31 verbs in total).

Table 1: Distribution of the three types of *-eln* verbs with regard to parts of speech of derivational basis

derivational basis	Type I: verbs that do not have *-l-* in the base lexeme, e.g. *tänzeln* n =125	Type II: verbs that have *-l-* in the base lexeme, e.g. *mäkeln* n = 126	Type III: verbs that do not have a derivational basis, e.g. *nörgeln* n = 22
verb	74%	5%[17]	n/a
noun	17%	87%	n/a
adjective	6%	2%	n/a
other / unclear[18]	3%	6%	n/a

As the table shows, Type I and Type II verbs are approximately equally numerous, while Type III verbs are much rarer. In addition, the Type I and Type II verbs show substantially different distributions. While three out of four Type I verbs are the results of deverbal derivation, this type of word-formation only accounts for one out of twenty Type II verbs. Denominal derivations exhibit a more or less complementary distribution.

4.2 Methodological considerations guiding the semantic analysis

The semantic analysis of the verbs in our database also relies to a large extent on information provided by the *Duden* dictionary. The focus of this analysis lies on features that are not part of the base lexemes of derived *-eln* verbs but seem to be connected precisely to this derivational element. For example, the verb *kippeln* ('to tilt back and forth') is considered to add an ITERATIVE element to its base verb *kippen* ('to tilt'); the verb *kränkeln* ('to be ailing'), which is derived from the adjective *krank* ('ill'), is analysed as containing the feature LOW INTENSITY, since the verb denotes a mild form of being ill. As semantic intuitions are notoriously subjective, especially when it comes to identifying subtle semantic nuances, in order to increase interrater reliability we do not challenge the *Duden's* original descriptions of the meanings or usage labels of given verbs, but adopt them directly into our analysis even if they do not entirely match our own intuitions. As far as meaning proper and the features related to the semantic complex of attenuation are concerned, two types of information from the *Duden* were taken into account: in addition to explicit meta-semantic signposts such as "iterativ" ('iterative') or "iterativ-intensiv" ('iterative-intensifying'), we consider the use of adjectives like "schwach" ('weak'), "klein" ('small') or "leicht" ('light', 'lightweight') or of adverbs such as "ein bisschen" ('a little'), "hin und her" ('back and forth') or "auf und ab" ('up and down') in the definitions to be a safe indicator of attenuation-related features of our target verbs. Regarding usage restrictions, this means that whenever a verb is marked as "umgangssprachlich" ('colloquial'), "landschaftlich" ('dialectal') or "abwertend" ('derogatory'), we systematically adopt this description.

Our intuition as native speakers of German only comes into play when the dictionary definitions and labels do not provide sufficiently detailed information. This is the case with *schwächeln* ('become weaker, not perform properly, but not in a serious way'), for example,

[17] Five *-eln* verbs are derived from existing *-eln* verbs according to the *Duden*: *kribbeln* < *krabbeln*, *krickeln* < *kritzeln*, *pökeln* < *pekeln*, *schnipseln* < *schnippeln* and *schunkeln* < *schuckeln*.

[18] The category "other/unclear" subsumes cases whose derivational source is not entirely clear according to the *Duden* (e.g. *sudeln* < *sieden*$_V$ or *Sudel*$_N$) and *-eln* verbs borrowed from other languages, viz. *metzeln* < Lat. *macellare*, *torkeln* < Mlat. *torculare* and *treideln* < ME. *trailen*. With the verbs *recyceln, handeln* (/æ/) and *paddeln*, which are borrowed from English (< *recycle, handle, paddle*), the spelling of the ending *-eln* has come about by the inversion of E. <le> to G. <el> signalling the integration of these loanwords into the German vocabulary.

which is derived from the adjective *schwach* ('weak'). As suggested by our paraphrase, it is our intuition that *schwächeln* is not simply used to describe someone's performance as weaker than desired or weakening, but to express that this deficit is not of a serious but of an attenuated nature. To put these intuitions about the semantic component of 'low intensity' on a more objective basis, a simple test was devised. For each of the questionable verbs, we tested whether it is possible to use them in a sentence like (1), in whose second part an expression using the derivational basis occurs. If no such derivational basis is attested in present-day German, we used the verb with the closest meaning resemblance for this comparison. This is illustrated in (2) and (3):

(1) Zuerst *schwächelte* sie nur ein wenig, aber dann begann sie, richtig *schwach zu werden*.
,At first, she only showed a little bit of weakness, but then she began to become really weak.'

(2) Zuerst *nörgelte* er nur ein wenig, aber dann begann er, sich richtig zu *beschweren*.
,At first he only moaned a little bit, but then he began to really complain.'

(3) Zuerst *schmunzelten* sie nur ein wenig, aber dann begannen sie, richtig zu *lachen*.
,At first she only smirked a little bit, but then she began to really laugh.'

(4) ?Zuerst *kugelten* sie nur ein wenig, aber dann begannen sie, sich richtig wie Kugeln zu bewegen.
,?At first they only bowled a little bit, but then they began to really move like balls.'

(5) ? Zuerst löffelte er nur ein wenig, aber dann begann er, richtig den Löffel zu verwenden.
,?At first he only spooned it a little bit, but then he began to really use his spoon.'

If it turned out to be impossible to find a corresponding verb, or if the test sentence did not make sense, as in (4) or (5), the element of 'low intensity' was rejected.

5. Analysis

We will now discuss the different types of verbal attenuation attested in our database, starting with Type I verbs (5.1). As the vast majority of verbs of this type are derived from verbs rather than nouns or adjectives, it can be excluded that a change of word-class lies behind these *l*-derivations, which, in turn, strongly suggests that the derivational process is motivated by the semantic changes. Type I verbs are therefore the best candidates for our search for semantic aspects associated with the meaning of attenuation and must be investigated first. In the second and third steps, we will check whether the semantic features identified by our analysis of Type I verbs can also be found in Type II and Type III verbs. Following Jurafsky's suggestions, we will divide the analysis of the meanings of *-eln* verbs into (more) semantic and (more) pragmatic aspects.[19]

Anticipating the most surprising results of the analysis, Table 2 shows that features associated with both semantic and pragmatic attenuation are by no means restricted to Type I verbs, where they are expected to occur, but are also found in Type II verbs and, most strikingly, to an even higher extent than in Type I, also in Type III verbs. Furthermore, Type III verbs show the highest proportion of items that include both semantic and pragmatic aspects associated with attenuation and the lowest proportion of items which are neither semantically nor pragmatically associated with attenuation. These results are highly

[19] It has rightly been pointed out by an anonymous reviewer of this paper that it is problematic to determine pragmatic meanings "in an armchair way", i.e. without looking at actual uses in actual contexts. However, as an extensive corpus study of more than 270 verbs clearly went beyond the scope of this first in-depth study of *-eln* verbs, we decided to rely on the information given in the *Duden* and our own native-speaker intuition.

unexpected because the monomorphemic, non-derived structure of the Type III verbs seems to exclude the possibility that there is a link between *-l-* and either the semantico-pragmatic complex of attenuation or, for that matter, any other meaning possibly shared by these verbs.

Table 2: Proportion of *-eln* verbs of all three types in terms of semantic and pragmatic attenuation

	Type I	Type II	Type III
semantic attenuation	82%	23%	91%
pragmatic attenuation	46%	36%	77%
both types of attenuation	36%	10%	68%
no features associated with attenuation	7%	51%	0%

5.1 Features associated with Type I verbs

5.1.1 Semantic aspects of attenuation

5.1.1.1 Jurafsky's core concept 'child' and associated features

As shown above, the concept of 'child' takes centre stage in Jurafsky's (1996) cross-linguistic account of meanings of diminutives. Even though at first sight it is hard to imagine how this concept could be elaborated or extended in such a way that it can be accommodated into the semantic structure of verbs, a search for possible manifestations of it in the data seems worthwhile. And indeed, some traces leading to the concept of 'child' can be found.

For one thing, it can be observed that nine Type I verbs in our database denote actions or kinds of behaviour that are almost exclusively attributed to children, among them *fremdeln* ('be scared of strangers'; < *fremd* 'strange'), *quengeln* ('whine'; < *twengen*, obs., 'squeeze, pressurize') or *strampeln* ('thrash about', 'kick your feet'; < *strampen*, obs., 'to stomp').

Secondly, the concept of 'child' can serve to explain the element of 'tentativeness', which can be linked back to the concept of 'child' by means of a concept of 'playfulness'. The verb *basteln* ('practise handicraft', 'create with one's hands') illustrates this semantic cluster. It denotes not only an action that is typically associated with children, but also expresses the idea that the action of repairing, building or creating something is carried out in a rather leisurely, non-serious or playful way, and that it is partly done for fun. As is typical of this type of verbs, *basteln* can also be used metaphorically to describe that someone keeps working on a certain project, e.g. a speech or a paper, trying to improve it in a somewhat ineffective way with hardly noticeable progress. As this example illustrates, the type of attenuation of the metaphorical use can sometimes switch to the feature LOW INTENSITY in these cases, which will be discussed in greater detail below. A similar description is possible for *werkeln* ('to potter about'), which denotes that some kind of work is done as a hobby. Note that *werkeln* is not associated with children anymore, so that PLAYFUL-TENTATIVE must be considered as being independent from LOW INTENSITY. The prototypical member of this group is certainly *tändeln* ('to play about', 'dally'), which is defined as 'doing something in a playful and light-hearted rather than in a serious way' ("etwas mehr in spielerisch-leichter als in ernsthafter Weise tun, ausführen"; Dudenredaktion 2012, s.v. *tändeln*).

Thirdly, the idea of a light-hearted kind of pretence, which shows up in some Type I verbs, could be related to the concept of 'child'. We refer to this feature as PLAYFUL-PRETENTIVE. *Frömmeln* ('affect or make a show of piety'), for example, does not describe the lifestyle and actions of someone who is actually *fromm* ('pious'), but of someone who tries to leave the impression of being *fromm*. The same is true for *künsteln* ('behave in an affected or unnatural way'), which denotes something that is supposed to look arty or sophisticated, but actually has very little to do with real art. While it must be emphasized that, as with the

feature PLAYFUL-TENTATIVE, these verbs are not directly linked to the concept of 'child', the associations with children are too strong to be left entirely unnoticed.[20]

Overall, then, the concept 'child' and some associations related to it do play a role in *-eln* verbs of Type I, but they seem to be less prominent than in Jurafsky's account of nominal diminutives.

5.1.1.2 SMALL PIECES

Five Type I verbs share a semantic feature related to the activity of 'splitting something into smaller parts or pieces'. Many of these verbs additionally have the features ITERATIVE and/or LOW INTENSITY, e.g. *schnetzeln* ('to slice') and *schnippeln* ('to snip'), but since not all of them do, it is necessary to postulate a separate feature SMALL PIECES. The clues typically found in the *Duden* definitions of these verbs are expressions such as "kleine Stücke" ('small pieces') or "in dünne Streifen" ('into thin strips'). Further examples in our database are *bröckeln* ('to crumble'; < *Brocken* 'lump, chunk, scrap') and *häckseln* ('to hack into smaller pieces'; < *hacken* 'to hack').

