A note on misplaced or wrongly attached *zu* 'to' in German*

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Abstract

This paper deals with the phenomenon of misplaced *zu* 'to' in German (with a side view of other Continental West Germanic varieties). While this phenomenon only occurs in certain configurations in the standard language, it is common in the dialects and shows quite a high degree of variability. Even though some attention has been devoted to this unexpected property of *zu*, previous accounts don't seem to consider or acknowledge the full range of structural types. Beside misplacings due to processes like "upper field formation" (cf. Bech 1955) or verb raising, the infinitival marker can also be detached to the left and even be doubled in certain contexts. I discuss two parsimonious options of how these as well as the "regular" cases can be analyzed, namely (a) precedence rules and (b) a special kind of infixing operation that was first proposed in the framework of *Categorial Morphology* (Bach 1984, Hoeksema 1985). I will show that even though the first approach has its merits (and might be worth pursuing in other theoretical contexts), the second one is more advantageous. The paper concludes with some remarks on the short-term diachrony of this construction. I argue that it constitutes the paradigm case of what Harris and Campbell (1995) call *exploratory expressions*.

Contents

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1 Introduction

> Es ist einfach 'ne Faszination, hier zu sein zu dürfen. Die Region braucht natürlich Erfolgserlebnisse. Mein größter Wunsch war ebenthalb, einmal [...] Trainer zu sein dürfen. So, das ist jetzt eingetroffen. Nichtsdestotrotz freu' ich mich da drauf.[1]
> "It's fascinating to be here. This region is in need of a sense of sucess. So, my biggest wish was [...] to be a team coach. Nonetheless, I'm looking forward to it."
>
> Thorsten Legat, German ex-football pro and coach of FC Remscheid

German is an awful language, at least when it comes to its infinitival morphosyntax. It's a small wonder, then, that even speakers less prone to spoonerisms than Thorsten Legat run into troubles with this domain—be they associated with parsing difficulties that can be encountered with "nested" or "crossed dependencies" in ECM-constructions (Bach, Brown, and Marslen-Wilson 1986) or mysteries like the "long passive" (1), i. e. case conversion of the embedded object when the matrix verb appears in the impersonal passive.[2] This construction shows a very high variance in terms of its general acceptability and in particular the type of the matrix predicates involved.

(1) a. wenn Karl den Wagen zu reparieren versucht
if Karl the car.AKK to repair tries
"if Karl tries to repair the car"

b. wenn der Wagen zu reparieren versucht wird
if the car.NOM to repair tried becomes
"if one tries to repair the car"

(Höhle 1978: 176)

This paper addresses a particular aspect of these entanglements, namely the placement of the infinitival marker *zu* 'to' in several dialects of German, which also sheds light on the proper analysis of the Standard system. Please note that I am not offering a thorough analysis of *zu* and all its intricacies. Rather, I want to share a new observation on the empirical domain and sketch an idea on what a proper analysis of this phenomenon might look like. In a nutshell, the basic generalization is the following: *zu* is a functional morpheme that can be handed down from the immediately dominated verb of a verbal chain to its next dependent.

In technical terms, there are two simple tools to capture this insight, namely:

1. Precedence statements in their original form, as introduced in *Generalized Phrase Structure Grammar* (GPSG) (Gazdar et al. 1985). This means that *dominance* (as a hierarchical relation) is dissociated from *precedence* (as a string-based, linear notion).
2. The (mis-)placing of *zu* can be treated in terms of a special kind of infixation operation. Such an approach was first developed in the context of *Categorical Morphology* (Hoeksema 1985), in particular by Bach (1984) or Hoeksema and Janda (1988), and proved to be useful beyond the realm of "pure" morphology.

These tools remain very well within the boundaries of a restrictive, yet formally explicit treatment of (morphological) displacement phenomena. Precedence rules can even be stated for context-free

1 Source: `http://www.sueddeutsche.de/medien/rtl-show-dschungelcamp-nachlese-niveaulos-charakterlos-schamlos-1.2821086` [last accessed on 31 December, 2017].

2 Crossed dependencies have figured prominently in the theory of grammar since they have been taken as evidence that context-free grammars are not powerful enough to express all syntactic dependencies that can occur in natural languages (see Shieber 1985 on Swiss German). This led to the construction of a family of new grammar formalisms, weakly context-sensitive grammars, enriched with additional mechanisms like e. g. function composition that go beyond the capacity of context-free grammars. In fact, such a device—namely wrapping rules—is also used in the analysis sketched in this paper.

grammars (even though they soon reach their limits in this simple fashion), and the wrap rules for infixation discussed below merely represent a mildly context-sensitive add-on. The choice of one of these two options is mainly dependent on where one wants to draw the line between syntax and morphology. While there is sufficient empirical evidence for treating *zu* as a syntactically independent element sensitive to constraints on linearization, it might be sensible to keep other displacement phenomena inside the realm of inflectional morphology.

The rest of this article is structured as follows: Firstly (section 2), I discuss the basic empirical facts about *zu* 'zu' in Standard German and dialectal varieties like Alemannic or Hessian. I will also turn to other displacement phenomena that can occur in the morphological domain. Then (section 3), I elaborate on some of the technicalities associated with the proper treatment of these phenomena. In section 4, I offer some thoughts on whether certain cases of the phenomenon of our interest might constitute *Exploratory Expressions* in the sense of Harris and Campbell (1995), i. e. forerunners of a new grammatical construction. The final section wraps up the main findings of the paper.

2 The syntactic behavior of *zu*

2.1 The basic facts

Let us now take a closer look at the syntactic behavior of the infinitival marker *zu* 'to' in German and its dialects. Bech (1955: 13) was the first to notice that this element—contrary to what the convention of treating it as a separate orthographic word might suggest—actually fits better within inflectional morphology. In current theoretical approaches to German sentence structure, this seems to be the majority position (Vogel 2009: 327, fn. 15). An analysis along these lines is supported by the data in (2) (cf. Haider 2010: 272–73).

(2) a. Er schien gleichzeitig [*zu* lachen und *(*zu*) weinen]
b. He seemed to [laugh and cry at the same time]
c. an*zu*fangen 'to begin' (lit. on=to=catch); an*ge*fangen 'begun' (lit. on=ge=catched)

The contrast between (2a) and (2b) shows that *zu* in German must be obligatorily realized in both conjuncts in coordinations (Bech 1955 calls this restriction *Statuskongruenz* "status agreement"). In English, by contrast, where the status of (cognate) *to* as a particle is uncontroversial, this restriction is not operative. In addition, (2c) shows that *zu* and the participial prefix *ge-* appear at the same structural position in particle verb constructions, i. e. between the stem and the particle.

Several other arguments which are particularly aimed at differences between *zu* and its English counterpart *to*—the latter being usually analyzed as an exponent of a functional head position (I^o or T^o, for that matter)—are discussed by Haider (1993: 234–236). In English, but not in German, the negation particle as well as adverbs can intervene between *to* and the VP (3a, b); (3c) shows that in VP ellipsis contexts, the particle must be retained.[3]

(3) a. He was careful to *not* destroy the atmosphere
b. He tried to *carefully* disentangle the complex argumentation
c. They are [$_{VP}$ laying eggs now], just like they used to [$_{VP}$ ∅]
(Haider 1993: 234, ex. (2-a), (2-b), (2-e))

3 Of course, split infinitives are frowned upon by prescriptivists, yet there is no doubt about the grammaticality and prominence of this phenomenon in spoken English. Just as an example, take pop-cultural memes like "to boldly go where no man has gone before" (Star Trek).

