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Special Issue: Combining formal and functional approaches to variation in (morpho)syntax

Guest Editor: Thomas Strobel

Articles

Thomas Strobel*

Combining formal and functional approaches to variation in (morpho)syntax: Introduction to the special issue

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Abstract: This special issue examines the question of how both formal(ist) and functional(ist) accounts or elements of theorizing can contribute to the explanation of (morpho)syntactic variation. Are formal and functional approaches really irreconcilable with each other, as often seems to be taken for granted by their respective advocates? It will be argued instead that they are rather complementary and that both can make a valuable contribution to explaining linguistic variation, in synchronic as well as diachronic respects. The integration of ways of looking at a certain phenomenon or problem from the respective other camp is proven to provide a significant added value and should not be excluded. The volume focuses on several Germanic languages and dialects, more specifically on German, Dutch, and Swedish varieties. It unites different formal and functional perspectives and, not least, it considers also semantic and phonological factors. The models covered include different versions of generative grammar, information-based morphology, construction grammar/construction morphology, natural morphology, and sociolinguistics.

Keywords: formalism; functionalism; variation; morphology; syntax

1 The formal–functional divide and the status of variation

Although the long-standing formalist–functionalist debate has certainly been one of the most contentious issues in linguistics (and beyond), it is based on an extreme abstraction, a strong simplification of a much more complex reality. Instead of a dichotomous categorization into ‘formalism’ and ‘functionalism’, we are dealing with a continuum of more formal or more functional elements of linguistic theorizing (for an example of an alternative classification of approaches to the study of

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language into 'externalism', 'emergentism', and 'essentialism', cf. Scholz et al. 2023). It is also a history of reciprocal misunderstandings and misconceptions, which goes back at least to the 1960s or 1970s, if one focuses merely on the contemporary history of scholarship and functionalism as a countermovement to Chomsky's unequivocally formalist generative framework. However, as Thomas (2020: 15, 28) convincingly shows, both approaches in their numerous modern versions build upon the ideas and work of many predecessors: traditions that, as to formalism, maybe could be traced back even until Pāṇini's grammar of Sanskrit and, in the first half of the 20th century, to American scholars such as Leonard Bloomfield and the 'post-Bloomfieldians', whereas functionalism, having its roots rather in Europe, is strongly connected to the foundation of the Prague Linguistic Circle in 1926 by Vilém Mathesius, Nikolaj Trubetzkoy, and Roman Jakobson (cf. already their 'Ten Theses', published as the group's manifesto in 1929, wherein they state: "language is a system of means of expression adapted to a goal"; Vachek 1967: 33, cited after Thomas 2020: 24). But, when attempting to give an outline of the history of science, it becomes evident as well that the attribution of many scholars and movements to one of the two camps is often doomed to fail (regarding, for example, Saussure's structuralism or Louis Hjelmslev and the Linguistic Circle of Copenhagen, his older compatriot Otto Jespersen, and so forth; for a detailed discussion, see Thomas 2020: Chapter 2).

There are many, more or less marked differences between 'formalism' and 'functionalism' (although there seem to be less gaps between the two in phonology; cf., e.g., Carnie and Mendoza-Denton 2003; Haspelmath 2000). Both formalists and functionalists themselves may experience severe difficulties when asked to define the core of their approaches while they seem to be more confident in defining the positions of the respective other group (Curnow 2002: 506). Thomas (2020: Chapter 1 and her summary table in the appendix) gives an impressively comprehensive basic characterization of formalism versus functionalism. According to her collection, formalism (not only in linguistics) is generally associated with a focus on the internal structure and organization of the object of study, often by abstracting away from its surface appearance, and with a prioritization of form over content or context ("form transcends function", Thomas 2020: 6). Even though the word 'function' itself has many facets and uses (cf. Nichols 1984), functionalism, on the other hand, is usually linked to emphasizing the role a phenomenon plays within its larger context, which determines its internal structure ("form derives from function", Thomas 2020: 6; interestingly, the often cited motto "form [ever] follows function" goes back to an American architect, namely Louis Sullivan).

As Thomas (2020: 12–13, 32, 45, 51) rightly points out, modern functionalism is more diverse than formalism in its internal architecture (or, as Elizabeth Bates put it, "functionalism is like Protestantism: it is a group of warring sects which agree only on the rejection of the authority of the Pope"; cited after Van Valin 1990: 171):

While contemporary formalism is centripetal, with a strong dominance of Noam Chomsky and his generative theory since decades, no single version of present-day functionalism can represent the whole. The development of the multiple versions of generative grammar from 1957 until today is usually subdivided into the stages of early transformational grammar (Chomsky 1957, 1965), principles and parameters theory (Chomsky 1984, 1986) and Minimalist Program (Chomsky 1995, 2000). The most important anti-Chomskyan but still generative (cf., e.g., Müller 2013: 59) varieties of formalist linguistics, from the late 1970s/1980s on, are Generalized Phrase Structure Grammar (GPSG; Gazdar et al. 1985) and, as a derivative thereof, Head-Driven Phrase Structure Grammar (HPSG; Pollard and Sag 1994) as well as Lexical-Functional Grammar (LFG; Bresnan 2001; Kaplan and Bresnan 1982); see, e.g., Thomas (2020: Chapter 3) and the literature cited therein for a first overview. Some exponents of the much more heterogeneous "galaxy of functionalism" (Graffi 2001: 389), on the other hand, are Lakoff's (1963/1976, 1971) counterconcept of 'generative semantics', Halliday's (1970, 2002) systemic functional linguistics, Dik's (1978, 1989) functional grammar, Givón's (1979, 1995, 2001) functionalist work, Foley and Van Valin's (1984) Role and Reference Grammar, Hopper's (1987) Emergent Grammar, Langacker's (1987, 2008) cognitive linguistics, Bates and MacWhinney's (1989) Competition Model, Goldberg's (1995) Cognitive Construction Grammar, Croft's (2001) Radical Construction Grammar etc. (see Thomas 2020: Chapter 4 for an outline of a selection thereof). Note that although many 'functionalists' accept both communication and cognition as fundamental influence factors, one could subdivide the approach into functional versus cognitive linguistics (cf., e.g., Siewierska 2013; for other classifications of modern functionalistic accounts, cf. Nichols 1984, who distinguishes between conservative, moderate, and extreme functionalism in her typology, as well as Newmeyer 1998, who separates 'formal functionalists' and then identifies external, integrative, and extreme functionalists as subgroups of functionalism proper).

Formalist frameworks are typically 'system-based/rule-based', whereas functionalist accounts are 'usage-based' (cf., however, Adli et al. 2015 for a more nuanced perspective, pleading rather for a continuum between system- and usage-based, with intermediate positions). Furthermore, formalist approaches are said to pursue 'internal' explanations, while functionalist approaches strive for 'external' explanations (for a concise overview of the discussion about what counts as an explanation in formalism vs. functionalism, cf. Thomas 2020: Chapter 6.3.1). Formalists thus focus on language as a system, shaped by (implicit) structural rules, constraints, principles etc. (whose exploration and explication are considered as the most important task of linguistics); their priority lies on theory construction and on attaining generalizations, characteristically by looking inward, i.e. at the inner structure of language (like a linguistic 'engineer', using Thomas's term). A frequent criticism related to this approach concerns the attempts, in some cases,

to integrate and explain new empirical facts merely theory-internally, on the basis of previously established theoretical concepts/constructs. In contrast, functionalists emphasize the central role of language used as a communicative tool (putting their efforts in the exploration of the relationship between language forms and functions); they prioritize language data and detailed records of its use in context (like a linguistic 'collector' or 'curator' assembling 'cabinets of curiosity', according to Thomas 2020: 111) and, normally, they search for explanations outside language ("under the assumption that languages are what they are because of the exigencies of human communication and cognition, or because of the external cultural environment in which language is used"; Thomas 2020: 6). Their focus on particularities and idiosyncrasies in combination with an extensive citation of language data earned them the criticism that, in some circumstances, data takes up more space than the actual analysis (Thomas 2020: 57, commenting on Givón 2001).

Some further, albeit partly too general, oversimplifying ascriptions to (generative) formalism, most of them gathered by and taken from Thomas (2020: appendix), comprise its understanding of language as a vehicle for thought/reasoning and of the 'language faculty' as a window into human nature, its assumption of a Universal Grammar (innateness hypothesis), its emphasis of autonomy and modularity in the organization of grammar (cf. the three autonomy hypotheses discussed by Newmeyer 1998: Chapter 2), the central role of linguistic competence, its openness to speculation, its predilection for abstraction (making use, e.g., of complex notational systems for the sake of a maximum of clarity and precision in the formalization of findings), its recourse to idealized, often engineered linguistic data[1] instead of representing actual speakers' actual usage (according to Fischer 2007: 54, for formalists "the *system* of grammar [is] more important as an object of study than the actual language data"), its preference of deductive methods, its pursuit of a rather narrow range of grammatical facts, its concentration on the sentence as the typical unit of analysis, the use of grammaticality/acceptability judgments as empirical evidence (i.e. native speakers' intuition and introspection), and the formulation of generalizations in absolute terms. In comparison (and in addition to the traits already mentioned above), functionalism has been characterized, sometimes in an overdrawn manner as well, by its fundamental understanding of language as performing social-interactive functions, its principled rejection of UG (in favor of learning, 'nurture' instead of 'nature'), its strong believe that all parts of language are integral to each other, its affinity to linguistic performance, its commitment to analyzing real language data and representing diverse data, its use of inductive methods, its exploration of the totality of language and neighboring phenomena, highlighting

1 In the last decades, of course, a wide range of methods of experimental syntax (cf., e.g., Sprouse 2023) have been extensively used in formal grammar research.

discourse as the level of analysis, its preference for deep analyses of particular cases (in the form of case studies, using corpora etc.), the formulation of generalizations as statistical probabilities, and many more (for these and other characteristics, summarized in the form of bullet points in her appendix and discussed in detail throughout her monograph, see Thomas 2020). Notice that this rather simplistic presentation is for illustrative purposes only.

One of the central motivations of the present volume is the question whether such black-or-white attributions are appropriate and up-to-date or if we are rather dealing with a continuum of formal and functional, as I had already suggested at the beginning of this introduction: Is 'formal(ist)' really identical to system-/rule-based, theoretical approaches, using introspection as the main method of collecting data, abstracting away from variation?[2] And is 'functional(ist)' then equivalent to usage-based, using quantitative-empirical and statistical methods, assuming mostly language-external causes for change and variation etc.? First, I want to stress that, despite the fact that the methods applied to study language(s) can (and, depending on the respective subdiscipline and research question, even need to) be quite diverse, theoretical modeling of any kind must be empirically well-founded. At least today, most formal-linguistic studies are based on questionnaire surveys, interviews with informants and/or the analysis of large language corpora. Second, a frequent misunderstanding about Chomsky's (1965) 'ideal speaker/hearer' has caused a lot of incomprehension on the part of non-formalists. It is indisputable that collective (interpersonal) as well as individual (intrapersonal) variation or heterogeneity is an essential feature of every natural language, and the concept was merely thought of as an (at least initially) necessary abstraction. Different linguistic subdisciplines are concerned with different kinds of variation from different perspectives (cf. also Weiß, this volume). Today, for example, dialect syntax constitutes a well-established and very lively field of research, both within and outside of dialectology. Notice that it was generative syntax that, in the late 1980s/1990s, contributed with decisive impulses to the field. The growing interest in dialect syntax (cf., in great detail, D'Alessandro et al. 2010; Poletto 2000; Weiß 1998, 2004, 2017; Weiß and Strobel 2018) has to do precisely with the more and more central role of variation and the opportunity dialects offer to investigate intralinguistic microvariation, "the minimal units of syntactic variation" (Kayne 1996: xiii), as well as their localization within the language system (lexicon, syntax-phonology interface etc.). Further reasons highlighted by Weiß (inter alia, 1998) concern the limited reliability of data from standard languages (subjected to normalization/codification and systematic instruction), i.e. the fact that dialects are more natural than their standard(ized) counterparts in

2 For example, the aspect of variation became more important in formal theories with the emergence of Optimality Theory (OT; see, e.g., Anttila 2007; Feldhausen 2016; Müller 2000, 2012).

terms of first language acquisition, and the general advantage of significantly extending the data basis by including dialects (since many phenomena occur only in the dialects but not in the standard varieties of the respective languages).

Only recently, the view has emerged that both formal and functional perspectives are necessary to account for the full range of variation we can observe in language ('hybrid' models of language; see, e.g., the contributions in Adli et al. 2015). For a long time, however, formalist and functionalist approaches had been regarded as complete opposites in linguistic theorizing, with neither of the two approaches considering the other's perspective in their work.[3] Famously, Haspelmath (2000) titled his review of Newmeyer (1998) *Why can't we talk to each other?* Indeed, formalists and functionalists may sometimes even insult each other as 'fuzzies' and 'symbol pushers', respectively, like in the case of Newmeyer's fictitious characters Sandy Forman (MIT), a formalist, and Chris Funk (University of California at Santa Barbara), a functionalist. However, while Newmeyer's imaginary dialogue does not have a positive conclusion, a later one by Carnie and Mendoza-Denton (2003), on occasion of their "interactive review" of Darnell et al. (1999), does: In the course of an invented conversation, where both play themselves (i.e. Carnie a "junior formal syntactician" and Mendoza-Denton a "junior variationist sociophonetician"), they discover a certain amount of compatibility (see also Thomas 2020: Chapter 6.2.1). So, is the formal–functional debate above all a/the "great(est) rhetorical divide/conflict" in linguistics (Newmeyer 2016: 129; cf. also Bülow and Vergeiner, this volume)? Most interestingly, in her survey of formalist and functionalist literature on their respective image of the other, Thomas (2020) proves that both camps seek to assimilate/reconcile the ideas of the other into/with its own positions (cf. her Chapter 6.2.2: *How formal is functionalism?*, alluding to Anderson's 1999 approach of *A formalist's reading of some functionalist work*, as well as her Chapter 6.2.3: *How functionalist is formalism?*, where she cites e.g. Bates and MacWhinney's 1990 title of their commentary on Pinker and Bloom 1990, namely *Welcome to Functionalism*). In a recent paper, Bošković (2021/2022) assigns typology the role of "setting grounds for a potential rapprochement of the functional and the formal approach to language".

There is no systematic investigation into the full range of grammatical phenomena and the extent to which formal and functional theorizing complement or even contradict each other. Thomas (2020: Chapter 5) compares formalism and functionalism with respect to some well-chosen long-running issues of linguistics concerning two syntactic phenomena as well as the ontogeny and phylogeny of language (word order, transitivity; first language acquisition; the origin of human

3 Furthermore, it should be added that the two occupy asymmetrical positions within linguistics: Functionalism often reacts and is defensive relative to formalism, which, at least in North America and East Asia, is perceived as the "default" (cf. Thomas 2020: Chapter 6.4).

language). Summarizing the range of positions, she reaches the conclusion that "formalists and functionalists sometimes study different language phenomena. […] [T]hey sometimes examine the same language phenomena but perceive them differently. In addition, formalists and functionalists sometimes approach the same language phenomena with different questions in mind" (Thomas 2020: 67–68). While she notices a significant gap and non-complementarity between formalism and functionalism in their accounts of word order, there is a certain overlap when it comes to transitivity, despite the notable contrast, and, in her opinion, functionalism "builds beyond" formalism here (Thomas 2020: 78–79). As for the debates about language acquisition and the origin of language, she sees an irreconcilable opposition/competition, a "fundamental incompatibility" (Thomas 2020: 79). The objective of the present volume therefore is to contribute to the following central questions: Is formal(ist) and functional(ist) theorizing complementary or even contradictory to each other, is one of them "redundant" as they both lead to the same explanation, or do the two perspectives treat two completely different aspects of language? Do we get different or similar results if we approach one and the same phenomenon from different (theoretical) perspectives? In particular: Can we explain linguistic variation using both perspectives, and what do we gain from this?

2 Contents of this volume

A large number of studies that assume a 'hybrid' approach investigate variation in English (and varieties thereof). Other Germanic varieties (including dialects) have remained under the radar so far. The present special issue makes an important contribution to filling this gap. Therefore, it brings together a total of seven papers that aim to explain (morpho)syntactic variation in other Germanic varieties than English (mainly German, Dutch, and Swedish) by uniting different formal(ist) and functional(ist) perspectives as well as, not least, by including also semantic and phonological factors. The diverse models and accounts covered in this volume include different versions of generative grammar, information-based morphology, Construction Grammar/Construction Morphology, natural morphology, and sociolinguistics. As it turns out, 'formal' and 'functional' are less different than assumed, and often it is rather the terminology that differs (cf., e.g., Reiner), while the underlying aim of describing and analyzing variation is essentially very similar.

Helmut Weiß's contribution *How to explain linguistic variation and its role in language change?* examines the interplay between variation and language change in terms of cause and effect. His central claim is that variation can be the result of

language change[4] and that the reverse is also possible, i.e., that variation can trigger language change. The first scenario is illustrated by the pronoun cycle (the relation between variation in the strength of pronouns and their relative word order), the second one is exemplified by the development of prepositions into complementizers (e.g., German *seit* 'since'). Weiß argues that a better understanding of the importance and role of variation in language change can only be reached if a proper distinction is made between the emergence of a variant (innovation/actuation) at the level of the individual and the diffusion (propagation) of a variant within the speech community. He maintains that the latter is treated by sociolinguistics (because the selection or replacement of a variant has often to do with the speaker's identity, prestige factors, adaptation to the interlocutor(s), and so forth), whereas the former can only be investigated by formal linguistic approaches that posit abstract underlying structures (taking a look 'under the surface'). In addition, Weiß claims that these two facets of language change proceed along different paths: While the emergence and further development of new variants often proceed in a cyclic fashion, the diffusion of an innovation typically can be described by an S-shaped curve (similar to the spreading of a mutation in a population). The paper thus does not only provide a discussion of the connection between linguistic variation and language change, but it also touches upon the division of labor between formal and sociolinguistic approaches to language change (see the paper for the reasons why sociolinguistics, as the study of the relationship between language and society, represents a type of functional linguistics). Weiß concludes that the two approaches are concerned with different aspects and hence complement rather than contradict each other: While grammar in a narrower sense (morphosyntax) changes in the way determined by principles expressed within formal theories (e.g., economy principles) and these principles explain why and how grammar changes, sociolinguistics can explain sociocultural aspects of variants as well as, for example, fluctuations in the rates of change (succession of stability and flux).

In their paper *On the asymmetry of wh-doubling in varieties of German and Dutch*, **Gisbert Fanselow, Sjef Barbiers, Jessica M.M. Brown, Natasja Delbar, Sophia Nauta and Johannes Rothert** present an empirical study on speaker variation concerning a special kind of wh-doubling (wh-copying) where one copy of the wh-phrase is more complex than the other. Provided that wh-doubling with simplex wh-words is accepted at all in the investigated varieties, the authors explore the question of which of the two extended versions is the preferred or only possible

4 Cf. also Strobel (2023) for an overview of reported cases from Germanic languages, where uncompleted language change ('change in progress') synchronically causes variation (between one or more 'old/archaic' and 'new/innovative' forms) and, potentially, grammatical doubts/uncertainties during a period of transition.

one: (i) wh … whXP (right-complexity), or (ii) whXP … wh (left-complexity). The aim of the study is to provide empirical evidence for the theoretical claim that the higher copy should be less complex, a claim that follows from assumptions of the copy theory of movement. In contrast to the prediction, their judgment experiments on the respective acceptability of the two versions, interpreted by a thorough statistical analysis, shows that both are in fact acceptable and that this can, but need not, be taken as a difference between dialects or groups of speakers. It would be interesting to search for authentic data as a further kind of evidence. The authors' structural analysis of left-complexity constructions is based on the assumption that the more complex copy on the left did not get there by movement but was base-generated in a high dislocated position. Eventually, they discuss whether a copy and deletion approach would favor right-complexity and/or exclude left-complexity at all, focusing on two different versions of copy and deletion. As an outlook on a possible functional perspective and future research on language processing, Fanselow, Barbiers, Brown, Delbar, Nauta and Rothert point to the question whether left-complexity is easier to process than right-complexity or vice versa. Given the potentially lower processing load in the case of left-complexity constructions, where the full constituent can be identified immediately, left-complexity would be expected to be preferred over right-complexity. This does not only contradict the finding that grammars with a preference for left-complexity do not exist, but also the observable opposed tendency in natural language for heavily loaded information to appear later in the sentence.

Jackie Nordström's article *Semantic agreement and the Dual Model of Language* deals with several agreement phenomena in, above all, Swedish (but, e.g., also in English and Russian) and the question of how these can be accurately modeled. More specifically, the paper concerns the problem of formal/grammatical and semantic agreement mismatches in Swedish predicative and passive constructions (among others, also so-called 'pancake sentences'). Notice that in such constructions, the predicative adjective or passive participle in Swedish agrees with the subject noun phrase in gender and number. Nordström's main point is that agreement is more than 'narrow syntax'. As is widely known, in English a collective or committee noun in subject position allows the verb in both singular and plural (e.g., *The committee is/are deciding on a solution*). There is no doubt that semantic agreement, i.e. the fact that the verb can agree with the referents of the noun rather than with its grammatical number, poses a problem for any account built on the assumption that agreement between an argument and a verb/adjective is a purely syntactic operation, without semantic repercussions. The author argues that the simple ontology of interpretable–uninterpretable features assumed in the Minimalist framework is not adequate for handling such phenomena, and she sketches alternative analyses showing that agreement can and sometimes even must be given a functional-

semantic explanation. She reaches the conclusion that person-number-gender affixes on verbs and adjectives are semantically interpretable even in languages such as English and Swedish because the PNG affixes convey meanings not overtly marked by the corresponding DPs. Furthermore, Nordström integrates her contribution into "a larger project that attempts to assign semantic functions to seemingly purely syntactic phenomena" and into her work on the 'Dual Model of Language' (Nordström 2022), which "offers a way of bridging the gap between the so-called formalistic and functionalistic grammars", as against the traditional "syntactocentric" Y-model of generative grammar.

Tabea Reiner's paper *A constructionist analysis of gapping against the background of generative analyses* illustrates how a comparison between a functional (constructionist) account and a formal (generative) account of the same phenomenon, namely gapping as one type of ellipsis (e.g., *Gonzo ate the peas, and/but Lola* [*ate*] *the carrots*; Aelbrecht 2015), can be conducted fruitfully. More precisely, Reiner compares mainly two analyses of gapping taken to be representative of a functional and of a formal approach, respectively: the theory of Goldberg and Perek (2019), which belongs to Construction Grammar (CxG), and the copy theory of Repp (2009a, b), which is situated within the Minimalist framework (MP). Gapping is an extremely well-described phenomenon with a vast literature on it, so that a selection was inevitable. After a general outline of the phenomenon in as theory-neutral terms as possible, Reiner shows in a detailed and equilibrated discussion that both accounts have their merits and potential shortcomings in the analysis or prediction of a number of empirical observations about gapping. Instead of arguing for one account or the other, she concludes that the functional and formal approaches have certain overlaps and that the main difference between them lies in the role and nature of (falsifiable) predictions they (can) make. While, contrary to a frequent assumption, both types of approaches have predictive power and provide generalizations, the success of the concrete predictions is shown to vary between them. From a more general perspective, Reiner highlights that formal approaches or MP make more far-reaching predictions that can be tested cross-linguistically, whereas functional approaches or CxG make language-internal predictions. She argues that cross-linguistic predictions are challenging for MP because their validation often is not successful and that CxG, in turn, faces the problem that basing predictions for individual languages merely on "communicative pressures plus conventionalization" is "so broad that it is vacuous". Reiner concludes that the two approaches only compete within the small domain of anticipating novel data in well-described languages.

Oliver Schallert's contribution *Number fission from a formal and functional perspective* provides a new view on the morphology of German modal verbs. Unlike in the present singular, they show phonologically unconditioned umlaut in the present plural (though not only there), with unclear functional motivation. The

distribution of this umlaut and other morphological irregularization processes such as contractions and/or consonant mutations in German modal verbs (with a special focus on the two modals *müssen* 'must' and *können* 'can') is investigated by a thorough empirical analysis based on a very fine-grained dialectological dataset of 308 dialect grammars in total. The theoretical claim of the paper is that, synchronically, the observable number split within the paradigms of modals is no transcategorial number marking (as has been suggested in the literature) but a morphomic pattern, signaling nothing more than inflectional class coherence ('distinctiveness'), since, in a substantial number of dialects, umlaut has been generalized to the infinitive or even to the past participle. Diachronically, however, for the first step of analogical extension of umlaut as a verbal plural marker, Schallert accepts the functional motivation of transcategorial umlaut (which resorts to analogy as a cognitive factor). In the modeling part, the author shows that the morphomic alternation can be captured by the formal word-based realizational model of Information-based Morphology (IbM), which was developed in the context of Head-Driven Phrase Structure Grammar (HPSG) and, due to several similarities, can be carried over to functional theories such as Construction Morphology (CM). Therefore, according to Schallert, "there is the chance of integrating the intuitive plausibility of functional explanations while maintaining a certain level of independence of morphological structure". Umlaut alternations are then modeled on the level of stem hierarchies, not on the level of features: "[T]he morphology of umlaut has more to do with the organization of stem spaces than with feature signatures." This approach disentangles the synchronic state as reported by the dialectological sources, and the diachronic spread of umlaut (which is corroborated by the hierarchies underlying the quantitative findings).

Lars Bülow and Philip C. Vergeiner adopt both formal and functional perspectives in order to explain recent empirical findings on a quite well-researched topic of verbal mood within their paper *Explaining morpho-syntactic variation and change: The case of subjunctive II in the Bavarian dialects of Austria*. The phenomenon has been dealt with in a number of studies from various angles and using different data from different time periods, proving that not only grammatical but also areal and social factors play a significant role. It is well-known that in the non-standard varieties of German in Austria, subjunctive II can be expressed both by synthetic and analytic means, but that the synthetic variants are being replaced by the analytic ones, especially by the *würde*-form. While the periphrastic variant with *würde* 'would' is quite generally and continuously on the rise, this is accompanied by a decrease in the frequency of use of the different synthetic forms as well as of the *täte*-periphrasis. Within synthetic formation, on the other hand, various *-at* variants (e.g., weak *sōgat* '[I, he/she/it] would say' or mixed *kamat* '[I, he/she/it] would come') are clearly preferred over strong forms (such as *kam* '[I, he/she/it] would come').

Previous research showed also that while synthetic structures are still widespread in the rural areas of Austria, they seem to be pushed back by the analytic ones in urban areas (Vienna and Graz). Building upon the results of such predominantly descriptive studies, Bülow and Vergeiner attempt to explain the present variation and change in the forms of subjunctive II in Austria from a (more) functional and (more) formal perspective, namely natural morphology (NM) and constructional morphology (CxM). Notice that, referring to Newmeyer (2003, 2016), they point out that "a formal explanation is not required to draw on a theory generally considered as formal, such as generative grammar" and that "[a]ccordingly, formal explanations can also be found in theories that are usually understood as functional". They explicitly state that "this does not mean that [they] consider CxM a formal theory". By uniting the two approaches in a complementary way in their theoretical model, the authors address the research desideratum of more theoretically grounded reflections on the phenomenon under investigation. In particular, they argue that NM can explain the extension of the *-at* suffix to strong and irregular verbs and that the application of key NM principles (constructional iconicity, uniformity, transparency) to the CxM framework allows to explain the spread of the analytic/periphrastic subjunctive II as the most iconic construction available and the easiest one to be acquired especially in urban areas that are characterized by language contact.

In their case study *A modal account of syntactically non-integrated* von wegen *in contemporary German*, **Manuela C. Moroni and Ermenegildo Bidese** address the question of how non-prepositional (thus, non-causal) instances of *von wegen* can be classified and integrated into Abraham's (2020) theory of modality. Moroni and Bidese's analysis is based on a total of 186 occurrences of *von wegen* in the two largest digital corpora *Forschungs- und Lehrkorpus Gesprochenes Deutsch* (FOLK) for contemporary spoken German and *Deutsches Referenzkorpus* (DeReKo) for written German. In addition, they take into account some historical attestations. The authors distinguish between an "illustrating/exemplifying" and an "opposing" type of non-prepositional *von wegen* in present-day German. Taking the classification of modal expressions based on evidentiality and epistemicity as a starting point, they show that both types encode a quotative meaning but only the second one exhibits an epistemic value. From a diachronic point of view, they argue that the illustrating use developed directly from the original preposition of pertinence ('in regard to'), while the opposing use emerged from a contrastive accent on *von wegen* indicating that it relates to a proposition that is inappropriate or in contrast to the given context. Moroni and Bidese analyze the opposing *von wegen* as a non-canonical expression of epistemic modality (in the sense of Abraham 2020) and thus show that syntactically non-integrated constituents are able to express modality, which they identify as a third strategy of modalization (beyond lexical and grammatical modality expressions) that operates at the discourse level (rather than at the propositional level).