5.1.1.3 LOW INTENSITY

As many as 55 of the 125 verbs collected under Type I, i.e. 44 %, are marked by a feature we have termed LOW INTENSITY. This prominent feature encapsulates the meaning of 'not very intense, of lower intensity than a given norm'. Jurafsky (1996) introduces the mechanism of lambda-abstraction to explain how the concept 'small in size' can develop to denote 'small on a particular scale':

> Lambda-abstraction takes one predicate in a form and replaces it with a variable. The resulting expression is now a second-order predicate, since its domain includes a variable which ranges over predicates. For the diminutive, this process takes the original concept 'small(*x*)', which has the meaning 'smaller than the prototypical exemplar *x* on the scale of size', and lambda-abstracting it to 'lambda(*y*)(smaller than the prototypical exemplar *x* on the scale *y*)'. (Jurafsky 1996: 555)

As Jurafsky himself notes, this process is particularly important for verbs and adjectives (1996: 554), and indeed it seems to be of crucial importance for this kind of attenuation. As the term *low intensity* already suggests, there is always a reference to an implicit scale that is not necessarily that of size. We would like to argue that this feature is a verbal counterpart to Jurafsky's second central concept of 'small', which lies at the heart of his network, next to 'child'. While the dimension of SIZE is part and parcel of thing-like concepts denoted by nouns, be they concrete or abstract, this dimension is practically inapplicable to the actions and events typically denoted by verbs: there is no such thing as a 'small playing', 'small going' or 'small reading'. The idea that an action is being carried out or that an event takes place with less-than-normal intensity is captured very clearly in verbs like *frösteln* ('to shiver'), *kränkeln* ('to be ailing'), *muffeln* ('to smell musty') or *schwächeln* ('become weaker, not perform properly, but not in a serious way'). As pointed out in Section 4, it is striking that in almost all cases in which the feature LOW INTENSITY is present, it is possible to find a verb that denotes exactly the same type of action but lacks the element of low intensity: while *frösteln* is used if someone is feeling a little cold, the verb *frieren* has the plain meaning of

[20] There is an obvious resemblance between the feature [PLAYFUL-PRETENTIVE] and the feature [IMITATION] which is mentioned by Jurafsky. However, Jurafsky does not link imitation directly to 'child' but regards 'small type-of' and 'small first' as mediating nodes in his network.

'being cold'. The same goes for *muffeln* and (*schlecht*) *riechen* ('to smell bad') or even *stinken* ('to stink').[21] As for *schwächeln* and *kränkeln*, there is no directly corresponding simple verb. However, as also mentioned above, corresponding stronger verbal expressions containing their derivational basis, i.e. *schwach sein* ('be/feel weak') or *krank sein* ('be ill'), respectively, do exist. Our analysis suggests that the meanings of verbs such as *frieren* and *riechen* can be projected onto a scale on which *frösteln* and *muffeln* signal a somewhat lower intensity. Just as the concept of 'small' seems to form the core of the network of nominal diminutive meanings, this concept of low intensity can be regarded as the conceptual basis of many other forms of attenuation for verbs.

The verbs *lispeln* ('to lisp'), *nuscheln* ('mumble', 'mutter') and *näseln* ('speak with a nasal twang'), on the one hand, and *sächseln* and *schwäbeln*, on the other, stand out from this group as specific manifestations of the feature LOW INTENSITY applied to the domain of language. These verbs can be characterized as denoting mild deviations from a tacit norm of how to speak. For the first group, i.e. *lispeln, nuscheln* and *näseln*, this norm is ordinary, i.e. properly articulated, speech, while for *sächseln* and *schwäbeln*, the reference point is Standard German. Thus, *sächseln* can be glossed as 'to speak German with some Saxonian influence'. The fact that it is perfectly possible to say "Dein Co-Moderator sächselt *total* - das ist lustig. [O]der auch gruselig." (http://www.lastfm.de/user/Kirstee/shoutbox; 'your co-host speaks with a strong Saxonian accent - that's funny. Or also creepy.'; our emphasis) shows that *sächseln* does not denote a weaker form of Saxonian, but more generally a Saxonian influence on Standard German.

5.1.1.4 ITERATIVE

As outlined in 0, the concept LOW INTENSITY is closely linked to an ITERATIVE meaning component, which forms part of the meaning of a large number of *-eln* verbs, among them 47 belonging to Type I (i.e. 38%). While it could be assumed that repeated actions result in more rather than less intense actions, there is, as already mentioned, a close conceptual connection between the two notions. A good example to illustrate this is *prickeln*, whose two meanings are defined by the *Duden* (Dudenredaktion 2012, s.v. *prickeln*) as "kleine, aufsteigende Bläschen bilden; perlen" ('to make small rising bubbles; to sparkle') and "wie von vielen, feinen, leichten Stichen verursacht kitzeln, jucken" ('to tickle, to make itch as if with many fine and light pricks'). Both of these meanings illustrate the link between reduced intensity and iterativity: rather than encoding a global and conclusive type of action, an ongoing, durative activity is conceptualized as consisting of smaller events that occur successively but have less force and intensity than the action proper. This becomes particularly clear in the sense denoting a punctual event of pricking, which corresponds to German *stechen* ('to stab, to prick'), but it also becomes visible when we compare the image of "small rising bubbles" to one big explosion-like event. The same is true of *funkeln* ('to sparkle'), which describes a flickering succession of flashes, each of which, however, is not very bright. In the cases of verbs such as *kippeln* ('to tilt/rock back and forth'; < *kippen*, 'to tilt') and *schütteln* ('to shake'; < *schütten*, 'to pour'), the idea of repetitive movements takes the form of a back-and-forth movement derived from conclusive and telic actions. It is important to note that *kippeln*, when used in the sense of 'rocking back and forth repeatedly on a chair', necessarily implies that the chair never falls over completely, although it very nearly does over and over again. A final illuminating example is the verb *rascheln* ('to rustle' from the obsolete *raschen*, 'to

[21] Further examples include *lachen* ('to laugh') and *lächeln* ('to smile'), spotten ('to mock') and spötteln ('to mock in a playful manner, to poke gentle fun'), *tanzen* ('to dance') and *tänzeln* ('to mince, to step delicately').

rustle'), where the notions of the low intensity of the sound denoted by the verb and the repetition of the events causing the sound are particularly closely intertwined.

Interestingly, the verb *schütteln* ('to shake') just mentioned and credited with an iterative meaning, is also labelled as "intensivierend", i.e. 'intensifying' in the *Duden* (Dudenredaktion 2012, s.v. *schütteln*). While the combination of the features LOW INTENSITY and ITERATIVE is, as we have seen, quite frequent, the semantic complex ITERATIVE-INTENSIVE is less common, despite its obvious connection to the features ITERATIVE and DIMINUTIVE (cf. Section 2.2). Among the few other cases in point are the verbs *prasseln* ('to clatter, to drum') and *trampeln* ('to stamp repeatedly, to trample), both of which denote a repetitive action carried out with great force.

The meanings of these verbs suggest that it is precisely the iterative aspect which forges the link between the seemingly contrary meanings of low and high intensity. Our data suggest that the effect of the repetition has to do with the nature of the repeated action: if a conclusive action such as stabbing or exploding is conceptualized as a sequence of smaller, uncompleted actions, this results in a reduction of the intensity, reflected in the feature LOW INTENSITY; if, however, a durative action such as drumming or trampling is conceptualized as being repeated, the conceived intensity of the action increases. In this way, the notion of iterativity can emancipate itself, so to speak, from the concept of scalarity and be used for repeated actions without necessarily reducing their individual force.

This completes the semantic analysis of *-eln* verbs of Type I. We will now turn to pragmatic aspects related to attenuation, again using Jurafsky's account as a basis.

5.1.2 Pragmatic types of attenuation

5.1.2.1 Jurafsky's 'affection' and 'sympathy'

According to Jurafsky (1996: 563), "the use of the diminutive to mark affection and sympathy has been well documented". Note that while Jurafsky seems to be talking about a pragmatic dimension (cf. "the use of ...") rather than a semantic one here, the boundary is far from clear. Three subgroups of *-eln* verbs can be related to this wider field.

Firstly, more on the semantic side, we find a considerable number of *-eln* verbs of Type I which denote affectionate actions like *kuscheln* ('to cuddle'), *streicheln* ('to stroke', 'to fondle') or *tätscheln* ('to pat'). In all of these cases, the verbs' potential to denote an affectionate action seems to have something to do with the fact that they describe soft and repetitive movements, which suggests links to the features LOW INTENSITY and ITERATIVE.

Secondly, sympathy and affection, as well as low intensity, play a role in the marking of actions as being not very harmful. The verb *plänkeln* ('to skirmish') expresses the idea that a certain argument does not have to be taken all too seriously or did not cause any real damage. This idea of playing down what happened explains why some *-eln* verbs lend themselves to euphemistic uses. *Baumeln* ('to dangle', 'to swing'), for example, can be used to express the idea of being hanged; *schwindeln* ('to fib') connects the feature LOW INTENSITY to a euphemistic component, suggesting that it is not such a serious lie; *hänseln* ('to tease') combines associations with 'child' with LOW INTENSITY and a somewhat trivializing effect.

Thirdly, when looking at the usage labels found in the *Duden*, it is striking that as many as 40 Type I verbs (i.e. 32%) are characterized as "colloquial" and/or "dialectal" and as being typical of the spoken medium. These labels locate the use of these verbs squarely in the domain of the "language of proximity" (cf. Koch and Oesterreicher 1990: 5-12), which, of course, is also the main habitat of affective language use. Verbs of this type are used to signal interpersonal proximity, again usually in addition to including semantic aspects such as LOW INTENSITY. Jurafsky's idea that this element can be traced to the concept 'child' is certainly very plausible. *Busseln*, for example, is a word that is used colloquially and dialectically to

denote a mild form of *küssen* (‘to kiss’). Further examples include *grummeln* (‘to mutter’), *kraxeln* (‘to clamber’) or *wursteln* (‘to muddle’, ‘to fiddle’). By using a word from an informal register, speakers can talk about what happened in a more laid-back way, portraying themselves as taking the actions they refer to altogether not too seriously.

5.1.2.2 ‘Contempt’

‘Contempt’ is another concept associated with the diminutive by Jurafsky. As shown in Figure 1, this concept is treated as a metaphorical extension of ‘small’ by Jurafsky. While ‘contempt’ seems to be in polar opposition to ‘affection’, both concepts are united by the fact that they typically find expression in the emotional language of proximity and the trivialization mentioned in 5.1.2.1. The concept ‘child’ appears to be the crucial link that explains why ‘affection’ and ‘contempt’ can be linked so closely. In our database, *deuteln* (‘to quibble’, ‘to niggle’), *hätscheln* (‘fondle’, ‘pamper’) and *quasseln* (‘blather’) can serve to illustrate this category. In its meaning description, the *Duden* mentions a stylistically neutral counterpart to each of these verbs: *hätscheln* is a derogatory equivalent to *liebkosen* (‘to fondle’), *deuteln* to *deuten* (‘to interpret’, ‘to explain’) and *quasseln* to *reden* (‘to talk, to speak’). As before with the component of ‘affection’, in all three cases semantic features, in addition to pragmatic ones, also resonate: *hätscheln* is strongly associated with ‘child’, and *deuteln* and *quasseln* with the feature LOW INTENSITY. Further Type I verbs which frequently combine semantic features of attenuation with ‘contempt’ are *frömmeln, klügeln, künsteln* and *lispeln*. However, as lies in the nature of pragmatic meanings, these verbs can perfectly well be used without any derogatory elements.