Sporadic older analyses of *zu* as a functional head have proven to be not very convincing on the empirical level (cf. the discussion by Haider 2010: 273–274), yet this assumption still has its advocates, see for example Hinterhölzl (2006: 157–158), who analyzes *zu* as an aspectual head, and Salzmann (2016, 2017), who assumes that *zu* is a functional head without making particular claims as to its semantic content or contribution. Of course, in a grammar-theoretic setting where *Lexical Integrity* is lifted (which seems to be the standard assumption within the Generative mainstream) and even bound morphemes can be considered as syntactic heads, this distinction is somewhat blurred. Thus, the question boils down to exactly which kind of functional category *zu* exactly is and whether it constitutes a bound or a free morpheme. Another question which shall not concern us any further is whether *zu* is syntactically active or just "ornamental", as has been assumed for nonfinite inflectional markers in general (Sternefeld 2006: 92, Rathert 2009: 184). As far as I know, Haider (1984) was one of the first to propose that *zu* blocks the designated argument in coherent infinitive constructions, thus also offering a natural explanation for modal *sein*-passives like (4a). With *haben*-passives, however, he has to assume that deblocking is possible (4b).

(4) a. Die Handtücher sind (von allen Badegästen) gewaschen zurückzugeben.
the towels are by all bath=guests washed back=to=give
"The towels are to be returned laundered by all bathers."

b. Alle Badegäste haben die Handtücher gewaschen zurückzugeben.
all bathers have the towels washed back=to=give
"All bathers have to return the towels laundered."

In the same vein, Rapp and Wöllstein (2009) distinguish between to variants of *zu*—one that is responsible for the referential anchoring of complements of factive and propositional verbs and one "expletive" variant incorporated into V°. Thus, the idea that the infinitival marker—somewhat orthogonal to its morphological status—is a syntactically (or also semantically) active element still has its advocates.

Let us return to the affix hypothesis. A problem for this view are data like (5a, b): They show that in Standard German, the *zu*-marking is confined to the right edge of the verbal complex. When processes like fronting of the temporal auxiliary occur, e. g. in substitute infinitive constructions (commonly referred to as IPP, i. e. "infinitivus pro participio"), the affix is handed down to the highest verb of the remaining verbal complex (5b), a process that can be stated in terms of something like Chomsky's (1957) affix hopping mechanism or alternative devices like the one proposed in this paper (see below). This restriction is one of the sources for the so-called *Skandalkonstruktion* ("scandal construction"), exemplified by (5c), where each verb in the right periphery bears the wrong (i. e. an unexpected) morphological marking (cf. Reis 1979, Vogel 2009, Haider 2011, Gaeta 2013).

(5) a. ohne singen gekonnt *zu* haben
without sing can.PCPT to have

b. ohne haben singen *zu* können
without have sing to can.IPP

c. ohne gesungen haben *zu* können
without sung.PCPT have to can.IPP
"without having been able to sing"
(Vogel 2009: 325, ex. (37))

Interestingly, Dutch is not subject to this restriction, as the contrast between (6a) and (6b) shows (examples taken from Bech 1963: 291–292). The syntactic inertness of *zu*, which is first mentioned by Merkes (1895), was integrated into Bech's (1955, 1957) topological model of German infinitival

constructions and used as a piece of evidence that the occurrence of an upper field is an indicator for coherence.

(6) a. Ich glaube es *haben* tun zu können. (Standard German)
I believe it have do to can.IPP

b. Ik geloof het *te hebben* kunnen doen. (Standard Dutch)
I believe it to have can.IPP do
"I believe to have been able to do it."

While traditional research—first and foremost Bech (1963) himself—was inclined to view such misplacings as indication for the workings of conflicting grammatical rules (see also Reis 1979), Vogel (2009: 324) takes (5a, b) as empirical hint for analyzing *zu* as a phrasal affix that is attached to the last verb of the verbal complex. In his opinion, the first status (simple infinitive) and the third status (participle) belong to word morphology, whereas the second status (*zu*-infinitive) reflects a morphological property of the verb phrase.[4]

A look at the dialects and the diachrony reveals that misplaced *zu* is not restricted to perfective contexts (with or without IPP). In the second volume of Otto Behaghel's German syntax, quite a variety of structural types can be found (see Behaghel 1924: 308–309). Apart from "regular cases" of misplaced *zu* caused by auxiliary fronting (7a), we also get configurations where *zu* attaches to the wrong verb without any reorderings having taken place (7b). Further examples of this type from Early New High German can be found in Ebert et al. (1993: 397), thus showing that it is a regular grammatical pattern. Finally, as documented by (7c), there are also certain interactions with other dialectal constructions, most notably "particle splits" that occur in older stages of German and several recent dialects (see Schallert and Schwalm 2015 for an overview).

(7) a. ich erinnere mich, einen Reisenden das eigentümliche Entsetzen haben schildern
I remember REFL a traveller the peculiar horror have narrate
zu hören (Freiligrath 5, 67)
to hear
"I remember a traveller having narrated the peculiar horror"

b. habt angefangen, das dag auf deim hausz *zu* verstreichenn lassenn (Paumgartner 1)
have started the day at your house to elapse let
"have stared to elapse several days at your house"

c. sich entslossen hat, kein verbot aus lassen *zu* geen (Toppler 136)
REFL decided has no ban out let to go
"decided not to put a ban on..."

Let us now take a look at recent dialects.[5] The phenomenon of misplaced *zu* is reported for different varieties of Alemannic, cf. e. g. Weber (1987: 244, fn. 1) on Zurich German and Hodler (1969: 560) or Bader (1995) on Bernese German, Schallert (2012: 252) on Vorarlberg Alemannic, but it is not confined to this dialect group, as we will see below. As the examples in (8) show, misplaced *zu* (realized in its clitic form *z*) also occurs in other contexts than IPP—(8a) features the modal *wöuue* 'want' in the upper field, (8b) is a simple case of verb raising.

4 As noted above, the positional restriction of *zu* is one of the sources for the scandal construction. Haider (2011) views this construction as an example of a "grammatical illusion". Under this label he subsumes phenomena that are judged acceptable by (some) informants, yet involve apparent violations of grammatical restrictions. In his opinion, they are the mirror-image of garden path sentences, which are judged unacceptable due to parsing restrictions when in fact they don't involve any grammatical violations. A typical illusory example would be wrongly inflected *genug* 'enough' (as a right-headed modifier) in examples like *eine groß genuge Summe* 'a big enough sum'. Leaving open whether the scandal construction belongs to the realm of grammaticality, there is clear evidence that misplaced *zu* is way too regular a phenomenon to banish it from this domain altogether.

5 For a general overview on syntactically triggered cases in which inflectional morphology appears at unexpected places in the verbal complex, see Höhle (2006: 65–72).

(8) a. dr Hans schiint dr Unfau wöuue gsee *z'haa* (Bernese German)
the Hans seems the accident want.INF see to=have
"Hans seems to have wanted to see the accident"
(Bader 1995: 22)

b. Schämsch di nüüd cho *z* bättle (Zurich German)
shame-∅ REFL not come to beg
"Aren't you ashamed of having come here begging?"
(Weber 1987: 244, fn. 1)

Even though displacements of *zu* have mainly been reported for Alemannic dialects, they are also found in other varieties. Further examples from different German dialects (mainly from the central region) are cited in Höhle (2006: 67–68). In a survey on particle splits in Hessian dialects conducted by Johanna Schwalm and myself we also found examples for misplaced *zu*, both in simple cases like (9a) and in interaction with particle stranding (9b), the former corresponding to example (7c) above.

(9) a. Dä oarm Anton bruch sech net immer so vo sim Chef *o* loss *ze* schnauze.
the poor Anton needs REFL not always so from his boss on let to scorn
(Günthers)

b. De arm Anton brucht sich von sim Chef net so loss uzeschnauze
the poor Anton needs REFL from his boss not so let on=scorn
(Simmershausen)
"Poor Anton doesn't need to be always scorned by his boss."