Their paper therefore contributes to a more comprehensive theory of modality. Moreover, it demonstrates that an integration of non-prepositional *von wegen* into Abraham's formal theory, where modality resides in the sentence structure and in a formal system of means of expression, can succeed if it is expanded to include a functional perspective, according to which modality can also arise through the interaction of semantico-pragmatic factors and the focalization of (opposing) *von wegen*. Following Axel-Tober and Gergel (2016) versus Aijmer (2016) and Newmeyer (2010, 2017), Moroni and Bidese's understanding of formalism in modality research is based on grammaticalized expressions of modality (as described in Abraham's account), whereas a functional view, according to them, starts from the semantics of modality and explores its different means of expression depending on the context, speech activities and text types involved.

In sum, all papers convincingly show that both formal(ist) and functional(ist) elements of theorizing can make a valuable contribution to explaining (morpho) syntactic variation, in synchronic as well as diachronic respects. The integration of ways of looking at a certain phenomenon or problem from the respective other camp is proven to provide a significant added value and should not be excluded *a priori*. An important precondition in order to increase intradisciplinary transparency and comparability is, of course, a shared (basic) terminology and as theory-neutral descriptions of the linguistic phenomena in question as possible. An eclectic approach that combines different perspectives has several advantages: Formal and functional (e.g., sociolinguistic) accounts may be concerned with distinct aspects of a phenomenon and hence complement rather than contradict each other; there may be a division of labor (cf. Weiß). Phenomena where not only grammatical but also areal and social factors play a crucial role (e.g., the variation and change of subjunctive II forms in Austrian dialects) even must be explained in a complementary way from both a formal and a functional angle (see Bülow and Vergeiner). Formal (generative) and functional (constructionist) models may show overlaps when it comes to one and the same phenomenon (cf. Reiner on gapping); both types of approaches provide generalizations and exhibit (a more or less successful) explanatory/predictive power. Similarly, specific language peculiarities (such as umlaut alternations in German modal verbs) may be captured both by formal and intuitively plausible functional theories, due to similarities between them (cf. Schallert). On the other hand, potential contradictions (e.g., between grammar theory, empirical findings, and different principles of language processing) must be reconciled in favor of a coherent explanation (as indicated by Fanselow, Barbiers, Brown, Delbar, Nauta and Rothert). As far as the interaction of linguistic subsystems is concerned, certain seemingly purely syntactic phenomena (such as agreement) can and sometimes even must be assigned a functional-semantic explanation (see Nordström). And the integration of non-canonical means of

expression (e.g., German non-prepositional, opposing *von wegen*) of a certain category (here: modality) into an existing formal theory of grammaticalized expressions can succeed if one includes a functional perspective (such as the interaction between semantico-pragmatic factors and focalization), leading to a more complete theory of the investigated category (see Moroni and Bidese).

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How to explain linguistic variation and its role in language change

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Abstract: Linguistic variation is a feature that characterizes every natural language. In this paper, I focus on linguistic variation and its importance and its role in language change (LC). To determine its importance and role, one must distinguish between emergence and diffusion of variants because both dimensions provide different contributions to LC. The emergence and further development of new variants is a process that often (though not always) displays the form of a cycle, whereas the diffusion within a speech community often follows an S-curve form. Both dimensions are important for LC, but they relate to very different aspects. In this paper, I will treat variation with respect to its role in LC. Variation, in general, is a crucial factor in LC in two respects: First, it is the result of LC and second, it can trigger LC.

Keywords: language change; pronoun cycle; reanalysis; emergence versus diffusion; iceberg principle

1 Introduction

Natural languages display significant variation, i.e., there is often more than one possibility to express the same content. In German, for instance, the statement MY BROTHER'S HOUSE can be expressed at least in three ways (1a)–(1c):

(1) a. *das Haus meines Bruders*
the house my-GEN brother-GEN
b. *das Haus von meinem Bruder*
the house of my brother
c. *meinem Bruder sein Haus*
my-DAT brother-DAT his house

Different linguistic subdisciplines are concerned with variation of this kind. Sociolinguistics takes for granted the existence of variation and investigates the sociolinguistic significance of variants because they "convey very different social meanings" (Chambers 2002a: 4). Applying such an approach to the examples in (1),

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one can identify (1a) as a prestige variant since it occurs in Standard German, while (1b)[1] and (1c) are substandard variants belonging to more colloquial or dialectal varieties. Concerning diachrony, sociolinguists are interested in, for instance, questions regarding the replacement of one variant by another in the standard and the social conditions for this to occur.

Current formal approaches do not take the existence of variation for granted. They assume that variation is constrained by grammatical principles and may therefore reflect different structures and/or grammars. Formal linguists may be interested in investigating which structural and grammatical or morphosyntactic changes underly the development of certain variants, cf. Weiß (2008, 2012) for the historical development and synchronic variation of (1c). Variation is therefore a very important topic in formal linguistics, especially microvariation since Kayne (1996), because it allows giving an answer to the question of "what are the minimal units of syntactic variation" (Kayne 1996: xiii).[2]

However, variation is not only treated differently in different linguistic subdisciplines or approaches; it is itself a highly heterogenous phenomenon (Weiß 2013). A variation on the language level typically involves cases where, for instance, different varieties or styles of a language use different constructions to express the same content, as exemplified with (1a) to (1c) above. That does not necessarily imply variation on the individual level because it is possible that, to stick with our example (1a)–(1c), some speakers of German always use the standard form (1a) and others (1b) for inanimate possessors and (1c) for animate ones. Both groups of German speakers would then have a homogeneous competence that does not display any variation (with respect to possessive constructions). Therefore, inter-speaker variation (i.e., on the level of speech communities or languages) does not necessarily involve intra-speaker variation (i.e., on the level of I-grammars).

Another crucial difference is between the emergence and diffusion of variants. The emergence of new variants concerns (I-)grammars because, for example, the development from (1a) to (1c) in the history of German is an instance of grammatical change that involves developments concerning genitive attributes and possessive pronouns (for details cf. Weiß 2012). The diffusion of variants within speech communities is in some cases a topic for sociolinguistics since replacing one variant with another often has to do with prestige and with adaptation to our interlocutors. As Chambers (2002b: 370) puts it: We are "selecting linguistic variants contingent upon the setting in which we are speaking and on not only our own class, sex, age, ethnicity, style and much more, but also contingent upon all those things in the people we are speaking to."

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1 One reviewer would not classify (1b) as substandard, but at most as colloquial.

2 It is often assumed by more functional-oriented linguists or sociolinguists "that the variants that occur in everyday speech are linguistically insignificant" (Chambers 2002a: 4). At a minimum, formal linguists do pay thorough attention to even the smallest linguistic variation.

However, linguistic change cannot always be explained by sociolinguistics. The reason why one variant wins over a competitor could also be that it has certain advantages over the latter. According to Haider (2021), the reason why *do*-insertion replaced the older variant with verb fronting in English had to do with computational and morphological simplifications (cf. also Weiß 2021a).

In this paper, I will treat variation with respect to its role in language change (LC). Variation, in general, is a crucial factor in LC in two respects: First, it is the result of LC, and second, it can trigger LC. In the following, I will discuss an example of synchronic variation that is the result of LC (Section 3) and cases where synchronic variation that gives rise to structural ambiguity is an indirect source of LC (Section 4). In Section 2, I will introduce some basic concepts regarding LC and variation and discuss what formal and functional approaches can and cannot contribute to explaining LC. In particular, I argue that only formal approaches can explain the emergence of variation, while the spread of individual variants within a linguistic community (also) depends on sociolinguistic aspects.

Here, a note on sociolinguistics is in place: Since this volume compares formal and functional approaches to variation, it needs to be explained why I am contrasting formal approaches with sociolinguistics. In treating sociolinguistics as a functional approach I follow, among others, Martin and Williams (2004), who argue that functional linguistics (in their case systemic functional linguistics) is in reality *functional sociolinguistics* because it develops "a functional model of language [which] is strongly implicated in the design of a model of the social" (Martin and Williams 2004: 12). According to Martin and Williams (2004: 120), functional linguistics "is concerned with explaining language in relation to how it is used" and sociolinguistics is defined by Chambers (2002a: 1) as "the study of the social uses of language," so sociolinguistics can be seen as a special kind of functional linguistics. Both functional linguistics and sociolinguistics see themselves as usage-based, and they also have in common their opposition to formal approaches of a generative nature.

2 Variation and LC: general remarks

LC and variation are inextricably linked. With respect to LC (especially grammar change, cf. e.g. Hale 2007; Fuß 2017), we have to distinguish between the three steps in (2) (Weiß 2021a: 75):[3]

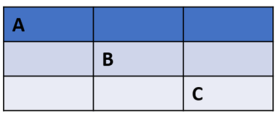
3 It is common to distinguish only two steps: innovation (or actuation) and propagation (diffusion) (cf. Croft 2010 among others). The second step is only available if an innovation first arises in one context and is then generalized to other contexts (e.g., when relative clause complementizers develop into general complementizers, as was the case with German *dass* 'that', cf. Axel-Tober [2017]). In cases where there is no expansion in new contexts, Step 2 is not present (e.g., with adverbial complementizers like *bis* 'until' or *seit* 'since', cf. Weiß 2019, 2020, 2021b).

(2) a. the emergence of a variant,
b. its (possible) spread within the grammatical system (extension into new contexts),
c. its diffusion within the speech community.

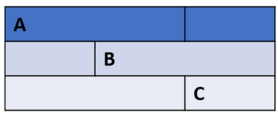
The emergence of a variant is a process at the level of I-grammars, and it is, as I assume, a sudden, abrupt change (Weiß 2021b). Diffusion, by contrast, proceeds at the level of speech communities, and it can last very long because it is normally a slow and gradient process. Both dimensions of LC (i.e., emergence and diffusion) often show characteristic, yet clearly different courses. With respect to the emergence of new variants and their further development, LC often has the form of a cycle (cf. Gelderen 2009, 2013, 2016; Breitbarth et al. 2019): A variant A is replaced by a variant B that eventually gets replaced by a variant C, which resembles the original variant A in some respect. Thus, A, B, and C are variants that compete for the same purpose. Synchronic variation arises when the succession of the single forms shows some chronological overlap, so that original and new forms often co-exist (cf. [3a] vs. [3b]).

(3)

a.



b.



The prototypical instance of a cyclical change is Jespersen's Cycle (JC), which describes the development of negation particles (cf., among many others, Breitbarth and Jäger 2018: 182). JC comprises three stages (4a)–(4c): A clitic neg-particle at Stage I is complemented by a free neg-particle at Stage II; at Stage III, the original neg-particle disappears, leaving the free neg-particle as the sole negative marker. This development is a cycle because in Stage III, there is again a one-part negation – exactly as in Stage I.

(4) a. Stage I: clitic neg-particle
b. Stage II: clitic and free neg-particle
c. Stage III: free neg-particle

The emergence of the German neg-particle *nicht* is traditionally explained with JC (cf. Donhauser 1996 among others). After weakening the original neg-particle *ni* to *ne*/*en*, it was strengthened with the particle *niht*, which ended up being the only neg-particle left.

More recently, however, researchers have argued that the second stage has not existed in Middle High German (MHG), cf. Breitbarth and Jäger (2018: 192): "From our data, there is no evidence for a stable Jespersen Stage II period in the history of German." While early MHG is still predominantly a Stage I language, classical MHG is already largely a Stage III language. This means that Stage II overlaps in time with

both Stage I and Stage III. However, this does not necessarily imply that Stage II was completely absent in the development of *nicht* as a neg-particle. That an intermediate step in a developmental cycle is not observable in the historical data could just mean that the loss of an old variant and the diffusion of a new variant proceed in a similar slow speed so that they overlap to a great extent. It is then an illusion that an intermediate step B does not exist because the emergence of a new variant C presupposes this stage, even if it is not visible or reconstructable in the data. A developmental cycle, such as (3b) above, could give the impression that Variant B is co-existent with both A and C so that it does not correspond to a separate stage of development. However, in a cyclical development, the emergence of Variant B requires the existence of Variant A, and the emergence of Variant C requires the existence of Variant B. W.r.t. JC, this means that the emergence of the new neg-particle *nicht* requires the bi-partite variant *ne*/*en* … *niht* as predecessor; otherwise, it could not have developed as neg-particle, that is, Stage III requires Stage II.

As historical linguists, we have to distinguish between the reconstruction of the grammar-/language-internal development and its chronology. The latter also concerns the diffusion of a new variant within a speech community: For its reconstruction, we are dependent on the availability of an appropriate amount of reliable data which we do not always have – especially for more distant periods. This seems to me to be the reason why the internal grammatical reconstruction of a development is not always exactly reflected in its chronology.

When we come to the diffusion of a variant within a speech community, we also often observe a typical course that takes the shape of an S-curve (cf. Denison 2003; Chambers 2002b, and many others). Initially, a new variant occurs only rarely, followed by a strong increase in frequency that eventually levels off. Chambers describes it as follows:

> The combination of these three stages – initial stasis, rapid rise, and tailing off – gives a characteristic shape in graphic representations that is known as an S-curve. […] The S-curve has […] been observed in diffusions of all kinds (Chambers and Trudgill 1998: 162–4), and is now established as a kind of template for change. (Chambers 2002b: 361)

The S-curve describes the spread of a new variant in a speech community. According to Chambers (2002b: 355), the three stages of the S-curve can be associated with the succession of generations "whereby some minor variant in the speech of the oldest generation occurs with greater frequency in the middle generation and with still greater frequency in the youngest generation." In my (but probably not in Chambers') view, this correlation is compatible with the assumption that language acquisition is responsible for grammar change (but not for LC in general). That means that new variants emerge during the language acquisition – e.g., via reanalysis, cf. Weiß (2021b). However, since this aspect is irrelevant to my argument here, I will not go into it further.

The important point is that cyclical change and S-curve change do not contradict each other, but instead describe different dimensions of LC: The succession of variants often follows a cyclical shape (3a, b above), whereas the diffusion of a certain variant into the speech community displays an S-curve.[4] Both types of change complement each other, for only both together capture a complete LC, i.e., its initiation (emergence) and completion (diffusion).

In the following two sections, I will focus on variation being the result of and variation triggering LC. In both cases, only a formal approach can give us the right explanation, but not a sociolinguistic one.

3 Synchronic variations as a product of LC

In most cases, we almost completely lack historical data for the emergence of a variant, and we see only synchronic variation. In these cases, we can conclude that the observed synchronic variation is the result of LC that, on the other hand, can be reconstructed based on the observed variation, i.e., the variation on the synchronic level allows us to draw conclusions with respect to possible LCs. An example of this is the pronoun cycle (PC) as reconstructed in Weiß (2015). In the case of the PC, we completely lack historical data, so we depend on the synchronic variation for its reconstruction.

The relevant variation shows up in the order of pronominal subjects and objects. As is widely known, in Standard as well as in dialectal German, pronominal arguments occur in the order of subject before the object, as in (5a), while the reverse order is only possible if the subject pronoun is emphasized and therefore stressed (5b). However, there are very few dialectal varieties where the reverse order object > subject pronoun is the grammatically accepted one. (5c) is an unmarked utterance in these varieties corresponding to (5a) in other varieties.

(5) a. *Tätst du ihn besser kennen!*
did you him better know
b. *Tätst ihn DU/*du besser kennen!*
did him YOU/*you better know
c. *Tätst ihn du besser kennen!*
did him you better know
'If you knew him better!'

4 The spread of a new variant within the grammatical system and its extension into new contexts probably follows the S-curve, too. According to Denison (2003: 64), Kroch (1989a, 1989b) has shown "that the S-curves for different syntactic contexts (e.g. interrogatives, negatives) show the same rate of change, his so-called Constant Rate Hypothesis."

The existence of these variants has been known since the Wenker survey (cf. Figure 1), which was conducted from the 1870s into the 1930s – see Fleischer (2017) for more information. In Figure 1, the black dots symbolize locations with the reverse order object before the subject pronoun, which are mainly found in the Upper-German-speaking areas.

The Wenker survey provides evidence for the existence of the reverse order in the 19th century. The next time the reverse order appears is in two of the six regional atlases of the *Bavarian Linguistic Atlas*, namely in the *Linguistic Atlas of Middle Franconia* (*Sprachatlas von Mittelfranken,* BSA – SMF) and in that of Bavarian Swabia (*Sprachatlas von Bayerisch-Schwaben,* BSA – SBS). The linguistic material was compiled in the 1980s and 1990s and represents more or less the second half of the 20th century.

Figure 2 illustrates a map from the *Middle Franconian Atlas* and Figure 3 a map from the Bavarian-Swabian one. Red squares symbolize the reverse order.

In Bavarian Swabia, the reverse order (black squares) is attested mostly in the north where another pattern is also very frequent – namely sentences with null subjects (gray circles). Null subjects also occur in Middle Franconian, but to a lesser extent (see Figure 2). Interestingly, the areas of Middle Franconia and Bavaria, where

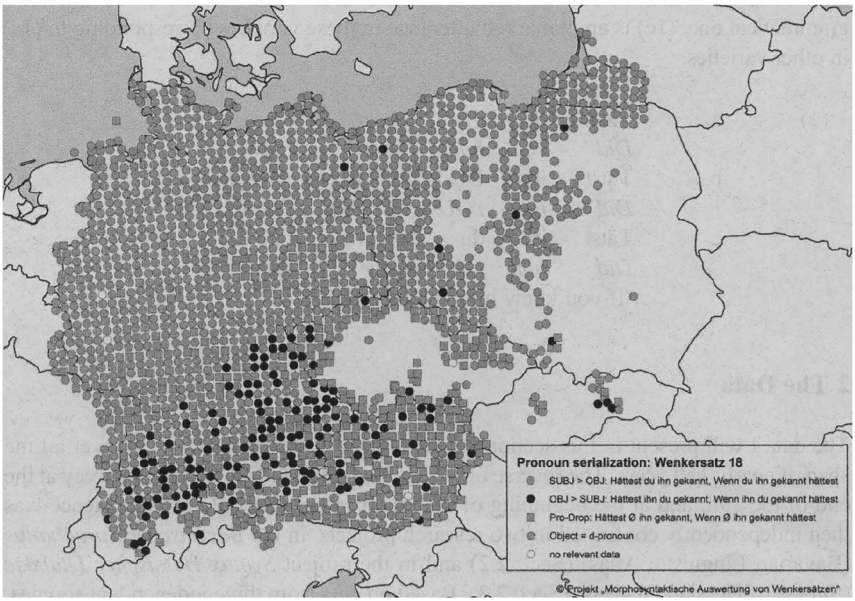


Figure 1: Wenker sentence 18 (Weiß 2015).

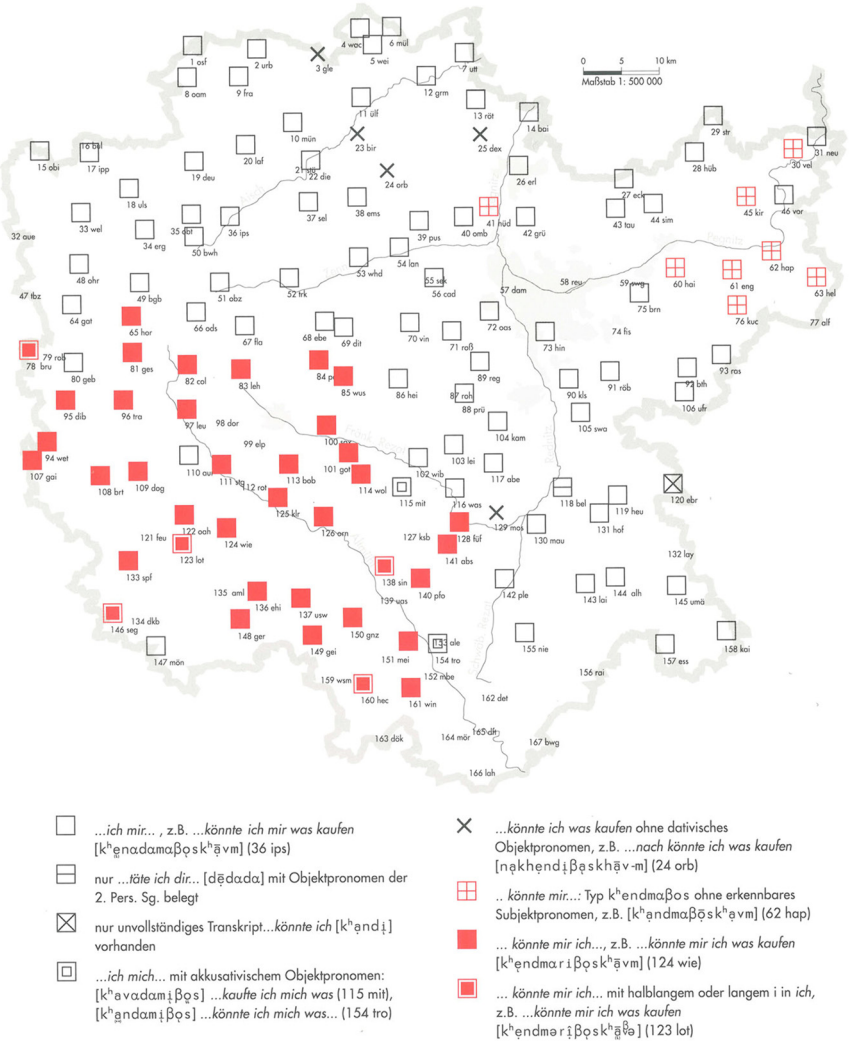
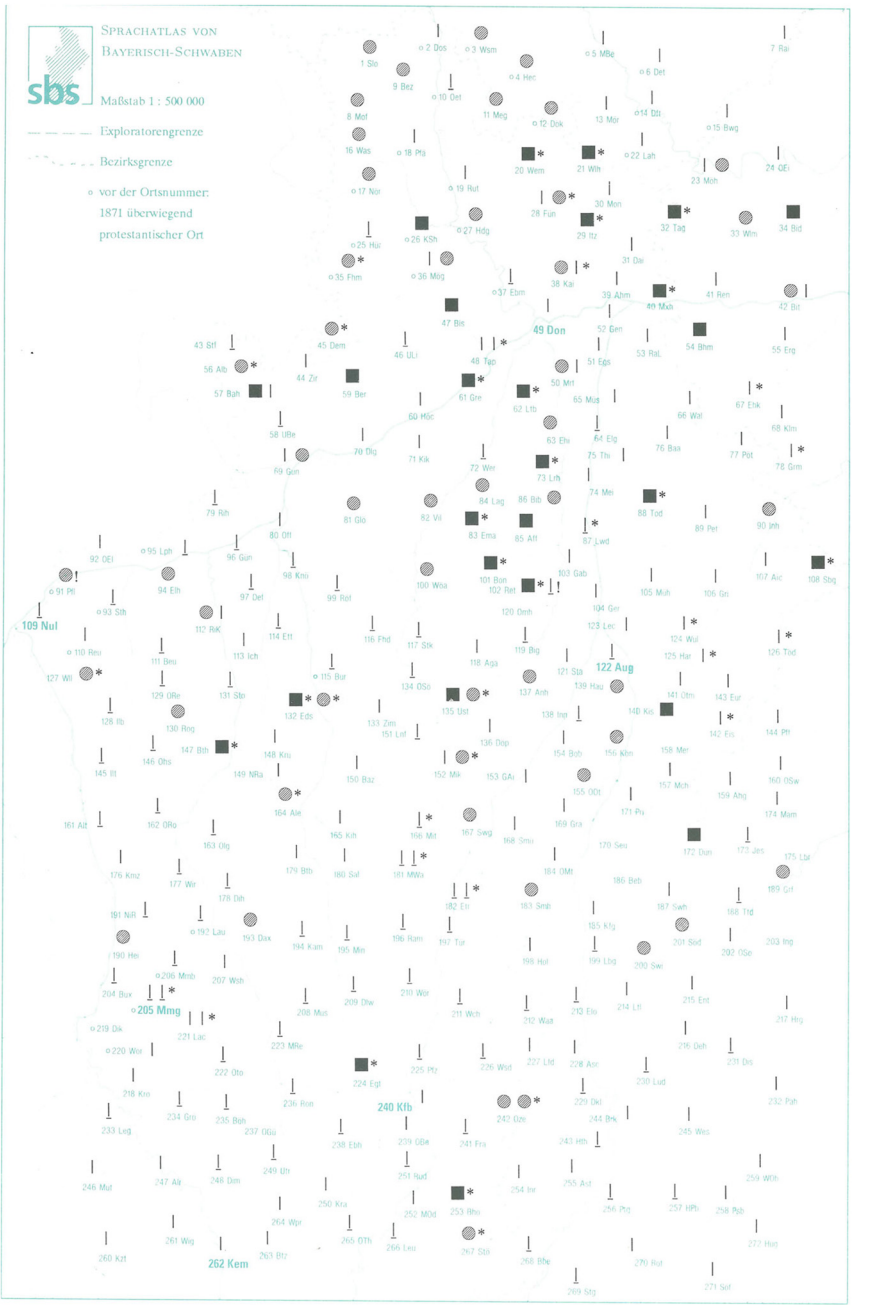


Figure 2: BSA – SMF vol. 7, Map 126.

reversed orders are attested, form a continuous region, since the north of Bavarian Swabia borders directly on the south of Middle Franconia (Weiß 2015).

The next source for the reverse order is the *Syntactic Atlas of Hessian Dialects* (SyHD), whose data were collected in the 2010s.[5] In Hessian dialects, the reverse

5 https://www.syhd.info//startseite/index.html (accessed 11 April 2024).



Karte 393: **Wortstellung** – im Satz *(da täte) ich mich fürchten*

Figure 3: BSA – SBS vol. 9.2, Map 393.

order is attested with the 2.SG and the 3.PL (Weiß 2015, 2016). Figure 4 illustrates areal distribution of the 2.SG, which was tested with a modified version of the Wenker sentence 18. As seen on the map, the reverse order is a minority variant that shows no areal focus.

Although the reverse order is attested only in a very small minority of dialects or dialectal varieties, its existence cannot be denied. Overall, there is sufficient empirical evidence: It is attested with 1.SG, 2.SG, and 3.PL, and in three independently conducted dialect surveys.

The variation between the canonical and the reverse order that we observe in synchrony finds its explanation in the diachrony, namely in the PC as I will show in

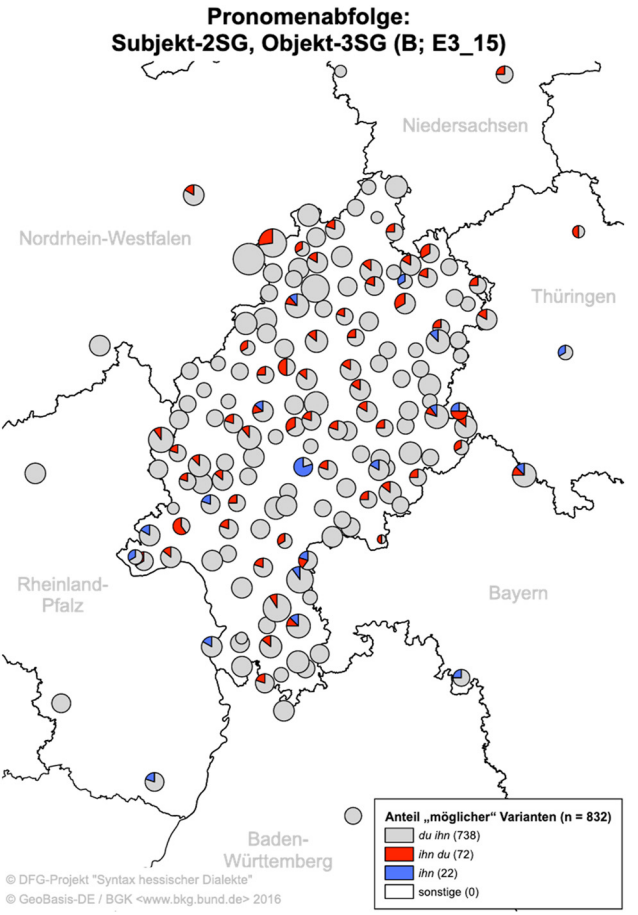


Figure 4: SyHD.

turn, after presenting some basic facts about pronouns in German dialects (based on Weiß 2015).