5.2 Interim summary

So far, we have demarcated the semantic complex associated with attenuation which is shared by *-eln* verbs of Type I and identified recurrent pragmatic aspects, trying throughout to tie our analysis to Jurafsky’s (1996) model of the diminutive. The features and aspects that emerge from this endeavour are, now rendered in the order of their importance:

Semantic attenuation
- LOW INTENSITY (with its specific manifestation in the domain of language)
- ITERATIVE (with its composite variants iterative-low intensity and interative-intensive)
- small pieces
- PLAYFUL-TENTATIVE and PLAYFUL-PRETENTIVE (both closely connected to the concept ‘child’)

Pragmatic attenuation:
- language of proximity
- contempt
- affection and sympathy
- trivialization
- euphemism

As we have tried to show, these features are not unrelated, but rather form a semantically and conceptually coherent network. In addition, while the most prominent features LOW INTENSITY and ITERATIVE are not part of Jurafsky’s terminology, his “universal system” can be transferred to the domain of verbs and dynamic concepts. The idea frequently found in the

literature that many verbs which are derived by means of the suffix *-el* have, at least in some sense of the term, 'diminutive' or 'attenuated' meanings, receives support from our analysis. The analysis of *-eln* verbs of Type I will serve as a backdrop for the investigation of Type II and Type III verbs.

5.3 Features associated with Type II and Type III verbs

Given the structural differences between Type I and Types II and III, it should be expected that the semantic and pragmatic types of attenuation identified for Type I verbs should not appear very prominently among Type II and Type III verbs. However, as Table 2 has shown, this is far from correct.

5.3.1 Type II verbs

Almost all types of semantic attenuation we observed in our discussion of Type I verbs are also attested for Type II verbs, although it must be admitted that their presence is much less pronounced in quantitative terms. As all details concerning the semantic features and pragmatic aspects have already been explained, we will only take up the features listed in Section 5.2 and provide examples and brief comments where necessary.

- LOW INTENSITY, n = 8: *fiedeln, gaukeln, knobeln, kribbeln, krickeln, nesteln, sudeln, torkeln*. That *kribbeln* ('to tickle') is a good example of low-intensity attenuation becomes clear when it is compared to the stronger *jucken* ('to itch'). The same goes for *mäkeln* ('to find fault with / to carp at sth.') with respect to *kritisieren* ('to criticize')
- ITERATIVE, n = 15: e.g. *hobeln*, *klöppeln*, *rammeln*, *schaukeln*, *schunkeln, wedeln*. In the cases of *pendeln* ('swing to and fro') and *kurbeln* ('to turn a crank'), the iterative meaning component is already part of the semantics of the derivational bases *Pendel* ('pendulum') and *Kurbel* ('crank'), respectively.
- SMALL PIECES, n = 8: *bröseln*, *krümeln*, *schnipseln*, *sprenkeln*, *würfeln*. Again, the meaning of 'small pieces' is taken from the bases of these verbs.[22]
- PLAYFUL-TENTATIVE, n = 2: *fiedeln, knobeln*. The verb *knobeln*, which has the meanings 'to roll dice' and 'to puzzle / rack one's brain' creates strong associations with the playing of children.

As for pragmatic attenuation, there are no Type II verbs that include the aspect of sympathy or affection. Neither are there examples of trivialization or euphemistic uses. Instead, Type II verbs have a tendency to express the opposite pole, namely that of contempt. This is what speakers convey when they use the verbs *buckeln*, *fiedeln, mäkeln, nesteln* and *dudeln*.

In as many as 38 Type II verbs (i.e. 30%), the pragmatic complex of COLLOQUIALITY and LANGUAGE OF PROXIMITY are represented. Examples illustrating colloquiality include *brutzeln*, *deichseln* and *gammeln*. Examples of Type II verbs that are marked as belonging to a particular dialect are *schunkeln*, *rodeln* and *klüngeln*. What is particularly striking about Type II verbs is the fact that no less than seven of them can be used for colloquial, often vulgar, reference to sexual intercourse, among them *hobeln*, *orgeln* and *rammeln*.

[22] In the case of *achteln, dritteln* and *vierteln*, which rely on a pattern that can be productively applied to all numbers (e.g. *fünfteln*, *siebteln*, etc.), it seems more likely that these verbs are derived from the corresponding terms denoting fractions, e.g. *Viertel*$_{N}$ or *Achtel*$_{N}$, deriving in turn from *Vierteil* and *Achtteil* (lit. 'fourpart' and 'eightpart', respectively), which already contain the letter <l> as part of the noun *Teil* 'part', rather than directly from the cardinal numerals *acht* ('eight'), *vier* ('four'), etc.

Semantically, some of these verbs can also be connected to the feature ITERATIVE which seems to be the source of their metaphorical extensions. Interestingly, no such uses are attested for any of the Type I or Type III verbs.

Overall, in light of the fact that the Type II verbs are not derived by means of an overt suffixation using the suffix *-eln*, but instead are a result of a conversion from nouns or, much less frequently, from verbs, the extent of meanings that can be associated with attenuation is clearly amazing. This remains true even if we take into consideration that the features ITERATIVE and SMALL PIECES are frequently inherent in the nominal bases of the verbs. What we should also keep in mind is the finding that pragmatic attenuation as such is represented almost as strongly as in the group of *-eln* verbs of Type I, although the main form of pragmatic attenuation is the language of proximity.

5.3.2 Type III verbs

As the overall number of Type III verbs (n = 22) is much lower than in the case of Type I and Type II verbs, we will list all examples here:

Semantic attenuation:

- LOW INTENSITY, n = 9: bimmeln, buddeln, bummeln, fummeln, humpeln, murmeln, nörgeln, schnüffeln, trippeln. All nine verbs have non-attenuated semantic counterparts: bimmeln – läuten, buddeln – graben, bummeln – gehen, fummeln – berühren, humpeln – gehen, murmeln – sprechen, nörgeln – kritisieren, schnüffeln – riechen, trippeln – gehen.
- ITERATIVE, n = 14: bimmeln, buddeln, dümpeln, hecheln, kitzeln, mümmeln, nörgeln, nuckeln, schnüffeln, trippeln, tummeln, wabbeln, wuseln, zappeln.
- 'child', n = 8: buddeln, kitzeln, krabbeln, nörgeln, nuckeln, trippeln, tummeln, zappeln

Pragmatic attenuation:

- trivialization, n = 2: *bimmeln, krabbeln*
- language of proximity, n = 14: bimmeln, brabbeln, buddeln, bummeln, dümpeln, fummeln, hecheln, mümmeln, munkeln, nuckeln, schnüffeln, trödeln, tummeln, wabbeln, wuseln.
- contempt, n = 3: brabbeln, nörgeln, trödeln

The extent of both semantic and pragmatic attenuation exhibited by the Type III verbs is clearly stunning. As pointed out above, all verbs in this group have semantically or pragmatically attenuated meanings, with a large proportion combining both types.

5.4 Summary of results

The summary of the results of our analysis will now be presented in the form of three diagrams taking up Jurafksy's universal structure, but adapting it to the situation at hand. The three figures render the semantic and pragmatic types of attenuation for the three types of verbs. In each figure, the thickness of the lines of bubbles gives a rough idea of the proportion of verbs exhibiting the specific type of attenuation. Features that pertain to more than 30% of the verbs in each group are marked by bold lines; features that are associated with lower

proportions of verbs by normal lines; and features that are not attested for the verbs in a given group are omitted or marked by broken lines for the central features CHILD and SMALL.

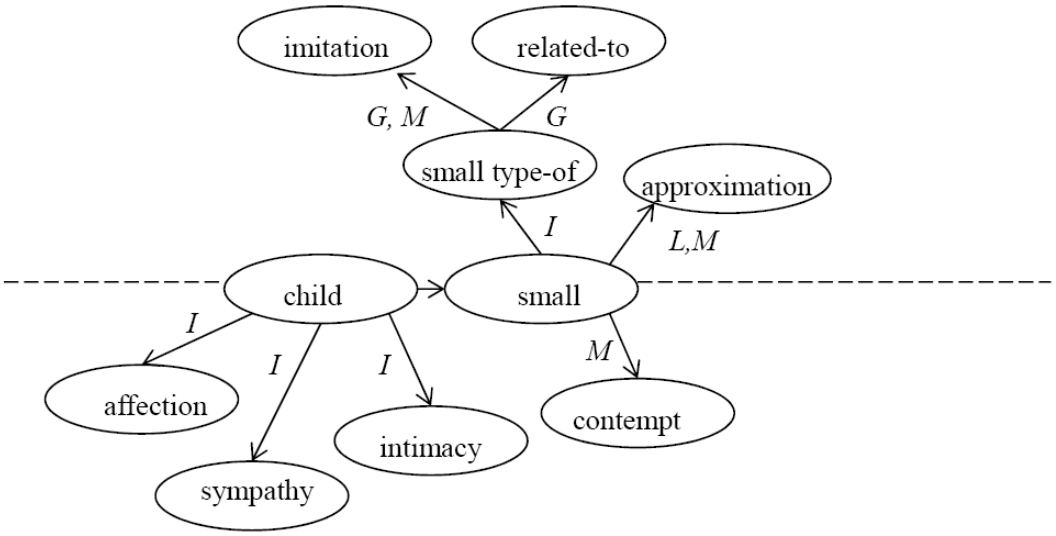

Figure 2.a Type I Verbs

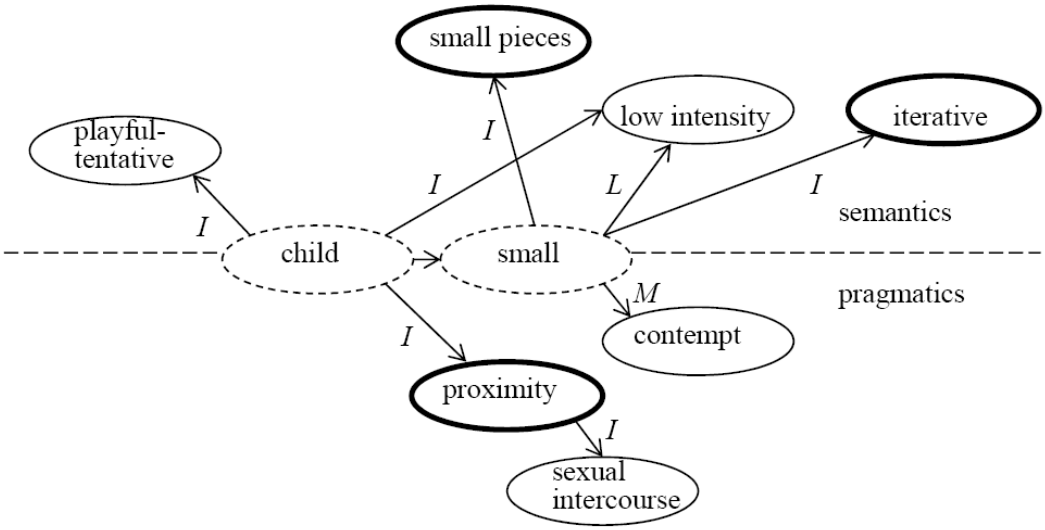

Figure 2.b Type II Verbs

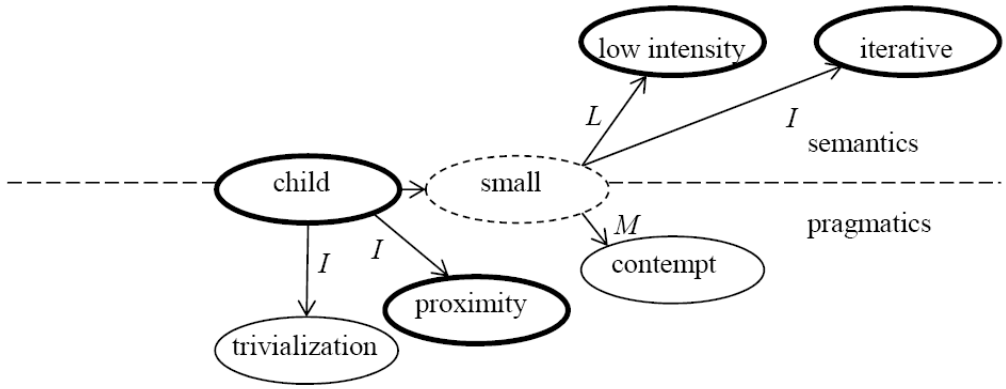

Figure 2.c Type III Verbs

A comparison of the three figures yields a number of interesting insights. Firstly, and most importantly, even though the individual ramifications and foci of the three networks differ, all three types of verbs participate in the same system of types of attenuation. Note that, just as in Jurafsky's model, the concept 'child' is the centre-stage link that explains how other concepts are interrelated. While it could be expected that Figure 2.a (Type I verbs) depicts the most complex and Figure 2.c (Type III verbs) the least complex network, the extent to which semantic and/or pragmatic attenuation is reflected in Figure 2.c comes as a surprise. This clearly runs counter to the assumption that the semantic complex of attenuation can be tied to the suffix-like element *-el*, since such an element is not part of the Type III verbs. For Type II verbs, both semantic and pragmatic attenuation are less prominent but still much more noticeable than would be expected in light of the fact that *-el* is part of the base of these verbs.