But also structures like (7b) above occur, where *zu* is attached to the left verb in a left-branching structure (which is assumed to be the base order in a Germanic OV language). An empirical survey conducted by Schallert (2012) with 94 speakers brought six examples for this structure in Vorarlberg Alemannic (10a); an analogous, albeit sporadic example could also be found in Southern Bavarian (10b).

(10) a. Er ist lieber humplig ham glofa, als sich vo mir *zfahra* lo. (Alemannic)
He is rather limping home walked than REFL from me to=drive let
"He rather walked home limpingly than being offered a ride by me"
(ID 58; 62/w, Satteins, Vorarlberg)

b. Mei Våta glap *z'gwing* kinn (St. Veit in Defreggen, Eastern Tyrol)
My father believes to=win can
"My father believes to be able to win"
(Mayerthaler, Fliedl, and Winkler 1995: 55)

Further examples of this construction from a West Central and a Low German dialect are quoted in (11). Interestingly, (11a, b) show doubling of *zu*, once in its regular position to the right, once displaced to the left. Thus, the verb *gelasse*, which shows the typical prefixed infinitive construction selected by certain verbs (mainly modals—*brauchen* 'need', of course, shows a high affinity to this class) in West Central German dialects alongside the anomalous *zu*-marking. Note that the *Frankfurter Wörterbuch*, from which source this example is quoted, states that *zu* appears "häufig in Verdoppelung" ("frequently in doubling") (Brückner 1988: 3650), so there can be no doubt that this construction is a regular grammatical pattern and not just a production error. Another example of this type comes from the urban dialect of Berlin, cf. (11b). Thanks to Thilo Weber for providing me with this syntactic bijou.

(11) a. ich brauch merr deß net *zu* gefalle *zu* gelasse (Frankfurt, West Central
i need me.DAT that not to please to let
German)
"I don't need to put up with that."
(Brückner 1988: 3651)

b. det brauch er sich nich *zu* jefallen *zu* lassen
that need.3.SG he REFL not to please to let
"He needn't put up with that!"
(Schildt and Schmidt 1986: 241)

c. Und nun sind wir dann wieder angefangen eine Neuüberschlickung da vonstatten
and now are we then again started a new.over.mudding there pass.off
zu gehen lassen. (North Lower Saxon)
to go let
"And now he have again started to pass of an overflow with mud."[6]
(ZW1Q3; Averlak, Schleswig-Holstein)

In the light of the diachronic and dialectal evidence, there is sufficient evidence for the assumption that *zu* mostly attaches to the rightmost verb in the verbal complex, yet in some cases it is handed down to the immediately preceding verb. This means that the long held generalization (since Merkes 1895), which is also maintained by Gaeta (2013: 584) or Salzmann (2016: 409) and Salzmann (2017: 11), is not entirely correct.[7]

A short typological digression: Misplacing of *te* is also reported for dialectal/regiolectal varieties of Dutch, as the following example (taken from Pots 2017: 3) shows.[8] It features the Dutch progressive construction with the verb *zitten* 'sit', which selects a *te*-infinitive. Interestingly, the respective morphological marking can surface at any verb in the right periphery.

(12) Peter zal vanwege de nieuwe dienstregeling binnenkort nog langer op de trein [⟨te⟩
Peter will because.of the new schedule soon even longer on the train to
moeten$_1$ ⟨te⟩ zitten$_2$ ⟨te⟩ wachten$_3$].
must.INF to sit.INF to wait.INF
"Because of the new schedule, Peter will soon have to wait even longer for the train."

However, there is considerable variation in terms of the overall acceptability of this process as well in the specific contexts in which it can apply. Pots takes this variation as sufficient evidence for a bipartite analysis of *te*. For speakers who only allow the in situ variant (i. e. where the infinitival marker appears at the expected verb), it acts as a prefix. Conversely, the dislocation configurations are modeled as instances of clitic climbing (familiar from restructuring verbs in Romance languages like Italian). A closer parallel to the misplacings from the German dialects I have been presenting can be found in Afrikaans, Flemish and certain varieties of Dutch where *te* seems to be able to appear right in front of the whole verbal complex (see Salzmann 2017: 43–44 for several examples).

Turning back to German and summarizing the data presentation, we are faced with a somewhat blurred picture: While the word order properties of *zu* (particularly in the dialects) point to the conclusion that it is a syntactically active element, the coordination facts hint at its status as a prefix (see also Salzmann 2017: 37–38 for some discussion on this aspect). Note, in passing, that

6 In North Western Low German, the phase predicate *anfangen* 'begin' uses the perfective auxiliary *sein* 'sein', as is the case for Dutch. See e. g. Schallert (2013: 123) for some further information.

7 Gaeta (2013: 584) views the placement of *zu* in the penultimate position as a "specified constructional idiom" in the sense of Goldberg and Jackendoff (2004) and sees its specific function in delimiting the verbal complex as a syntactic domain.

8 Thanks to Martin Salzmann for making me aware of these facts.

the situation in Dutch is comparable (cf. Zwart 1993: 104). On closer inspection, even the facts about "status agreement" (in the sense of Bech 1955: 19) might turn out to be not as clear-cut as previously assumed. Salzmann (2017: 38, fn. 28) points to cases where *zu* can be missing in X^o-coordinations. An investigation of the DWDS corpus[9] seems to support this observation: While examples like (13a) with this kind of structure pop up quite regularly (49 cases), complex coordinations always show status agreement (13b) (no counterexamples).

(13) a. Du wirst wissen, was zu tun und lassen ist, damit alle Spaß haben.
Du will know what to do and let is so.that all fun have
"You will know what needs to be done and what needs to be avoided for everybody to have fun."
(Braun and Nell: *Man muß sich nur zu helfen wissen*; Leipzig 1971, p. 148)

b. "Die Franzosen haben das Recht, ihre Ansichten zu veröffentlichen und drucken zu
the French have the right their views to publish and print to
lassen (...)."
let
"The French have the right to publish their views and have them printed"
(Habermas: *Strukturwandel der Öffentlichkeit*; Neuwied 1965 [1962], p. 83)

Interestingly, this kind of variation is also acknowledged by prescriptive grammars of German. In the volume of the *Duden* series on grammatical cases of doubt ("grammatische Zweifelsfälle"), the recommendation can be found that in coordinations like (14), both conjuncts shall be marked with *zu* (Hennig 2016: 1060).

(14) Es begann zu stürmen und §(*zu*) schneien.
It began to storm and to snow
"It began to storm and snow."

Against this background, it doesn't come as a big surprise that also in the dialects, conflicting data like (15a) do turn up alongside the regular cases like (15b) where the infinitival marker is present in both conjuncts (examples from the *Zwirner* corpus[10]).

(15) a. und jetzt wußte ich halt nicht, was ich *zu* [tun und lassen] habe
and now knew I MP not what I to do and let have
"and then I didn't know what to do and not to do"
(ZWG83; Kreimbach-Kaulbach, Rhineland-Palatinate)

b. Man muß ja doch wissen, was man [*zu* tun] und [*zu* lassen] hat.
one must MP MP know what one to do and to let has
"One has to know what to do and what not to do."
(ZW3G8; Panrod, Hesse)

As the examples (16) from the Early New High German period show, this kind of variation seems to have its roots in older stages of German. In his general grammaticalization scenario from the allative preposition to the infinitive marker, Haspelmath (1989: 297) takes data like these as being indicative of *zu*'s structural scope as one of the common grammaticalization parameters (cf. Lehmann 2015: ch. 4): Whereas it is able to attach to bigger syntactic domains—namely phrasal conjuncts— in this era, it gradually turns into an element attached to single stems (i. e. an affix).

9 This corpus can be accessed via the following URL: `https://www.dwds.de/` [last accessed on 21 February, 2018].

10 This corpus can be accessed via the *Datenbank für Gesprochenes Deutsch* (DGD): `https://dgd.ids-mannheim.de/dgd/pragdb.dgd_extern.welcome` [last accessed on 2 January, 2018].