First, pronouns can have four forms, as shown in Figure 5.[6] These forms differ from each other morphologically as well as syntactically. On the morphological level, pronouns can be full, reduced, clitic, or even null. However, each individual pronoun only has two forms – one full form and one of the non-full forms.[7] Central Hessian is a so-called "distinct reduced" dialect where the non-full form is mostly a reduced one. The pronoun of the 3.SG.FEM 'she', for instance, has the two forms *säi* and *se*: The first one is the full form (6a), and the second one is a reduced form (6b)/(6c). Bavarian, a "distinct clitic" dialect, by contrast, shows a dichotomy between the full form and a clitic form in, for example, the 1.SG 'I': *e* (7a) versus *i* (7b). Reduced and clitic pronouns differ syntactically: Clitic pronouns (as well as null pronouns) are restricted to the Wackernagel position (WP). This is the position immediately following finite verbs in root sentences or the complementizer in embedded clauses, whereas reduced pronouns are additionally allowed in SpecCP (cf. [7a] vs. [6b]/[6c]), where, on the other hand, clitic pronouns cannot occur (cf. [7c]). Full pronouns are banned from the WP.

(6) a *SÄI singd unn daazd de gannse Doag.*
SHE sings and dances the whole day
b *Se singd unn daazd de gannse Doag.*
she sings and dances the whole day
'She sings and dances the whole day.'
c *Dai Kist hoddse de Inge gegäwwe.*
Your box has.she the Inge given
'She gave your box to Inge.'

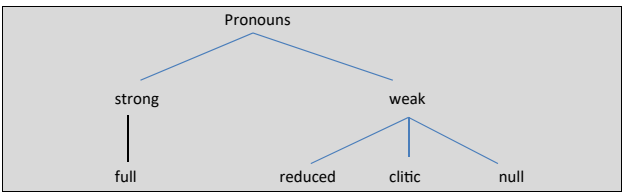


Figure 5: Typology of pronouns.

6 This four-part typology modifies Cardinaletti and Starke's (1999) tripartite system with strong, weak, and clitic pronouns. I will not go into it further here, but see Weiß (2015), and Weiß and Dirani (2019) for arguments as to why Cardinaletti and Starke's (1999) system is not sufficient theoretically or empirically.

7 There are a few exceptions where a pronoun has only one form (Weiß 2015).

(7) a *Gesdan han'e's gmocht.*
yesterday have.I.it made
b *I han's gesdan gmocht.*
I have.it yesterday made
c **e han's gesdan gmocht.*
I have.it yesterday made
'I made it yesterday.'

As (7a) shows, the regular order of arguments within the WP is subject before object. This, however, only holds if all pronouns are of the same type. Independent evidence that the pronoun type can force a reversal of order comes from object pronouns. If both indirect and direct objects are clitic pronouns, as in (8a), the indirect object precedes the direct one. However, if the indirect object is a full pronoun, then the order is reversed, as in (8b). This is the case with the dative form of the 3.SG.MASC in Bavarian for which only the full form *eam* 'him' exists.

(8) a. *Und hod'a'da'n geem?*
and had.he.you.it given
'And did he give it to you?'
b. *Und hod'a'n eam geem?*
and had.he.it him given
'And did he give it to him?'

This observation concerning object pronouns gives us a clue as to how the reversed order of subject and object pronouns came about. (9) shows the variation we observe with the order of pronominal subjects and objects. In addition to the regular order (9a) and the reverse order (9b), a *pro*-drop variant appears more often (9c). Sentences with only object pronouns are attested with 1.SG (see Figures 2 and 3) and with 2.SG (Figures 1 and 4).

(9) a. Subj > Obj
b. Obj > Subj
c. Obj

The areal distribution of the options in (9a) to (9c) reflects the diachronic development within the PC. The PC describes the development of pronouns and it involves the following steps (10):

(10) **Pronoun cycle (PC)**
full > reduced > clitic (> null or agreement)

For the possibility that the different pronominal forms evolve out of each other along the scale in (10) through increasing weakening, a necessary precondition is that each

form is syntactically in direct competition with its neighbor(s). Full pronouns can be used as weak pronouns in SpecCP (as well as reduced pronouns), where they may get segmentally reduced and would then be allowed in the WP also (just like clitic pronouns) and where they could develop into a clitic (and eventually become null). Therefore, each step in the PC is theoretically plausible and needs no stipulation. The reverse order can be explained as a certain stage in the PC. In the *Linguistic Atlas of Middle Franconia* (BSA – SMF, cf. Figure 2 above), where all data were transcribed phonetically, the reverse order is attested with full pronouns (11a)/(11b) and with reduced/clitic pronouns (11c). The full forms have a consonant [χ] (11a) or a long vowel (11b), whereas the reduced/clitic form only consists of a short vowel.

(11) a. *Dęskhąndarįχgēm.* (021 Stübach)
that.can.you.DAT.I.give
'I can give that to you.'
b. *Dëskhųndərīšǫgēm.* (165 Dietfurt)
that.can.you.DAT.I.already.give
c. *Dęskhǫndarįšǫgēva.* (078 Brundorf)
that.can.you.DAT.I.already.give
'I can give that to you.'

(12a) to (12e) describe the development that led to the reverse order with 1.SG pronouns and to its eventual disappearance.[8] At Stage I (12a), two clitic pronouns appear with the canonical order subject before object (scl > ocl); at Stage II (12b), the subject clitic has vanished and become null; at Stage III (12c), the null subject is replaced with a full pronoun that is non-clitic and thus appears to the right of the object clitic; at Stage IV (12d), the new subject pronoun is weakened to a reduced pronoun and eventually develops into a clitic that, however, initially stays in the position after the object clitic; at Stage V (12e), the canonical order subject before object clitic is restored again. Note that (11a) and (11b) correspond to Stage III and (11c) to Stage IV – thus providing empirical evidence for our explanation.

(12) a. /ə/ (=scl) V_{fin}-scl_1>ocl (= Stage I)
b. ∅ V_{fin}-ocl (= Stage II)
c. redPron V_{fin}-ocl>$Pron_{full/red}$ (= Stage III)
d. scl V_{fin}-ocl>scl_2 (= Stage IV)
e. scl V_{fin}-scl_2>ocl (= Stage V)

The explanation of how the reverse order emerged is found in the PC, but the question that remains is why pronoun forms weaken at all. Weakening (or erosion,

8 The reverse order with the 2.SG and the 3.PL can be explained in the same way, cf. Weiß (2015) for further details.

i.e., phonetic reduction) is a process that is often part of grammaticalization processes (Heine 2003: 579). However, the fact that weakening occurs with grammaticalization does not yet explain why weakening occurs at all. Gelderen's (2004: 11) *Head Preference Principle* (HPP) may supply an answer: "Be a head, rather than a phrase." To see why the HPP is relevant here, one must consider that the pronominal forms of the PC differ structurally. The respective structures are given in (13a) to (13d):[9] Pronouns are DPs containing a ϕP (or AgrD in the sense of Wiltschko 1998), and all pronouns start as heads of ϕP, where they may remain as clitic, or null pronouns (13b), or from where they may raise to D° as full pronouns, which then spell out the D part. As for reduced pronouns, I assume that they are ambiguous in that they can spell out both parts depending on the syntactic position they appear in. The evidence for this assumption comes from German dialects, where they are possible in SpecCP as well as in the WP (see [6b] and [6c] above). Being in SpecCP, reduced pronouns must be a phrase (13c), whereas in the WP they need to be a head (13d). Now we can see why the PC finds its explanation in the HPP: The weakening of the individual forms is a development from phrase to head – as predicted by the HPP.

(13) a. [DP $\text{Pron}_{\text{full}}$ [ϕP ~~Pron~~ [NP …
b. [DP [ϕP $\text{Pron}_{\text{cl/ø}}$ [NP …
c. [DP Pron_{red} [ϕP ~~Pron~~ [NP …
d. [DP [ϕP Pron_{red} [NP …

The synchronic variation observed with the order of pronominal arguments is an example for the kind of variation that has no sociolinguistic basis or do not "convey […] different social meanings" (Chambers 2002a: 4). To understand why it exists and how it emerged, one has to investigate grammar properly.

4 Variation as a trigger of LC

In this section, I will focus on variation in the sense of different surface strings or manifestations that share the same underlying structure. This kind of synchronic variation can trigger LC rather than being itself the result of LC. This is possible because some of the surface strings are structurally ambiguous and can therefore trigger a particular type of LC, namely reanalysis involving rebracketing and relabeling (Weiß 2021b).

9 This structural proposal combines assumptions made, e.g., in Wiltschko (1998), Freidin and Vergnaud (2001), Déchaine and Wiltschko (2002), Craenenbroeck and Koppen (2008), Roberts (2010), or Fuß and Wratil (2013).

Consider the following example: In MHG, the preposition *seit* 'since' could select for a clausal complement. This clause could have the form of a relative clause embedded under a d-pronoun (14a), which seems to be the 'maximal' surface manifestation.[10] Alternative forms are first what seems to be an ordinary *that*-complement clause[11] (14b) or second a clause where the complementizer is dropped for stylistic reasons as in (14c). Complementizer-drop is attested even then when the d-head of the relative clause was not absent (14d)/(14e).

(14) a. *sît des, daz ich von lande schiet* (Tristan 4123)
since that.GEN that I from country departed

b. *sît daz ich von lande schiet* (Tristan 4123, mss. W, N, O)
since that I from country departed

c. *sît ich von lande schiet* (Albrecht von Johansdorf, MF 92,7)
since I from country departed
'since I departed from the country'

d. *sît des mîn muot betrogen ist* (R. von Ems, Barlaam und Josaphat, l. 8402)
since that.GEN my courage betrayed is
'since my courage was betrayed'

e. *sît dem sîn vreide sî ze wege* (Ulrich von Singenberg, 20, 5, 7)
since that.DAT his delight be to way
'since his delight was on the way'

Thus, we have four surface variants that share the same underlying structure in (15). They only differ in which parts of the structure are spelled out and which ones are not – as indicated in (15) with brackets. In (14a), all parts of the structure are spelled out, whereas in (14b), the d-head of the relative clause, and in (14c), additionally, the complementizer of the relative clause remain unpronounced. In (14d) and (14e), the d-head, but not the complementizer of the relative clause, reaches the surface structure.

(15) [PP *sît* [NP (*des*/*dem*) [CP (*daz*) …]]]

In MHG, all four forms seem to appear in free variation with no grammatical or otherwise functional difference between them. In particular, the types represented by (14b) and (14c), i.e., without the d-head of the relative clause, occurred very

10 If not mentioned otherwise, all examples from MHG are quoted after the *Mittelhochdeutsche Begriffsdatenbank* 'Middle High German Conceptual Database' (MHDBDB), which is available online and contains a large number of annotated MHG (and Early New High German) texts.

11 As becomes clear in the structure (15), it is a relative clause with a 'mute' external head. Besides *daz*, (subordinating) *und* 'and' and *so* 'so' are attested as complementizers in such constructions (Weiß 2021b).

frequently in MHG texts. (16a) and (16b) give an example: Both variants are used within three lines. The reason why the variant without the complementizer is used in (16a) and the one with it in (16b) may simply lie in the meter – note that *Meleranz* is a verse epic –, but that means that both variants do not differ grammatically in any substantial way.

(16) a. *sît* *er* *dar* *inne* *gehûset* *hât* (Meleranz, l. 1747)
since he there in housed has
'since he lived in it'

b. *sît* *daz* *ich* *dir* *hân* *verjehen* (Meleranz, l. 1749)
since that I you.DAT have told
'since I have told you'

We will not know with certainty whether the following speculation is true or not, but we could speculate about the following scenario: Both variants had a different sociolinguistic meaning in everyday speech in MHG, with the variant with the complementizer being considered more conservative and the variant without as more innovative. The innovative variant has prevailed, as we know, while the conservative one has been lost so that only the former occurs in New High German. Now, it might be the case that a comprehensive corpus study would show that the increase in the complementizer-less variant corresponds to the S-curve. However, that would not be the whole story for two reasons. Firstly, the S-curve would only describe the spread of the innovative variant within the speech community. Secondly, it would not explain the actual development on the grammatical level: the emergence of the conjunction *seit* 'since' from the preposition *seit*. This development is the result of a structural reinterpretation (cf. [17]) in which the original structure was simplified and the lexeme *seit* was categorically reinterpreted. Therefore, the actual development consists in a reanalysis involving rebracketing and relabeling (Weiß 2021b). What triggered the reanalysis of the preposition *seit* as a complementizer was that utterances like (14c) or (16a) were structurally ambiguous because they match both structural options in (17) – the original structure and the new one.

(17) [PP *sît* [NP (*des*/*dem*) [CP (*daz*) …]]] → [CP [C° *sît*] …][12]

The syntactic behavior of other lexemes often contributes to making an utterance structurally ambiguous. This can be seen clearly in the behavior of pronouns: If an

12 One reviewer points to the possibility "that the structural description of *seit* + clause remains in modern times as given to the left of the arrow in (17), such that there is no real syntactic change." As mentioned in Weiß (2019, 2021b), this indeed seems to be the case in some German dialects. As far as non-dialectal German is concerned, *seit* also counts as a conjunction, i.e., it can be assumed that the development in (17) actually took place. Note that this objection does not apply to the following example *weil* 'while', so the argument as such would not lose validity if *seit* had indeed remained a preposition.

overt complementizer is absent, pronouns in the WP attach to (nearly) any material to their left – and this could even be the preposition outside the relative clause as in (18a) to (18c). Pronouns cliticize onto the preposition *sît,* giving it the 'flavor' of being a complementizer.[13]

(18) a. *seidu mich chenst so wol* (Der Münchner Oswald, l. 1240)
since-you me know so well
'since you know me so well'
b. *sitt sô grôze gâbe gîst* (Ortnit, Stanza 118, l. 1)
since-you so big gift give
'since you give such a big gift'
c. *sîts ir sô smerzent* (Friedrich der Knecht, Lied 20, Stanza 6, l. 8)
since-it her so hurt
'since it hurts her so'

A comparable case is the complementizer *weil* 'while' that emerged from the noun *Weile* 'while, space of time' (MHG *wîle*) (Weiß 2019, 2021b). Here again, the source structure involves a relative clause, and we find several surface variations (19a)–(19d) depending on which parts are spelled out and which ones are not. The different surface manifestations of the same underlying structure produce a structural ambiguity, which eventually triggered a reanalysis as noted in (20).

(19) a. *alldiewil das ich uwer pflegen sol* (Prosalancelot 224, 27)
all-the-while that I you care shall
'as long as I shall care for you'
b. *al die wîl du bî mir bist* (Parzival 485, 9)
all the while you at me.DAT are
'as long as you are with me'
c. *Dwil ich off ertrich on sunde nit enmocht gewesen*[14]
the-while I on earth without sin not NEG-could been
'because I could not live on earth without sin'
d. *di here cristenhait … sal loben … Wile ummer diese werlt gestet*[15]
the noble christianity … shall praise … while always this world persists
'the noble christianity has to praise, as long as this world exists'

13 See Weiß (2019, 2021b) for more details on how and why structural ambiguity can trigger this type of reanalysis.

14 Prosalancelot 40, 35–36.

15 Leben V7780.

(20) [DP *wîle* [CP …]] → [CP [C° *wîle*] …]

The emergence of both *seit* and *weil* are instances of LC that have their starting point in the synchronic variation of a special kind: The respective utterances differ slightly in their surface manifestation, but they are all the expression of one and the same underlying structure (more examples of this kind are presented and discussed in Weiß 2021b). In order to trigger LC, this kind of synchronic variation must create a situation where the underlying structure of an utterance becomes ambiguous, and this structural ambiguity then triggers reanalysis involving rebracketing and relabeling. Therefore, synchronic variation of this kind is indirectly responsible for LC.

Synchronic variation is the starting point of LC in that one variant out of several similar ones prevails and spreads within a speech community. In this section, I tried to show that the actual LC does not consist in the suppression of the competing variants and in the spread of the 'winning' variant within the language community, but in the structural and categorical changes that happen 'under the surface'. Further, one can only take a look 'under the surface' within a formal framework by using an approach that provides for more than one structural level.

5 Conclusions

Linguistic variation characterizes every natural language. In this paper, I discussed linguistic variation and its role in LC. I argued for a strict distinction between emergence and diffusion of variants because both dimensions provide different contributions to LC. The emergence and further development of new variants is a process often (though not always) displaying the form of a cycle, whereas the diffusion within a speech community often follows an S-curve form. Both emergence and diffusion are essential aspects of LC, but they relate to very different dimensions. Grammar in a narrower sense, i.e., particularly (but not exclusively) morpho-syntactic features, changes in the way it is determined by principles expressed in formal theories. Such principles are, for example, economy principles as formulated in Gelderen (2004) or Weiß (2019), and these principles explain why and how grammar changes. The development of nouns or prepositions into complementizers is triggered by Weiß' (2019) *Early Merge Principle*, whereas Gelderens' (2004) HPP is responsible for the emergence of complementizers out of wh-pronouns (to mention just two examples). All of these developments can thus be explained within formal approaches, but not within sociolinguistic ones. The domain of the latter ones is the diffusion of variants within speech communities that often has the form of an

S-curve. Since (some) linguistic variants bear "sociocultural significance" (Chambers 2002b: 369), sociolinguists can explain the observation "that rates of change fluctuate, and that periods of relative stability can be followed by periods of considerable flux" (Chambers 2002b: 364). However, this is not LC in the strict sense, but the spread of innovations in a speech community – and these are two different things.

In sociolinguistics, "[s]tudying language variation proceeds mainly by observing language use in natural social settings and categorizing the linguistic variants according to their social distribution" (Chambers 2002a: 3). In formal linguistics, however, the study of variation serves other purposes. In this paper, I focused on two aspects of the relationship between variation and LC: synchronic variation as result and as starting point of LC. I tried to show that only a formal approach can detect what is going on 'under the surface'. Thus, it is only possible to give a satisfying explanation for the observed variation between the canonical and the reverse order of pronominal arguments if one refers to formal concepts and principles (like the PC or Gelderens' HPP). Similarly, one needs to apply formal concepts and principles to see why variation in the surface manifestations of the same underlying structure can trigger LC in form of reanalysis involving rebracketing and relabeling. As I have argued in Weiß (2018), language seems to resemble an iceberg of which seven-eighths are invisible because they are 'under the water'; thus grammar change often happens 'under the surface' and "not visible to the naked eye" (Uriagereka 2002: 237).

To summarize these findings: Formal linguistic and sociolinguistic approaches to LC are concerned with different aspects (emergence and diffusion), thus complementing rather than contradicting each other.

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On the asymmetry of wh-doubling in varieties of German and Dutch

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Abstract: This paper combines experimental, theoretical and quantitative approaches to syntactic microvariation. The empirical goal is to clarify the situation with respect to wh-doubling (also: wh-copying) in varieties of German and Dutch. With a large-scale survey in the German and Dutch language areas we sought to establish which speakers allow wh-doubling, which speakers allow right-complexity, i.e., configurations in which the lower copy of the wh-dependency is more complex that the higher one, and which speakers allow left-complexity, i.e., the reverse, with a more complex higher copy. We also wanted to know whether there are associations between these properties, to identify groups of speakers and dialects. We found three types of grammars: (i) a grammar that allows both wh-doubling and right- and left-complexity, (ii) a grammar that allows wh-doubling and has a strong preference for right-complexity over left-complexity, and (iii) a grammar that does not allow any wh-doubling configuration. This shows that there is a clear limit to variation in this domain. Grammars with a preference for left-complexity do not exist. We then point out the consequences of these findings for the copy theory of movement, and for analyses that enrich this theory with the option of partial deletion.

Keywords: wh-copying; wh-doubling; PF-deletion; German language varieties; Dutch language varieties; complexity asymmetry

Note on the paper, by Sjef Barbiers: Gisbert Fanselow (1959–2022), the first author of this paper, sadly passed away on 17 September 2022, when the submitted version of this paper was ready. He and his wife gave permission to publish this paper.

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1 Introduction

Questioning a constituent of a subordinate clause in English requires placing the wh-counterpart of that constituent in the first position of the main clause while leaving the root position of the displaced constituent empty (1a)/(1b). Many varieties of German and Dutch allow, often in addition to (1b), wh-doubling (also called wh-copying), in which a wh-constituent does not only occur in the first position of the main clause but also in the first position of the embedded clause, as is illustrated for German in (1c). In such varieties, the two wh-constituents do not always have to be identical, i.e. we also find (1d), where the linearly second wh-constituent is more complex than the first one. There are various claims in the literature (e.g., Fanselow and Ćavar 2001) that the reverse is not possible, i.e., it would not be possible for the first wh-constituent to be more complex than the second one (1e).

(1) a. *you think* [*that she likes* ***Mary***].
b. ***who*** *do you think* [*that she likes* ___]*?*
c. ***wen*** *denkst du* [***wen*** *sie mag*]*?* German
who think you who she likes
'Who do you think she likes?'
d. ***wen*** *denkst du* [[***wen von den Studenten***] *sie mag*]*?* German
who think you who of the students she likes right-complexity
'Who of the students do you think she likes?'
e. *[[***wen*** *von den Studenten*] *denkst du* [***wen*** *sie mag*]*?* German
who of the students think you who she likes left-complexity
'Who of the students do you think she likes?'

Configurations such as (1d) and (1e), henceforth right-complexity and left-complexity configurations, are relevant for the correct formulation of the copy theory of movement (Chomsky 1995), according to which displacements of the type in (1b) are in fact instances of internal Merge: copying of a wh-constituent, placing the copy in a higher position (to the left of the original) and subsequently deleting the original.

If the contrast between right-complexity (1d) and left-complexity (1e) exists, this would support the copy theory of movement, as it is possible to partially copy a wh-constituent but not to add material to the original. In (1d), *wen* can be a partial copy of *wen von den Studenten*. The sentence in (1e) can not be the result of copying *wen*, as this would require adding *von den Studenten* during the copying process. Therefore, the copy theory of movement predicts that right-complexity (1d) is possible, whereas the reverse, left-complexity (1e), should not be possible.

Somewhat more abstractly, Barbiers et al. (2009a) argue for cases such as (2a) and (2b) that Dutch *wat* 'what' is simpler than *wie* 'who' in that it has a subset of the features of *wie*, and therefore (2a) can be the result of partially copying *wie*, while (2b) cannot be the result of partially copying *wat* and therefore is impossible.

(2) a. ***wat*** *denk je* [***wie*** *zij mag*]*?* Dutch
what think you who she likes
'Who do you think she likes?'

b. ****wie*** *denk je* [***wat*** *ze mag*]*?* Dutch
who think you what she likes
'Who do you think she likes?'

However, observations in the literature suggest that in some varieties the first wh-constituent can be more complex than the second one. Pankau (2014: 47) gives the sentence in (3), which he found to be possible in the grammar of five speakers of different varieties of German that he interviewed, one speaker from Westphalia, one from Rheinland, one from Bavaria, one from Saxony and one from Franconia. According to Pankau, this suggests that this is not a dialectal but an idiolectal phenomenon.

(3) ***welchen Mann*** *glaubst du* [***wen*** *sie eingeladen hat*]*?* German
which man believe you who she invited has
'Which man do you think she has invited?'

In view of the diverging empirical claims in the literature, the main goal of this paper is to systematically test the hypothesis that right-complexity is possible in wh-dependencies but left-complexity is not. We have tested the hypothesis on a large number of speakers from different varieties of German and Dutch.[1] We combine a theoretical perspective on this variation with statistical data analysis. If the theory predicts that there are two or more distinct grammars of wh-doubling, then we should be able to find clear and distinct distributional patterns in the German and Dutch population. We will see, however, that this is not the case, with important consequences for the theory.

To be able to test the hypothesis, one has to be explicit about what complexity means in this context. In (1d), this is clear as the second wh-constituent contains a PP that the first one lacks. In (2a) and (3), this is less clear, as the difference in complexity of the two wh-constituents depends on analysis. *wat* 'what' in (2a) is only less complex than *wie* 'who' if the assumption is correct that it has a subset of the grammatical features of *wie*. In (3), the constituent *welchen Mann* looks more complex than *wen* as it has two words, but a phrasal analysis of *wen* might show that the latter is in fact syntactically more complex.

1 See https://scholarlypublications.universiteitleiden.nl/handle/1887/3307645 (accessed 23 February 2024) for regions and numbers of speakers per region.

In this paper, we will therefore restrict our attention to the clearest case, i.e. (1d) and (1e). We test the three sentence types in (4) to answer the following questions:[2]

- Which speakers have wh-doubling (4a)?
- Which speakers have right-complexity in wh-doubling (4b)?
- Which speakers have left-complexity in wh-doubling (4c)?
- Is it possible to identify groups of varieties/speakers based on the answers to (4a)–(4c)?

(4) German

a. *wen denkst du wen sie mag?* **simple**
who think you who she likes
'Who do you think that she likes?'

b. *wen denkst du wen von den Studenten sie mag?* **right-complex**
who think you who of the students she likes
'Who of the students do you think she likes?'

c. *wen von den Studenten denkst du wen sie mag?* **left-complex**
who of the students think you who she likes
'Who of the students do you think she likes?'

The central issue of this paper could also be considered from a functional perspective. The question would then be whether left-complexity is easier to process than right-complexity or vice versa. We do not know of any research on this question in this empirical domain. On the one hand, it might be expected that the sooner a constituent can be fully processed, the lighter the processing load.[3] In the case of right-complexity, identification of the full constituent has to wait until the beginning of the embedded clause, in left-complex constructions it can be identified immediately. Such functional considerations would then lead to the expectation that left-complexity is preferred over right-complexity. On the other hand, there is also a tendency in natural language for heavily loaded information to occur later in the sentence, for example in sentences with an expletive subject at the beginning and an associated full subordinate clause at the end of the sentence (as in: ***It** is nice **that you have called me***). No clear predictions can be derived from the current literature on processing. The data that we report on in this paper can be used as the basis for future processing research.

2 It will be clear that these questions can only be answered with acceptability judgment tasks, not with a corpus study. A corpus study would not provide useful information on the relation between the four questions. More generally, a corpus study can tell us what is possible, not what is impossible.
3 An anonymous reviewer points out, however, that there is very little evidence in the sentence parsing literature in support of the idea that heavily loaded information would come earlier.

2 Background

In this section, we briefly describe the empirical and theoretical background against which we have carried out the research for this paper. In the West Germanic languages, one finds a remarkable variety of constructions that are used for questioning a constituent of a subordinate clause. The construction in which the wh-constituent is repeated, as illustrated for Dutch and German in (5), also occurs in Frisian (e.g., Hiemstra 1986), Afrikaans (du Plessis 1977), and Romani (McDaniel 1986).

(5) a. ***wie*** *denk je* ***wie*** *haar gezien heeft?* Dutch
who think you who her seen has
'Who do you think has seen her?'

b. ***wen*** *denkst du* ***wen*** *sie gesehen hat?* German
who think you who her seen has?
'Who do you think has seen her?'

There is an important restriction on wh-doubling in West Germanic. Wh-elements in doubling constructions can only occur at the left-periphery of embedded and main clauses. No copy of the wh-phrase may appear in the root position of the wh-chain (6)/(7). Therefore, there is also no doubling for short movement in general (8)/(9).

(6) Dutch

a. ***waar*** *denk je* ***waar*** *hij geslapen heeft?*
where think you where he slept has?
'Where do you think that he has slept?'

b. ****waar*** *denk je dat hij* ***waar*** *geslapen heeft?*
where think you that he where slept has

c. ****waar*** *denk je* ***waar*** *hij* ***waar*** *geslapen heeft?*
where think you where he where slept has?