Secondly, the key features and aspects associated with attenuation are shared by all three types of verbs: the semantic features LOW INTENSITY and ITERATIVE, and the pragmatic aspects related to the language of proximity and the expression of contempt. If one wished to identify a core meaning for the notion of attenuation, it is this complex of semantic and pragmatic aspects.

Thirdly, Type I and Type III verbs have in common the fact that the features LOW INTENSITY and ITERATIVE are very prominent, and that many verbs including these features also belong to the language of proximity. While the latter aspect is also shared by Type II verbs, the former is not, at least not to the same extent.

6. Implications for our research questions

What do these findings mean in terms of the research questions formulated in Section 3, which are repeated here for readers' convenience:

1. What is the status of the *-el* element in *-eln* verbs? What kind of morphological unit is it?
2. Can meanings related to the wider notion of attenuation be identified for *-eln* verbs across all three types, i.e. also those that do not have an overt suffix?
3. To what extent can Jurafsky's notion of diminutives and our concept of attenuation be applied to the analysis of meanings of *-eln* verbs?
4. Which theoretical framework promises the most adequate explanation for these findings?

With regard to the status of *-el* as a morphological unit, the evidence suggests that the insights gained from a formal and categorial analysis of *-eln* verbs, which underlies the division into verbs of Types I, II and III, is not fully matched by the semantic and pragmatic analysis.[23] The assumption that *-el* is a derivational morpheme which is only at work in Type I verbs but not in those of Types II and III must be rejected on both semantic and pragmatic grounds, since meanings and use specifications which would be associated with this morpheme are more prominent in verbs of Types II and especially III than would be predicted. As *-el* does not have the status of a meaning-carrying component in verbs of Types II and III, an account in terms of morphological homonymy has to be ruled out, too. A way of keeping up a morpheme-like status for *-el*, which seems plausible from both an intuitive and a historical point of view, would be to treat it as a phonaestheme associated with the meaning of attenuation. This would have the advantage that *-el(n)* could be regarded as a meaning-bearing, or at least meaning-triggering, element, while leaving room for cases that do not carry elements associated with attenuation. Alternatively, one could shift the perspective on *-eln* verbs from the predominantly input-oriented and 'generative' perspective (in the wider sense of this term) to a result- or output-oriented one (cf. Plank 1981: 148–183; Neef 1996; Raffelsiefen 1999). From this fresh perspective, the question concerning the morphological status of *-el* and the nature of the input to potential morphological processes involved in the formation of *-eln* verbs loses in importance dramatically – a move strongly recommended, among others, by Plag (2004) for derivational morphology in general and by Bauer, Lieber and Plag (2013: 391) specifically for English diminutives. Instead, the phonological structure as well as the semantic and pragmatic properties of the word as such, no matter whether it is the product of a morphological process or exhibits a form that happens to look as if it could be, play a key role. We will pursue this avenue of reasoning in more detail in Section 7 below.

Concerning the second research question formulated in Section 3, it has emerged that meanings related to the wider notion of attenuation can indeed be identified for *-eln* verbs across all three types. To be fair and precise, it should be added that both the extent to which this meaning complex is manifested and the specific forms in which it is manifested vary from type to type. So, on the one hand, it could be shown that more *-eln* verbs than expected have meanings associated with attenuation. On the other hand, however, there can be no doubt that a sizable proportion of *-eln* verbs mainly of Type II show no such meanings. This supports the homonymy view to some extent, while the wide applicability of attenuation refutes it – a dilemma that has to be explained by models of derivational morphology (see again Section 7).

Regarding the third question, Jurafsky's notion of diminutives turns out to provide fully applicable descriptions for some of our cases (e.g. 'child') and at least good starting points for developing others, which explains the choice of this model despite the criticism brought up against it. The importance of concepts such as LOW INTENSITY for the analysis of *–eln* verbs, which does not feature in Jurafsky's original model, justifies the assumption of a concept of verbal attenuation.

Our fourth question, which addresses the wider theoretical implications of our research, requires a more elaborate response. We will therefore dedicate the following section to the discussion of how these findings can be explained most adequately. In doing so, we will highlight the basic differences between the three approaches outlined in Section 2.2.4 above. As the greater part of this paper had to be devoted to the descriptive analysis of *-eln*-verbs, implementations of fully-fledged models have to await a later publication.

[23] A similar observation is made by Günther (1974: 256) with respect to German *be-* verbs: "Consider, for instance, the three verbs *beflügeln*, *beschwingen* und *beseligen*. They derivationally belong to three different types, but share the same grammatical and semantic properties." Neef (1996) makes a related point for formations of the type *Gehopse*.

7. Theoretical appraisal

7.1 The rule-based approach

As suggested in Section 2.2.4, the rule-based approach would try to come up with a maximally general and at the same time maximally specific rule explaining the empirical findings. In rule-based models, the specification of the grammatical properties of the base and of the output of a morphological process plays a key role. Therefore, this approach would start out from the tripartite, form-based division into Types I, II and III and specify the word class of the base as well as that of the derivative. Given the aim to formulate a maximally parsimonious rule, the semantic description would rely on the core features identified in Section 6. As the rule-based model is generally not interested in pragmatic aspects, these would presumably be neglected. A possible account from a rule-based perspective is given in (6):

(6) Rule for German verbs ending in *-(e)l*

a. Type I
   phonological representation: /(ə)l/
   semantic representation: 'attenuation': low intensity, iterative
   categories: $]_{V,\ N,\ Adj}$ __$]_V$
   examples: *kippen*$_V$ > *kippeln*$_V$
   Kunst$_N$ > künsteln$_V$

b. Type II
   phonological representation: Ø
   semantic representation: 'act of N-ing'
   categories: *-el*$]_N$ __$]_V$
   examples: *Ekel*$_N$ > *ekeln*$_V$
   Handel$_N$ > handeln$_V$

c. Type III
   n/a

Rule 6.a essentially accounts for Type I verbs as deverbal, denominal or deadjectival suffix-derivations by means of the suffix *-(e)l* resulting in an addition of the features LOW INTENSITY and ITERATIVE. Rule 6.b explains Type II verbs as a conversion from nouns ending in *-el* to *-eln* verbs which adds no extra semantic content. As Type III verbs are not derived, they are unsegmentable lexical items belonging to the lexicon and not explained by means of a word-formation rule.

Even if a more ambitious and differentiated rule-based explanation certainly seems possible, the general problems of this approach seem obvious. First, the rules fail to model the semantic and phonological similarities between verbs of Types I, II and III identified in the course of our analysis. Second, the fine semantic nuances of the domain of attenuation are not included in this account. Third, Rule 6.a, which explains Type I verbs, is too general, as it does not account for those derived *-eln* verbs which do **not** carry aspects related to attenuation, e.g. *mangeln* < *mangen* or *bördeln* < *Bord*. Fourth, in order to do justice to the empirical data, rule 6.a has to specify not only verbs and nouns but even adjectives as potential bases of *-eln* derivation; this, however, clearly violates the venerable Unitary Input Hypothesis (Aronoff 1976: 47-48, Scalise 1984: 137-146)[24]. Fifth, the strong pragmatic associations connected with verbs in all three groups are not captured. And sixth, the model does not provide information about the range of application of the two rules in terms of

[24] Cf. Plag (2004) and Bauer, Lieber and Plag (2013: 635–636) for strong arguments in favour of abandoning this hypothesis.

numbers of lexical items formed according to them. Admittedly, the fifth and sixth point may not be regarded as shortcomings from the point of view of rule-based approaches, since these aspects are not considered to fall within the remit of morphological rules anyway.

Two ways of improving the rule-based account especially with regard to the morphological properties of Type II and Type III verbs come to mind.

For Type II verbs like *fiedeln* it could be argued that these verbs are indeed derived from their base (*Fiedel*) with the suffix *-eln*, if it is assumed that a general phonological degemination rule applies that reduces the sequence *-ll-* to *-l-*. However, under this assumption it would not be clear how to deal with Type II verbs like *ekeln* (< *Ekel*), which have no feature of attenuation. What makes this assumption even more questionable is the fact that Type II verbs often have additional metaphorical uses. Note that, for example, all *-eln* verbs denoting sexual intercourse, such as *hobeln* and *orgeln*, are Type II verbs.

As regards Type III verbs, one could bring into play the notions of bound root or quasi-root (cf. e.g. Kubrjakova 2000: 423), which allow to treat the residue after *-eln* is taken away as a submorphemic morphological component similar to the notorious *cranberry morpheme* or neoclassical word-components such as *demo-*, *bio-* or *-ology*. In this way, *nörg-* and *fumm-* could be regarded as bound roots. We have serious doubts about the feasibility of this move, too, because it would result in a considerable ad-hoc-like extension of the notion of bound root, taking it far away from the typical cases of elements borrowed from the classical languages and very few cases of paradigm-forming quasi-morphemes such as *cran-* and *Tues-*.

In sum, although the rule-based model captures a number of important structural generalizations, the reduction in complexity comes at a heavy price, since the model is neither sufficiently specific nor sufficiently precise in its description of identifiable lexical, semantic and pragmatic properties of *-eln* verbs.

7.2 The schema-based approach

Figure 3 presents a highly idealized version of a network model of *-eln* verbs from a schema-based perspective.