(16) a. das ain yeglicher widersach / vndersteet seynen wiedersacher zu belaydigen. beswaren
that a each opponent desists his opponent to insult burden
vnd zu raitz̄n
and to irritate
"that each opponent desists from insulting, burdening, and irritating his opponent"
(Geiler, *Predigten teütsch* 144a; Ebert et al. 1993: 397)

b. der gewonet auch die leute zu reissen und fressen
who is.used.to also the people to seize and devour
"who is also used to seize and devour the people"
(Luther, Ez. 19,6; after Haspelmath 1989: 297)

2.2 Other displacement phenomena

In his seminal paper on substitutes in the system of non-finite morphology, Höhle (2006) shows that the wrongly attached infinitival prefix is but an instance of several morphological displacement phenomena that occur in the context of complex predicates. Another example can be seen in (17), stemming from an East Central German dialect and displaying the following peculiarities: In this variety, *werd-* 'become' normally selects a so-called gerundial form of the infinitive (suffixed by *-e(n)*), which goes back to an inflected form of the infinitive in the OHG/MHG era. In particular, cases where the dependent of this verb itself embeds another verb its expected form is replaced by the special substitute form *müd* 'must'.

(17) mə wæn müd glün (Kleinschmalkalden, Thuringia)
we will must.SUP sue
"we probably have to go to law"
(Dellit 1913; quoted after Höhle 2006: 66)

Höhle calls this form a "supine" since it differs from the regular past participle by truncation of the participial prefix and sometimes also vowel alternations.[11] Typical examples of this construction would be perfective contexts like (18), which feature the modal verbs *müssen* 'must' and *dürfen* 'be allowed to', the latter obviously derived from a different ablaut level than the regular participle, yet it is also reported for future and passive auxiliaries.[12]

(18) a. ij håwe musd gi:e (Oberschwöditz [Trebnitz], Saxony-Anhalt)
I have must.SUP go.GER
"I had to go" (regular participle: *gemusd*)

b. du håsd darfd driŋke
you have been.allowed-SUP drink
"you were allowed to drink" (regular participle: *gedorfd*)
(Trebs 1899; quoted after Höhle 2006: 57–58)

Let us return to example (17) above: The interesting observation is that even though the gerundial form required by *werd-* is not realized by *müss*, it appears on its immediate dependent, *glün* 'sue' (as shown by the suffix *-n* instead of the bare infinitive, which shows no suffix in this dialect). Thus, morphological selection requirements are passed down to the next verb, very much

11 The most prototypical case of a substitute form would be the well-known IPP-effect where an expected participle is replaced by the infinitive in perfective contexts. Thus, it is but one of several cases with an unexpected morphological marking appearing in a verbal chain.

12 In some cases, the morphosyntactic marking of the embedding perfective auxiliary can be reflected by the concrete form of the supine in that subjunctive mood triggers the respective stem (see Höhle 2006: 60–61 and Schallert 2014b: 268 on such forms in Alemannic).

the same as with the *zu*-cases discussed earlier. A further level of displacement is represented by cases where the most deeply embedded verb satisfies the selectional requirements of both its superordinate verbs, as is shown with the Alemannic example in (19), which is quoted by Höhle (2006: 70). Here, the *zu*-marked infinitive *z'häuffe* 'to help' can be interpreted as simultaneously fulfilling the requirements of *schiint* 'seems' and *probiere* 'try'. Against the background of the doubling cases I presented above, one might also wonder whether this example is the effect of syntactic haplology.

(19) dr Hans schiint sine Fründe probiere z'häuffe (Bernese German)
the Hans seems his Friends try to=help
"Hans appears to try to help his friends"
(Bader 1995: 22)

Further cases of this phenomenon are discussed by Salzmann (2016: 428–432) and Salzmann (2017: 31–34); a respective example from Early New High German is quoted in Behaghel (1924: 308). Interestingly, in the *Duden* volume mentioned earlier the recommendation can be found that cases of haplology like (i), i. e. when only one of two *zu*-infinitives bears the respective (and expected) marking, should be avoided (Hennig 2016: 1060):

(20) Ich hoffe mich §(*zu*) erkennen geben zu können.
I hope me.REFL to recognize give to could
"I hope to be able to reveal myself."

Finally, and somewhat orthogonally to the cases we have discussed so far, detachment phenomena can also be observed with finite forms. Famous examples come from Swabian (e. g. Steil 1989 and references quoted therein, Hiller 1999) or East Franconian (Heyse et al. 2007: 439) where the finiteness features in complex predicates can occur on the embedded instead of the embedding predicate; this effect is reported for the benefactive verb *helfen* 'help' and the phase predicate *anfangen* 'begin'. See also Schallert (2014a: 192) and Salzmann (2017: 45) for some discussion on this phenomenon.

(21) a. Hilf mir schiebe!
help.IMP me shove.INF
b. Schieb mir helfe!
shove.IMP me help.INF
"Help me shove!"
(Häfner 1951: 136)
c. Glaubsch, der hedd mr hälfa kochd?
believe.2.SG he.DEM had me help.INF cook.3.SG
"Do you believe he would have helped me cook?"
(Steil 1989: 41)

2.3 Generalizations about *zu* and displaced morphology

In the light of the data compiled by himself, Höhle (2006: 73) makes an interesting generalization about displacement phenomena as the ones discussed here: In his view they are order-sensitive in that they are blocked in left-branching configurations (22a), whereas they are free to apply in right-branching orders (22b). As we saw in the preceding section, this generalization is confronted with counterevidence, at least when it comes to the behavior of the infinitival marker *zu*.

Höhle (2006: 73–74) takes this generalization to hold in disharmonic configurations as well, i. e. syntagmas that show partially right-branching and partially left-branching orders, as long as

the relevant segment is right-branching. Thus, of the serializations schematized in (23), transfer of V_2's selectional requirements on to V_3 would be blocked in (23a, b), while being licenced in (23c).

(22) a. V_{fin}/C ... V_2 V_1 (no displacement)
b. V_{fin}/C ... V_1 V_2 (displacement)

(23) a. V_1 V_3 V_2
b. V_3 V_1 V_2
c. V_2 V_1 V_3

However, also this corollary runs into trouble. One famous instance of the "scandal construction", quoted in (5c) above and repeated in (24), also features a disharmonic word order, namely 3-1-2, yet it only partially corresponds to Höhle's generalization. While the displacement of *zu* features a right-branching segment, namely ⟨*haben können*⟩, the other relevant segment, ⟨*helfen können*⟩, is clearly left-branching.

(24) ohne gesungen haben *zu* können
without sung-PCPT have to can-IPP
"without having been able to sing"
(Vogel 2009: 325, ex. (37))

More precisely, the relevant generalization seems to be that under certain conditions, a syntactic element X_n that governs a second status (*zu*) can transfer its selectional requirements to X_{n+1}, the category it immediately dominates, a process that is schematically visualized in (25). Note that the way in which I formulate this generalization is inspired by Höhle (2006), yet in a less restrictive way. Branching direction doesn't seem to be the relevant factor, as misplacing occurs in left- (26a) as well as in right-branching configurations (26b). Formation of an upper field, that is fronting of the governing category to the leftmost position of the verbal complex, poses no obstacle for the transfer of *zu* (26c), nor does the occurrence of nonverbal interveners (verb projection raising), as can be observed in Swiss Alemannic (27).

(25) a. [... [X_n *zu*] [X_{n+1} ...]]
b. [... [X_{n+1} ...] [X_n *zu*]]

(26) a. [V z fahra] loo
b. choo [V z bättla]
c. haben [V helfen zu können]

(27) ohni mi [V welle [V uf d bullesite z stelle]], im gegeteil, aber ...
without me want.INF on the cops.side to put.INF on=the contrary but
"without wanting to side with the cops, on the contrary, but ..."
(Salzmann 2013b: 77)

Let me summarize the discussion in this section: *zu*-infinitives show an unexpected behavior in that they can be misplaced both to the left *and* to the right within the verbal complex. Such a behavior seems to be absent for other types of infinitival morphology, however with the exception of the scandal construction (see Salzmann 2017: 11–15 for a detailed discussion).