(7) German

a. ***wo*** *denkst du* ***wo*** *er geschlafen hat?*
where think you where he slept has
'Where do you think that he has slept?'

b. ****wo*** *denkst du dass er* ***wo*** *geschlafen hat?*
where think you that he where slept has

c. ****wo*** *denkst du* ***wo*** *er* ***wo*** *geschlafen hat?*
where think you where he where slept has

(8) Dutch
*__waar__ *heeft zij* __waar__ *geslapen?*
where has she where slept
'Where has she slept?'

(9) German
*__wo__ *hat sie* __wo__ *geschlafen?*
where has she where slept
'Where has she slept?'

This restriction does not hold for northern Italian dialects, where there may be a wh-copy in the right periphery of the clause, as exemplified by (10) from La Strozza/Lombardy (Manzini and Savoia 2011: 86). There is no wh-copy present in the intermediate Spec,CP position of the embedded clause, as illustrated by (11) from the Borgo di Terzo variety (Manzini and Savoia 2011: 92). There is a debate in the literature whether the right-peripheral wh-element in northern Italian dialects is in its base position (Manzini and Savoia 2011) or has been moved leftward, with the latter movement masked by subsequent remnant movement (Poletto and Pollock 2005). Manzini and Savoia (2011) argue that the main diagnostic used by Poletto and Pollock, i.e. island sensitivity, also allows for an in-situ analysis of the right-peripheral wh-element.

(10) Northern Italian (La Strozza/Lombardy)
a. __ndo__ *l purt'i: f* __indoɛ__*?*
where it bring you where
'Where did you bring it?'
b. *so mia* __ndo__ *dyr'mi* __indoɛ__*?*
I.know not where you.sleep where
'I do not know where you slept.'
(Manzini and Savoia 2011: 86)

(11) Northern Italian (Borgo di Terzo)
(__koha__) *pɛnset k el vøli mia* __koˈhɛ__*?*
what you.think that he wants not what
'What do you think that he does not want?'
(Manzini and Savoia 2011: 92)

If the right-peripheral wh-copy is in the root position of the chain, the difference between West Germanic and northern Italian will reduce to the fact that northern Italian dialects tolerate wh-in-situ, while West Germanic does not. West Germanic

wh-phrases can stay in situ only if they compete with another contentful wh-phrase for the left edge position, see (12) and (13).[4]

(12) Dutch
wie heeft wat gezien?
who has what seen
'Who has seen what?'

(13) German
wer hat was gesehen?
who has what seen
'Who has seen what?'

In both language groups, one can identify complexity restrictions for the left wh-copy. Poletto and Pollock (2005) observe that when the copy in situ is a PP, only the wh-word itself can appear at the left edge, cf. (14) from Grumello. Likewise, the examples in (10a) and (10b) show that the left copy is phonologically less strong than the right one.

(14) Italian (Grumello)
koha l fe:t koŋ ko'hɛ?
what it you.do with what
'With what did you do it?' (Manzini and Savoia 2011: 105)

Restrictions on the complexity of the wh-constituents of the construction have also been discussed for Dutch and German. E.g., McDaniel (1986), Höhle (2000), and Felser (2004) report that the doubling of wh-phrases is at least questionable for some speakers when the wh-phrase is part of a PP (15b) – a restriction not affecting all speakers (Fanselow and Mahajan 2000) – unless the PP is a single word (a pronominal adverb), as in (15a).

(15) German
a. *wovon hat sie gesagt wovon sie träumt?*
where-of has she said where-of she dreams
'What has she said she dreams of?'

4 Note, however, that some varieties of Swiss German (e.g., the Uri dialect) have a wh-doubling construction that resembles northern Italian in some respects (Frey 2005), see (i).

(i) *was macht de Urs ietz was?*
what does de Urs now what
'What does Urs do now?'

b. %*von wem hat sie gesagt von wem sie träumt?*
of who has she said of who she dreams
'Who has she said she dreams of?'

In addition, Fanselow and Ćavar (2001) report that wh-doubling is compatible with the constellation given in (16), in which the right but not the left copy is syntactically complex.[5] The authors propose to derive this from an economy condition on overt copying. The amount of material copied to a higher position must be minimal, i.e. not more material may be copied than necessary for meeting the requirements in the upper position (e.g., clausal typing), which usually means that only the rightmost copy can be larger than a word.

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5 One could deny that the second copy in (16a) is complex by assuming that *wen* has been subextracted from the NP *wen von den Studenten* when it moves to embedded Spec,CP (Pankau 2014). The linear order in (i), PP preceding the subject pronoun, implies that this subextraction would have to take place after the complete NP was adjoined (scrambled) to TP:

(i) $[_{CP}$ *wen*$_k$ $[_{TP}$ $[_{DP}$ t_k *von den Studenten*$]_i$ $[_{TP}$ *er mag* $t_i]]]$
who of the students he likes

This suggestion seems prosodically implausible (*wen von den Studenten* forms a prosodic unit) and syntactically unlikely, since unstressed subject pronouns are in the Wackernagel position and nothing can be adjoined to this position (Weiß 2016), cf. (ii), as would be required for (i):

(ii) **ich denke dass einen aus Hamburg er mag*
I think that somebody from Hamburg he likes
'I think that he likes somebody from Hamburg!'

Consider (iii), in which the first overt copy of the wh-phrase does not materialize in the clause in which it originated but in a higher clause it can only have reached by wh-movement. Since wh-phrases do not adjoin to TP in cyclic wh-movement, it is unclear how (iii) could be analyzed avoiding the assumption that *wen von den Studenten* sits in the intermediate Spec,CP position.

(iii) *wen denkst du* [*wen von den Studenten sie sagt* [*dass man* t *einladen sollte*]]*?*
who think you who of the students she says that one invite should
'Who of the students do you think she says that one should invite?'

In dialects that tolerate doubly-filled-comp-filter violations, sentences such as (iv) are acceptable, which also allow no analysis that does not place a complex wh-phrase into the specifier of the lower CP.

(iv) *wen meinst du wen von den Studenten dass du einladen musst?*
who think you who of the students that you invite must
'Who of the students do you think you must invite?'

(16) German

a. *wen denkst du wen von den Studenten er mag?*
who think you who of the students he likes
'Who of the students do you think that he likes?'

b. *wieviel denkst du wieviel Bücher er geschrieben hat?*
how many think you how many books he written has?
'How many books do you think that he has written?'

c. *wen meinst du wen sie sagt wen von den Studenten sie vorzieht?*
who think you who she says who of the students she prefers
'Who of the students do you think that she says that she prefers?'

Barbiers et al. (2009a) formulate a more general descriptive principle on the distribution of complexity in wh-chains that contain more than one overt element (17). It is derivable on the basis of three assumptions: (i) a rich internal structure of wh-pronouns and wh-phrases; (ii) the complex functional structure of wh-expressions can also be copied partially in the formation of movement chains; (iii) phrasal spell-out of the lower wh-copy.

(17) In a syntactic movement chain, a higher chain link is not more specified than a lower chain link. (Barbiers et al. 2009a: 4)

Both Fanselow and Ćavar (2001) and Barbiers et al. (2009a) imply that the leftward (= upward) decrease in complexity in wh-chains is an intrinsic consequence of the mechanics of movement and copying. The predictions are different, however, if movement always involves full copying in syntax and if scattered deletion is possible at the level of spell-out (PF; see, e.g., Nunes 2004). The choice of which part of a copy to spell out may then depend on extragrammatical factors, e.g. social variables such as region and register (see Barbiers 2005, 2008). Such a theory would allow for both left- and right-complexity.[6] It is the distribution of complexity among the items in a wh-chain the present paper will be concerned with.

6 An anonymous reviewer suggests that a preference for right-complexity may in fact be a preference to have the restriction (e.g. the PP *von den Studenten* in [16a]) close to the quantifier (*wen*). Testing sentences such as *Wen denkst du wen sie von den Studenten geküsst hat?*, lit. 'who think you who she of the students kissed has', may give an indication as to whether this preference is playing a role.

3 Variability

The empirical landscape for wh-doubling in West Germanic appears to be even more diversified, however. Höhle (2000) states that wh-doubling is not uniformly accepted by speakers of German, without any obvious regional or dialectal basis. An unpublished study carried out by one of us (Fanselow) with Dario Paape and Nina Wiedenhof confirmed that wh-doubling is acceptable to (some) speakers in all regional varieties, but the Ruhr area, Bavaria and Berlin-Brandenburg come with a slightly higher acceptability of the construction.

For Dutch, a complex geographical distribution is given on two maps (Barbiers et al. 2005, SAND Vol. 1, Maps 91a/b).[7] These maps do not show any clear regions where full and partial wh-doubling are or are not available. Non-systematic observations on Standard Dutch suggest that the two wh-constructions are common in colloquial Dutch and that many speakers have a normative rule that they would not be allowed in more formal Standard Dutch, although the origin of this rule is unclear. The same appears to hold for German.

We also find variability with respect to complexity as such, and its distributions. As Fanselow and Mahajan (2000) and Felser (2004) stress, the exclusion of PPs from doubling (15b) is not true for all speakers of German. Likewise, not all speakers accept partial copying of *wie viel* + NP as in (16b). Ideally, this is related to a similar variability in left-branch-extraction contexts: (18a) is not acceptable to all, while (18b) and (18c) seem both unacceptable in general.

(18) German

a. %*wieviel hast du Schweine im Stall*?
How many have you pigs in.the pigsty
'How many pigs do you have in the pigsty?'

b. **welche hast du Schweine im Stall*?
which have you pigs in.the pigsty
'Which pigs do you have in the pigsty?'

c. **welche denkst du welche Bücher er gekauft hat*?
which think you which books he bought has
'Which books do you think he has bought?'

Variability can also arise with respect to the ability of the lower copy of undergoing further grammatical processes. In Dutch, (19) is acceptable (Schippers 2012: 86): the lower copy of *waarvoor* has undergone P-stranding, leading to a situation in which the two copies in Spec,CP are not identical. Note that the splitting of the wh-phrase in

7 Map 92a in Barbiers et al. (2009b) (SAND Vol. 2) shows that some varieties of Dutch also allow full and/or partial wh-copying with a relative pronoun at the left periphery of the embedded clause.

the complement clause in (19) leads to a constellation in which the left copy is indeed more complex than the right one!

(19) Dutch
waarvoor denk jij waar deze mensen voor dienen en voor worden
what-for think you what these people for serve and for are
betaald?
paid
'What do you think that these people serve and are paid for?'

Lohndal (2010) observes that both copies can be full DPs in Afrikaans (20), a structure that does not contradict (17), however. Du Plessis (1977) observes that Afrikaans allows copying of full PPs as well (21).

(20) Afrikaans
watter meisie se hy watter meisie kom vanaand kuier?
which girl say he which girl come tonight visit
'Which girl did he say comes for a visit tonight?'

(21) Afrikaans
met wie het jy nou weer gesè met wie het Sarie
with who did you now again said with who did Sarie
gedog met wie gaan Jan trou?
think with who go Jan marry
'Whom did you say (again) did Sarie think Jan is going to marry?'

German possesses varieties that fail to be in line with (17), as first pointed out by Anyadi and Tamrazian (1993), who report that sentences of the kind of (22) are acceptable in Ruhr/Low Rhine German. Similar claims were made by Fanselow and Ćavar (2001) for the dialects of Bavarian Franconia. As noted in Section 1, Pankau (2014) describes a variety of German also allowing (22) but does not attribute it to a particular region. Similar constructions in Dutch (child) language are discussed in Barbiers et al. (2009a). They propose, following van Craenenbroeck (2004), that *which*-DPs are base generated in a high dislocated position and that there is an empty operator below it that is associated with the wh-phrase that is in the initial position of the embedded clause. Under such an analysis, sentences such as (22) are not a counterexample to (17).

(22) German
welchen Mann denkst du wen er kennt?
which man think you who he knows
'Which man do you think that he knows?'

Irrespective of the details of the analysis, the varieties accepting (22) constitute a different system. It is the *left* copy that is a full wh-DP, whereas the right copy must be a proform, in particular a free relative proform, as proposed by Pankau (2014). In some varieties, the d-form of the relative pronoun can be used instead of the wh-form, both in Dutch and German, see (23).

(23) German
welchen Mann denkst du den er kennt?
which man think you who he knows
'Which man do you think that he knows?'

Fanselow and Ćavar (2001) have proposed that right-complexity (24b) and left-complexity (24c) belong to different constructions and different dialects. If two dialects are involved, and/or if two constructions are at stake, one would expect to find some variability among speakers. In particular, there should be at least two groups of speakers with respect to the location of the complex wh-phrase in a doubling construction. In the dialect that generates wh-doubling by copying in the narrow sense, the rightmost copy should (arguably) have to be the complex one. The dialect that generates wh-doubling with the help of a free relative pronoun inserted into the lower Spec,CP tolerates complex wh-phrases only in the left copy. More concretely, there should be a group of speakers in which the difference in acceptability between (24a) and (24c) is larger than the difference in acceptability between (24a) and (24b) (the copying group), and there should be a group of speakers for which the reverse holds (the relative pronoun group).

(24) German
a. *wen denkst du wen sie mag?* **simple**
who think you who she likes
'Who do you think that she likes?'
b. *wen denkst du wen von den Studenten sie mag?* **right-complex**
who think you who of the students she likes
'Who of the students do you think she likes?'
c. *wen von den Studenten denkst du wen sie mag?* **left-complex**
who of the students think you who she likes
'Who of the students do you think she likes?'

One of us (Fanselow) ran a pilot study with speakers from Berlin and Brandenburg, with the goal of testing for the existence of two dialects. Thirty two speakers who indicated that they and at least one of their parents had grown up in Berlin or Brandenburg rated six sentences each for the three construction types exemplified in (24) with a Latin square design, in a written acceptability rating study on a 7-point scale (1 worst, 7 best). Mean ratings were 3.57 for simple doubling (24a), 3.12 for the

right-complex version (24b), and 2.69 for left-complex constructions (24c).[8] We excluded those twelve participants from the next analysis step who had a mean rating below 3 for simple doubling (assuming this means that doubling is not part of the grammar of the subject). For the remaining 20 subjects, the acceptability of simple doubling was at 4.64, for right-complex elements, acceptability was at 3.82, and the acceptability of left-complex element was at 3.31.

Figure 1 shows the mean rating for the construction exemplified by (24b) on the *x*-axis and mean ratings for left-complex constructions (such as [24c]) on the *y*-axis. Participants with the same mean rating for the two complexity types fall on the diagonal line. Participants with a higher rating for the right-complex construction are below the line. Figure 1 gives no evidence whatsoever for the possible existence of two dialects. According to Hartigan's dip test for unimodality/multimodality, this distribution does not show any significant signs of multimodality. In other words, there is no indication for any dialectal split.

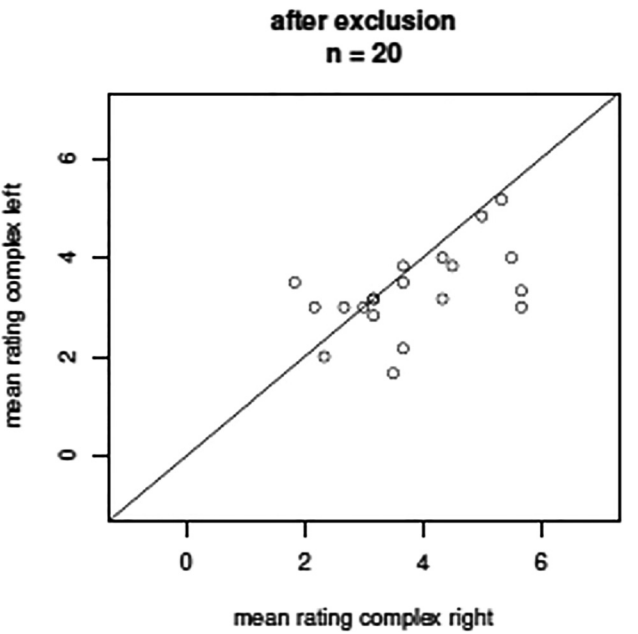

Figure 1: Pilot study Berlin-Brandenburg area.

8 Many thanks go to Marta Wierzba for carrying out the statistical analysis.

Given that the test was carried out in one region only and in written rather than spoken language (so that one might miss aspects of colloquial language), we felt it was necessary to replicate the study in a more systematic way in further areas of German and Dutch and with auditory presentation.

4 Design of the study

We carried out two parallel acceptability rating experiments for Dutch and German that asked for judgments of doubling constructions that differed with respect to the left versus right localization of the full complex wh-phrase. The studies tested the same construction with identical (translated) lexical material with the same method in both languages.

All the experiments reported below had the following characteristics. We constructed 18 sentence triplets of the type exemplified in (24) for German and (25) for Dutch, using identical lexical material in both languages, so that each lexicalization appeared in the simple doubling condition (SIMPLE), the left-complex condition (LEFT), and the right-complex condition (RIGHT).

(25) Dutch

a. *wie denk je wie ze gezien heeft?* A: simple doubling
who think you who she seen has
'Who do you think that she has seen?'

b. *wie denk je wie van de studenten ze gezien heeft?* B: right-complex
who think you who of the students she seen has
'Which of the students do you think that she has seen?'

c. *wie van de studenten denk je wie ze gezien heeft?* C: left-complex
who of the students think you who she seen has
'Which of the students do you think that she has seen?'

In addition, there were 35 distractor items unrelated to wh-doubling, which were also identical in Dutch and German. Each of the experimental items was preceded by a context sentence in order to enhance the acceptability of the items. The material was presented auditorily in an online survey. All test sentences were recorded by a speaker of the pertinent regional dialect or regional version of the standard language.[9]

The experiment was constructed using a Latin square design with three versions, such that each participant was confronted with six experimental items

9 See https://scholarlypublications.universiteitleiden.nl/handle/1887/3307645 (accessed 23 February 2024), Appendix 2, for the full list of test sentences.

per condition (simple, right, left). The sentences were presented to the participants in a pseudo-randomized order. Participants were asked to rate the naturalness of the sentences on a 7-point Likert scale (1 = very unnatural; 7 = completely natural). Participants were born and raised in the relevant region where the dialect/regional variant is spoken and similarly for at least one of their parents.

We were particularly interested if there was any indication in the data collected in the experiments suggesting that there are two (or more) dialects on Dutch and German with respect to left- or right-complexity. To this end, we decided to analyze the data in the frequentist framework using Gaussian finite mixture models, as suggested to us by Shravan Vasishth. A Gaussian finite mixture model can be used to find out how many overlapping normal distributions a given distribution consists of and to calculate the means and standard deviations of these normal distributions. Crucially, it is also possible to set the unknown parameter that specifies the number of normal components to a certain value before applying the model to the data. Given this possibility, we fitted three models to each data set that differed in the number of underlying normal components (1, 2, or 3, Models M1, M2, M3). This means that each model is forced to analyze the given data distribution as if it consisted of the specified number of normal components. After fitting the three models to a data set, we compared the log-likelihoods of these models in a pairwise fashion (M1–M2, M1–M3, M2–M3) using the likelihood-ratio test procedure. The likelihood-ratio test is a hypothesis test that compares the log-likelihoods (a measure of the goodness of fit of a statistical model to the data) of two nested models to find the model that best fits the data. Whether or not one of the two models being compared is a better fit to the data is indicated by the chi-square value resulting from the comparison of the log-likelihoods. If the observed chi-square value is greater than the critical chi-square value, there is evidence that the two models do not have the same log-likelihoods (i.e., both models differ regarding their ability to explain the data). In this case, the model with the higher log-likelihood is to be preferred since it is a better fit to the data. If the observed chi-square value is smaller than the critical chi-square value, there is no evidence that the two models do not have the same log-likelihoods (i.e., both models can explain the data equally well). In this case, the simplest model is to be preferred for reasons of parsimony.

It should be noted, however, that our procedure comes with two potential disadvantages: First, it might be possible that a model assuming more than three underlying normal components is a better fit to the data than the model picked by our procedure. Second, the procedure makes the assumption that linguistically meaningful dialects correspond to normal distributions in our data. These two factors relativize the force of our conclusions. Note that we also carried out the weaker Hartigan's dip test for all our experiments, which never indicated any reason for postulating more than one dialect for our data.

5 Variation in wh-doubling in the Dutch and German varieties: the results

5.1 Dutch

For Dutch, our analysis combines data from two studies – one in which speakers gave judgments about the standard language and one in which speakers of different dialects judged doubling constructions. The conclusions based on the individual studies are very much in line with those based on the pooled data.[10]

One hundred sixty one participants judged the acceptability of 18 doubling constructions in the three conditions simple, right- and left-complex, as described above. The left part of Table 1 gives the mean ratings of all participants for each of the conditions:

Table 1: Mean ratings.

All participants (*n* = 161)		After exclusion (*n* = 112)	
Left	3.69	Left	4.55
Right	4.26	Right	5.01
Simple	4.01	Simple	5.00

It makes most sense to control for the existence of two varieties with respect to complexity among those speakers who accept the construction at all – it is difficult to interpret preference for left or right-complexity for speakers whose grammar disallows doubling. Hence we constructed a second data set by excluding the judgments of those participants whose mean rating for the simple construction was below 3.0, assuming this means that they do not accept the construction. The results for this reduced data set can be found in the right part of Table 1.

We observe a slight numerical advantage for constructions in which the complex wh-phrase appears in the right position over constructions in which it occupies the left position, but the difference is rather small (<0.5 on the 7-point Likert scale), and we observe that constructions with two simple wh-phrases and those with a right-complex phrase are at (nearly) the same acceptability level.

10 For a more detailed description of the parameters of the individual studies, see https://scholarlypublications.universiteitleiden.nl/handle/1887/3307645 (accessed 23 February 2024), Appendix 1.1.

The plots in Figure 2 show the mean rating for Condition B (complex right) on the *x*-axis and the mean rating for Condition C (complex left) on the *y*-axis for each participant. Participants with an equal rating for both complex conditions fall on the diagonal line. Participants with a higher rating for complex right are below the line. Participants with a higher rating for complex left are above the line. Larger distance from the line reflects a larger distance between the two conditions.

The histograms in Figure 3 show the data distribution when considering the difference between complex right and complex left. E.g., a value of –1 on the *x*-axis means that the difference between the mean rating for Condition B was one point lower than for Condition C.

However, we set out to investigate if there are two dialects that govern the distribution of left- and right-complexity, i.e., whether there are two or more distinct grammars (or speaker types), more specifically, grammars with a clear preference for right-complexity and grammars with a clear preference for left-complexity. A statistical method to test for multimodality is the likelihood-ratio test as described above. Here and for the following experiments we fitted three Gaussian finite mixture models to the data that differed in the number of underlying normal components (1, 2, or 3, Models M1, M2, and M3). Using the likelihood-ratio test procedure,

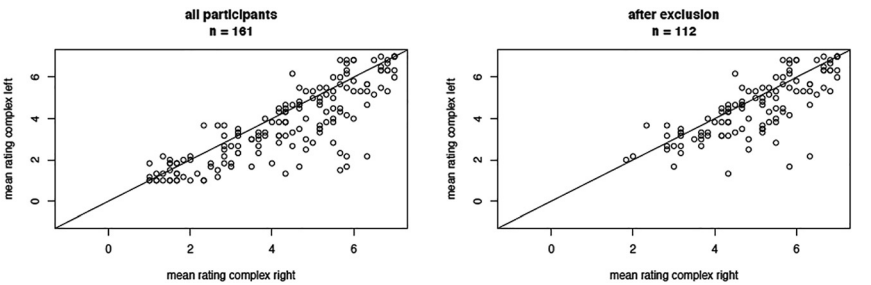

Figure 2: Scatter plot right and left complexity, pooled Dutch data.

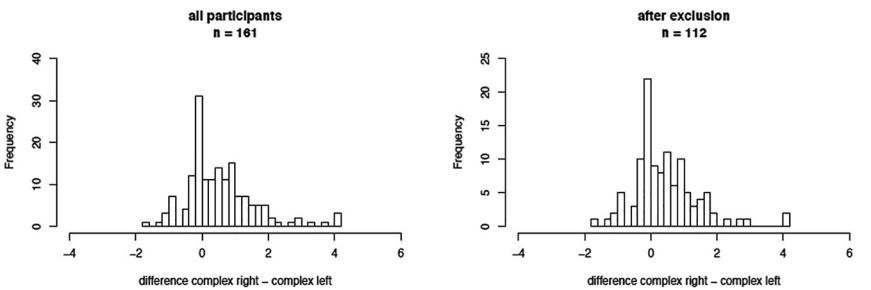

Figure 3: Difference between right and left complexity, pooled Dutch data.

we compared the log-likelihoods of these models to find the model that best fits the data.[11]

It turns out that the assumption that there are two normal distributions underlying the data best fits both the complete data set and the reduced data set. In other words, the likelihood-ratio test indeed suggests that there are two dialects in

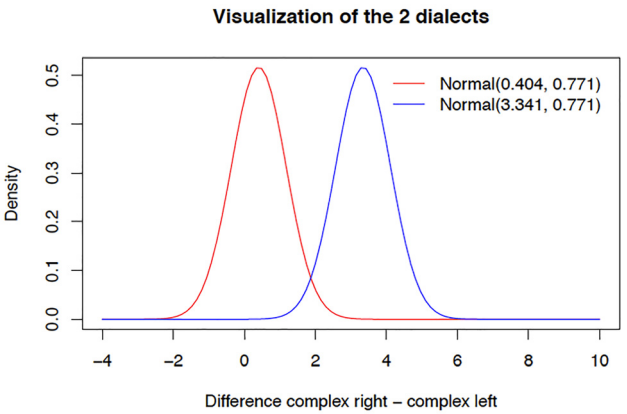

Figure 4: Dialects of complete data set, pooled Dutch data.

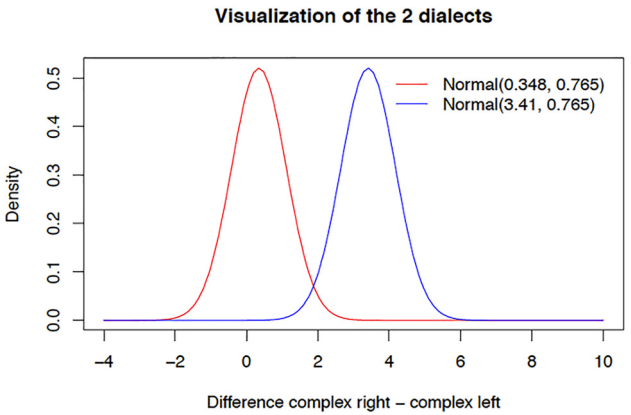

Figure 5: Dialects of reduced data set, pooled Dutch data.

11 The details of the statistical analysis for the pooled Dutch data are given in https://scholarlypublications.universiteitleiden.nl/handle/1887/3307645 (accessed 23 February 2024), Appendix 1.1.4.

Dutch for the distribution of left- and right-complexity. Figure 4 visualizes these dialects for the complete data set and Figure 5 for the reduced data set.

While the existence of two dialects would conform to our expectations, their nature is slightly surprising. The normal distribution of one dialect is characterized by a peak slightly above 0 (a tiny preference for right-complexity), while the distribution of the other dialect peaks slightly below 4. It reflects a normal distribution with a strong preference for right-complexity, but it is constituted by very few participants as the histogram (Figure 3) shows.

5.2 German

For German, our analysis also combines data from two studies carried out in two different regions.[12] Again, the conclusions based on the pooled data are similar to those based on the individual studies. One hundred twenty five participants judged the acceptability of 18 doubling constructions in the three conditions simple, right- and left-complex, as described above. The left part of Table 2 gives the mean ratings of all participants for each of the conditions, while the right one gives the values for the data of those participants accepting the simple doubling construction, as evidenced by a mean rating above 3.

By and large, the judgments for German are quite similar to those for Dutch, with the difference that doubling constructions involving a complex wh-phrase are rated slightly below their Dutch counterparts, but we doubt the difference can be of a linguistic significance. In particular, just like in Dutch, there is a small numerical advantage for constructions with right-complexity over those with left-complexity of around 0.5 on the 7-point Likert scale.

The plots in Figure 6 show the mean rating for Condition B (right-complex) on the *x*-axis and the mean rating for Condition C (left-complex) on the *y*-axis for each

Table 2: Mean ratings, pooled German data.

All participants (*n* = 125)		**After exclusion (*n* = 111)**	
Left	4.08	Left	4.33
Right	4.55	Right	4.85
Simple	4.73	Simple	5.07

12 The parameters of the individual studies are described in more detail in https://scholarlypublications.universiteitleiden.nl/handle/1887/3307645 (accessed 23 February 2024), Appendix 1.2.