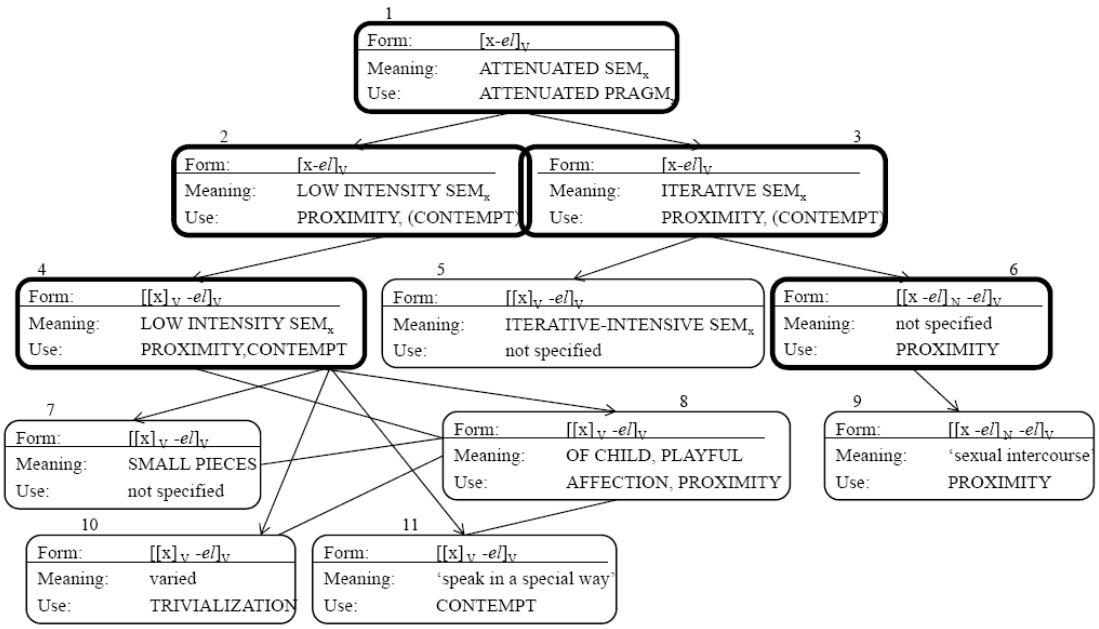

Figure 3: Idealized version of a schema-based model of *-eln* verbs

While for the sake of transparency this model is not worked out in all details regarding possible nodes and links, it nevertheless gives a good idea of what such a model could look like. The nodes in the model are constructional schemas which are specified with regard to their form, meaning and use specifications. As in Figures 2a to 2c, bold lines indicate schemas that are prominent in terms of the proportion of verbs instantiating them in our database.[25] Numbers have only been added for ease of reference. Arrows indicate inheritance links, normal lines conceptual links.

The top node in the diagram (schema 1) captures the general finding that verbs ending in *-eln*, irrespective of their internal structure, show a tendency to include semantic and pragmatic elements associated with attenuation. This is the most general schema possible and must be left unspecified as to the structural morphological level. As we move downwards in the figure, this general schema is specified by further pieces of information. On the second level, represented by schemas 2 and 3, the formal information is not yet specified any further, but two partly overlapping, equally strong schemas representing the meanings of 'low intensity' and 'iterative' are distinguished. Each of these two then becomes specified with regard to formal, i.e. structural information on the next level. Schema 4, which is marked as being particularly salient by the boldest lines, represents deverbal *-eln* verbs of Type I instantiating the core semantic and pragmatic properties (e.g. *wursteln*). Schemas 5 and 6 elaborate the iterative schema 3. Schema 5 shares the formal specifications with schema 4, but is different with regard to the intensive semantic element and does not specify any pragmatic characteristics either (e.g. *trampeln*). Schema 6 represents denominal *-eln* verbs of Type II, which are mainly characterized by shared pragmatic rather than semantic properties (e.g. *radeln*). The yet more specific schemas 7 to 11, to which more could be added, specify further details on the semantic and/or pragmatic levels (in this order e.g. *häckseln*, *knobeln*, *hobeln*, *baumeln*, *werkeln*).

In our opinion, this model marks a substantial improvement over the rule-based approach. While the top-level schema 1 accounts for the finding that *-eln* verbs of all three types share basic semantic and pragmatic aspects, the intermediate schemas 2, 3 and especially 4 identify those patterns that seem to be particularly prominent and specify the formal, semantic and pragmatic properties that have emerged from the analysis. In addition, the arrows and lines indicating inheritance links and conceptual links respectively provide a good idea of the semantic coherence of the types of meanings of *-eln* verbs.

The model is not free from shortcomings, however. First, like the rule-based model, it does not provide any information on restrictions concerning the applicability of individual schemas, e.g. due to phonological aspects, and is thus prone to produce over-generalizations. This is particularly problematic for the top-level schema of the network, which would suggest that all verbs ending in *-eln* have the potential to include semantic and pragmatic aspects related to attenuation. This deficit could be remedied by two measures: information about the existing words formed according to the schema could be integrated into the model, and templates could be supplemented by information on phonological constraints on the output. These two moves would introduce the item-based and product-oriented components that mark the exemplar-based and output-oriented models discussed in Section 7.3. A second shortcoming is that the model, at least in its present impressionistic form, is unable to render multiple links on different levels of description. For example, while the specification added by schema 4 to schema 2 relates only to the formal side, further schemas elaborating the semantic or the pragmatic side exist as well, but are not reflected in the figure. While this could be remedied in a more sophisticated version of the model, it causes problems for balancing coherence, accuracy and redundancy on the different levels of description. In an ideal model, more specific elaborations of general schemas should inherit all the properties of

[25] Note that, strictly speaking, frequency of tokens would have to be considered as well.

the superordinate schema and only add further specifications, essentially making the upper-level specification redundant on the lower levels. Such an avoidance of redundancy seems impossible, however, because more specific semantic elaborations sometimes differ with regard to their pragmatic properties and because the semantic properties of lower-level schemas are not always fully licensed by upper-level schemas. As a result, information about the language of proximity has to be added afresh each time it is relevant for a schema. This could be solved by allowing that some children in the network have two or more mothers instead of only one, as would be plausible for 6, which carries over the element of 'proximity' from both 3 and 2.

Overall, then, the schema model clearly has the potential to outperform the rule-based one, but appears to require a number of add-ons borrowed from exemplar models to do justice to the complexity of the data.

7.3 The exemplar-based approach

Exemplar-based models go beyond schema-based models in assuming that a vast amount of knowledge about individual word exemplars is retained, even when schema-like representations may have been formed at some time. Multiple and redundant representations are explicitly allowed and considered to be likely. Furthermore, it is assumed that links in the network are established between similar word exemplars rather than schemas. In principle, these similarity relations can be of a range of different types: phonological, graphemic, morphological, structural, grammatical, semantic and pragmatic. Elements in the network can be interconnected to other elements on all these levels. The position of elements is determined by the strength and multiplicity of their connections. For example, the Type III verb *bimmeln* is semantically similar with regard to its core denotative meaning to *klingeln*, but in addition also to the large number of *-eln* verbs sharing the features LOW INTENSITY and ITERATIVE; it is pragmatically similar to the numerous *-eln* verbs sharing the pragmatic aspects of trivialization and the language of proximity; and, due to the rhyme /əln/ in its final syllable, it is phonologically similar to all *-eln* verbs and, more specifically, to a range of *-eln* verbs (among them *wimmeln, schimmeln, bummeln, fummeln, tummeln*) sharing the phonological pattern /Vməln/. *Brabbeln*, another Type III verb, is semantically linked to two groups of *-eln* verbs, those associated with the concept 'child' and those denoting specific ways of speaking; it is phonologically similar to *krabbeln, schwabbeln, wabbeln* and many others, and pragmatically linked to the language of proximity and to trivialization or contempt. These multiple interconnections make up, so to speak, for the fact that *bimmeln* and *brabbeln* are not derived, and they account for the impression that they are not fundamentally different from derived *-eln* verbs such as *hüsteln* or *tänzeln*. In contrast, those Type II verbs for which the homonymy approach seems most convincing, for instance *adeln, gipfeln, handeln, hebeln* or *kegeln*, show no similarity links to other *-eln* verbs except for the phonological one. As a result, they are isolated and marginal members of the network.

It is generally assumed that clusters of elements connected by multiple links can function as attractors licensing new formations very much like schemas. However, a small number of similar exemplars, in extreme cases maybe even a single one, can suffice to serve as a basis for new analogical formations. For example, since *sächseln* and *schwäbeln* already exist and show phonological, morphological, semantic as well as pragmatic similarities, a very similar formation such as *fränkeln* seems highly acceptable. Due to phonological differences, *hesseln* or *bayerln*, for example, appear less acceptable, and in fact, (admittedly unsystematic) Internet searches indicate that *fränkeln* exists, while *hesseln* and *bayerln* do not.

Due to the large number of nodes in the network and the large number of potential types and levels of similarity links, two-dimensional representations are unable to do justice

to the complexity of exemplar-based networks. In order to partly overcome this limitation, we will give two selective illustrations of what an exemplar-based network would look like: one which focusses on the one dimension of semantic similarity and can thus include a large number of verbs (Figure 4), and one which includes several dimensions and must therefore be limited to a smaller sample of verbs to remain transparent (Figure 5).

The idealized network representation given in Figure 4 was worked out on the basis of our introspective assessment of semantic similarities. The distances between verbs in the graph reflect our intuitions concerning their distance in semantic space. Circles and ellipses indicate similarity-based clusters sharing semantic features associated with attenuation and other semantic features that are common to the denotations of several verbs. As this representation is based on semantic similarity links, it is vaguely reminiscent of the figures we provided in Section 4. In the present figure, however, the semantic map is fleshed out in much greater detail by taking into account the full denotative meanings of *-eln* verbs. For the sake of transparency, only very few multiple cluster-memberships of exemplars are rendered. As many as 176 *-eln* verbs are represented in this network, 115 Type I verbs, 39 Type II verbs and all 22 Type III verbs. Type II verbs are marked by small capitals, Type III verbs by italics. The figure shows that all eight clusters contain verbs of all three types of *-eln* verbs. The largest clusters are united by the major semantic features associated with *-eln* verbs, namely 'iterative', 'child', 'low intensity' and 'small pieces'. The semantically more specific clusters labelled 'locomotion', 'craftsmanship', 'language-related meanings' and 'meanings associated with mouth and nose' may well come across as being collected in an ad-hoc manner and relying on somewhat coincidental similarities. Why, for example, should verbs denoting types of craftsmanship be marked by a shared ending? While we are unable to answer this question, the data collected in Figure 4 certainly testify to the fact that such semantico-phonologically motivated clusters of verbs exist. Further inspection of the figure shows that other smaller semantic clusters are united by phonological similarities in addition to semantic ones, e.g. the clusters *raspeln, ribbeln, rubbeln* and the neighbouring group *rappeln, rascheln, rasseln*. In general, many verbs in the iterative cluster and some verbs in the locomotion cluster and the language-related cluster tend to share the onomatopoetic motivation mentioned by a number of authors referred to in Section 2.1.