3 What is the proper analysis of *zu*?

Ever since Höhle's (2006) important contribution, the last few years have seen a revived interest in morphological mismatches in the right non-finite domain, the *zu*-anomaly just being a small piece of the puzzle. Since the main contribution of this paper is on the empirical level, I won't be dealing with the specifics of different existing approaches (see Salzmann 2016: 19–23 and in particular Salzmann 2017 for a recent overview). What is more, they are all incomplete in the sense that they act on the two following assumptions, which have been contested by the data quoted in the preceding section:

1. *zu* attaches to the rightmost verb of the verbal complex.
2. Misplaced morphology only occurs in right-branching configurations.

So back to the drawing-board, then. What is the easiest way of capturing the generalization that *zu* can be handed down to the next dependent verb? Directionality comes into play as a (micro-)parametric option, because this one step can either apply to the right (which seems to be the more common option) or to the left (the less common option).[13] The answer to this question will be twofold: Firstly, I will discuss precedence statements as a technical means to deal with the (mis-)placement of *zu* (section 3.1). As a more powerful alternative for handling our phenomenon I use the infixing operations introduced by Bach (1984) as a analytical tool. Finally (section 3.3), I discuss Salzmann's (2013b, 2016, 2017) approach on how *zu* and other cases of misplaced morphology might be treated and address some open problems with his analysis.

3.1 Precedence rules

The first explicit formalization of precedence rules can be found in the context of *Generalized Phrase Structure Grammar* (GPSG) even though ideas in this direction had been around for a while (see Gazdar et al. 1985: ch. 3). The basic approach consists of reformulating a context-free production rule like (28a) as an *Immediate Dominance* (ID) rule in the format of (28b). The crucial difference between the two formats is that the latter formulation doesn't make any claims about the linear ordering of the nodes on the right-hand side of the rule, i. e. any of the $n!$ permutations of the nodes $B_1, B_2, \ldots, B_n$ is licenced. In their original form, precedence statements are restricted to *local trees*, that is a single mother node plus all the nodes it immediately dominates.

(28) a. $A \rightarrow B_1\ B_2\ B_3\ \ldots B_n$
b. $A \rightarrow B_1, B_2, B_3, \ldots, B_n$

As Gazdar et al. (1985: 44–45) note, this statement is part of the definition of which set of trees a particular context-free phrase structure grammar admits. As an additional device, (linear) precedence rules as a local relation between the nodes on the right-hand side are introduced. I now give the precise definitions of these concepts, which are taken and slightly adapted from Klenk (1985: 39):

Definition 1. An ID/LP syntax is a 5-tuple (V_{NT}, V_T, ID, LP, S) where V_{NT}, the set of non-terminals, and V_T, the set of terminals, are vocabularies with $V_{NT} \cap V_T = \varnothing$. S is the starting symbol, ID the set of immediate dominance rules, and LP the set of linear precedence rules.

Definition 2. An immediate dominance rule (ID) is a finite, non-empty set of pairs of the form $(A,\ \langle A_1, \ldots, A_n\rangle)$ with $n > 0$ or $(A, \langle \ldots \rangle)$ (deletion rule) where $A \in V_{NT}$ and $A_i \in V_{NT} \cup V_T$ for $1 \leq i \leq n$. Alternatively, we can notate such rules as $A \Rightarrow \langle A_1, \ldots, A_n\rangle$ or $A \Rightarrow \langle \ldots \rangle$.

13 Qualifying cases as the ones already given in Schallert (2012: 252) as "very rare exceptions" (Salzmann 2016: 9) is the sign of theory-geared prejudices, at least to my mind. If we agree that the *zu*-anomaly is a phenomenon in its own right, not just a "grammatical illusion" (Haider 2011), then we ought to take its chirality seriously.

Definition 3. A linear precedence rule (LP) is an asymmetric relation $R \subseteq V_{NT} \times V_T$. This means that for each $x, y \in V_{NT} \cup V_T$ it follows that $x \sim_R y$ implies $y \nsim_R x$. In addition, this relation is transitive, meaning that for some $z \in V_{NT} \cup V_T$ there is the connection that if $x \sim_R y$ and $y \sim_R z$, then also $x \sim_R z$ holds. I denote this relation by $\prec$ and its inverse (R^{-1}) by $\succ$.

Klenk (1985: 40–41) proves an interesting result with regard to the formal complexity of an ID/LP syntax, showing that the sets of context-free languages L_{CF} and those of $L_{ID/LP}$ languages are idempotent. However, this doesn't mean that both types of underlying grammars are equivalent. In general, it is not possible to construe an equivalent ID/LP syntax for a given context-free syntax directly, i. e. without conversion into a modified context-free syntax (see ibid.).

Let us now proceed to an analysis of the *zu*-facts in terms of precedence rules. Linearization statements have been applied to word order properties of languages like German in general (Kathol 2000) and to complex predicates in particular (Müller 2002). An open questions in this respect is how flat or layered the verbal complex is. For instance, the observation that scope sensitive material occurring within this domain (e. g. in verb projection raising structures) seems to only allow narrow readings has been taken as evidence for the latter assumption (Haegeman and Riemsdijk 1986, Salzmann 2011), yet there is also conflicting evidence (see Schallert 2014a: ch. 3.2.2 for some discussion). With regard to the special case of the infinitival marker, however, there is no indication that word order variation is associated with differences in interpretation (see Salzmann 2017: 23–25). The same holds true for split infinitives in English, yet for independent reasons, of course—*zu* is a functional head and thus always scopes over the VP. Note that the approach by Salzmann (2013b, 2016, 2017) makes use of linearization statements as well, yet they are couched in a quite complex setting: *zu* is assumed to be a head-final functional head, and displacement is the effect of *Local Dislocation* (in the sense of *Distributed Morphology*, cf. Embick and Noyer 2001). Ironically, this approach isn't powerful enough because it ignores the misplacings to the left, for which I have given sufficient empirical evidence. Although I fully agree that a linearization approach to *zu* is on the right track, it can be stated in much easier terms while still (or even) covering much of the relevant data. By fleshing out precedence rules to the bare bone, so to speak, it is easier to adapt or extend them, thus fitting them with the syntactic model of your choice.

In the following, I want to show how the most common serializations can be derived with an ID/LP-syntax. First, we have to ask ourselves how Gazdar et al.'s (1985) notion of a local tree in the above sense can be sensibly applied to the case at hand. As *Linearization Domain* (LD) or local tree we consider all verbal heads of the VP-domain, including *zu*/*te* (and perhaps other infinitival markers), irrespective of what exact hierarchical relations between them might hold.

(29) $LD \Rightarrow V_1\ V_2\ V_3\ \ldots V_n$

Let us take the three main serializations with respect to the positioning of *zu* from (26), which are illustrated with the same lexical material in (30). For the time being, I treat the regular placement of *zu* as in (30a) on par with the stranding case in (31). The latter structure is triggered by fronting the auxiliary in the context of the substitute infinitive construction, but I only consider the placement of *zu*, the modal *können* 'can', and the lexical verb *helfen* 'help'. Turning our attention back to (30), we are interested in the position of the ECM-verb *lassen* 'let', which we regard as belonging to the category *Mod*, *zu* 'to', and the lexical verb *fahren* 'drive', meaning that $LD := \{V, zu, Mod\}$. The latter label is to cover all verbs that are able to enter a selectional relation with other verbs, i. e. show "status government" in Bech's (1955) traditional terminology, but aren't auxiliaries:[14] (30a) represents the Standard German system

14 I don't want to claim that ECM-verbs are actually modals. The only important assumption I am making is that they are categorically different from auxiliaries (no argument structure) and lexical verbs (no status government), so you can replace this category label with a fancier one of your taste.

with *zu* at the rightmost end of the verbal complex, (30b) the system of Swiss German and other dialects with dislocation to the right, (30c) the mirror-image counterpart, as represented e. g. by Vorarlberg Alemannic.