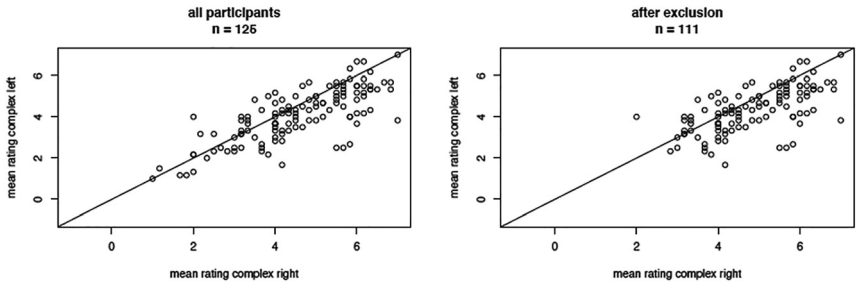

Figure 6: Scatter plot right and left complexity, pooled German data.

participant. Participants with an equal rating for both complex conditions fall on the diagonal line. Participants with a higher rating for complex right are below the line. Participants with a higher rating for complex left are above the line. Larger distance from the line reflects a larger distance between the two conditions.

The histograms in Figure 7 show the data distribution when considering the difference between complex right and complex left. E.g., a value of –1 on the *x*-axis means that the difference between the mean rating for Condition B was one point lower than for Condition C.

We fitted three Gaussian finite mixture models to the data that differed in the number of underlying normal components (1, 2, or 3, Models M1, M2, and M3). Using the likelihood-ratio test procedure, we compared the log-likelihoods of these models to find the model that best fits the data.[13] Again, the results seem to be best analyzed

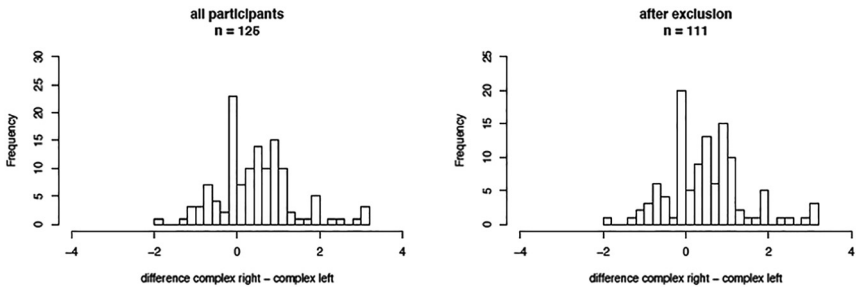

Figure 7: Difference between right and left complexity, pooled German data.

13 The details of the statistical analysis for the pooled German data are given in https://scholarlypublications.universiteitleiden.nl/handle/1887/3307645 (accessed 23 February 2024), Appendix 1.2.

by the assumption that the data is characterized by two normal distributions, both for the complete and the reduced data set. Figure 8 depicts these two normal distributions for the complete data set, and Figure 9 does the same for the reduced data set.

A comparison of these figures with the ones presented for Dutch gives no evidence for any interesting difference between the two languages with respect to the location of complexity in the doubling construction. Hence, both the Dutch and German pooled data sets are characterized by two normal distributions, one that does not make a systematic distinction between left- and right-complexity (a tiny preference for right-complexity notwithstanding) and one that strongly prefers right-complexity but is composed of very few participants only.

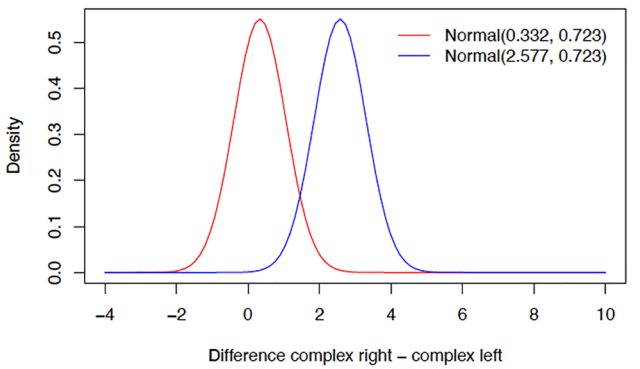

Figure 8: German pooled data.

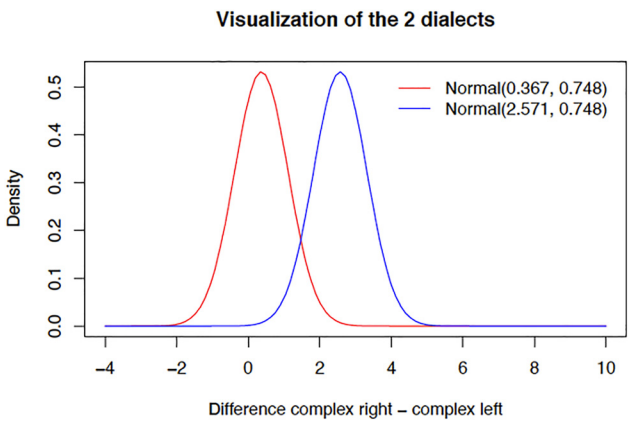

Figure 9: German, reduced data.

6 Discussion and conclusion

Our experiments have revealed a slight preference for complex wh-phrases to appear in the right copy in a doubling construction both for Dutch and German, a preference that even seems to have the same magnitude in the two languages. The difference in means is rather small, ranging between 0.36 (German, Bochum/NRW) and 0.56 (German, Berlin/Brandenburg).

If we look at the sets of language varieties as a whole, there is no grammatically significant difference between the left and right realizations of a complex wh-phrase in the doubling construction. This is compatible with the assumption described above that there are two mechanisms of generating doubling constructions: (i) a simple process of copying and (partial) deletion (yielding right-complexity); (ii) the base generation of complex wh-phrases in their left scope position (yielding left-complexity). Most idiolects would then have both mechanisms, and both right- and left-complexity.

The absence of a difference between left- and right-complexity can also be taken as an argument against existing theoretical assumptions that favor right-complexity. E.g., a copy and deletion approach to wh-doubling favors right-complexity if it is carried out in a uniformly cyclic fashion, such that (partial) deletion applies after each movement step. It is inconceivable how β might reemerge in the movement step linking 2 to 1 if deletion of the lower Copy 2 would have to precede movement (26). Similarly, if the step from 2 to 1 involved partial copying, i.e. only copying of the wh-element α, one would expect only right-complexity to be possible.

However, if in the full copying + post-syntactic deletion approach discussed in Section 2 the removal of the complement β could take place after the completion of the whole movement chain (27a), the assumption that all but one of the occurrences of β would need to be eliminated by a process of 'free deletion in Comp' would as such neither favor (27b) nor (27c).

(26) $((_{wh}\ \alpha\beta)\ \ldots\ldots\ ((_{wh}\ \alpha\beta)\ \ldots\ldots\ (_{wh}\ \alpha\beta)))$
1 2 3

(27) a. $((_{wh}\ \alpha\beta)\ \ldots\ldots\ ((_{wh}\ \alpha\beta)\ \ldots\ldots\ (_{wh}\ \alpha\beta)))$
b. $((_{wh}\ \alpha\beta)\ \ldots\ldots\ ((_{wh}\ \alpha\beta)\ \ldots\ldots\ (_{wh}\ \alpha\beta)))$
c. $((_{wh}\ \alpha\beta)\ \ldots\ldots\ ((_{wh}\ \alpha\beta)\ \ldots\ldots\ (_{wh}\ \alpha\beta)))$

If, on the other hand, it is really possible to identify two distinct groups of varieties, a model operating with (at least) two components has an advantage. Specifically, it can be assumed that a variety with a strong preference for right-complexity lacks the option for base generation of wh-phrases at the left sentence periphery. As we have seen, there are very few such varieties, however.

While it is not possible to make a firm choice between competing theoretical analyses on the basis of our results, this study shows that for phenomena such as the left- and right-complexity of wh-chains, systematic data collection and quantitative analysis is necessary to clarify the empirical and theoretical situation.

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Semantic agreement and the dual model of language

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Abstract: This paper will show that agreement cannot be considered a purely narrow-syntactic phenomenon, i.e., a phenomenon which cannot be given a functional-semantic explanation. It will show that person-number-gender (PNG-) affixes on verbs and adjectives are semantically interpretable even in languages such as English and Swedish, where they at first sight seem to be completely redundant. Several instances of so-called semantic agreement will reveal that these PNG-affixes convey important meanings not overtly marked by their co-referential DPs. In some cases, this even holds for the opposite case, i.e., that the PNG-affixes displaying grammatical agreement with their co-referential DPs also contribute with meanings not conveyed by the latter. Attempts to explain away semantic agreement by assuming there to be phonologically null determiners that give the DPs the same PNG-values as the agreement affixes will be refuted by data that show that the nouns often cannot be modified by such elements. Instead of being uninterpretable features that must be deleted before the derivation is sent to the semantic component, it will be shown that PNG-affixes on verbs and adjectives function like pronominal affixes, i.e., that they are arguments of the verbs and adjectives. They can either be anaphoric, in which case they can display semantic agreement, agreeing with the lexical semantics of the referent rather than with the PNG-values of the co-referential DP, or cataphoric, in which case they behave like formal-subject pronouns, signifying the PNG-value of the following logical DP subject.

Keywords: grammatical agreement; Y-model; anaphoric pronouns; semantic component; null pronouns; lexical semantics

1 Introduction

Agreement has been seen as one of the unique features of narrow syntax, together with recursive-embedding, the obligatory subject position (the ‘extended projection principle’, EPP), and structural case (Pinker and Jackendoff 2005). According to Chomsky (2000 et seq.), agreement affixes represent semantically uninterpretable

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features on the predicate that must be deleted before the derivation is sent to the semantic component. Agreement affixes are semantically uninterpretable for the predicate in the sense that a predicate cannot be semantically modified in person-number-gender (PNG) in the same way as it can be semantically modified in tense, aspect, and mood. Instead, it represents displaced information pertaining to an argument of the predicate. Thus, to researchers such as Chomsky, Pinker, and Jackendoff, agreement does not have a semantic function and hence cannot be explained by functional grammars. It constitutes a stumbling block for anyone who wishes to combine the formalistic and functionalistic theories into one unified theory of language.

In Nordström (2014), I showed that language cannot be recursive embedding if one wants it to be able to manage two central features of language, namely, discrete infinity and specifiers. Moreover, in Nordström (2017, 2022) I proposed semantic accounts for the EPP, structural case and even agreement. This paper will go further in not only showing that agreement *can* be given a functional-semantic explanation but in some cases must be, namely in semantic-agreement constructions.

2 Formal versus functional grammars and the dual model of language

The present paper is part of the dual model of language, as worked out in Nordström (2022). The dual model of language offers a way of bridging the gap between the so-called formalistic and functionalistic grammars. Traditionally, the formalistic grammars have focused on one aspect of language, syntax, whereas phonology and semantics are treated as different and ancillary components. In this "syntacto-centric" tripartite model of language, the so-called Y-model, syntax is the generator of linguistic structures and the two other components then map these structures into meaning and sound units (Chomsky 1995 et seq., Culicover and Jackendoff 2005). However, as Culicover and Jackendoff (2005) point out, it has become increasingly clear during the last decades that the phonological and semantic components have their own combinatorial processes and their own structures. In fact, through the adoption of the minimalist program, Chomsky (1995 et seq.) has come to the conclusion that many phenomena that were previously ascribed to syntax are either phonological in nature, in the wider sense of the word, such as head raising and the head-complement order, or semantic in nature, such as argument and information structures. Furthermore, according to his 'strongest minimalist thesis', the faculty of language only contains features motivated by the linking of sound and meaning, and this linking process should function as simply as possible (Chomsky 2007: 4).

Therefore, Culicover and Jackendoff (2005) argue that the three components semantics, syntax, and phonology operate in parallel when a linguistic structure is derived. Indeed, Fitch et al. (2005), but also Culicover and Jackendoff (2005) even mention the possibility that there is no narrow-syntactic component at all, although they do not explore that option. That is essentially what the dual model of language does. Since I show that language cannot be recursive embedding and since the EPP, agreement, and structural case can be given functional-semantic explanations, there is no need to assume a narrow-syntactic component. Syntax, as a phenomenon, is distributed between the semantic and phonological components, it is argued.

Functional grammar, as represented by Halliday and Matthiessen (2004), Valin (2005), Givón (2001), Bybee et al. (1994), puts more emphasis on the functions of language, and ultimately on semantics. For example, Bybee et al. (1994) assume that language consists of a semantic and a phonetic substance, but no third part, syntax. Syntactic structures are merely the products of the substance in this framework (i.e., they are themselves semantic and phonological substances; see also Croft 2003: 287). This is reminiscent of Aristotle's description of language as sound with meaning and Saussure's division of the linguistic unit into a signifier and a signified. Similarly, Halliday and Matthiessen (2004) divide language into two dimensions: content and expression. By expression they refer to the sound side of language, phonology and phonetics (including signs and graphemes), whereas content refers to the meaning side of language, semantics proper and lexicogrammar. Lexicogrammar is the way in which meaning is mapped into a complex integrated structure. Semantics and lexicogrammar are intimately linked, and semantics determines the lexicogrammatical structure (semantic hierarchies, iconicity, etc.) The relation between content and expression, however, is more arbitrary (as already noted by Saussure), supporting the idea that they are two separate components.

Generative grammar, on the other hand, assumes a separate syntactic component (narrow syntax) which has its own structures and rules. In this Y-model, the generation of an expression begins in the narrow-syntactic component and is then transferred to the semantic and phonological components, which merely interpret this structure. The dual model of language rather agrees with the functional view of grammar in this respect. However, this does not entail that the dual model of language is identical to that of functional grammar. Firstly, functional grammar represents a set of different frameworks (such as lexical-functional grammar and role-and-reference grammar), all with their own particular assumptions. Secondly, many assumptions of these frameworks are not adopted by the dual model of language. For example, Halliday and Matthiessen (2004) view language as highly stratified, compositional and hierarchical, with phonetics at the basic level and semantics at the highest level. In the dual model of language, language is also structured and stratified, but the phonological component is not assumed to be embedded in the semantic

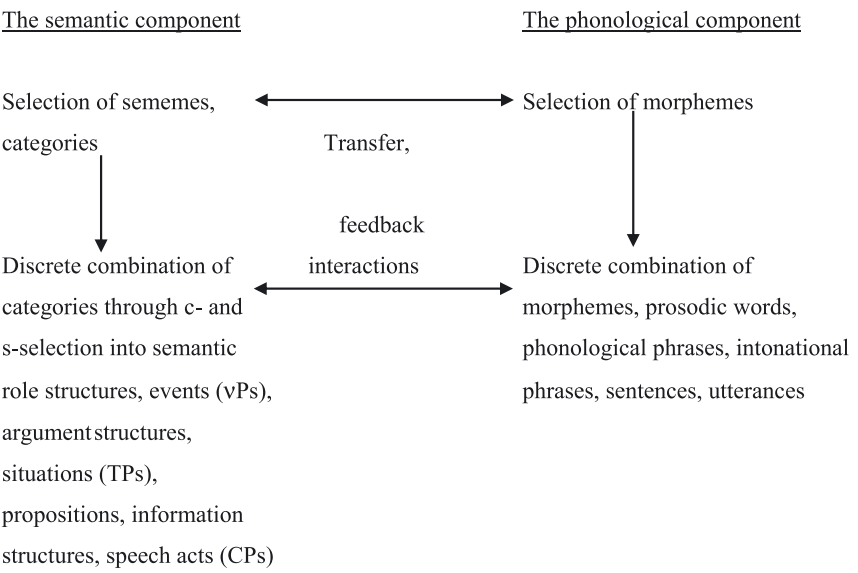

Figure 1: The dual model of language (Nordström 2010:10).

component. Rather they represent two separate systems that interact and operate in parallel, in the sense of Culicover and Jackendoff (2005).

At the same time, the dual model of language is fundamentally different from Culicover and Jackendoff (2005) in that it does not recognize the third component, narrow syntax, as being responsible for the assembly of lexical items into syntactic structures. Instead, the dual model of language relocates the assembly of the abstract universal categories into argument structures, events (νPs), situations (TPs), propositions, information structures and speech acts (CPs) to the semantic component, and the assembly of the concrete morphemes into words, phrases and clauses to the phonological component. The model can be illustrated as in Figure 1. For more information, see Nordström (2022: 10).

Already when Haspelmath (2000) wrote his review paper "Why can't we talk to each other", where he advocated for more cross-disciplinary dialog and even cooperation, the previously vast differences between formalist and functionalist grammars had begun to disappear. With the introduction of the minimalist program (1995), Chomsky started to dismantle much of the redundant machinery of the government-and-binding and principles-and-parameters theories. During the next two decades, many phenomena which had previously been thought as parts of an autonomous narrow-syntactic component were argued to be semantic and phonological in nature, such as theta-role assignment (Chomsky 2004), head raising

(Chomsky 2001) and even head-dependent word order (Chomsky 2007). Indeed, according to the *strongest minimalist thesis*, narrow syntax should only contain features motivated by the linking of sound and meaning, and this linking process should function as simple as possible (Chomsky 2007: 4). Likewise, Culicover and Jackendoff (2005) argued for a 'simpler syntax' operating in parallel with the semantic and phonological components, whereas Stroik and Putnam (2013) argued against the autonomy of syntax, placing narrow syntax in an intersection between the sensory-motor (form) and the concept-intentional (meaning) systems. The dual model of language goes even further in arguing that the core function of narrow syntax assumed by Chomsky, inter alia, i.e., recursive-embedding, cannot capture two of the most fundamental functions of language, namely, discrete infinity and specifiers. Furthermore, all remaining syntactic phenomena, such as agreement, case marking, the *that*-trace effect and the EPP, etc., can be given semantic and/or phonological explanations, rendering narrow syntax obsolete. From this point of view, there are no longer any theoretical incompatibilities that would make cross-disciplinary cooperation between formalist and functionalist research impossible.

3 Semantic agreement and the Y-model

As said in Sections 1 and 2, the standard model of generative grammar, as presented by Chomsky (1995 et seq.) is often referred to as the Y-model. The Y-model assumes that language in the narrow sense consists of three components: a narrow-syntactic component, a semantic component, and a phonological component. The narrow-syntactic component generates the structure and then transfers it to the semantic and phonological components, where it is interpreted and spelled out (Chomsky 2007, 2008). Narrow syntax is thought to represent a component unique to language (Chomsky 2007) and is therefore the main difference between formalistic and functionalistic theories. According to this model, there are certain features that can only be given a formalistic explanation, and these are located in the narrow-syntactic component.

As also said in Section 1, the Y-model assumes that agreement affixes on predicates are semantically uninterpretable as far as the predicate is concerned, since a verb cannot be semantically modified in PNG in the same way as it can be modified in aspect, tense, and mood. Therefore, the PNG-features must be somehow "eliminated" before the derivation is sent to the semantic component. According to Chomsky (2000 et seq.) the uninterpretable features are eliminated by being co-indexed with the PNG-features of the associated DP, for which they are interpretable. Only after this formal operation has taken place, the derivation can be transferred to the semantic and phonological components.

The phenomenon called semantic agreement constitutes a major problem for this account of agreement. Semantic agreement refers to constructions where the predicate does not agree with the associated DP but rather with the lexical semantics of the referent, in conflict with the PNG-features of the co-referential DP. In (British) English, this can occur with collective nouns (Corbett 2003: 161, 2006: 2–4):

(1) a. *The committee is deciding on a solution.* [group]
(Smith 2017: 824)
b. *The committee are deciding on a solution.* [individuals]
(Smith 2017: 824)

In (1a), the subject DP is in the 3rd person singular, and the finite verb agrees with it in person and gender. In (1b), on the other hand, the verb disagrees with the subject DP in that it is in the plural. Furthermore, there is a semantic difference between the constructions. Example (1a) is interpreted as a group, whereas (1b) is interpreted as a set of individuals, a meaning not conveyed by the form of the co-referential DP. Thus, it appears that in (1b), the finite verb does not agree with the subject DP in form but rather with the lexical semantics of the referent. This suggests that at least some cases of agreement must have access to the semantic component and cannot be an elimination of uninterpretable features in the narrow-syntactic component.

In order to preserve the Y-model of agreement, previous accounts of semantic agreement such as Dikken (2001), Pesetsky (2013) and Josefsson (2006) have been forced to introduce additional premises to account for the phenomenon, namely the presence of phonologically null elements that give the DPs the right PNG-values. However, these assumptions are clearly departures from the minimalistic methodology needed in a theory of language which is built on rationalistic assumptions and whose underlying premises have not yet been independently substantiated. One should not introduce additional premises that are not possible to verify only to save the theory, especially if there is no independent evidence to support the presence of these null elements.

The approach taken here does the opposite. Since the data is not compatible with the Y-model, it is the Y-model that should be changed, not the data. Furthermore, the dual model of language is not only able to explain the data, but it can do so by reducing the number of premises through assuming that language in the narrow sense only consists of two components rather than three.

To be sure, there are instances in language systems when one could make a better case for the presence of null elements. In Swedish, for example, there are five noun declinations (or six depending on how one counts). These are defined by their different plural endings, *-or*, *-ar*, *-(e)r*, *-n* and zero. In the case of the fifth declination, one could argue in the vein of tagmemic grammar that there is an ending, only that it is null. The existence of the other endings clearly implies that nouns of the fifth declination are also declined in the plural. On the other hand, it is almost always the

case when a language has a set of markers belonging to a certain grammatical category that one value is unmarked. This is often the case with the present tense in the tense system and the indicative in the mood system, etc. Therefore, in the vein of functional typology, it could equally well be argued that the Swedish fifth declination, originally the declination for all neuters, is the unmarked value and that there is simply no suffix for this value. The absence of any of the other suffixes in a plural construction such as *flera hus* 'many houses' indicates that the noun belongs to the fifth declination.

Such null morphemes or unmarked values are quite different from the kind of null morphemes that some scholars argue exist in order to account for semantic agreement in terms of grammatical agreement. In these cases, there are nouns that can be overtly marked in a particular number or gender, by means of determiners and attributive adjectives. Nevertheless, these scholars argue that there are null elements of a conflicting number or gender that dominate these DPs and somehow turn the DPs into that number or gender instead. In this case, it is not a matter of introducing an element that is fully compatible with the noun it modifies, an element that is predicted by analogy by the existence of similar overt elements in the presence of other nouns. On the contrary, these elements are *incompatible* with the PNG-values of the nouns they are supposed to dominate and are *not* predicted by the presence of similar elements.

The dual model of language offers a systematic explanation for semantic agreement without introducing such additional premises, namely that agreement is a phonological realization of either a set of functional categories (grammatical agreement) or a set of lexical-semantic features (semantic agreement) pertaining to the antecedent. This is similar to Wechsler and Zlatić's (2003) and Wechsler's (2011) distinction between "concord", which involves grammatical features on nouns, and "index", which involves referential features. Furthermore, the notion that PNG-affixes on predicates represent uninterpretable features that must be deleted before transfer to the semantic components cannot be correct. In most subject-predicate agreement systems in the languages of the world, the PNG-affixes on the predicate function as pronouns (Siewierska 1999; Nordström 2017, 2022: Chapter 5). Indeed, in cases of semantic agreement, they contribute with meanings not conveyed by the co-referential DPs. This is also the case with certain instances of grammatical agreement, as will be shown in Section 5.

Data on semantic agreement has previously focused on English and Russian. In this paper, I will present data from Swedish. Most of the data is not new but has been discussed rather thoroughly within Scandinavian linguistics. My contribution to the matter is to relate the English and Swedish data to the generative Y-model model of agreement and show that this model cannot account for the phenomenon, whereas the dual model of language can. I also present new authentic and constructed

examples on semantic agreement in order to make my case. I choose Swedish since it is my mother tongue. This enables me to make grammatical and semantic judgments on constructed examples. Furthermore, Swedish has no less than three types of semantic-agreement constructions. In Swedish, there can be semantic agreement in both passive and predicative constructions in both formal and colloquial language. Thus, it is not simply a matter of style, but a matter of meaning. In many of these cases, it is not possible to reconstruct null elements. Furthermore, some of these semantic-agreement constructions are more or less obligatory, in conflict with the PNG-features of the co-referential DP. Interestingly, the grammatical-agreement option is avoided due to its *semantic* implications.

4 Semantic agreement in English and Russian

To illustrate how semantic agreement poses a challenge for the standard generative model of agreement, I will use some classical examples from English and Russian. As said in the last section, collective nouns in (British) English can either be constructed with a singular or a plural verb, depending on whether the referent should be interpreted as a group or as individuals. Example (1a) and (1b) are repeated here as (2a) and (2b):

(2) a. *The committee is deciding on a solution.* [group]
(Smith 2017: 824)
b. *The committee are deciding on a solution.* [individuals]
(Smith 2017: 824)

As said above, the Y-model of agreement has no way of accounting for this phenomenon. In that model, the lexical items, in this case the collective noun and the finite verb, are selected by the narrow-syntactic component and then agree, in the sense that the DP assigns its PNG-values to the finite verb (more precisely to its category tense) and the finite verb assigns nominative case to the DP (Chomsky 2000 et seq.). By co-indexing the finite verb with the subject DP, for which the PNG-values are interpretable, the semantically uninterpretable features of the verb are eliminated, and the structure can be sent to the semantic component (Chomsky 2000 et seq.) Therefore, when a collective noun is in the singular, the finite verb *should* always be assigned that value. Yet, as seen above, this is *not* always the case. The finite verb can be put in the plural, in conflict with the PNG-value of the DP. Furthermore, this plural value on the verb *has* a semantic interpretation not conveyed by the co-referential DP. It forces an individualistic reading of the collective noun.

Arguably, the only way to account for this discrepancy without introducing additional premises, such as phonologically null elements, is to *not* assume that the verb is assigned uninterpretable PNG-features by agreeing with the grammatical PNG-values of the DP subject in examples such as (2b), but rather that the verb receives its value by agreeing with the lexical semantics of the noun. The semantic component can thus play an integral role in agreement and agreement affixes can be semantically interpretable. The fact that the noun and the verb can grammatically disagree has rather to do with a formal difference between nouns and PNG-affixes. Both the noun and the PNG-affix can index a particular referent. However, whereas collective nouns have the possibility of either being interpreted as a group or as several individuals, PNG-affixes behave like personal pronouns in that they are more feature specific.

Thus, the collective noun is polysemous in that it could either be interpreted as a group or as individuals. Once introduced, the PNG-affix of the verb can either be in the singular or the plural depending on which meaning the speaker wishes to convey, much in the same way as an anaphoric pronoun following a collective noun can either be in the singular or the plural depending on the intended meaning, see (3):

(3) a. *As for the government, it has offered itself up for criticism.* [group]

b. *As for the government, they have offered themselves up for criticism.* [individuals]

The notion that the verb is not assigned its PNG-values through agreement with the grammatical PNG-values of the DP in a semantic-agreement construction, but rather through agreement with the lexical semantics of the referent is strengthened by the fact that singular collective nouns cannot have plural modifiers even though the verb is in the plural, see (4):

(4) a. *This committee are deciding on a solution.*
(Smith 2017: 824)

b. **These committee are deciding on a solution.*
(Smith 2017: 824)

Such examples are clear indications that we are not dealing with covertly plural nouns. The noun is in the singular and hence its demonstrative modifier must also be in the singular. If there was a phonologically null plural operator that turned the DP plural, it should arguably be possible to insert the plural modifier.

Thus, semantic-agreement affixes seem to function like anaphoric pronouns. They are *pronominal affixes*. This explains another puzzling feature of semantic agreement pointed out by Smith (2017), namely that reflexive pronouns agree with the PNG-affix of the verb, not with the subject DP in semantic-agreement constructions, see (5):

(5) a. *The government has offered itself up for criticism.*
(see Smith 2017: 826)
b. *The government have offered themselves/*itself up for criticism.*
(see Smith 2017: 826)

The construction is similar to collective *as-for*-topic constructions with semantic-agreement subject pronouns. The reflexive pronoun agrees with the pronominal subject, not with the topic DP, see (6):

(6) a. *As for the government, it has offered itself up for criticism.*
b. *As for the government, they have offered themselves/*itself up for criticism.*

The notion that the PNG-affix functions as an anaphoric pronoun explains another puzzling feature of semantic agreement, namely that it is not possible when the DP is a logical subject in situ in the VP (Smith 2017), see (7):

(7) a. *There is/*are a committee deciding the budget for next year.*
(Smith 2017: 825, 827)
b. *There are committees deciding the budget for next year.*

The DP *committee* is new information that has not yet been introduced. Thus, the PNG-affix of the verb cannot refer back anaphorically to the lexical semantics of the noun. Anaphors must be locally bound and be c-commanded by their antecedents. Instead, the agreement affix merely functions as a cataphor, indicating the PNG-value of the logical subject DP, which will be spelled out later in the clause, like a formal subject in an existential construction. Semantic agreement only works when a referent has already been introduced in the form of a polysemous noun. Then, an anaphor can be used to disambiguate the meaning.