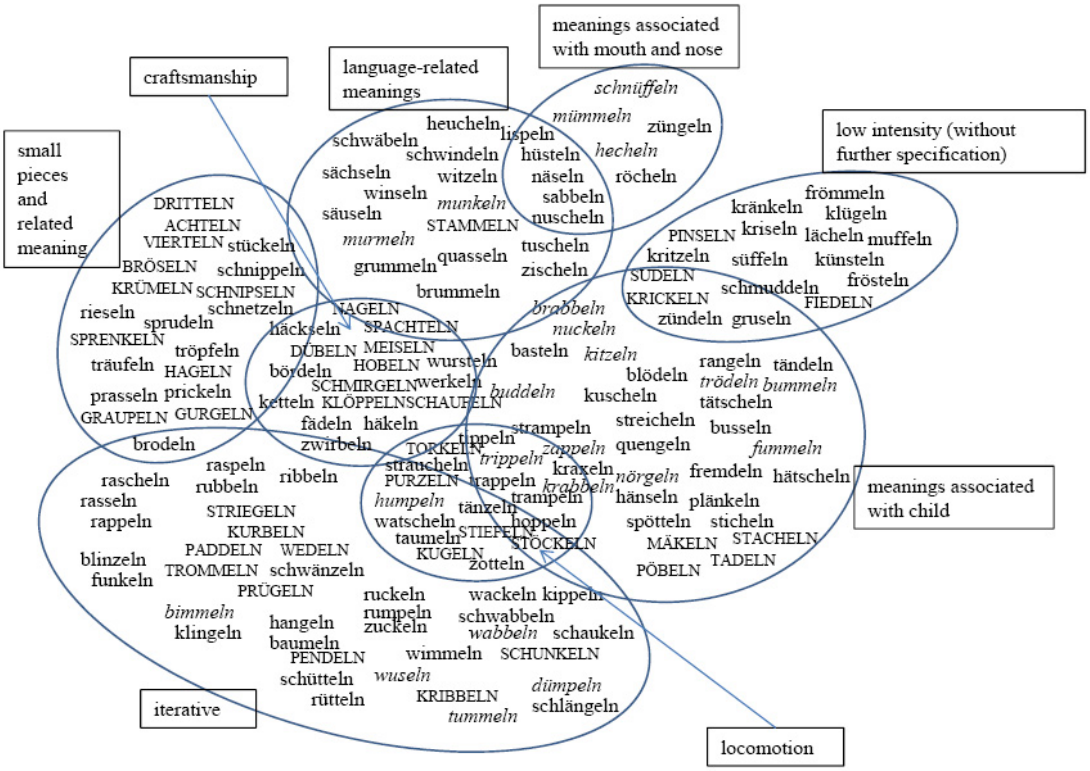

Figure 4: Idealized exemplar-based network representation of semantic similarities between *-eln* verbs of all three groups

The theoretical assumption behind such an exemplar-based network representation is that speakers store experience of former exposure to these verbs as well as the similarities between them and can decide on the basis of this detailed knowledge whether a new formation they come across seems acceptable and how the meaning of such a formation can be worked out.

The second representation aims to give an idea of the complexity of the similarity links on different levels while preserving transparency. To this end, a systematic sample of 10%, i.e. 27 verbs was selected from the database.[26] Figure 5 shows a network representation produced on the basis of a manual analysis of the semantic and pragmatic properties of these 27 verbs. The network was constructed by mapping similarities with regard to these parameters (type I-III, semantic features and pragmatic features) onto two-dimensional space. Clusters of similar verbs, i.e. verbs that have one or more features in common, are collected in boxes with rounded corners. The features shared by these verbs are provided in smaller rectangular boxes functioning as labels for the clusters. For example, the largest cluster carries the label "-eln" because this is the only feature all verbs share. To give a second example, the cluster containing the verbs *lümmeln, orakeln, vögeln* and *rodeln* is labelled as "0 / prox" indicating that these verbs have no semantic feature of attenuation (indicated by "0" *before* the slash) but share the pragmatic feature 'proximity' (indicated by "prox" *after* the slash). Additionally, features of attenuation are also indicated for each individual verb (semantic features before the slash, pragmatic properties following the slash). *Schnipseln*, e.g., is marked as "small p / prox" because it has the semantic feature 'small pieces' and the

[26] Our list of 273 *-eln* verbs was ordered first according to verb type and then according to alphabetical order within each of these three sections. Every tenth entry from this list was then selected for our sample, starting with the third item. This procedure allows for a random selection and at the same time preserves the quantitative relevance of the three types with respect to each other.

pragmatic feature 'proximity'. *Tuscheln* has the semantic feature 'low intensity' ("low I") and the pragmatic feature 'contempt ("cont"). Each verb is also marked with regard to its type, i.e. as I, II or III.
As the figure shows, the two Type II verbs *ekeln* ('to be disgusted') and *handeln* ('to take action') stand out as the only ones which share only the feature *-eln* with all other verbs. The most prominent similarity relation in this sample is the language of proximity, which is supported by other commonalities in a complex but coherent pattern.

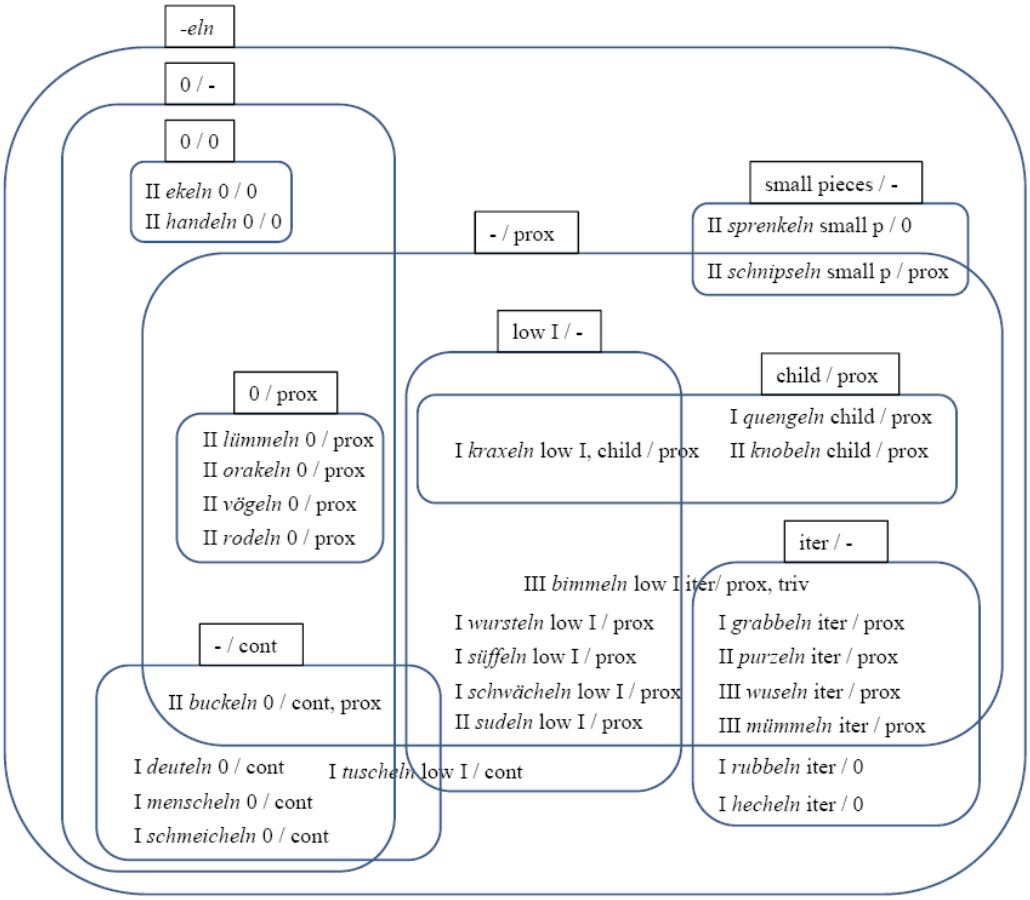

Figure 5: Multiple-link exemplar-based network based on a systematic selection of 27 *-eln* verbs (semantic types of attenuation are indicated before the slashes, pragmatic types after them)

What are the advantages of the exemplar-based account of *-eln* verbs? First, the model provides rich information about existing *-eln* verbs and their phonological, morphological, semantic and pragmatic similarities. This information, second, reflects speakers' experience of what is out there and, importantly, equips them with the knowledge required to coin new verbs, to judge whether a new verb makes sense and to assess the positions of potential formations in the network. Third, the model shows that even those *-eln* verbs which do not exhibit aspects associated with attenuation are also parts of the network on the basis of their phonological properties, but at the same time the model treats them as peripheral nodes in all other respects. As a consequence, it is not necessary to assume, as the rule-based and the schema-based models do, that speakers are actually aware of the morphological bases of all these verbs and able to analyze their morphological structures. If it is claimed that speakers have indeed transferred meanings from derived *-eln* verbs to non-derived ones, it is certainly necessary to assume that they recognize phonological similarities between the verbs despite their structural differences. This plausible assumption receives support from previous pleas

for a stronger output-orientation in morphology, especially prosodic morphology and morphonology (e.g. Plag 1999, Raffelsiefen 1999, Pater 2004, Lappe 2007), which are in turn supported by the current findings on *-eln* verbs. A fourth advantage of the model is that it unites semantic and phonological aspects, which actually seem to work hand-in-hand at least in the case of iterative verbs and some verbs denoting locomotion and speaking.[27] Finally, exemplar-based models are by definition usage-based models, and therefore do not assume that there is a clear-cut boundary between semantic and pragmatic meaning components. The exemplar-based model thus inherently caters for the possibility that recurrent pragmatic meanings can motivate analogical formations and eventually become semanticized along the lines of changes explained in terms of "context-induced re-interpretation" (Heine, Claudi and Hünnemeyer 1991: Ch. 3), "invited inference" (Traugott and Dasher 2004: 34-41) and "context-absorption" (Kuteva 2001: 150).

It goes without saying that the exemplar-based theory produces anything but a parsimonious model of *-eln* verbs. On the contrary, as it assumes a very detailed and highly redundant memory of previous exposure to *-eln* verbs, one may well argue that it does not really deserve to be referred to as a 'model' in the first place. However, we trust that in order to represent speakers' knowledge of the meanings and uses of *-eln* verbs and to explain their capacity to form new *-eln* words and judge the acceptability of newly formed ones, all the information provided by the model is required. We would therefore consider it realistic in spite of its high demands on memory capacity. A second criticism that could be levelled at the model is that it unduly downgrades the structural information that has taken centre stage in derivational morphology over the past decades. While it is true that morphological structure ends up being just one of many dimensions that can give rise to similarity relations in the exemplar-based model, the distribution of the verbs of Types I, II and III in Figure 5 indicates that it remains an important organizing principle. Whether everyday 'lay' speakers actually have tacit knowledge of the different morphological structures of *tänzeln, mäkeln* and *nörgeln* is, of course, another question. In fact, it is much more likely that the semantic and phonological similarities which lie at the heart of the output-oriented approaches mentioned above are (unconsciously) noticed by speakers and play a role in giving coherence to the full set of *-eln* verbs. Finally, we have to emphasize again that our account of the exemplar-based approach remains quite sketchy, since it neither offers a metric for a multivariate measurement of similarity on the different levels of phonological and morphological structure and semantic and pragmatic meaning nor does it apply any of the algorithms that have been developed so far to capture this complexity (cf. Arndt-Lappe 2014: 520 for a recent survey).

8. Conclusion

The goal of this study was to examine the meaning and use of 273 non-prefixed German verbs ending in *-eln*, as well as the theoretical appraisal of the outcome of this examination.[28] Among these verbs, three subtypes can be distinguished according to the morphological process from which they result. In the 125 verbs of the first type (e.g. *tänzeln* < *tanzen*), the presence of *-l-* is the result of an (apparently semantically motivated) derivational process of suffixation or infixation. In Type II verbs (e.g. *fiedeln*; n =126), the presence of *-l-* is somewhat coincidental, since it is taken over directly from their derivational base (< *Fiedel*). Finally, Type III verbs like *nörgeln* (n=22) are monomorphemic, so no derivational process is involved at all. However, while this morphological examination suggests a homonymic

[27] By underlining the importance of phonological similarities, this model also allows for the possibility of conceptual links to diminutive nouns like *Städtl* ('small town') or *Bergl* ('small mountain').