(30) a. anstatt sich von mir fahren *zu* lassen (ST)
instead REFL from me drive to let

b. anstatt sich von mir lassen *zu* fahren (CH)
instead REFL from me let to drive

c. anstatt sich von mir *zu* fahren lassen (V)
instead REFL from me to drive let
"instead of letting me drive him"

(31) ohne ihm [haben [helfen zu können]] (ST)
without him.DAT have help to could
"without having been able to help him"

The standard system can be derived with the precedence rules in (32). LP_1 and LP_2 alone are powerful enough to filter out the serializations (30a, c), which is incidentally the system of Vorarlberg Alemannic—alongside displacement to the left, the Standard German serialization is always possible in this variety (see Schallert 2012: section 8.3.2 for an overview). Of course, ungrammatical serializations like e. g. ⟨*Mod, V, zu*⟩ are ruled out due to LP_2 in the present case.

(32) a. LP_1: $V \prec Mod$
b. LP_2: $zu \prec Mod$
c. LP_3: $V \prec zu$

For the system of Swiss German (and other varieties with dislocation to the right) the precedence rules in (33) are needed. Note that LP_4 and LP_5 in (33a, b) are the exact mirror image of LP_1 and LP_2 in (32). Once again, ungrammatical patterns are banned by these precedence rules, for instance ⟨*zu, Mod, V*⟩ due to LP_5.

(33) a. LP_4: $Mod \prec V$
b. LP_5: $Mod \prec zu$
c. LP_6: $zu \prec V$

As these examples showed, it is not so difficult, with the aid of precedence rules, to get the basic serialization patters of *zu* right. However, an analysis along these lines soon runs into trouble with more complex configurations. Take the misplacement caused by auxiliary fronting in (31). Without additional precedence rules for the placement of the auxiliary, there is the problem of overgeneration because ungrammatical serializations like (34) are not blocked by the rules stated in LP_1–LP_3.

(34) a. * helfen zu können haben (V *zu* Mod (Aux))
b. * helfen zu haben können (V *zu* (Aux) Mod)

A quite natural solution to these problems would be defining more elaborated precedence rules like e. g. $zu \prec V_n$, which translate to "*zu* always has to precede the verb with the highest index (i. e. the most deeply embedded verb)". However, such a rule cannot be stated in the context-free manner I introduced them in this section. Another obvious problem is posed by the doubling cases discussed in section 2.1. Apart from the fact that they cannot introduce new material, it is very difficult to formulate appropriate precedence rules for both tokens of *zu*.

3.2 Morphosyntactic infixing operations

In the previous section, I showed that the basic patterns of the *zu*-anomaly can be treated in a sufficient manner with the aid of precedence rules. It became apparent, however, that such rules soon reach their limits when confronted with the great range of variability in the verbal complex. What is more, an approach along this lines cannot cover cases of *zu*-doubling. I now want to propose an alternative analysis of the *zu*-facts in terms of a special kind of infixation. Such an approach was first developed in the context of categorical morphology (see the overview in Stewart 2016: 22–26). This analysis was originally proposed for dealing with "verb raising" constructions in Dutch, but it can also be easily extended to our phenomenon.

Bach (1984) proposes several wrapping rules[15] which operate on a string x of grammatical categories $x_1 \ldots x_n$; these operations were taken up by Hoeksema and Janda (1988: 206–221) to analyze a wide variety of (morphological) infixation processes. Since we are interested solely in the process of prefixation, we focus on the respective operations in (35).

(35) a. LWRAP-pref(x, y) = (LREST(x) (y LAST(x))))
b. RWRAP-pref(x, y) = (FIRST(x) (y RREST(x)))

These operations allow prefixing an element y either to x_n, the last category of x (35a), or to the right rest of x, i. e. the first element following x_1. Evidently, such devices are inspired by the typical string methods that are implemented in almost all modern programming languages. Taking `Python` as an example, the following code snippet splits the string `string` into its first element and the rest, respectively. For completeness' sake, I also give the reverse operation right below.

```
>>> s = "string"
>>> s[:1], s[1:]
>>> ('s', 'tring')
>>> s[:-1], s[-1:]
>>> ('strin', 'g')
```

The cases where *zu* attaches to the left, i. e. the first element of the verbal complex, can be handled by defining one further wrap operation that prefixes *zu* to the first element of the string $x_1, \ldots, x_n$. I want to call this operation FWRAP—the respective definition is given in (36).

(36) FWRAP-pref(x, y) = ((y FIRST(x)) LAST(x))

Empirical motivation for such a rule comes from the observation that in Dutch, for instance, verb particles can stranded at the left edge of the verbal complex, as the examples in (37) show. Crucially, *op* still constitutes a part of the verbal complex in that no nonverbal interveners can be inserted between it and the following verb.

(37) Dutch (Neeleman and Weerman 1993: 435):
a. dat Jan het meisje wil opbellen
that John the girl wants PART=phone
"that John wants to call the girl."

15 Wrap rules were proposed by Bach (1979) and employed in the analysis of a range of phenomena, most notably order-sensitive effects of linking syntactic functions (see Baldridge and Hoyt 2015: 1065–1066). An example for such a rule would be *Forward Wrap* as defined in (i).

(i) $(X/Y)/_w Z \Rightarrow_{Wrap} (X/Z)/Y$

In technical terms, we are dealing with a commuting combinator ($Cfxy \equiv fyx$) that permutes the arguments of a given functor category (Baldridge and Hoyt 2015: 1065). This device extends the generative power of a Categorial Grammar to the level of so-called mildly context-sensitive languages (Vijay-Shanker and Weir 1994).

b. dat Jan het meisje *op* will bellen

How do standard concatenative morphological operations like prefixation or suffixation work in this framework? Hoeksema (1985) takes categories, be they simple or derived, to be represented as ordered triples after the blueprint of (38), comprising a phonological (π_p), a categorial (π_c), and a semantic component (π_s) (Hoeksema 1985: 15).

(38) $\mathrm{L} := \langle \pi_p(\mathrm{L}); \pi_c(\mathrm{L}); \pi_s(\mathrm{L}) \rangle$

Affixiation is handled via two directionally specified application rules—Hoeksema (1985: 19) speaks of "cancellation"—whose categorical dimension is listed in (39)–(40), respectively.

(39) Right cancellation (RC) (i. e. prefixation): $(\mathrm{A}/\mathrm{B}, \mathrm{B}) = \mathrm{A}$

(40) Left cancellation (LC) (i.e. suffixation): $(\mathrm{A}, \mathrm{A}\backslash\mathrm{B}) = \mathrm{B}$

Ordinary *zu*-prefixation just amounts to applying a suitable argument to the affix as a functor, whereby the phonological representations are concatenated (my discussion partly follows Stewart 2016: 23). In categorical short shrift this can be written down as follows: $\mathrm{V}_{[\mathrm{zu}]}/\mathrm{V}$, $\mathrm{V} \Rightarrow_{>} \mathrm{V}_{[\mathrm{zu}]}$. Thus, a verb like *scheinen* 'seem' in German subcategorizes for a category V with the morphological index [zu] ("status government"), which is itself a derived category. The doubling cases mentioned in section 2.1, one of them repeated as (41), can be derived by a combination of simple application ($\mathrm{X}/\mathrm{Y}\ \mathrm{Y} \Rightarrow_{>} \mathrm{X}$) plus FWRAP als defined above.