Russian has a similar type of semantic agreement as English. If the subject is a polysemous masculine noun such as *vrač* 'doctor', which can either refer to a male or a female, and the referent is a female, the agreement affix on the verb can be feminine in conflict with the gender of the noun, see (8):

(8) a. *Nov-yj* *vrač-ъ* *prišël-ъ*.
new-MASC.NOM.SG doctor-NOM.SG arrived-MASC.SG
'The new doctor arrived.' [= a male or a female]
(Pesetsky 2013: 36)

b. *Nov-yj* *vrač-ъ* *prišl-a.*
new-MASC.NOM.SG doctor-NOM.SG arrived-FEM.SG
'The new doctor arrived.' [= a female]
(Pesetsky 2013: 36)

The only way of preserving the standard generative model of agreement as valuation and elimination of uninterpretable features is, as said above, to assume phonologically null elements that have features that correspond to the PNG-features of the agreement affix. This is a solution that has been advocated for both English and Russian semantic-agreement constructions. These proposals will be evaluated in Section 6 below. Here, it suffices to say that one should always be cautious in introducing additional premises only to save the model, especially if there is no independent evidence to support that these elements exist. The more additional premises that are introduced, the more likely it becomes that some other combination of premises represents the true explanation. According to the principle of Occam's razor, one should therefore always strive to use the model with least number of premises.

5 Semantic agreement in Swedish

A similar situation to that of English and Russian is found in Swedish passive and predicative constructions, where the passive participle or predicative agrees with the subject in gender and number. Firstly, if the subject is a collective noun, the passive participle or predicative can either be in the singular or in the plural, depending on whether the noun should be interpreted as one entity or as several individuals (Svenska språknämnden 2005: 239–246; Teleman et al. 1999: III 343), see (9):

(9) a. *Grupp-en* *blev* *intervjuad* *av* *Sveriges* *radio.*
group-DEF.UTR.SG became interviewed.UTR.SG by Sweden's radio
'The group was interviewed by the Swedish radio.' [as a group]
b. *Grupp-en* *blev* *intervjuad-e* *av* *Sveriges* *radio.*
group-DEF.UTR.SG became interviewed-PL by Sweden's radio
'The group were interviewed by the Swedish radio.' [as individuals]

In the plural case, one interpretation is that the members were interviewed one at a time. That interpretation is unlikely in the singular case.

As in English, the PNG-affixes behave like anaphoric pronouns, since the latter can also agree semantically with the lexical semantics of the referent, as seen in dislocated topic constructions, see (10):

(10) a. *Rörande grupp-en, så blev den intervjuad*
regarding group-DEF.UTR.SG so became it.UTR.SG interviewed.UTR.SG
av Sveriges radio.
by Sweden's radio
'As for the group, it was interviewed by the Swedish radio.'

b. *Rörande grupp-en, så blev de intervjuad-e*
regarding group-DEF.UTR.SG so became they interviewed-PL
av Sveriges radio.
by Sweden's radio
'As for the group, they were interviewed by the Swedish radio.'

Secondly, neuter nouns referring to humans, which are rare,[1] tend to be constructed with predicatives or passive participles in the common gender, the so-called "uter". This is due to the fact that the uter represents a formal collapse of the Old Swedish masculine and feminine genders, so that humans and animates in general are strongly associated with that gender, whereas the neuter is strongly associated with non-humans and inanimates (Svenska språknämnden 2005: 247–250; Teleman et al. 1999: II 226, III 343), see (11):

(11) a. *Statsråd-et har varit sjuk länge.*
cabinet.minister-DEF.NEUT.SG has been sick.UTR.SG long
'The cabinet minister has been sick for a long time.' [= 'he' or 'she']

b. *Statsråd-et har varit ??sjuk-t länge.*
cabinet.minister-DEF.NEUT.SG has been sick-NEUT.SG long
'The cabinet minister has been sick for a long time.' [= 'it']

The neuter option sounds odd since it has dehumanizing connotations, corresponding to the pronoun *it* in English. Instead, the uter option is chosen, in conflict with the DP. In this case, *both* options can be said to represent semantic agreement, since the neuter gender on the participle/predicative also contributes with a meaning not conveyed by the DP. Arguably, therefore, both options are semantically interpretable. If the grammatical agreement option was uninterpretable and therefore deleted before being transferred to the semantic component, it would not be avoided.

Again, the PNG-affixes on the predicative behave like anaphoric pronouns, since the latter also need to semantically agree with the lexical semantics of the noun rather than with the formal PNG-values of the DP, see (12):

1 Other notable examples are *vittne* 'witness', *biträde* 'assistant', *ombud* 'agent', *barn* 'child' and *syskon* 'sibling'. The common denominator between all these is that they are semantically gender neutral, i.e. not specified for male or female reference.

(12) a. *Rörande statsråd-et, så har han/hon varit*
regarding cabinet.minister-DEF.NEUT.SG so has he/she been
sjuk länge.
sick.UTR.SG long
'As for the cabinet minister, he/she has been sick for a long time.'

b. *Rörande statsråd-et, så har ??det varit*
regarding cabinet.minister-DEF.NEUT.SG so has it been
??sjuk-t länge.
sick-NEUT.SG long
'??As for the cabinet minister, it has been sick for a long time.'

As pointed out by an anonymous reviewer, there is a caveat to the pattern just described. The noun *barn* 'child' is, as mentioned in fn. 1, also in the neuter gender. In this case, however, it sounds better with the neuter gender on the predicative, *barnet är sjukt* 'the child is sick'. A similar situation is found in German, where the neuter noun *Kind* 'child' tends to be followed by the neuter anaphor *es* 'it' without having any negative connotations. I would argue that this is part of a semantic principle of assigning the neuter gender to referents of a small size. A case in point here is the German diminutive ending *-chen*, as in *eine Magd* (archaic:) 'a.FEM girl' > *ein Mädchen* 'a.NEUT little girl'. Furthermore, as with *syskon* 'sibling', *barn* is a superordinate noun, referring to both male and female infants.

Thirdly, mass nouns in the uter gender, which are also rare, tend to be constructed with predicatives in the neuter gender, since that gender is strongly associated with mass, generic and superordinate meanings, whereas the uter is associated with type, individual, and specific meanings (Malmgren 1990; Teleman et al. 1999: III, 344). Hence, with the uter gender on the predicative, a type reading is implied, whereas with the neuter gender a mass meaning is implied (Enger 2004), see (13):

(13) a. *Rysk råolja är inte förnybar-t.*
Russian.UTR.SG crude.oil is not renewable-NEUT.SG
'Russian crude oil is not renewable.' [as a mass]

b. *Rysk råolja är inte förnybar.*
Russian.UTR.SG crude.oil is not renewable.UTR.SG
'Russian crude oil is not renewable.' [as a specific type]

Examples such as (13a) are generally known as *pancake sentences*, referring to the fact that concrete nouns in the uter gender or in the plural, such as *pannkaka* 'pancake' can also be constructed with predicatives in the neuter gender, in this case to generate a generic meaning, see (14):

(14) a. *Amerikanska pannkak-or är god-a.*
American.PL pancake-PL are good-PL
'American pancakes taste good.' [as a specific type]
b. *Amerikanska pannkak-or är gott.*
American.PL pancake-PL are good-NEUT
'American pancakes taste good.' [generic meaning]

For a more detailed description of the phenomenon, see Åkerblom (2020). Apart from Swedish, the phenomenon also exists in Danish and Norwegian.

Just as in the other cases of semantic agreement, the PNG-affixes of the predicative behave like anaphoric pronouns, in that the latter can also agree with the lexical semantics of the noun rather than with the formal PNG-values of the DP, see (15):

(15) a. *Rysk råolja, den är inte förnybar, den.*
Russian.UTR.SG crude.oil that.UTR.SG is not renewable.UTR.SG it.UTR.SG
'As for Russian crude oil, that one is not renewable.' [as a specific type]
b. *Rysk råolja, det är inte förnybar-t, det.*
Russian.UTR.SG crude.oil that.NEUT.SG is not renewable-NEUT.SG that.NEUT.SG
'As for Russian crude oil, that's not renewable, that.' [as a mass]

As regards predicative and passive participle agreement in general, Chomsky (2001: 7–8) argues that the predicative/passive participle, like the finite verb, is assigned its PNG-value through agreement with the DP as its argument (which is later raised to the Spec-TP position). Through this agreement relation, the uninterpretable PNG-features of the predicative/participle are valued and deleted before the derivation is transferred to the semantic component. However, the fact that these PNG-values can be assigned by the lexical semantics of the noun in conflict with the formal PNG-values of the DP and that these values can contribute with important semantic information about the argument not conveyed by the PNG-values of the DP demonstrate that the Y-model of agreement must be wrong. Both semantic and grammatical agreement affixes represent semantically interpretable features that cannot be deleted before they are transferred to the semantic component.

The analysis proposed for semantic agreement can quite naturally be extended to noun-adjective concord. As regards the semantic relevance of adjective concord, attributive adjectives can occur without their associated nouns in many languages of the world, so that the agreement affixes alone signify the identity of the referent. In

Swedish, for example, the definite form on the attributive adjective can signify whether the referent is a male or a female. In that case, gender-specific nouns such as *man* 'man' and *kvinna* 'woman' become superfluous, see (16):

(16) a. *den* *gaml-e* (*mannen*)
the.UTR.SG old-DEF.MASC.SG man
'the old man'

b. *den* *gaml-a* (*kvinnan*)
the.UTR.SG old-DEF woman
'the old woman'

Furthermore, just as was the case with subject-predicate agreement, noun-adjective concord can contribute with information not given by the noun, i.e., semantic agreement. In Swedish the old masculine and feminine genders have, as said above, formally collapsed into one common gender on nouns, the uter gender. However, the adjective inflection can still signify biological gender (Bylin 2016), see (17):

(17) a. *den* *ny-e* *chef-en*
the.UTR.SG new-DEF.MASC.SG boss-DEF.UTR.SG
'the new boss' [typically interpreted as a male]

b. *den* *ny-a* *chef-en*
the.UTR.SG new-DEF boss-DEF.UTR.SG
'the new boss' [a male or a female]

Again, this natural gender cannot be assigned by agreement with just the PNG-value of the associated noun since the noun is in the common gender. Rather, it is assigned anaphorically through agreeing with the lexical semantics of the referent.

The idea that an adjective or verb can agree with the lexical semantics of a noun follows from the dual model of language in the sense that all kinds of agreement are seen as interactions between the semantic and phonological components. Through cross-linguistic investigations, it has become increasingly clear that linguistic categories have a semantic core, a proposition that even Chomsky (2007: 14) subscribes to. Nouns denote concrete or abstract entities, adjectives properties or classifications (Anderson 1997), verbs different types of events (Ramchand 2008; Nordström 2022: Chapter 6), prepositions and case semantic roles and relations between entities (Blake 2001; Nordström 2022: Chapter 6), etc. Even the most grammatical categories have been shown to have semantic functions, such as complementizers, which have been shown to denote propositional modality (Nordström 2010), and infinitive markers, which have been shown to denote event modality (Dixon 2005). The dual model of language therefore relocates the lexical and functional categories to the semantic component, where they represent a higher level of abstraction than lexical semantics (Nordström 2022: Chapter 3). Therefore, unlike the Y-model, which places

grammatical agreement in the narrow-syntactic component and semantic agreement either in the narrow-syntactic or in the semantic component (see next section), the dual model of language argues that both take place in the semantic component (although the production of the concrete morphemes of course takes place in the phonological component).

Even gender has been shown to have a semantic core (Corbett 1991) although phonology also plays an important role in gender assignment in many languages, such as the Germanic ones (Nordström 2022: 111–113). As shown by Zubin and Köpcke (1986) and Steinmetz (1986), gender assignment in German is based on over 100 semantic principles. Apart from this, gender, like person and number, fulfills an important deictic function on anaphoric pronouns, signaling which noun or referent an anaphoric pronoun is referring back to. Lastly, gender can be divided into two subcategories, grammatical gender and natural gender (Corbett 1991: 9). Grammatical gender has to do with dividing nouns into classes/groups on the basis of different semantic and phonological principles, some of which were applicable in an earlier stage of the language and are no longer transparent except for historical linguists. Natural gender on the other hand is only based on semantic principles, such as sex, animacy, countability, etc. Arguably it is this very difference that grammatical and semantic agreement utilize. When a predicate is agreeing grammatically, it refers back to the grammatical gender of a previous noun, called concord in Wechsler and Zlatić's (2003) framework. When it agrees semantically, it instead refers back to the lexical semantics of a previous referent, its referential index according to Wechsler and Zlatić (2003). As shown above, agreement affixes function like anaphoric pronouns in this respect. A relevant observation here, made by Wechsler (2011), is that subject-verb agreement, like personal pronouns, can be in the 1st and 2nd person, referring back to a pronoun that in turn refers back to the speaker or the listener. This is a kind of referential indexing that nouns and their modifiers cannot utilize at all.

The precise mechanisms for grammatical and semantic agreement in the dual model of language is slightly different from that of lexical-functional grammar, as described in Wechsler (2011). According to Wechsler (2011: 1014), index agreement takes place when the controller somehow is defective in terms of PNG-features: "whenever the controller fails to satisfy the constraining equation, the semantic value of the target is added to the denotation of the controller". Wechsler (2011) bases this generalization on the fact that nouns such as *professeur* 'teacher' in French lack formal gender specifications, so that the choice between the article *le* (masc.) or *la* (fem.) depends on the semantic gender of the referent. However, as we have seen above, semantic gender is not only used when the controller is unspecified but also when it has a certain grammatical PNG-value that is in conflict with its semantic

PNG-value. In the dual model of language, semantic agreement is rather seen as a strategic choice of the speaker to either specify a PNG-value not signified by the controller or to signify a conflicting one in order to convey a certain meaning.

6 Previous explanations

Within the framework of generative grammar, different solutions have been proposed to account for the phenomenon of semantic agreement that maintain the standard model of agreement. Firstly, Dikken (2001) and Sauerland (2004) both assume that English collective nouns in semantic-agreement constructions are headed by null pro-forms or operators that turn the DP plural. However, as said above, one should not introduce additional premises only to save the theory, in particular if there is no independent evidence that supports the existence of these elements. As Smith (2017: 824) points out, there is no plural element that could possibly be reconstructed with which the predicate agrees in English. Singular collective nouns cannot have plural modifiers even though the verb is in the plural, see (18):

(18) a. *This committee are deciding on a solution.*
(Smith 2017: 824)
b. **These committee are deciding on a solution.*
(Smith 2017: 824)

It is true that the *as-for*-construction in English can involve a collective noun followed by a plural subject pronoun, as in (6b). However, such topics have a phonological pause between them and the subject pronoun, whereas in the semantic-agreement construction, there is no pause between the collective noun and the finite verb. Furthermore, the dislocated topic has a special topic intonation not seen on the corresponding subject DP. Thus, the constructions are completely different. In order to derive a semantic-agreement construction from an *as-for*-construction, one must first omit the *as-for*-preposition, then the topic intonation, then the pause and lastly the personal pronoun. That would mean four additional premises.

As regards Swedish semantic-agreement constructions involving neuter human nouns, Josefsson (2006) proposes that the disagreement between the subject and the predicative can be explained by assuming a null personal pronoun that dominates the noun. Hence, what looks like a case of semantic agreement is really a case of grammatical agreement. As evidence for this hypothesis, Josefsson (2006) points out that there is an alternative construction in Swedish where the definite human noun is preceded by a personal pronoun, see (19):

(19) *Han/Hon statsråd-et har varit sjuk länge.*
he/she cabinet.minister-DEF.NEUT.SG has been sick.UTR.SG long
'That cabinet minister, he/she has been sick for a long time.'

Against this argument, it should firstly be pointed out that the construction is an informal alternative with certain subjective and evaluative connotations, signaling familiarity and common knowledge. It also has a different intonational contour with the noun receiving topic intonation. In many respects, it is similar to the *as-for*-construction in English, the DP representing a new topic. It is easy to insert a phonological pause and a resumptive pronoun after the DP (*Han statsrådet, han har varit sjuk länge, han*). The construction is thus not equivalent to the semantic-agreement construction (11a). Furthermore, even if it could explain why it is grammatical to have disagreement between a human neuter noun and a predicative in the uter gender (11a), it does not explain why the other option, neuter agreement between the human noun and the predicative (11b), sounds odd. To explain that in terms of grammatical agreement, one would have to postulate that the neuter noun is always constructed with the null pronoun, a highly unlikely scenario.

There is, however, one fact that to my mind settles the issue. The neuter human noun can also be in the indefinite form and then it is not possible to have a personal pronoun preceding the noun. Nevertheless, the predicative can be, and mostly is, in the common gender, see (20):

(20) a. *Anders Ferbe från IF Metall talade också om vikten*
Anders Ferbe from IF Metall spoke also about the.importance
av att alltid se till att det finns ersättare ifall
of to always see to that there is replacement in.case
ett ordinarie skyddsombud är sjuk eller på semester.
a.NEUT.SG regular safety.delegate is sick.UTR.SG or on vacation
'Anders Ferbe from IF Metall also spoke about the importance of always making sure that there is a replacement in case a regular safety delegate is sick or on vacation.'
(*Arbetet*, 04.03.2015; Linda Flood: *40 nya inspektörer ska minska olyckorna* [40 new inspectors to reduce accidents])

b. * … *ifall han/hon ett ordinarie skyddsombud är sjuk eller på semester.*

To conclude, the idea of a null personal pronoun cannot be used to explain semantic agreement in Swedish predicative constructions involving a human neuter noun and a predicative in the uter gender.

The construction with a preceding personal pronoun is furthermore not available for the other cases of semantic agreement in Swedish. For collective nouns, it is possible to be constructed with a demonstrative determiner in the singular, e.g., *den*

där gruppen 'that group'. However, this determiner cannot be in the plural (*de där*), see (21):

(21) a. *Den där gruppen blev intervjuade av Sveriges radio.*
'That group was interviewed by Sweden's radio.'
b. * *De där gruppen blev intervjuade av Sveriges radio.*

The subjects of pancake sentences cannot be constructed with such a definite determiner, since they must be in the indefinite form, see (22):

(22) * *Det där rysk råolja är inte förnybar-t.*
that there Russian.UTR.SG crude.oil is not renewable-NEUT.SG
'That thing Russian crude oil, it's not renewable.'

Even in this case, however, Josefsson (2006, 2014) assumes a null pronoun [*det*], see (23):

(23) a. *Pannkak-or är gott.*
pancake-PL is good.NEUT.SG
'Pancakes taste good.'
b. *[*Det*] *pannkak-or är gott.*
it.NEUT.SG pancake-PL is good.NEUT.SG
Intended meaning: 'Pancakes taste good.'

According to Josefsson (2006: 1354), there are two gender systems in Swedish, one grammatical and one semantic. The grammatical genders are the ones described above, uter (*en*, *den*, etc.) and neuter (*ett*, *det*, etc.). The semantic genders are two animates, the masculine for male referents (*han*) and feminine for female referents (*hon*), and two inanimates, the uter for things (*en*, *den*, etc.) and the neuter for masses (*ett*, *det*, etc.). In general, I concur with this analysis since it agrees with the general division of grammatical and semantic genders referred to in Section 4 above. Furthermore, as demonstrated in Section 3 above, it appears that nouns and their modifiers and determiners are in the grammatical gender, whereas anaphoric pronouns and agreement affixes on predicative adjectives and passive participles, which refer back to the noun or another previously mentioned noun or referent, can either be in the grammatical or in the semantic gender, depending on what they refer back to.

However, instead of arguing that semantic agreement takes place in the semantic component between the predicative and the lexical semantics of the noun, Josefsson (2006) introduces a "semantic phrase" headed by the null pronoun [*det*] that dominates the uter noun in pancake sentences. Thus, she again turns semantic agreement into grammatical agreement. This assumption simply cannot be accepted in a rationalistic theory of language in the sense of Hempel (1965) since the null

pronoun can *never* be spelled out. Since the null pronoun cannot be spelled out, the existence of the null pronoun can never be verified (see Enger 2013: 296 for similar arguments). If the theory of language permits such assumptions, basically anything could be argued for.

It might be counterargued that bare mass nouns in the uter gender could potentially be constructed with the demonstrative pronoun *det där* in colloquial speech, e.g., ??*det där råolja* 'that thing crude oil', ??*det där dijonsenap* 'that thing Dijon mustard'. Likewise, Josefsson (2014) points out that the neuter quantifier *något* can marginally be used with uter mass nouns, e.g. ??*något snö* 'a little snow' instead of *någon snö*. To this, it could be retorted, however, that modified uter mass nouns, such as *rysk råolja* or countable nouns in the plural such as *amerikanska pannkakor* simply cannot be constructed with *det där* or *något*: **det där rysk råolja*, **något rysk råolja*, **det där amerikanska pannkakor*, **något amerikanska pannkakor*.

Nevertheless, Josefsson (2006, 2014) argues that *det* can modify uter and plural nouns in pancake sentences, only that it can only do so covertly. This raises the obvious question why *det* should be phonologically null before indefinite uter and plural nouns in pancake sentences but overt before definite neuter nouns. It can hardly be due to a conflict in values between *det* and the uter or plural nouns, since *det* cannot be overt with indefinite neuter nouns either (**det ett vatten* '*that a water'). Furthermore, this assumed obligatory covertness means that the postulated element can *never* be directly observed, that its existence can never be either confirmed or refuted, or as Josefsson (2014: 438) herself puts it, "it is impossible to provide empirical proof of the existence of a null *det* heading the subject". This cannot be permitted in an empirical science, which builds upon confirmation or refutation through observation. If it was permitted, it would open up the possibility for any researcher who observes a phenomenon that cannot be explained by the model he or she uses simply to postulate an unobservable category to explain the phenomenon, and nobody could ever refute it (nor verify it either for that matter).

The only possible option for the subject of pancake sentences to be constructed with a neuter pronoun is again to dislocate the DP and insert a resumptive pronoun in the subject position, see (14b). However, as was the case with the *as-for*-construction, this cannot be seen as support for the idea that there is a null pronoun in the pancake sentence. If that was the case, one must assume not only that the resumptive pronoun is omitted but also the phonological pause between the left-dislocated DP and the pronoun and the topic intonation on the DP.

The option of dislocating the DP and inserting a resumptive pronoun is not available for the semantic-agreement constructions involving collective nouns at all. Rather, one must make a paraphrase with a present participle *rörande*/*angående gruppen* 'regarding/concerning the group' followed by a resumptive pronoun and subject verb inversion (due to the V2 rule), see (24):

(24) a. * *Grupp-en, de blev intervjuad-e av Sveriges*
group-DEF.UTR.SG they became interviewed-PL by Sweden's
radio.
radio
Intended: 'As for the group, they were interviewed by the Swedish radio.'

b. *Rörande/angående grupp-en, så blev de*
regarding/concerning group-DEF.UTR.SG so became they
intervjuad-e av Sveriges radio.
interviewed-PL by Sweden's radio
'As for the group, they were interviewed by the Swedish radio.'

It would be impossible to argue that the semantic-agreement construction is derived through omitting the participle, the topic accent on the DP, the phonological pause, *så*, and the inverted subject. To conclude, the idea that there are phonologically null pronouns that assign the PNG-value of the agreement affix in semantic-agreement constructions in English and Swedish seems highly unlikely.

Moreover, the notion that there is a phonologically null plural operator/pronoun in English that turns the collective noun plural does not explain why existential constructions cannot have semantic but do have grammatical agreement, see (7), here repeated as (25):

(25) a. *There is/*are a committee deciding the budget for next year.*
(Smith 2017: 825, 827)

b. *There are committees deciding the budget for next year.*

On the other hand, as said in Section 3, this pattern follows from the semantic analysis of semantic agreement. Since the referent has not yet been introduced, the verb cannot agree with it anaphorically. Anaphors must be locally bound and be c-commanded by their antecedents. On the other hand, the PNG-affix on the verb can function as a cataphoric pronoun, indicating the PNG-value of the following DP. However, unlike anaphoric pronouns, cataphoric pronouns cannot agree semantically with their postcedents.

A third problem with the plural-operator/pronoun analysis of English semantic-agreement constructions, which Smith (2017) points out, is that it is not necessarily the case that the verb must semantically agree in plural in order for a reflexive pronoun to be in the plural, see (26):

(26) *There is a team starting to psych up themselves in that dressing room.*

Here, the collective noun is the logical subject structurally below the finite verb. Hence, the verb cannot be in plural, as seen above. However, in the following appositive participle phrase, the reflexive pronoun *is* in the plural. If one assumed

the plural-operator/pronoun analysis, which turns the collective noun into a plural noun, it would be difficult to explain how it can be that the verb is in the singular, but the reflexive pronoun is in the plural. In the semantic-agreement account argued for here, however, it would follow as a logical consequence. Since the referent has been introduced when the participle phrase is spelled out, the reflexive pronoun can again agree with the lexical semantics of the referent rather than with the formal features of the preceding DP.

Smith's (2017) explanation of semantic agreement unfortunately also involves several additional premises. To begin with, he assumes the traditional Chomsky (2000 et seq.) view of agreement as involving interpretable and uninterpretable features. In order to accommodate both types of agreement, he furthermore assumes that agreement can either take place before the derivation has been sent to the interfaces or after. In the former, but not in the latter case, the interpretable features play a role in the agreement. Thirdly, he assumes that agreement can go in two directions, either from the top down or from the bottom up. Semantic agreement requires that the probe is c-commanded by the goal, he argues.

There are several problems with this analysis. Firstly, there are reasons to believe that PNG-affixes on verbs are interpretable for the verb since the verb selects and assigns a semantic role to the argument in question. Arguments are thus semantically interpretable for verbs. Since the PNG-affixes behave like subject pronouns, they are also interpretable for the verbs. Moreover, a verb denotes an event, and an event is often different when the subject is plural instead of singular in terms of iteration, duration, etc. Secondly, the recursive-embedding model of Chomsky (2000 et seq.) does not permit probing from the bottom up, since the head is embedded in a set with its complement. It can only probe its set-member, the complement. Thirdly, again, one should not introduce additional premises only in order to save the theory.

Pesetsky (2013) also assumes a null morpheme to account for feminine semantic agreement in Russian. His motivation for doing so is that classifying attributive adjectives to masculine human nouns cannot be in the feminine gender, whereas descriptive attributive adjectives can. This suggests that the derivation is made feminine by a null morpheme located between the classifying and descriptive adjectives, see (27):

(27) a. *Nov-yj/-aja* *vrač-ъ* *prišl-a.*
new-MASC/FEM.NOM.SG doctor-NOM.SG arrived-FEM.SG
'The new doctor arrived.'

b. *Glavn-yj/*-aja* *vrač-ъ* *poliklinik-i* *skazal-a*
head-MASC/*FEM.NOM.SG doctor-NOM.SG clinic-GEN.SG say-PST.FEM.SG
čtoby …
that.SUBJ
'The (female) head doctor of the clinic ordered that …'

Again, this paper does not accept null morphemes introduced only to save the hypothesis. As long as the existence of such null morphemes cannot be independently verified, one should not assume them. Furthermore, the semantic subject-verb agreement in Russian is independent of whether or not the attributive adjectives also have semantic agreement. In one of the options in (27a) above, for example, the descriptive attributive adjective does not agree semantically but grammatically with the masculine head noun. Nevertheless, the verb agrees semantically, not grammatically.