[28] Prefixed verbs were excluded from this study. See 4.1 for more details on the method of data acquisition.

relationship between these different types, this is contradicted by the observation that there are striking semantic and pragmatic similarities between verbs of all three types.

What is shared by the verbs of all three types can be subsumed under the term *attenuation*. Based on Jurafsky's model of (nominal) diminutives, the notion of *attenuation* developed in this paper not only comprises concepts from his original model, such as CHILD or AFFECTION, but also concepts like LOW INTENSITY and ITERATIVE, which turn out to be particularly relevant in the verbal domain. As suggested by a distinction in Jurafsky's model, attenuation has both a semantic and a pragmatic dimension. The various aspects associated with semantic and pragmatic attenuation are closely interconnected, a fact which becomes particularly clear when they are arranged in a semantic map (cf. Figure 2.a). Our corpus has also enabled us to identify the conceptual core of verbal attenuation in *-eln* verbs as being constituted by the features LOW INTENSITY, ITERATIVE and CONTEMPT.

We have shown that verbs of all three types feature elements of both semantic and pragmatic attenuation. Most surprisingly, the group boasting the largest proportion of both types of attenuation is the one constituted by Type III verbs. This outcome contradicts a strictly homonymic interpretation, which would trace back aspects related to attenuation to the addition of the suffix-like element *-l-* and would not predict attenuation to play a role in non-derived, monomorphemic verbs. As a consequence, rule-based approaches in morphology have great difficulties providing a coherent description of the heterogeneous group of *-eln* verbs, since they can only explain a common feature of ATTENUATION for Type I verbs. We have argued that schema-models do much better than rule-based ones, but are in fact surpassed by exemplar-based models, which are capable of explaining similarities between the three types of verbs on the levels of morphology, phonology, semantics and pragmatics. In addition, the exemplar-based model is able to explain why some *-eln* verbs are less typical, i.e. more peripheral members of the network than others. While this is true of verbs like *ekeln* or *handeln*, which are only phonologically similar to other *-eln* verbs, verbs like *kraxeln* or *bimmeln*, which intuitively deserve a place at the very centre of this network, can actually be shown to belong there, as their simultaneous membership in various overlapping subgroups demonstrates (cf. Figure 5). Our discussion of the way in which different models of morphology handle our data has also indicated that including an output-oriented component improves the explanatory power of schema-based and exemplar-based approaches.

Overall, what these findings suggest is that the production and comprehension of new formations such as the example of *optimisteln* in the introductory quote may benefit more from associations with the general schema of attenuation and from phonological, semantic and pragmatic analogies to existing *-eln* verbs than from linguistic knowledge that would lend itself to description in terms of a formal rule. This supports recent findings on the flexibility and variability of word-formation processes in general (cf. e.g. Schmid 2011: 87, 119; Bauer, Lieber and Plag 2013: 640–641).

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Appendix

The appendix supplies all verbs included in the study listed in alphabetical order. Column 1 specifies the Type of verb, column 2 the lemma, column 3 the base and column 4 the word class of the base, both as listed in the *Duden*. Column 5 gives English translation equivalents taken from bilingual dictionaries checked by a bilingual speaker of English and German.

1	**2**	**3**	**4**	**5**
type	**verb**	**base**	**word class of base**	**English translation equivalent(s)**
1	*achteln*	*acht*	numeral	*divide into eight parts*
2	*adeln*	*Adel*	noun	*bestow a peerage, enoble*
1	*basteln*	*Bast*	noun	*practise handicraft, create with one's hands*
1	*baumeln*	*Baum / bammeln*	noun / verb	*dangle, swing*
3	*bimmeln*	n/a	n/a	*ring with a light and soft tone*
1	*blinzeln*	*blinzen*	verb	*blink*
1	*blödeln*	*blöd*	adjective	*fool about*
1	*bördeln*	*Bord*	noun	*flange*
3	*brabbeln*	n/a	n/a	*mumble, mutter, babble*
1	*bröckeln*	*Brocken*	noun	*crumble*
1	*brodeln*	*Brot / Brühe*	noun	*bubble, seethe*
2	*bröseln*	*Brösel*	noun	*crumble, make crumbs*
1	*brummeln*	*brummen*	verb	*mumble, mutter*
2	*brutzeln*	*brodeln*	verb	*sizzle*
2	*buckeln*	*Buckel*	noun	*bow and scrape, kowtow*
3	*buddeln*	n/a	n/a	*dig*
1	*büffeln*	*buffen*	verb	*swot, cram*
2	*bügeln*	*Bügel*	noun	*iron*
3	*bummeln*	n/a	n/a	*stroll*
2	*bündeln*	*Bündel*	noun	*bundle, tie into bunches, concentrate*
1	*busseln*	*bussen*	verb	*kiss*
2	*deichseln*	*Deichsel*	noun	*wangle*
1	*deuteln*	*deuten*	verb	*quibbeln, niggle*
2	*doppeln*	*Doppel / doppelt*	noun / adjective	*double*
2	*doubeln*	*Double*	noun	*stand in for, double for*
1	*drängeln*	*drängen*	verb	*jostle*
2	*drechseln*	*Dræhsel*	noun	*turn (wood)*
1	*dritteln*	*drei*	numeral	*divide into three parts*
2	*drosseln*	*Drossel*	noun	*throttle, choke, turn down, reduce*
2	*dübeln*	*Dübel*	noun	*plug*
2	*dudeln*	*Dudel(sack)*	noun	*tootle, hum*
3	*dümpeln*	n/a	n/a	*hover, bob up and down*
2	*ekeln*	*Ekel*	noun	*be disgusted*
1	*fädeln*	*Faden*	noun	*thread*
2	*fesseln*	*Fessel*	noun	*tie up, fetter, shackle*
2	*fiedeln*	*Fiedel*	noun	*fiddle, scrape on the fiddle*
1	*fremdeln*	*fremd*	adjective	*be scared of strangers*
1	*frömmeln*	*fromm*	adjective	*act piously, affect piety*
1	*frösteln*	*Frost*	noun	*shiver*
3	*fummeln*	n/a	n/a	*fiddle, fumble*
1	*funkeln*	*funken*	verb	*sparkle*
1	*füßeln*	*Fuß*	verb	*play footsie*
2	*gammeln*	*gammal*	adjective	*laze about, loaf about*
1	*gängeln*	*gengen*	verb	*spoon-feed, keep tied to apron strings*

2	*gaukeln*	*Goukel*	noun	*trick, flutter, flit*
2	*geißeln*	*Geißel*	noun	*whip, flagellate, scourge*
2	*gipfeln*	*Gipfel*	noun	*culminate in*
1	*grabbeln*	*grabben*	verb	*grope around, rummage*
2	*graupeln*	*Graupel*	noun	*hail (shower of hailstones)*
1	*grummeln*	*grummen*	verb	*mutter*
1	*gründeln*	*Grund*	noun	*feed under water, on bottom of lake*
1	*gruseln*	*grausen*	verb	*give s.o. the creeps*
2	*gurgeln*	*Gurgel*	noun	*gargle*
1	*häckseln*	*hacken*	verb	*hack into smaller pieces*
2	*hageln*	*Hagel*	noun	*hail, rain down on*
1	*hakeln*	*haken*	verb	*finger-wrestle*
1	*häkeln*	*haken*	verb	*crochet*
2	*handeln*	E. *handle*	borrowed	*take action*
1	*hangeln*	*Hang*	verb	*move hand over hand*
1	*hänseln*	*Hanse*	verb	*tease*
1	*hätscheln*	*hatschen*	verb	*fondle, pamper*
2	*hebeln*	*Hebel*	noun	*lever*
1	*hecheln*	*hechen*	verb	*gossip, heckle, pant*
3	*hecheln*	n/a	n/a	*pant, hatchet, heckle*
1	*heucheln*	*huchen*	verb	*be a hypocrite, simulate*
2	*hobeln*	*Hobel*	noun	*plane*
1	*hoppeln*	*hoppen*	verb	*lollop, scamper*
3	*humpeln*	n/a	n/a	*limp, hobble*
1	*hüsteln*	*husten*	verb	*cough slightly and repetitively*
2	*jubeln*	*Jubel*	noun	*cheer, rejoice*
2	*kacheln*	*Kachel*	noun	*tile*
2	*kapseln*	*Kapsel*	noun	*place into a capsule*
2	*kegeln*	*Kegel*	noun	*play skittles or ninepins*
1	*ketteln*	*ketten*	verb	*link, loop*
1	*kippeln*	*kippen*	verb	*tilt back and forth*
3	*kitzeln*	n/a	n/a	*tickle*
1	*klingeln*	*klingen*	verb	*ring a bell*
2	*klöppeln*	*Klöppel*	noun	*make lace*
1	*klügeln*	*klug*	adjective	*puzzle*
2	*klüngeln*	*Klüngel*	noun	*form a clique*
2	*knebeln*	*Knebel*	noun	*gag*
2	*knobeln*	*Knobel*	noun	*roll dice, puzzle/rack one's brain*
2	*knüppeln*	*Knüppel*	noun	*club, beat with a club or stick*
2	*koppeln*	*Koppel*	noun	*tie together, couple, join*
3	*krabbeln*	n/a	n/a	*crawl, tickle*
1	*kränkeln*	*krank / kranken*	adjective / verb	*be ailing*
1	*kräuseln*	*krausen*	verb	*make frizzy, crimp, screw up, pucker, ruffle*
1	*kraxeln*	*Kraxe*	noun	*clamber*
1	*krempeln*	*krempen*	verb	*card, turn, roll up*
2	*kribbeln*	*krabbeln*	verb	*tickle*
2	*krickeln*	*kritzeln*	verb	*scrawl, scribble*
1	*kriseln*	*Krise*	noun	*be in a state of impending crisis, trouble*
1	*kritzeln*	*kritzen*	verb	*scribble, scrawl*
2	*krümeln*	*Krümel*	noun	*crumble, make crumbs*
2	*kugeln*	*Kugel*	noun	*roll*
2	*kungeln*	*Kunkel*	noun	*scheme*
1	*künsteln*	*Kunst*	noun	*feign, behave in an affected manner*
2	*kurbeln*	*Kurbel*	noun	*turn a crank*
1	*kuscheln*	*kuschen*	verb	*cuddle*