(41) ich brauch merr deß net zu gefalle zu gelasse (Frankfurt, West Central German)
i need me.DAT that not to please to let
"I don't need to put up with that."
(Brückner 1988: 3651)

3.3 Morphological displacement as local dislocation

Salzmann (2016, 2017) proposes to treat the cases of morphological misplacement phenomena we discussed in section 2.2 (the *zu*-anomaly being but once instance) as the effect of *Local Dislocation* in the sense of Embick and Noyer (2001). Whereas processes like lowering operate on hierarchical structure, LD "operates in terms of linear adjacency" (p. 561). The most famous instance of the first operation is the well-known fact that in languages like English, verbs do not move to $\mathrm{T}^{\mathrm{o}}/\mathrm{I}^{\mathrm{o}}$, yet instead the finiteness features of this head are realized on the verb, viz. the contrast between (42a) and (42b) (p. 562).

(42) a. Mary [$_{\mathrm{TP}}$ t_l [$_{\mathrm{vP}}$ loudly play-ed$_l$ the trumpet]]
b. * Mary did loudly play the trumpet.

Salzmann treats verbal complex formation as a PF-phenomenon that comes to play when the ordering of heads of nested verbal projections (as hierarchical representations) has to be determined. Starting with a right-branching base order à la (43a), adjacent heads can be rebracketed and inverted (43b).

(43) a. [$_{\mathrm{VP}}$ V_1 [$_{\mathrm{VP}}$ V_2 [$_{\mathrm{VP}}$ V_3]]]
b. [V_1 V_2] > [V_2 V_1] V_3

The same mechanism is now employed for the derivation of *zu*, yet there are different kinds of interactions between the two processes (cf. Salzmann 2013b). The basic idea is that *zu* heads a left-branching functional projection right above the VP-level, while the base order for the latter projection is taken to be right-branching, by contrast. In (44), the derivations for the different ordering of *zu* are listed: (44a) would be the type of upper field formation discussed by Bech (1963), (44b) the regular case with a completely left-branching configuration, (44c) a case of the scandal construction. Finally, (44d), represents *zu*-dislocation to the right (as we saw earlier, Salzmann doesn't consider the dislocation cases to the left; the same applies to doubling of the infinitival marker).

(44) a. 1[32] *zu* ⇒ 1[3 + zu + 2] (*zu*)

b. [[32]1] *zu* ⇒ [[32] + zu + 1] (*zu*)

c. [3[12]] *zu* ⇒ [3[1 + zu + 2]] (*zu*)

d. 123 *zu* ⇒ 1 2 zu + 3 (*zu*)

The crucial point is that *zu*-affixation operates after verb cluster formation (at least in this context): "By Local Dislocation, it is affixed onto and inverted with the closest, i. e. linearly adjacent verbal element" (Salzmann 2016: 417). The simplest case would be (44d), which corresponds to the right-branching base order of verbal heads he assumes.

To my mind, an approach along these lines offers an interesting possibility to model different cases of morphological dislocation in a uniform fashion. However, it comes at a high price, because Salzmann makes quite a lot of auxiliary assumptions. Firstly, it is by no means obvious why *zu* would constitute a left-branching functional head. As mentioned earlier, no claims as to its semantic contribution are made. Salzmann (2016: 417–418, fn. 9) also has to assume that it constitutes a morphological word (in the parlance of Embick and Noyer 2001: 577–578) that adjoins to a segment of a complex head (thus a subword), which is in conflict with the requirement that only elements of the same morphological type can be inverted. To circumvent this problem, further technicalities arise, in need of proper independent justification. What is more, an analysis of *zu* as a functional head once again opens up Pandora's box, so to speak, in that all the problematic configurations why such an analysis was dismissed pop up again (cf. Haider 2010: 273–274). To mention just one example (taken from Haider 2003: 93): As is a well-known fact, VP can act as an extraposition site in German (45a). However, in the right periphery, extraposed material has to follow the verbal complex as a whole, as can be seen with the contrast between (45b) and (45c).

(45) a. [Gerechnet damit]$_i$ hat sie nicht mehr e$_i$
reckoned it=with has she not anymore

b. * dass sie nicht mehr gerechnet damit hat
that she not anymore reckend it=with has

c. dass sie nicht mehr gerechnet hat damit

If, however, the cascade of VPs is below FP, we would expect extraposed material to be squeezed in between the (topmost) VP node (that is the relevant case for us) and FP, as demonstrated in (46). Thus, it has to be stipulated that extraposition comes after verb cluster formation because otherwise local dislocation between *zu* and its left neighbour from the verbal complex would be blocked.

(46) * um [FP [VP [VP rechnen können] *mit so etwas*] F° zu]
in.order.to reckon could with so something to
"in order to be able to reckon with something like that"

Taking *zu* to be the head of a left-branching FP, makes matters even worse because semantically compatible adverbials are predicted to be able to intervene between FP and the VP-domain:

(47) [FP F° [AdvP [VP ...]]]

To be fair, there is also the possibility to treat the different displacement phenomena we are interested in as instances of *Lowering*, with *zu* attaching to the verbal head of its complement. I don't want to claim that such an analysis in impossible, but it renders the original motivation for Salzmann's approach, namely treating verbal complex formation as a PF-phenomenon and thus capturing its compactness property, obsolete (see Salzmann 2013a). To conclude, the approach of Salzmann couched in a Distributed Morphology setting has the charm of offering a more general analysis of morphological displacement phenomena, yet nontrivial adaptions or modification are necessary to make it work. As of now, it is confronted with different conceptual and empirical problems.

4 The *zu*-phenomenon as an exploratory expression

Let me now add some thoughts on misplaced *zu* from a (short-time) diachronic perspective. As we saw, the only relevant context where this phenomenon appears are cases of moving the *zu*-marked auxiliary to the front of the verbal complex, as displayed by (48); see also examples (5)–(6) above (Bech 1955: 62 calls this process "upper field" formation). Since *zu* seems to be inert, it ends up with the wrong verb, as it were.

(48) ohne es haben lesen zu können
without it have read to could
"withoug having been able to read it"

As we saw, this peculiarity is one of the sources for the so-called scandal construction where all verbs in the right periphery bear an unexpected morphological marking. While Vogel (2009), Salzmann (2016) or Wurmbrand (2012) treat this phenomenon as a regular part of German syntax, other voices in the literature are more sceptic: Reis (1979) expresses the idea that this construction belongs to the realm of phenomena that are not fully rule-governed,[16] and Haider (2011) even goes so far as to treat it as a "grammatical illusion", i. e. a phenomenon that is deemed acceptable by some speakers while in fact it conflicts with well-established grammatical rules and thus is better regarded as ungrammatical. To my mind, these diverging opinions are also geared by implicit notions of the overall design of a grammar theory, which can be associated with two major camps (Pullum and Scholz 2001; see also the discussion in Müller 2016: ch. 14): Generative-enumerative approaches (e. g. Categoral Grammar, Minimalism, etc.) view well-formed structures as the result of a convergent application of rewrite-rules, whereas model-theoretic approaches treat them as conforming to structural descriptions specified by the theory. In Müller's (2016: 490) succinct formulation: "the generative side only allows what can be generated by a given set of rules, whereas the model-theoretic approach allows everything that is not ruled out by constraints". Most importantly, both approaches make different claims about gradient acceptability. In model-theoretic terms, the (un-)acceptability is the cumulative

16 This reminds me of Sapir's (1921: 39) famous quote on grammars as leaking systems: "Were a language ever completely 'grammatical' it would be a perfect engine of conceptual expression. Unfortunately, or luckily, no language is tyrannically consistent. All grammars leak."

effect of constraint-violation, in generative-enumerative terms it is the impossibility to find a convergent derivation.