The reason why Russian classifying attributive adjectives cannot have semantic agreement whereas descriptive adjectives can should be seen as part of a general distributional difference between these types of adjectives. As opposed to descriptive adjectives, classifying adjectives (such as *a chemical experiment*) cannot generally be inflected in degree (? *a more chemical experiment,* ? *the most chemical experiment*) and cannot function predicatively (? *The experiment was chemical*) without losing their classifying meaning, i.e., being interpreted as descriptive adjectives. Furthermore, classifying adjectives can often be transformed into genitive attributes (*a presidential order* > *the president's order*) and first elements of compounds (*a biological course* > *a biology course*), something which descriptive adjectives never can. Thus, classifying adjectives are functionally closer to the noun than descriptive adjectives. They are arguably bound constituents headed by the noun whereas descriptive adjectives are adjuncts and hence more independent of the noun. It is therefore unsurprising that classifying adjectives in Russian behave like articles and determiners in that they cannot display semantic agreement.

To return to Scandinavian pancake sentences, it has also been argued, by Malmgren (1990: 100) in particular, that these have underlying infinitive verb phrases as subjects. Since infinitive phrases are in the neuter gender, there is again no disagreement between the subject and the predicative and hence no semantic agreement. Compare the examples in (28):

(28) a. *En ny utrikesminister vore inte så dum.*
a.UTR.SG new.UTR.SG foreign.minister were not so stupid.UTR.SG
'A new foreign minister wouldn't be so stupid.'

b. *En ny utrikesminister vore inte så dum-t.*
a.UTR.SG new.UTR.SG foreign.minister were not so bad-NEUT.SG
'A new foreign minister wouldn't be such a bad thing.'

c. *Att ha en ny utrikesminister vore inte så dum-t.*
to have a.UTR.SG new.UTR.SG foreign.minister were not so bad-NEUT.SG
'To have a new foreign minister wouldn't be such a bad thing.'

Examples (28b) and (c) are more or less synonymous, and it could be argued that (28b) is simply (28c) with the infinite verb omitted. Thus, it could be argued that (28b) is not a case of semantic agreement. However, as Enger (2004) points out, the same cannot be said about true pancake sentences:

(29) a. *Amerikansk-a pannkak-or är go-tt.*
American-PL pancake-PL are good-NEUT.SG
'American pancakes taste good.'
b. ?? *Att äta amerikansk-a pannkak-or är go-tt*
to eat American-PL pancake-PL are good-NEUT.SG
'??To eat American pancakes tastes good.'

Example (29b) sounds odd because it is not the act of eating of the pancakes that tastes good but the pancakes themselves. Similar arguments can be made in regard to mass nouns as in example (13a). It is not the act of using Russian crude oil which is not renewable but the crude oil as a product. It is therefore not possible to say that examples such as (29a) are derived from examples such as (29b). Examples such as (13a) and (29a) are true cases of grammatical disagreement and semantic agreement.

Yet another explanation for pancake sentences has been offered by Åkerblom (2020: 156–183). She argues that it is a matter of default agreement and that it is used in cases when the controller is defective. As seen above, pancake sentences are used for indefinite nouns, i.e., when the referent is non-specific, such as *amerikanska pannkakor* 'American pancakes', *rysk råolja* 'Russian crude oil', etc. Thus, rather than agreeing with the subject, a default 3rd person singular neuter form is inserted, Åkerblom argues.

I have three problems with this analysis. Firstly, it would have been more convincing if pancake sentences only involved bare mass nouns, such as *olja* 'oil', *senap* 'mustard', etc., since these lexical items lack any number or gender marking and since mass nouns are generally uncountable. However, as shown above, pancake sentences also involve modified mass nouns, such as *rysk råolja*, and countable nouns in the plural, such as *amerikanska pannkakor*. These noun phrases are definitely *not* defective in terms of number and gender marking.

Secondly, as shown in Section 4, there is a semantic difference between pancake sentences with semantic agreement and their grammatical-agreement counterparts. With the neuter gender on the predicative, a generic or mass meaning is generated, whereas with the uter gender, a type meaning is indicated. This has to do with the fact that mass nouns and generic or superordinate nouns tend to be in the neuter gender in Swedish, such as *vatten* 'water', *guld* 'gold', *vin* 'wine', *folk* 'people', *djur* 'animal(s)', *verktyg* 'tool(s)', etc. The use of the neuter gender in pancake sentences is to utilize this meaning association. If it were only a matter of default agreement, no semantic contrast would occur.

Thirdly, there are actual cases of default agreement in Swedish, but these follow rather strict syntactic rules. Default agreement in the 3rd person singular neuter can exist on objective predicatives (Teleman et al. 1999: III 341). As opposed to semantic agreement, however, it only occurs when the object comes *after* the predicative. When the object comes before the predicative, the predicative instead agrees grammatically with the object. Crucially, there is no semantic contrast between the options default agreement (30a) and grammatical agreement (30b):

(30) a. *Vi slipade ren-t fönsterbräde-na.*
we sanded clean-NEUT.SG window.sill-DEF.PL
'We sanded the window sills clean.'
b. *Vi slipade fönsterbräde-na ren-a.*
we sanded window.sill-DEF.PL clean-PL
'We sanded the window sills clean.'
c. * *Vi slipade fönsterbrädena rent.*

To conclude, there are strong arguments for not accepting the hypothesis that pancake sentences are cases of default agreement. Again, one must accept that a predicate can agree with the lexical semantics of a noun in conflict with its grammatical number and gender.

7 Conclusions

Irrespective of whether one adopts the idea that the faculty of language merely consists of a semantic component and a phonological one, as in Nordström (2022), or one maintains the Y-model, in which there is an intermediate component, narrow syntax, where the derivation is generated before it is sent to the other components, this paper has shown that agreement cannot be considered a purely narrow-syntactic phenomenon, a phenomenon which cannot be given a functional-semantic explanation. It has been shown that PNG-affixes on verbs and adjectives are semantically interpretable even in languages such as English, Swedish and Russian, where they at first sight seem to be completely redundant. Several instances of so-called semantic agreement have revealed that these PNG-affixes convey important meanings not signified by their co-referential DPs. In some cases, this even holds for the opposite variant, i.e., that the PNG-affixes displaying grammatical agreement with their co-referential DPs also contribute with information about the referent not conveyed by the latter.

Attempts to explain away semantic agreement by assuming there to be phonologically null determiners that give the DP the same PNG-values as the agreement affixes have been refuted by data that show that the noun often cannot be modified

by such elements. Furthermore, in a rationalistic theory of language, in the sense of Hempel (1965) one should not introduce additional premises only to save the hypothesis, especially if there is no independent evidence to support these elements.

Instead of being uninterpretable features that must be deleted before the derivation is sent to the semantic component, it has been shown that PNG-affixes on verbs and adjectives function like pronominal affixes, i.e., that they are arguments of the verbs and adjectives. They can either be anaphoric, in which case they can display semantic agreement, agreeing with the lexical semantics of the referent rather than with the PNG-values of the co-referential DP, or cataphoric, in which case they behave like formal-subject pronouns, signifying the PNG-value of the following logical DP subject.

The paper is part of a larger project that attempts to assign semantic functions to seemingly purely syntactic phenomena. In Nordström (2017, 2022) phenomena such as the obligatory subject position (EPP) and structural case (nominative-accusative) were also given functional explanations in terms of information structure (the theme-rheme principle) and the argument saliency hierarchy. Together with the insight of Nordström (2014), which showed that language cannot be recursive-embedding but must be a discrete combinatorial system, the dual model of language argues that the narrow-syntactic component has become obsolete and that syntax as a phenomenon is distributed among the semantic and phonological components. If these arguments are accepted, there are no longer any theoretical incompatibilities that would make it impossible for the functional and formal camps to have cross-disciplinary cooperation. Rather, the dual model of language opens up the possibility for a unified theory of language.

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Tabea Reiner*

A constructionist analysis of gapping against the background of generative analyses

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Abstract: The present contribution starts from Goldberg and Perek's (2019) analysis of gapping within a constructionist framework. The authors promote their analysis as surpassing non-constructionist takes on gapping and ellipsis more generally. In particular, they claim predictive power. That this is not the whole truth is explained in detail in this contribution. It is shown which predictions can be made from their perspective versus from a generative perspective and it is discussed whether they are borne out. Furthermore, I highlight how the predictions relate to the fundamentals of the respective theories and, as a consequence, how they differ in kind.

Keywords: ellipsis; gapping; generative grammar; formal semantics; construction grammar; predictions

1 Introduction

Ellipsis phenomena have been extensively treated in the generative literature (for a fairly recent survey cf. Aelbrecht 2015, note also the composition of Craenenbroeck and Temmerman 2019). At the same time, ellipsis has received comparatively little attention from explicitly functional perspectives. An exception is Goldberg and Perek (2019) from a constructionist-functional point of view. Interestingly, the authors point out repeatedly that their account is capable of making predictions (Goldberg and Perek 2019: 188, 192, 194, 195, 198, 204). Predictive power, however, is something that is standardly associated with generative accounts rather than with constructionist ones. Thus, the question arises whether and how constructionist and generative predictions might differ from each other. This is the question addressed by the present paper.

When comparing predictive power of generative versus constructionist approaches, ellipsis is well suited as an example. Not only is there the prompt by Goldberg and Perek (2019), but ellipsis also provides an extreme test case for the

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respective analyses underlying the predictions: both approaches struggle with incompleteness, each in its own way. This will be shown when presenting the approaches in Sections 2.2 and 2.3. Then Section 2.4 compares the two approaches with respect to predictivity. In sum, this paper elaborates for syntax on a point that has been made for morphology in Reiner (2022: 155): the kind of prediction hinges on the kind of theory.

By default, I will use the term *ellipsis* in the following sense:

> ellipsis = a structure that lacks grammatically obligatory parts but is robustly judged well formed by native speakers and conveys a complete predication – notably without signalling omission *as such* (e.g., by intonation)[1]

This definition more or less mirrors the ones provided by recent handbook entries from a generative syntax (Aelbrecht 2015) or formal semantics (Reich 2011) perspective (I will treat formal semantics as a close ally of generative syntax in the present paper). Constructionists, on the other hand, do not initially need a general notion of ellipsis, as will become apparent from the discussion in Section 2. However, the definition excludes the extreme view that all utterances are elliptical in the sense that they are not maximally specified semantically (sketched and refuted by Tschauder 1986: 464). So, in sum, the definition above is narrow but not too narrow. Moreover, it makes explicit what is so special about ellipsis: incomplete sentences can seem as if they were complete.

For practical reasons, the focus will be on one type of ellipsis, viz. gapping. This phenomenon will first be presented in theory-neutral terms, thereby proving that such translation is possible even when starting from the distinct terminology of generative frameworks. I consider this step crucial in comparing theories since otherwise any dialogue might end abruptly by stating that "The phenomena […] are all framed within the theoretical framework of […]" (Fortuin 2021: 49, commenting on D'Alessandro 2021). In fact, generative labels for ellipsis types represent an easy case of translation. Despite the opaque terminology (cf. *gapping*, *pseudogapping*, *sluicing*, *stripping*, *right node raising* etc.[2]), the terms can be readily transferred to theory-neutral parlance as long as constituents are accepted as building blocks of syntax. This assumption should be consensual among a broad range of linguists even though they may entertain quite different notions of syntax and have different views on how basic constituents are.

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1 This is not to say that prosody plays no role in ellipsis. The point of excluding prosody from the definition of ellipsis is merely excluding aposiopesis, i.e. consciously breaking-off an utterance. To the extent that this is accompanied by signals of omission *as such*, it is excluded by the definition, cf. Hoffmann (2006: 92–93), Imo (2013: 305–314), Zifonun (2017: 46–47).

2 For an overview, cf. Reich (2011), Aelbrecht (2015).

2 Gapping

2.1 The phenomenon

Gapping is defined for languages that require a morphosyntactically finite verb in every full clause. With respect to these languages, the term refers to the absence of at least the finite verb in such a way that the definition of ellipsis given above is met; in particular the relevant sentence as a whole is judged well formed despite its incompleteness and there is no signal of omission as such, prosodic or otherwise. As a result of omitting the finite verb, typically two constituents remain. Since these are not (perceptibly) linked by a finite verb, there seems to be a gap between them – hierarchically and often also linearly. This might have motivated the term *gapping* (cf. Klein 1993: 777). (1) represents a standard example.

(1) *Gonzo ate the peas, and/but Lola the carrots.*
(Aelbrecht 2015: 569)[3]

In (1), two independent clauses are conjoined, where the second one lacks a finite verb so that the conjunction is followed by no more than the subject and the object. For interpretation, the lacking part is in some way or other obtained from the first conjunct, which makes (2) a more explicit version of (1).

(2) *Gonzo ate the peas, and/but Lola* [*ate*] *the carrots.*

Apart from the definitional properties, gapping is observed to be restricted to the second conjunct of coordinations in English, cf. (3) and (4).

(3) * *Gonzo the peas, and/because Lola ate the carrots.*
(Aelbrecht 2015: 569)

(4) * *Gonzo ate the peas, although/because Lola the carrots.*
(Aelbrecht 2015: 569)

The present contribution will focus on the "English" type represented by (1) above. For an example of gapping in the first conjunct of a coordination, coming from a verb-final language, cf. Ross (1970: 258).

As to the sources of the definition and observations laid out above, the core, i.e. the absence of the finite verb, seems to be presupposed in most of the literature and is explicitly stated for example in Repp (2009b: 5). The same holds for the restriction to the second conjunct of coordinations, which can be traced back at least

3 In examples adopted from the literature, punctuation before connectives follows the original examples.

as far as Jackendoff (1971: 21). In contrast, the remaining of two constituents is from Aelbrecht (2015: 569).[4] In addition, her definition requires the remnants to be contrasted with their syntactic equivalents from the first clause. I prefer to remain agnostic as to whether these properties – the remaining of exactly (or at least) two constituents as well as the requirement of contrast – should be part of the definition or of the empirical observations.

As a last step in presenting the phenomenon of gapping, please recall that the above definition of gapping is restricted to languages that require a morpho-syntactically finite verb in every full clause. Nothing is said on whether all such languages in fact exhibit gapping or whether the notion of gapping can be extended to yet other languages (for discussion cf. Ross 1970 and subsequent literature). This uncertainty means that the theory-neutral definition at the beginning of this section comes at the price of losing immediate reference to universal grammar (UG).

Having been defined in a theory-neutral way, gapping can be viewed through different theoretical lenses in the following sections. I will first present the constructionist-functional approach offered by Goldberg and Perek (2019), then contrast it with generative approaches to gapping, and finally compare the two perspectives.

2.2 A constructionist-functional analysis

2.2.1 The analysis as such

Goldberg and Perek (2019) provide an analysis of gapping within the framework of construction grammar. This theory can be said to have a functional orientation in that it puts an emphasis on both form *and* semantic-pragmatic meaning (Goldberg 2013: 30); in particular, it regards many linguistic phenomena as motivated by communicative needs (e.g., Goldberg 2013: 23–25; Goldberg and Perek 2019: 188). Moreover, it contrasts with generative grammar in that it is ostentatiously non-generative (Goldberg 2013).

The fact that constructionists deal with ellipsis seems surprising in the first place. After all, the notion of ellipsis presupposes a notion of incompleteness, hence also a notion of completeness. This does not seem to fit well with the tenet that the primary unit of description is the construction, i.e. a learned form-meaning pair of virtually any size or type (Goldberg 2013: 17). Potential internal structure is

4 There, it reads as a part of the definition. Indeed, defining gapping (and also stripping) via the remnants rather than via the missing parts comes with the potential advantage that the definitions of ellipsis types refer to (maximal) constituents only.

secondary. For example, although the proverb *An eye for an eye and a tooth for a tooth* does not include a finite verb, it counts as a construction just like a canonical sentence does since the form is associated with a meaning ('retaliation in kind is the appropriate way to deal with an offence or crime'). Similarly, certain bound morphemes are constructions, e.g., *pre-* (Goldberg 2006: 5). In other words: constructions are inherently complete. However, it will be shown below in which sense there is (in)completeness even in construction grammar. This will be part of presenting the constructionist notion of gapping in the following paragraphs.

The constructionist notion of gapping, as offered by Goldberg and Perek (2019), is summarized in their formula below.

GAPPING (+ argument cluster conjunction) construction	
Register:	formal
Form:	overtly expressed: [P(X, Y, Z*)], [<conjunction> [**X'**, **Y'**]]
Function:	P(X, Y, Z*) <conjunction> P(X'_{focus}, Y'_{focus}, Z'*) X' ≠ X; Y' ≠ Y; Z' ≈ Z Determine second use of P using POINTER function to a recently uttered simple or compound verb including tense, aspect, and voice. X, Y, Z: arguments or adjuncts. Underlining is used to indicate form as opposed to interpretation. **Boldface** indicates lexical stress (here, on X' and Y')[5] Constituents are indicated by brackets. *: 0 or more. (Goldberg and Perek 2019: 194)[6]

The gapping construction appears to be quite straightforward and this is not the place to study the formula line by line (reference to the lines is for clarity only). Instead, I will merely explain its most basic aspects, to be taken up in the following sections.

The first line of the actual formula specifies the register where the construction tends to appear. From a constructionist perspective, this is not just a statistical observation but an integral part of the language user's knowledge about the function of the form (Goldberg and Perek 2019: 188). In particular, an elliptical construction might differ in overall pragmatic function from its full-fledged counterpart (Goldberg and Perek 2019: 196). Imagine, for instance, that (2) is pronounced fully in planned speech (e.g., *Gonzo ate the peas and Lola ate the carrots*). Given the option of

5 A reviewer remarks that the remnants rather bear focal stress. Presumably, Goldberg and Perek mean the same thing because stating that an English word form or one of its syllables bears lexical stress would be quite uninformative, cf. Gut (2013: 244).

6 The authors do not spell out the abbreviation "P" within the formula but shortly afterwards when discussing an example; it stands for 'predicate' (Goldberg and Perek 2019: 194).

gapping, the realization of the second verb violates Grice's (1975: 45–46) second maxim of quantity – or Horn's (1984: 13) R-principle or Levinson's (2000: 37–38) I-principle. The violation, being obvious to the hearer, invites implicatures like the one that Lola does not normally just eat (for example because of gastric gavage).

The next line specifies the form of the construction in a quite unsurprising way. After that, the next three lines give the function of the form just specified. This is the step that turns the whole thing into a potential construction: a form paired with a meaning. To be a true construction, however, the pair must also be stored holistically rather than composed on demand (Goldberg 2006: 5). Little is said in Goldberg and Perek (2019) on why gapping should be non-compositional. At most, the authors suggest the following argument: languages vary so wildly in precisely which elliptical structures they allow that there can be no organizing principle at work (Goldberg and Perek 2019: 198).

For now, I focus on the first line of the functional specification. Within the first part of the utterance (plus the conjunction), every formal unit corresponds to a functional unit. The second part, however, is enriched in such a way that it conveys a full predication too. Within this predication, the meanings of the contrasting arguments or adjuncts (X', Y') are focused while the meanings of potential further arguments or adjuncts from the first part (Z'*) simply reappear, more or less as they stand. In particular, adjuncts from the first part are understood in the second part as well. Consider, for instance, a variant of (1), i.e., (5).

(5) *Gonzo ate the peas for lunch, and Lola the carrots.* (constructed, T.R.)

Following the gapping construction formula, the meaning 'for lunch' (Z) simply reappears in the semantics of the second part. This is indeed the most natural reading according to my native speaker informant.[7] Thus, the gapping construction formula captures the fact that non-obligatory material may figure in the interpretation of the second conjunct. Surprisingly, this asset is not particularly emphasized by the authors.

More generally, the formula does not differentiate between arguments and adjuncts or between obligatory and non-obligatory material. This might raise the question whether the gapping construction instantiates ellipsis at all: recall that ellipsis was defined as the accepted absence of *obligatory* parts (Section 1). The answer is simple. As long as the finite verb is missing and as long as we take the finite verb to be obligatory, we are dealing with ellipsis in the sense of the present paper (cf. the definition of gapping in Section 2.1). I am of course speaking from an outside perspective here; from a constructionist (inside) perspective, the finite verb is not obligatory per se in every kind of clause. Rather, the individual construction

7 I thank Hannes Warcup (8 February 2022, 21 February 2023).

determines its slots and which of them have to be filled. This means that construction grammar does not need a general notion of ellipsis but can nonetheless devise constructions like the gapping construction, which do instantiate ellipsis from an external point of view.

As an interim summary, the actual function of the second conjunct is an expansion of its expressed function in that it (a) constitutes a full predication and (b) includes potential further arguments or adjuncts from the first conjunct. It was shown above how this enrichment is achieved with respect to arguments and adjuncts.

The question remains how the enrichment is achieved with respect to the finite verb. As to this, the gapping construction formula states in a separate line: "Determine second use of P using POINTER function to a recently uttered simple or compound verb including tense, aspect, and voice". The pointer function is introduced by the authors as a psychological mechanism that is required in describing language use also beyond ellipsis: expressions like *respectively*, *vice versa*, or *ditto* cannot be understood but by referring back to some previous linguistic expression (Goldberg and Perek 2019: 190–191). Likewise, [<conjunction> [**X'**, **Y'**]] prompts the hearer (and is intended in this way by the speaker) to recall a recently uttered verb that is specified for tense, aspect, and voice. I would add: it is *the* most recently uttered verb with the required specifications, i.e., the one from the first conjunct. Note that these specifications include neither agreement nor negation, which is important to keep in mind for later discussion (Section 2.2.2).

For present purposes, the most important point to note is that a notion of incompleteness has surfaced: the manifestly expressed function of the second conjunct is an incomplete version of its actual function. For example, the mere form codes 'and entity entity' while the meaning specifies 'and entity acts on entity'. This answers the question in which sense there can be incompleteness within a constructionist framework. To this end, not even the framework's dedication to surface form as opposed to underlying form has to be abandoned: all that is compared are two functions. Goldberg and Perek (2019: 189) call this relationship the "SAME-EXCEPT relationship", where the "SAME" is specified by the pointer mechanism introduced above.

Interestingly, the pointer points to form, not function (Goldberg and Perek 2019: 192). This rather conservative view, i.e. assuming memories of form rather than function, might constitute a missed opportunity: gapping is known to tolerate morphosyntactic but not morphosemantic mismatches (Reich 2011: 1859–1860). This fact would have been nicely captured by a pointer mechanism that is restricted to function. Maybe Goldberg and Perek refrained from imposing such a restriction because voice mismatches (which *are* generally disallowed by gapping) would then have to be classified as semantic rather than syntactic.

In sum, the gapping construction is characterized by the following properties, which have been rearranged here:

- It is independent of any general notion of ellipsis.
- It is not compositional.
- The predicate for the second part is retrieved from the first part by a psychological pointer-mechanism.
- Arguments and adjuncts are treated alike.
- In the register where it can be expected, it differs pragmatically from its full-fledged counterpart.

Having laid out and discussed the gapping construction formula, the next section highlights one of its potential assets: making predictions on novel data. The focus will be on how the predictions are arrived at, not yet on how far-reaching they are. Furthermore, one of the predictions will be examined critically.

2.2.2 Predictions

From Goldberg and Perek's (2019: 194–197) exposition it becomes quite clear that construction grammar can do what is usually considered the hallmark of formal accounts, i.e. predicting novel data (cf., e.g., D'Alessandro 2021: 54–58). Indeed, the gapping construction formula makes at least five correct predictions. Four of them are hidden in the properties already listed above, the fifth derives from a tiny detail of the formula that has not yet been addressed. Furthermore, only the third and fifth prediction are particularly emphasized by the authors while detecting the other ones as they stand is left to the reader.

First prediction: in less formal registers, the formal realization of the enriched function (i.e., no gapping) invites other or no implicatures compared to formal speech. If we equate formal speech with planned speech, this prediction is borne out by the discussion of (2) above: while its full version appears plausible as a spontaneous description of an observed scene, it appears over-explicit in planned speech, inviting implicatures.

Second prediction: the hearer/reader may enrich the second conjunct by (versions of) all non-contrasting arguments and adjuncts from the first conjunct. This prediction is borne out by (5) above and other examples can be imagined easily.

Third prediction: since the pointer points to tense, aspect, and voice, voice mismatches are predicted to be impossible in gapping. This prediction is borne out by (6) and (7).

(6) ?? *She ate ice cream, and string beans by him.*
intended: 'She ate ice cream, and string beans were eaten by him.'
(Goldberg and Perek 2019: 195)

(7) ?? *The duck was struck by a car, and a truck the goose.*
intended: 'The duck was struck by a car, and a truck struck the goose.'
(Goldberg and Perek 2019: 195)

Fourth prediction: to the extent that the pointer points to tense, aspect, and voice only, agreement mismatches are predicted or at least not excluded. Put differently, the pointer mechanism is sufficiently underspecified to allow for agreement mismatches. This prediction is borne out by the standard observation that gapping tolerates mismatches related to morphosyntax, including agreement (Reich 2011: 1859–1860). Reich's handbook example shows that the mismatch may even involve suppletive forms, cf. (8).

(8) German

…weil	*ich*	*alt*	*bin*	*und*	*er*	*jung.*
since	I	old	am	and	he	young

'… since I am old and he is young.'
['weil ich alt **bin** und er jung **ist**']
(Reich 2011: 1860)

Fifth prediction: there are so-called sloppy readings. The defining characteristic of sloppy readings is that, in some way or other, a pronoun is understood in an elliptical clause which, however, differs from its antecedent in reference (Reich 2011: 1865). This phenomenon is predicted to occur in gapping by Goldberg and Perek's formula to the extent that any arguments or adjuncts functionally reoccurring in the second part are not required to be strictly identical to their antecedents (Z ≈ Z'). This prediction is borne out by (9).[8]

(9) A: *You made me what I am today.*
B: *And you me.* ['And you made me what I am today.']
(Goldberg and Perek 2019: 194)

The argument functionally reoccurring in the second part (Z) is the caused object *what I am today*. So, in some way or other, there is an *I* in both turns but the first one refers to A whereas the second one refers to B. This is a sloppy reading in the sense specified above.

8 It has to be noted that this example represents one of the rare cases where sloppy (as opposed to strict) readings are obligatory (apparently due to turn-taking).

However, I will argue that the condition "Z ≈ Z'" does more harm than good. First, the ≈-sign does not specify which other kinds of non-strict identity are allowed (if any). Second, it remains unclear whether strict identity is an option, too (it certainly should be). Third, sloppy readings would be predicted by Z = Z just as well. The reason is that the notion of function does not distinguish between concept and referent (cf. the semantic triangle by Ogden and Richards 1923: 11). In fact, it is the *same* concept that occurs in both parts of a gapping structure like (9). This becomes clear from the paraphrases in (10).

(10) A: *Current addressee made current speaker what current speaker is today.*
B: *And current addressee current made speaker what current speaker is today.*[9]

In both turns, the relevant concept is 'current speaker', irrespective of the fact that it relates to different referents. So I dare to conclude that sloppy readings are not sloppy at all. Therefore, I will not treat them further in the present paper.

To round off the present section, Goldberg and Perek's constructionist-functional account of gapping makes several correct predictions, as advertised by the authors. Some of them might seem to be trivial in deriving directly from the definition. This point, among others, will be addressed in Section 2.3.2., when comparing the constructionist-functional approach to generative/formal semantic ones. Before that, I introduce the latter in the following section.

2.3 Generative and formal semantic analyses

There is no shortage of generative analyses of gapping (to name just a few: Bîlbîie and La Fuente 2021; Broekhuis 2018; Carlson et al. 2005, Féry and Hartmann 2005; Johnson 2009; Repp 2009a, 2009b). Likewise, there is no shortage of such analyses of ellipsis generally (overviews in Aelbrecht 2015; Reich 2011). In order to set the constructionist analysis above against this wealth of generative and formal semantic analyses, I will focus on the list of properties at the end of Section 2.2.1. There, gapping was characterized from a constructionist point of view as: independent of any general notion of ellipsis, non-compositional, working with a psychological pointer mechanism

9 Standard examples of sloppy readings, where the sloppy reading is optional, can also be rendered this way, cf. (i) versus (ii).

(i) *John scratched his arm and Bill did, too* (VP-ellipsis, Reich 2011: 1865)
(ii) *John scratched some male person's arm and Bill scratched some male person's arm, too.*

for retrieval, blind to the argument-adjunct distinction, and heavily dependent on pragmatics. These properties contrast with standard properties of generative and formal semantic approaches.