1	*lächeln*	*lachen*	verb	*smile*
1	*lispeln*	*lispen*	verb	*lisp*
2	*löffeln*	*Löffel*	noun	*spoon, ladle*
2	*lümmeln*	*Lümmel*	noun	*sprawl, flop down*
1	*makeln*	*maken*	verb	*act as a broker*
2	*mäkeln*	*Makel*	noun	*carp, be finicky*
1	*mangeln*	*mangen*	verb	*press, iron, be lacking*
2	*mangeln*	*Mangel*	noun	*mangle, iron, be lacking*
2	*meißeln*	*Meißel*	noun	*chisel*
2	*mendeln*	*Mendel*	proper name	*mendelize, conform to Mendel's laws*
1	*menscheln*	*Mensch*	verb	*showing humanity*
2	*metzeln*	Lat. *macellare*	borrowed	*slaughter, butcher*
1	*meucheln*	*muchen*	verb	*assassinate*
1	*muffeln*	*moppen*	verb	*smell musty*
3	*mümmeln*	n/a	n/a	*nibble*
3	*munkeln*	n/a	n/a	*be rumoured that*
2	*murmeln*	*Murmel*	noun	*murmer, mumble, mutter*
3	*murmeln*	n/a	n/a	*murmer, mumble, mutter*
2	*nageln*	*Nagel*	noun	*nail*
1	*näseln*	*Nase*	noun	*speak with a nasal twang*
2	*nebeln*	*Nebel*	noun	*be misty, be foggy*
2	*nesteln*	*Nestel*	noun	*fumble or fiddle with sthg.*
3	*nörgeln*	n/a	n/a	*moan, carp*
3	*nuckeln*	n/a	n/a	*suck, suckle*
1	*nuscheln*	*Nase*	noun	*mumble, mutter*
2	*orakeln*	*Orakel*	noun	*prophesy, prognosticate*
2	*orgeln*	*Orgel*	noun	*play the organ*
2	*paddeln*	*E. paddle*	borrowed	*paddle*
1	*päppeln*	*Papp*	noun	*nourish*
2	*pendeln*	*Pendeln*	noun	*swing, oscillate, commute*
2	*picheln*	*Pegel*	noun	*booze, knock back alcohol*
2	*pinseln*	*Pinsel*	noun	*paint, daub*
1	*plänkeln*	*blenken*	verb	*skirmish*
2	*pöbeln*	*Pöbel*	noun	*use bad language*
2	*pökeln*	*pekeln*	verb	*pickle, salt*
2	*popeln*	*Popel*	noun	*pick one's nose*
1	*prasseln*	*brasten*	verb	*clatter, drum*
1	*prickeln*	*pricken*	verb	*make small rising bubbles, sparkle*
2	*prügeln*	*Prügel*	noun	*beat*
2	*purzeln*	*Burzel*	noun	*tumble, trip*
2	*puzzeln*	*Puzzle*	noun	*do a jigsaw puzzle*
1	*quasseln*	*quassen*	verb	*blather*
1	*quengeln*	*twengen*	verb	*whine*
1	*radeln*	*(Fahr)Rad*	noun	*cycle*
2	*rammeln*	*Ramme*	noun	*mate*
1	*rangeln*	*rangen*	verb	*tussle, wrangle, scrap*
1	*rappeln*	*rapen*	verb	*rattle, shake*
1	*rascheln*	*raschen*	verb	*rustle*
1	*raspeln*	*raspen*	verb	*grate, rasp*
1	*rasseln*	*raen*	verb	*rattle*
2	*rätseln*	*Rätsel*	noun	*puzzle, rack one's brain*
2	*recyceln*	E. *cycle*	borrowed	*recycle*
2	*regeln*	*Regel*	noun	*settle, resolve, control*
2	*rempeln*	*Rämpel*	noun	*barge into s.o., jostle, elbow*
1	*ribbeln*	*ribben*	verb	*rub*

2	*riegeln*	*Riegel*	noun	*bolt (door)*
1	*rieseln*	*risen*	verb	*trickle*
2	*riffeln*	*Riffel*	noun	*comb, groove, channel, flute*
2	*ringeln*	*Ringel*	noun	*(en)twine, curl*
1	*röcheln*	*rohen*	verb	*breathe with rasping sound*
2	*rodeln*	*Rodel*	noun	*toboggan, sledge*
1	*rubbeln*	*rubben*	verb	*rub, scratch*
1	*ruckeln*	*Ruck*	noun	*jerk*
1	*rumpeln*	*rimpen*	verb	*rumble*
2	*runzeln*	*Runzel*	noun	*wrinkle, crease*
1	*rütteln*	*rütten*	verb	*shake, rattle*
1	*sabbeln*	*sabbern*	verb	*slobber, slaver*
2	*säbeln*	*Säbel*	noun	*saw away (at)*
1	*sächseln*	*sächsisch*	adjective	*speak a little bit like a Saxon*
1	*sammeln*	*samenen*	adjective	*collect*
2	*satteln*	*Sattel*	noun	*saddle*
1	*säuseln*	*sausen*	verb	*rustle, sigh, murmer*
2	*schachteln*	*Schachtel*	noun	*put into a box*
2	*schaufeln*	*Schaufel*	noun	*shovel, dig*
1	*schaukeln*	*schucken*	verb	*swing, rock*
2	*scheiteln*	*Scheitel*	noun	*part, divide*
2	*schimmeln*	*Schimmel*	noun	*go mouldy*
1	*schlängeln*	*Schlange*	verb	*wind, snake, wriggle*
2	*schlüsseln*	*Schlüssel*	noun	*code/calculate according to given data*
1	*schmeicheln*	*smeichen*	verb	*flatter*
2	*schmirgeln*	*Schmirgel*	noun	*sand, rub down*
1	*schmuddeln*	*smudden*	verb	*make dirty, make messy*
1	*schmunzeln*	*smunzen*	verb	*smile*
1	*schnetzeln*	*schnitzen*	verb	*slice*
1	*schniegeln*	*Schnecke*	noun	*spruce up*
1	*schnippeln*	*schnippen*	verb	*snip*
2	*schnipseln*	*schnippeln*	verb	*snip, hack*
2	*schnorcheln*	*Schnorchel*	noun	*snorkel, go snorkelling*
3	*schnüffeln*	n/a	n/a	*sniff, nose around*
1	*schrumpeln*	*schrumpen*	verb	*go/get wrinkled*
2	*schunkeln*	*schuckeln*	verb	*link arms and sway from side to side*
1	*schütteln*	*schütten*	verb	*shake*
1	*schwabbeln*	*schwabben*	verb	*wobble (about)*
1	*schwäbeln*	*schwäbisch*	adjective	*talk with a Swabian accent*
1	*schwächeln*	*schwach*	adjective	*become weaker, not perform properly*
1	*schwänzeln*	*schwanz*	noun	*wag tail*
2	*schwefeln*	*Schwefel*	noun	*sulphurize*
1	*schwindeln*	*schwinden*	verb	*fib*
2	*segeln*	*Segel*	noun	*sail*
2	*siedeln*	*Sedel*	noun	*settle*
2	*siegeln*	*Siegel*	noun	*seal*
2	*spachteln*	*Spachtel*	noun	*fill in, smooth over*
2	*spiegeln*	*Spiegel*	noun	*reflect, mirror*
2	*spitzeln*	*Spitzel*	noun	*spy, act as an informer*
1	*spötteln*	*spotten*	verb	*to mock, in a playful, light-hearted way*
2	*sprenkeln*	*Sprenkel*	noun	*sprinkle*
1	*sprudeln*	*sprühen*	verb	*bubble, fizz, effervesce, pour out*
2	*stacheln*	*Stachel*	noun	*spur on, goad*
2	*staffeln*	*Staffel*	noun	*grade, graduate, stagger*
2	*stammeln*	*stammal*	adjective	*stammer*

2	*stapeln*	*Stapel*	noun	*stack, pile up*
2	*stempeln*	*Stempel*	noun	*stamp*
1	*sticheln*	*stechen*	verb	*sew, embroider, make snide comments*
2	*stiefeln*	*Stiefel*	noun	*hoof it, leg it*
2	*stöckeln*	*Stöckel(absatz)*	noun	*trip, mince*
2	*stöpseln*	*Stöpsel*	noun	*connect*
1	*strampeln*	*strampen*	verb	*thrash about, kick your feet*
1	*straucheln*	*struchen*	verb	*stumble, trip, come to grief*
1	*streicheln*	*streichen*	verb	*stroke, fondle*
2	*striegeln*	*Striegel*	noun	*curry/comb, spruce oneself up*
1	*stückeln*	*Stück*	noun	*patch (together)*
2	*sudeln*	*sieden / Sudel*	verb / noun	*scrawl, daub*
1	*süffeln*	*Suff / saufen*	noun / verb	*tipple*
2	*tadeln*	*Tadel*	noun	*rebuke, reprimand*
2	*tafeln*	*Tafel*	noun	*feast, dine with s.o.*
2	*täfeln*	*Tafel*	noun	*wainscot, panel, line with wooden panels*
2	*takeln*	*Takelage*	noun	*rig*
1	*tändeln*	*tenten*	verb	*play about, dally*
1	*tänzeln*	*tanzen*	verb	*mince, step delicately*
1	*tätscheln*	*teschen*	verb	*pat*
1	*taumeln*	*tumen*	verb	*stagger, sway*
2	*tingeln*	*Tingeltangel*	noun	*appear in small nightclubs/theatres*
1	*tippeln*	*tippen*	verb	*tiptoe, trip, patter*
2	*titeln*	*Titel*	noun	*give as headline*
2	*torkeln*	Med.L. *torculare*	borrowed	*stagger, reel*
1	*trampeln*	*trampen*	verb	*stamp repeatedly, trample*
1	*trappeln*	*trappen*	verb	*clatter, clip-clop*
1	*träufeln*	*träufen*	verb	*dribble, trickle*
2	*treideln*	ME. *trailen*	borrowed	*tow*
3	*trippeln*	n/a	n/a	*trip, skip, toddle, mince*
3	*trödeln*	n/a	n/a	*dawdle*
2	*trommeln*	*Trommel*	noun	*drum*
1	*tröpfeln*	*tropfen*	verb	*drip*
3	*tummeln*	n/a	n/a	*romp about*
1	*tuscheln*	*tuschen*	verb	*whisper, talk behind somebody's back*
1	*vierteln*	*vier*	numeral	*divide into quarters*
2	*vögeln*	*Vogel*	noun	*screw*
3	*wabbeln*	n/a	n/a	*wobble*
1	*wackeln*	*wacken*	verb	*wobble, shake, wriggle*
1	*wandeln*	*wanton*	verb	*change, walk, stroll*
1	*watscheln*	*wakzen*	verb	*waddle*
2	*wechseln*	*Wechsel*	noun	*change*
2	*wedeln*	*Wedel*	noun	*wag*
1	*werkeln*	*werken*	verb	*potter about*
2	*wichteln*	*Wichtel*	noun	*play Secret Santa*
2	*wickeln*	*Wickel*	noun	*wrap, bind, roll up*
1	*wiegeln*	*wegen*	verb	*rock gently*
1	*wimmeln*	*wimmen*	verb	*be teeming/swarming/riddled with sthg.*
1	*winseln*	*winsen*	verb	*whimper*
2	*wirbeln*	*Wirbel*	noun	*whirl, swirl*
1	*witzeln*	*Witz*	noun	*joke, crack silly jokes*
2	*würfeln*	*Würfel*	noun	*dice, cut into cubes, roll the dice*
1	*wursteln*	*wursten*	verb	*muddle, fiddle*
2	*wurzeln*	*Wurzel*	noun	*take root, be rooted in sthg.*
3	*wuseln*	n/a	n/a	*scurry, be teeming*

3	*zappeln*	n/a	n/a	*fidget, wriggle*
1	*zischeln*	*zischen*	verb	*whisper*
1	*zotteln*	*Zotte*	noun	*amble*
1	*zuckeln*	*zucken*	verb	*jog, trot wearily*
2	*zügeln*	*Zügel*	noun	*rein in*
1	*zündeln*	*zünden*	verb	*play with fire, play with matches*
1	*züngeln*	*Zunge*	noun	*dart tongue in and out, (flames) lick*
2	*zweifeln*	*Zweifel*	noun	*doubt*
1	*zwirbeln*	*zwirben*	verb	*twirl, twist*