I don't want to claim that one of these two basic conceptions of what a grammar theory is supposed to model is per se better equipped to deal with the *zu*-anomaly (this is a different discussion). Instead I want to offer a different angle on the question why this construction has such an exceptional status. An interesting idea in this regard is expressed by Gaeta (2013: 376) who believes morphological mismatches like the *zu*-anomaly to be the by-product of the extension of a new construction (in diachronic terms), which can lead to grammatical conflicts. On a more basic level, misplaced *zu* in its different facets constitutes a paradigm case of what Harris and Campbell (1995: 73) call *exploratory expressions*:

> By exploratory expressions we mean expressions which are introduced through the ordinary operation of the grammar and which 'catch on' and become fixed expressions and eventually are grammaticalized. Such expressions may originally be introduced for emphasis, for reinforcement, for clarity, for exploratory reasons, or they may result from production errors or afterthoughts. It appears that most initial exploratory expressions are made by applying the rules of grammar in a regular way, but it may be that some perhaps also involve ignoring (breaking) existing rules of grammar. The vast majority of such expressions are never repeated, but a few will come to be used frequently, will gain unmarked status, and will be grammaticalized. It is only when the exploratory expression has been reanalyzed as an obligatory part of the grammar that we may speak of a grammatical change having occurred.

Helmut Weiß (p. c., 16 January, 2018) expresses the opinion that this statement by Harris and Campbell (1995) seems to confuse two aspects, i. e. constructions that are generated via (somewhat) unusual application of grammatical rules, and constructions that result from simple production errors. In his view, ignoring or even breaking existing rules of grammar is not a feasible assumption since it always implies intentionality, so it is more plausible to treat the genesis of the zu anomaly under the second label. While it is true that grammatical rules are mostly opaque (grammar is a cognitively opaque system), this might not necessarily the case for the extension of a certain grammatical pattern, however.

In my opinion, the infinitive marker *zu* behaves as strangely as it does because it is stuck somewhere in the middle between a particle (free morpheme) and an affix. Of course, this explanation is not sufficient for the other cases of morphological mismatches in the right periphery, let alone detachments of finite morphology (see the discussion in section 2.2), but it might very well be the case that they stem from different grammatical sources altogether. More specifically, the difference between the quote by Thorsten Legat, representing the *zu*-anomaly in the guise of a production error, and the misplacings we get in the dialects, so to speak, boils down to how deeply wired they are into the grammar. It is not difficult to find comparable examples for which an interpretation as a simple production error is less likely:

(49) Der entfernte Beitrag war heftig kritisiert worden. So schrieb Proll in Richtung jener Frauen, die über sexuelle Belästigung berichteten, sie würde sich "schämen, damit jetzt zu hausieren gehen".[17]
"The deleted posting had been criticized heavily. Proll wrote, in the direction of those women reporting about sexual harassment, she would 'be embarrassed now to hawk with it'".

According to Harris and Campbell (1995: 74–75), the following three stages can be distinguished when an exploratory expression becomes established: Firstly, there is the *introductory stage*

17 Source: `derstandard.at/2000066842231-2000066323204/Nina-Proll-Facebook-hat-kontroversen-notme-Beitrag-geloescht` [last accessed on 9 November, 2017]).

where the respective expression has only been used seldomly. There is the (not very likely) chance that it "catches on", meaning that it is used more widely while its unusualness or newness might still be apparent. Expressions that have reached this second stage are labeled *popular*. The last stage is when few of these expressions become *fixed*, i. e. gain the status of the unmarked pattern. As Harris and Campbell (1995: 75) note – and this is crucial –, fixation can also have an areal component: "Some areal phenomena apparently develop through the fixing of exploratory expression". That is exactly what we observe with the different variants of the *zu*-misplacings, the variant to the right being more widespread than the one to the left or, for that matter, the doubling cases.

5 Conclusions

This short paper had two main intentions: On the empirical level, I showed that the discussion about *zu* 'to' (and its cognates in other West Germanic languages) suffers from the deficit that not all relevant data are taken into consideration. On the theoretical level, I proposed two simple, yet formally fully explicit devices to handle different cases of displaced morphology. For the infinitive marker, there is sufficient evidence that it does indeed behave like a phrasal affix (Vogel 2009) in that it combines properties of a bound (cf. the gapping facts or, at least as a preference pattern, coordination) and a syntactically active, free morpheme (cf. displacement). I showed that a context-free ID/LP syntax is powerful enough to derive some of the the basic patterns, yet on the long run, the wrap rules discussed in section 3.2 in the guise of morphosyntactic infixing operations are more powerful and flexible, thus also allowing to model cases of *zu*-doubling.

As for other cases of misplaced or unexpected morphology, it might very well be the case that more powerful tools like *Reverse agree* (Wurmbrand 2012) or *Local Dislocation* (Salzmann 2016, 2017) are in place (cf. the discussion in section 3.3), yet it is clear that the respective analyses have to be adapted to accomodate the new (and hitherto unnoticed or ignored) empirical facts about the syntactic distribution of *zu* presented in this paper. It could also be worthwhile to exploit some of the simpler devices we have at hand, e. g. function composition or, in the specific context of categorial morphology, substitution as a one-place operation for deriving portmanteau morphs like e. g. French *du* ($<$ *de* + *le*) (cf. Schmerling 1983: 228–230) or even morphological substitute forms in the verbal complex in their different shapes and guises. As of now, however, I have no concrete proposal along these lines to offer, so these matters have to be left to future research.

A final reflection: If it is the goal of grammar-theory not only to develop reasonably explicit and mathematically elegant formalisms, but also to model the grammatical knowledge of native speakers and its interaction with other cognitive domains, then also adequacy criteria from these branches of science come into play. For that reason, I don't agree with Stefan Müller's (2016: 529) position (who quotes a statement in that direction by Carl Pollard) that the formal complexity of a descriptive language should not be the limiting factor:

> The question at this point is whether it is an ideal goal to find a descriptive language that has exactly the same power as the object it describes. Carl Pollard (1996) once said that it would be odd to claim that certain theories in physics were not adequate simply because they make use of tools from mathematics that are too powerful.[Footnote omitted] It is not the descriptive language that should constrain the theory but rather the theory contains the restrictions that must hold for the objects in question.

By now, it is far from clear that knowledge of language, as well as other cognitive capacities, is an *algorithmic* property of our minds/brains. But if we maintain this hypothesis, which is still one of the basic tenets of cognitive science, we have to start with those concepts of our descriptive

language which are sufficiently well founded (e. g. constituents, dependencies) and move our way up the ladder (or down the Chomsky hierarchy, for that matter). Irrespective of whether they are stated in a generative-enumerative or a modell-theoretic fashion (Pullum and Scholz 2001), the primary goal is to develop analyses that use the most parsimonious (formal) means; more powerful devices (function composition, traces/slashes, etc.) should not be introduced without proper justification and at no cost. Another way of putting this tension is the "iceberg principle" (Weiß 2018): Sometimes, one has to assume (much) more structure than is actually visible on the surface. Of course, this is not *carte blanche* for taking as many silent structure as one wishes for granted just to make one's intricate derivational entanglements work—a typical problem of cartographic approaches. On the other hand, naive surface-oriented approaches that ban hidden levels of representations or zero elements altogether, as are fashionable in *Construction Grammar* (CxG) (cf. Goldberg 2003: 16), might also lead to unsatisfactory or shallow analyses (see Haider 2017 for interesting examples). Weiß (2018: 433) gives a nice formulation of this maxim by Albert Einstein: "Everything should be made as simple as possible, but not simpler."

With 60 years of research, our discipline is still very young, and it becomes more and more obvious that an integrated theory of grammar that covers a substantial piece of our linguistic knowledge is out of reach for now. What we do have, though, is quite a large toolbox with an unorderly inventory of tools, some of which fit for everyday use, some with overlapping uses, some outdated, clumsy, yet still somewhat useful, etc. With such a toolbox at our disposal, why shouldn't we make use of its whole contents? We have no way of knowing which of our tools might come in handy sometime in the future.

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