2.3.1 Characteristics of the analyses

2.3.1.1 Ellipsis as a notional problem

Elliptical structures per se appear to combine two traits that are actually incompatible from a generative perspective: they are at the same time grammatical and incomplete. In order to solve this paradox, one usually tries to restore completeness by copy or deletion accounts of retrieval (cf. the overview in Aelbrecht 2015).

Even more fundamentally, incompleteness has its own problems. By incompleteness I mean the absence of obligatory material (cf. the definition in Section 1). This is also something that Reich (2011: 1850) emphasizes in delimiting ellipsis. For example, (11) is not ellipsis according to Reich.

(11) *She ate for hours.*
(Reich 2011: 1850)

The reason is that the theme argument of *eat* does not have to be realized anyway. As a consequence, however, (12) is not ellipsis either since the missing material is not obligatory.

(12) *She ate and he drank for hours.*
(meaning that both activities lasted for hours)

In contrast, (13) would be an example of Reich's leftward deletion (traditionally known as right node raising), which is a type of ellipsis. This is due to the fact that the patient arguments of *pat* and *stroke* usually must be realized.

(13) *She patted and he stroked the cat.*

By the same reasoning, (14) below qualifies as ellipsis but only because of the missing argument not because of the missing adjunct.

(14) *She patted and he stroked the cat for hours.*
(meaning that both activities lasted for hours)

This means that, strictly speaking, the retrieval of adjuncts can only be discussed with respect to sentences that lack an argument as well – an undesirable situation. Alternatively, the definition of ellipsis may be loosened so as to include lacking parts which are not obligatory otherwise. Then, however, the question arises in which sense the parts are lacking at all. Perhaps they are lacking in comparison to the hearer's interpretation. This way out would be reminiscent of the gapping

construction formula and is discussed below in the subsection titled "Variable role of the argument-adjunct distinction".

2.3.1.2 Compositionality

Copy or deletion accounts of retrieval also serve to rescue the standard assumption of compositionality. That is, if the precise mechanisms at work in ellipsis can be stated, together with their triggers, then elliptical structures arise in a compositional way like all other structures. This seems to be easiest if the missing parts are conceived of as being somehow "there" after all. Exactly how they are "there" is the topic of the next section.

2.3.1.3 Retrieval by copy or deletion

One way for a missing element to be actually present in the analysis is that it is syntactically represented by an empty pronoun. This form then receives its interpretation either like an overt pronoun or via copying from the antecedent (Aelbrecht 2015: 573–575). In both cases, the presence of the empty pronoun instead of the full structure has to be licenced in some way or other. Approaches that assume such a pronoun will be subsumed under "copy" approaches in the following. Another way for a missing element to be actually present is that it has not arrived at spell-out (Aelbrecht 2015: 575–576). What must be licenced here is the deletion of the element before it can be pronounced. I will call these approaches "deletion" approaches in the following.

From a language processing perspective, the hearer recognizes the licencing conditions for ellipsis (or a given type of ellipsis) and is prompted to reconstruct or reactivate the missing material. Whether reconstruction or reactivation is the psychologically correct option is still open to debate. A recent psycholinguistic contribution in favour of reactivation is Paape (2017), discussing VP-ellipsis, sluicing, and stripping. Kim et al. (2020) investigated gapping and found indications of reconstruction under certain conditions. Thus, the question whether ellipsis is processed in terms of reconstruction or reactivation may ultimately depend on the type of ellipsis. In this case, the general pointer mechanism invoked by Goldberg and Perek would be too general: pointing, as a holistic process, can only correspond to reactivation, not reconstruction.

2.3.1.4 Variable role of the argument-adjunct distinction

As to the question what exactly is retrieved, we saw above (Section 2.3.1) that the question cannot even be reasonably posed with respect to sentences like (12) if the definition of ellipsis is too narrow. Alternatively, a broader definition was envisaged

(otherwise retaining the characteristics from the initial definition) and is spelled-out now: ellipsis is the invariable presence of meaning that does not correspond to overt material. This is exactly the path that Aelbrecht (2010: 1, 2015: 563) takes, working within a deletion approach. Therefore, she is in a position to discuss at some length which adjuncts are retrieved in Dutch modal complement ellipsis (Aelbrecht 2010: 51–59).

Similarly, Repp (2009b), working more or less within a copy approach, appears to start from a sufficiently broad notion of ellipsis. Gapping is then analysed as follows: certain obligatory material, always including the finite verb, is silently copied from the first part to the second. Semantically, what is copied is the anchoring of the situation to the factual world. This analysis (very briefly summarized here) permits several correct predictions, to be presented in Section 2.3.2. However, it cannot directly generate the retrieval of non-obligatory material, in particular the retrieval of adjuncts. For example, it cannot – on its own – generate (5) above, repeated here for convenience.

(15) *Gonzo ate the peas for lunch, and Lola the carrots.*
(meaning that Lola had the carrots for lunch)

So there must be another way to generate the retrieval of adjuncts (or what looks like it). Indeed, the intended reading derives from Repp's (2009b: 83) *principle of balanced contrast*: "the two conjuncts of a gapping coordination must make the same kind of contribution to an overarching discourse topic". In (15), the first conjunct sets lunch choices as the discourse topic and the second conjunct can only make the same kind of contribution to this topic (kind of vegetable/food) if it is also about lunch. This means that, strictly speaking, the adjunct is not retrieved but its function is transferred pragmatically. The test case for this account versus the wholesale reactivation of adjuncts in Goldberg and Perek (2019) would be one where the broader context sets a discourse topic beyond the meaning of the adjunct. For example, 'for lunch' should not be understood in the second conjunct if (15) is an answer to the question *Has every child eaten at least one type of vegetable during the day?*. If it is understood all the same, this would indicate that Goldberg and Perek's wholesale reactivation of adjuncts is on the right track.

2.3.1.5 Pragmatics secondary

In the last section, a pragmatic principle was invoked in order to complement the syntactic-semantic analysis. Similarly, when differences between elliptical sentences and their full counterparts are discussed, the focus is on semantic differences rather than genuinely pragmatic ones. One of the classic examples even involves a

sentential meaning that is pragmatically unplausible. Compare the so-called parallel reading of VP-ellipsis (16) to the non-parallel reading of its full version (17).

(16) *The chickens are ready to eat and the children are, too.*
(Reich 2011: 1864)[10]

(17) *The chickens are ready to eat and the children are ready to eat, too.*

The elliptical version (16) is usually said to convey either that both the chickens and the children are done or that both the chickens and the children are waiting for the food to be served. Both scenarios are utterly unlikely, judging from world knowledge. In contrast, the non-elliptical version (17) allows for the more natural reading that the chickens are done and the children are waiting for the food to be served. A concise overview on parallel readings in VP-ellipsis can be found in Duffield and Matsuo (2009: 93–101).

However, pragmatic-only differences like the ones discussed by Goldberg and Perek (cf. Section 2.2) seem to play a minor role in generative or formal semantic accounts of ellipsis. In this regard, the constructionist account nicely complements the generative and formal semantic accounts.

Summing up, several characteristics of generative analyses of gapping and other ellipsis types were laid out and contrasted with the constructionist-functional account of gapping presented above. Metaphorically speaking, generativists must rescue completeness while constructionists get completeness for free. Along the way, some predictions of the accounts were discussed. There are, however, more, especially those following from the account by Repp. This is the topic of the next section.

2.3.2 Predictions

I will focus here on three predictions by Repp (2009a, 2009b) on gapping because they represent core properties of generative predictions to be discussed in Section 2.4. To repeat her analysis: certain obligatory material, always including the finite verb, is silently copied from the first part to the second. Semantically, what is copied is the anchoring of the situation to the factual world.

First prediction (Repp 2009a: 245–246): if the second part is a subordinate clause, the copying is blocked by a certain incompatibility. That is, the copy of the finite verb from the first part would introduce into the second part an independent anchoring of

10 The example goes back to Lakoff's (1968: 63) pronominal version *The children are ready to eat and so are the chickens.*

the situation to the factual world while the exact same situation is already anchored (dependently) by the complementizer. So gapping should not be possible here. This prediction is borne out by examples like (4) above and the standard observation that gapping is restricted to coordination at least in English.

Note that things might be different with respect to backward gapping. Personally, I tend to accept sentences like (18), which, however, did not receive high acceptability rates in an online survey (Tauber 2021).

(18) German
Wenn ihrem Sohn ein Hemd, kauft Katharina ihrer Tochter
if to.her son a button shirt buys Katharina to.her daughter
auch ein Kleid.
also a dress
'If Katharina buys a button shirt for her son, she also buys a dress for her daughter.' (intended)
(Tauber 2021)

Second prediction (Repp 2009b: 229): gapping is perfectly fine in coordinations *within* a subordinate clause but the second complementizer (subjunction) must not be realized. The reason is that complementizers are, semantically, one way of anchoring (see above) and thus, syntactically, get copied from the first conjunct. As a consequence, the position that the realized complementizer tries to occupy is already filled. Put another way, two dependent anchors of the same kind are too much. This prediction is borne out by (19); for examples from additional languages, cf. Repp (2009b, Chapter 5).

(19) English
I believe that Peter will travel with his wife to India and (**that*) *Martin with his colleagues to Switzerland.*
(Repp 2009b: 210)

Recently, it has been shown that this structure is, in fact, permitted in Spanish, with the degree of acceptability depending on the type of embedding verb (Bonke and Repp 2022). The authors argue that the relevant property is assertion embedding. Against this background, the Spanish data do not militate against Repp's original account since any additional assertion needs an additional anchor.

Third prediction (Repp 2009b, Chapter 2): if negation is copied from the first conjunct to the second, it must be part of the obligatory material for building clauses in the respective language. This predicts correctly that so-called distributed readings, cf. (20), are possible in languages like English, where negation is a head, hence obligatory, but not in languages like German, where negation is an adjunct, hence non-obligatory, cf. (21).

(20) *Max didn't read the book and Martha the magazine.*
(¬A) ∧ (¬B)
(Repp 2009b: 42)

(21) German[11]
?? *Max hat das Buch nicht gelesen und Martha die Zeitschrift.*
Max has the book not read and Martha the magazine
intended: 'Max did not read the book and Martha did not read the magazine.',
i.e. (¬A) ∧ (¬B)
(Repp 2009b: 42)

Please note that the account does not state that *all* obligatory material is copied, so the prediction is not that obligatory negation must be copied, merely that it can be copied. In fact, Repp shows already in the introduction to her monograph that other examples from English allow other readings (Repp 2009b: 2).

Beyond these specific predictions, it should also be noted that Repp's account does not at first glance require the presence of an explicit conjunction. This is different from Goldberg and Perek's gapping construction, which evidently does require a conjunction. However, Repp (2009b: 72) assumes that a coordination head like *and* is needed to complete the numeration of the second conjunct. Depending on what exactly may instantiate a conjunction/coordination head (a mere comma intonation?), both accounts do not seem to capture asyndetic gapping like in (22).

(22) German

Wir	*machen*	*Deine*	*Fotos,*	*Du*	*Karriere.*
we	make	your	photos	you	career

'We take your photos, you make it to the top.'
['Wir **machen** Deine Fotos, Du **machst** Karriere.']
(https://milled.com/studioline/wir-machen-deine-fotos-du-karriere-GNLjjCVRntt3N84W, accessed 7 March 2022)

Since asyndetic gapping appears to be an under-researched topic generally, I will not treat it any further in the present contribution but leave it as a topic to future research.

In sum, the predictions by Goldberg and Perek's constructionist-functional account (Section 2.2.2) appear to work very differently from predictions in generative

11 A reviewer remarks that the same holds for the Scandinavian languages and gives the following Swedish version of (21): **Max har inte läst boken och Märta tidskriften.*

accounts (present section). Exactly what is at the heart of this difference is laid out in the following section.

2.4 Comparison: predictive power

Before the predictions as well as their nature are compared between the two perspectives, let me add a word on coverage. Goldberg and Perek entitle their formula: "Gapping (+ argument cluster conjunction) construction" (Section 2.2.1). The latter term refers to cases of gapping (or at least prima facie cases of gapping) where the missing verb in the second conjunct would not intervene between the two remaining constituents (Goldberg and Perek 2019: 195). The authors cite the following example.

(23) *We visited Jan on Monday and* [*we visited*] *Yo on Tuesday.*
(Beavers and Sag 2004: 49)

According to Goldberg and Perek (2019: 195), such cases are covered by their own definition of gapping but not by "the derivational account". If by this they refer to the discussion they cite, i.e. Beavers and Sag (2004), it should be noted that Beavers and Sag argue against capturing examples like (23) by a very specific derivational account, i.e. by combinatory categorial grammar. These authors do not touch upon more widespread derivational frameworks like those coming from the generative tradition, i.e. government and binding or minimalism (if the latter counts as a framework rather than just as a programme). In fact, Aelbrecht, working in a minimalist context, chooses as her introductory handbook example of gapping one that is exactly parallel to (23) with respect to the location of the gap, cf. (24).

(24) *Lola gave her brother strawberries and* [*Lola gave*] *her sister cherries.*
(Aelbrecht 2015: 569)

Accordingly, her general definition of gapping does not depend on the gap being located between the remaining constituents (Aelbrecht 2015: 569).[12] In this sense, Goldberg and Perek's gapping construction formula does not, as its title suggests, cover more kinds of data than a common generative notion of gapping.

Coming back to the predictions, the first question to be asked is whether all the predictions from one theoretical perspective can also be made from the other perspective. Partly, this question has already been answered in the preceding sections. The following list summarizes and complements these findings.

12 Nor does the one used in the present paper (this is the same for the narrow and the loosened version).

1. Pragmatic differences between elliptical sentences and their full versions are predicted by the gapping construction but are of secondary interest from a generative perspective.
2. The retrieval of adjuncts in gapping is predicted as mandatory by the gapping construction but hinges on pragmatic considerations in at least Repp's generative account.
3. Voice mismatches in gapping are predicted to be impossible by both accounts: either via the pointer that points, among other things, to voice or via copying the finite verb, which has already been specified for voice.
4. Agreement mismatches in gapping are predicted to be possible by the gapping construction and, at closer inspection, also by Repp's account: since the copying takes place at the level of logical form, agreement is invisible (Repp 2009b: 19).
5. The restriction of gapping to coordination is included in the gapping construction (if "conjunction" is to be read as 'coordinating conjunction', excluding subordinators) and also follows from Repp's analysis of gapping.
6. The ban of the second complementizer (where the coordination as a whole is subordinated) does not seem to be derivable from the gapping construction whereas it falls out naturally from Repp's account.
7. The availability of distributed readings of negation in English but not German likewise does not seem to be derivable whereas it follows from Repp' analysis.

Thus, with respect to Predictions 1 to 5, there is, metaphorically speaking, virtually a tie. The question remains as to how a constructionist account could accommodate Predictions 6 and 7. This question directly leads to a fundamental difference between the two sorts of predictions. A construction is not supposed to predict anything beyond its own obvious content. The observations behind Predictions 6 and 7 would be stated as empirical generalizations, which in turn might then be shown to follow from general cognitive principles. Or at least, general cognitive principles are invoked to make the observations plausible. This is what Goldberg and Perek (2019) do with respect to other observations involving ellipsis (also cf. Goldberg 2013: 15–16). With respect to the two predictions at hand, however, it appears hard to see how these could relate to general cognitive principles. Regarding 7, however, there is a way out: devise a separate construction, perhaps called "Distributed negation in gapping", specify its usage conditions and attach it to the original gapping construction within an inheritance hierarchy (Goldberg 2013: 21–23). More precisely, the new construction would be a daughter of the older one in being more specific. Like the old construction, the new one does not predict anything beyond its obvious content.

Put differently, constructions are first and foremost descriptions of language facts whereas the assumption of specific structural mechanisms usually generates a

range of structures, all of which are predicted to exist. Constructionist predictions are obvious, generative predictions are hidden.

What has been said about the treatment of different structures by constructionist versus generativist approaches transfers, to a certain extent, to their treatment of different languages and the structures therein. A cross-linguistic difference already mentioned is the scope of negation in ellipsis; other well-known examples include the availability of backward gapping or VP-ellipsis. Constructionists are not surprised by the finding that there are incomplete structures in a range of languages since all of these structures fulfil the function of communicating efficiently; likewise differences between languages are expected as a product of conventionalization and learning (Goldberg and Perek 2019: 198). It should be noted, however, that these statements lack, in contrast to a single language's constructional network, any predictive power. For the only prediction that can be derived from them would be this: languages are structured in such a way that they can be learned, can be conventionalized, and can serve efficient communication. The first two points are trivially true while the third hinges on a precise notion of efficient communication (including its conditions), which to my knowledge is absent in the constructionist literature. Predicting the availability of specific structures is out of reach. Please note that this point of criticism also applies beyond ellipsis.

Generative approaches, in contrast, start from a different basis. Even if UG is assumed to be relatively poor (e.g., Haider 1993: 7–8), generative linguists are forced to give a structural account of any inter-language difference they might find. This is so by definition since all structures in all languages have to be derivable from UG in some way or other, e.g., by parameter settings. Adhering to this ideal, though, is difficult to the extent that parameter theory continues to be one of the big unsolved issues in the generative enterprise (cf. Roberts 2019). Later minimalist investigations like the one just cited even rely heavily on so-called third factors, which appear to be equivalent to constructionists' general cognitive principles: they „represent general cognitive optimization strategies which may well apply in other areas of cognition" (Roberts 2019: 6–7). Thus, there is a certain convergence of theories with respect to the overall developments. This, however, does not alter the fact that generativists are obliged to predict specific structures cross-linguistically.

In sum, constructionist accounts provide single language predictions, given that the constructional network for the language at hand is reasonably complete. In contrast, generative predictions are, at least in principle, inherently cross-linguistic. For the rest, constructionists maintain the general expectation that language as a whole has evolved via communicative pressures plus conventionalization, which is, as stated above, a prediction so broad that it is vacuous. In sum, the two approaches only compete within a small domain: anticipation of novel data in well-described languages.

3 Conclusions

A constructionist-functional approach to gapping was compared with generative approaches to gapping and ellipsis more generally. The focus was on the content and kind of predictions made. With respect to content, five out of seven predictions could directly be made from both perspectives. Among these was the retrieval of adjuncts. It remains to be seen whether the wholesale retrieval as predicted by Goldberg and Perek is empirically correct or rather a more nuanced view. The two additional predictions from a generative perspective (ban of the second complementizer, distributed scope of negation) could not so easily be transferred into a constructionist framework. With respect to the kind of prediction, it was argued that constructions, organized in networks, make predictions for individual languages that are sufficiently well described. Constructionist cross-linguistic predictions, however, were shown to be so broad that they are vacuous.

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Number fission from a formal and functional perspective

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Abstract: Modal verbs in German show phonologically unconditioned umlaut in the PRES.PL versus PRES.SG whose functional motivation is unclear. Based on a large sample of dialectological data, I explore the distribution of this umlaut as well as other irregularization strategies like contractions and/or consonant mutations in different paradigm cells. My observations point to the conclusion that these facets of irregularity are *morphomic* in that they serve no other function than signaling inflectional class coherence. A promising approach to capture these complex patterns of stem allomorphy is *Information-based Morphology* (IBM), an inferential-realizational approach to morphology developed in the context of *Head-driven Phrase Structure Grammar* (HPSG). The concept of a *stem space* allows for expressing implicational or directed generalizations in stem formation and their mapping to phonology. In diachronic terms, however, transcategorial number marking, as proposed in the relevant literature, is a plausible functional motivation for the analogical extension of umlaut as a verbal plural marker.

Keywords: morphomics; umlaut; suppletion; German dialects; HPSG

1 Introduction

Among many other peculiarities, German modal verbs show phonologically unconditioned umlaut in the present plural (1a), which is missing in the two main verb classes, i.e. the weak (1b) and the strong one (1c), respectively.[1] Disregarding several syncretisms, these examples may be conceived of as first person forms illustrating the general pattern. It is likely that this development spread from the subjunctive domain (Birkmann 1987; Weinhold 1967 [1883]; and others), yet its functional motivation remains unclear.

1 Throughout this paper, I use the *Leipzig Glossing Rules* for annotating morphosyntactic features.

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(1) a. *muss* (1SG) – *müssen* (1/3PL) 'must'
b. *kaufe* (1SG) – *kaufen* (1/3PL) 'buy'
c. *trinke* (1SG) – *trinken* (1/3PL) 'laugh'

Number as a morphological category of verbs is of comparatively small relevance (Bybee 1985), meaning that its expression via stem allomorphy is unexpected. Nübling (2009) regards umlaut in this context as a 'transcategorial plural marker' that signals nominal and verbal plurality, in analogy to languages like e.g. Turkish. This parallelism is demonstrated by the examples in (2) and (3).

(2) a. *muss* (1/3SG) – *müssen* (1/3PL) 'must'
b. *Mutter* (SG) – *Mütter* (PL) 'mother'

(3) a. *kavun* (NOM.SG) – *kavun-lar* (NOM.PL) 'melon'
b. *geliyor* (3SG) – *geliyor-lar* (3PL) 'come'

However, this interesting idea is challenged by the complex areal diffusion of this phenomenon in German dialects (Schirmunski 1962: 613–623; Sčur 1961): There are varieties that show no traces of umlaut at all, others display analogical spread to other paradigm cells, most notably the infinitive and the past participle. While the exact directionality is unclear, there seems to be a strong preference for an implicational scale like the following (Beckmann 1990: 56–57; Dammel and Schallert 2021: 208–210):

(4) Subjunctive (SBJV) > present plural (PRES.PL) > infinitive (INF)

Moreover, modals like *können* 'can', *dürfen* or *mögen* 'may' already had a number distinction in the present for historical reasons (ablaut) so that umlaut can be only regarded as a kind of reinforcement strategy. This connection becomes apparent when we compare the respective present and preterite forms, as given in (5): While PRES.SG and PRES.PL contrast in vowel quality and umlaut, it is only the latter phenomenon that sets apart PRES.PL and PST forms because they are based on the same ablaut level. Note that with *wollen* 'want', ablaut is the only distinguishing feature in the PRES, while *sollen* does not show any number contrast in its stem shape in Standard German.

(5) a. *darf* (1/3SG.PRES) – *dürfen* (1/3PL.PRES) – *durften* (1/3PL.PST) 'may'
b. *kann* (1/3SG.PRES – *können* (1/3PL.PRES) – *konnten* (1/3PL.PST) 'may'

Remarkably, number splitting seems to interact with other morphological irregularization processes like contraction and/or consonant mutation, as the examples in (6) from Alemannic show. From the form-function perspective, the status of 'number reinforcement' is unclear. On the one hand, it could be regarded as a somewhat

unusual case of overdifferentiation. On the other hand, suppletive processes like umlaut or contraction also spread to other paradigm cells, sharing no coherent features or feature values. This situation is illustrated in (7), where we observe a contracted form of the infinitive (7a) and an umlauted participle (7b). Even though they obviously also occur in other contexts, I refer to the different strategies of strengthening the (verbal) number distinction as *number fission*.

(6) Zurich German (Weber 1987):
   a. *cha* (PRES.SG) – *chönd* (PRES.PL) 'can'
   b. *will* (PRES.SG) 'want' – *wänd* (PRES.PL) 'want'
   c. *mag* (PRES.SG) 'may' – *mönd* (PRES.PL) 'may'

(7) a. Marburg region: *mun* (INF) 'must' (Bromm 1936)
   b. Zorn Valley, Alsace: *gəmẏst* (PTCP) 'must' (Lienhart 1891)

On the empirical base of 308 grammatical descriptions of local dialects, I investigated the distribution of umlaut and contraction in German. Two modals were analyzed in detail, i.e. *müssen* 'must' (no number ablaut), and *können* 'can' (number ablaut), with the following results:

– Both verbs regularly mark umlaut in the plural versus singular (no exceptions).
– Umlaut often spreads to the infinitive and the past participle as well (60 cases with *müssen*, 68 with *können*).
– Contraction shows a strong tendency for one of the two numbers: Its presence/absence in the PRES.PL often correlates with the stem shape of the INF. Only with *müssen*, it conspires with umlaut in the PRES.PL.

This state of affairs supports the hypothesis that umlaut and contraction are not confined to a consistent set of morphological features or feature values so that they can be regarded as *morphomic processes* (Aronoff 1994).

A promising approach to capture these complex patterns of stem allomorphy is *Information-based Morphology* (IBM; Bonami and Crysmann 2016; Crysmann and Bonami 2016, etc.). It constitutes a formal approach to morphological structure, yet design features like type hierarchies can be carried over to functional theories like *Construction Morphology* (Booij 2010). In fact, it "can be seen as both a predecessor [fn. omitted; O. S.] to and a formally explicit variant of Construction Morphology" (Bonami and Crysmann 2016: 645).

Dialects constitute an interesting source for understanding these developments because they are in some sense more 'natural' due to their status as primarily oral varieties (Weiß 2001). In particular, they allow to tackle minimal system contrasts between sufficiently similar grammatical systems and use them as a basis for theoretical modeling (see e.g. Bresnan et al. 2007 on agreement phenomena in the

Survey of English Dialects). A direct reflex of such contrasts are patterns of areal variation, which have been extensively studied in traditional dialectology so that a large arsenal of grammatical descriptions is available. From a morphological perspective, a suitable reference point is *Canonical Typology* (Brown and Chumakina 2013, Corbett 2015, etc.) and the idea that a canonical instantiation of the phenomenon in question can be defined (e.g. inflectional classes, suppletion, etc.). Deviations from this idealized vantage point along several dimensions can be used for assessing the possible space of typological variation. Against this background, dialects offer a fine-grained picture of this variational space.

This paper is structured as follows: First, I give an overview on the irregularity of modals, which can be observed on several grammatical levels (Section 2). I demonstrate that inflectional classes are an important point of reference for coherently describing their properties. Then, I proceed with a detailed account of the relevant irregularization processes, as they present themselves in my sample, and their potential functional motivations (Section 3). I focus on the origin as well as the distribution of umlaut in the PRES.PL and other relevant paradigm cells (infinitive, past participle) and patterns of contraction in the SG versus PL/INF. I critically evaluate 'transcategorial number marking' (Nübling 2009) as a potential functional motivation for number fission via umlaut and other strategies. More specifically, I show that it cannot be regarded as a special case of overdifferentiation. In the next step (Section 4), I develop a formal analysis of these complex patterns of stem allomorphy in IBM. The final section wraps up the main findings of this paper and gives a more general perspective on the form-function debate in the theory of grammar, in particular in morphological description.

2 The irregularity of modals

In this section, I take a closer look at the irregularity of modals. While this irregularity shows itself across different grammatical levels, I focus on morphological exponence and the overarching profile of modals as an inflectional class. Syntactic aspects, most notably the substitute infinitive (*infinitivus pro participio*, IPP) and related phenomena, are ignored (see e.g. Schallert 2014; Dammel and Schallert 2021: 213–219 for a more detailed discussion). The same applies to semantic peculiarities like the emergence of epistemic or reportative uses (Fritz 1997; Maché 2019).

2.1 Inflectional properties

Diachronically, most Germanic modals are derived from the class of the so-called preterite-present verbs (PPs). This class comprises strong verbs with mainly cognitive

semantics whose preterite (continuing the Indo-European perfect) has assumed a resultant state, i.e. present interpretation (see Birkmann 1987). The standard example is the verb *wissen* 'know': Its Old High German (OHG) equivalent *ih weiȝ* can be rendered as 'I have seen and, therefore, I know' (cf. Latin *videō*). Due to this temporal shift, the paradigm of the PPs becomes defective and the ensuing gaps are gradually compensated for. Formally, they stand between the two main inflectional classes, combining typical properties of both weak and strong verbs in an idiosyncratic manner (Dammel 2011: 140). While ablaut (mainly signaling number) constitutes a strong property (8), additive formation of the preterite and the past participle are typical weak properties (9).

(8) a. *darf* (PRES.SG) – *durfte* (PST) 'may'
b. *kann* (PRES.SG) – *konnte* (PST) 'can'

(9) a. *durfte* (PST) – *gedurft* (PTCP) 'may'
b. *konnte* (PST) – *gekonnt* (PTCP) 'can'

Additionally, PPs show several features that cannot be found in either class: They exhibit ø-exponence in the 1/3PRES.SG and, most importantly, phonologically non-conditioned umlaut in the PRES.PL and the infinitive (10). These innovations are connected to the analogical extension of the *i*-umlaut in Middle High German (MHG) and Early New High German (ENHG) times. In terms of inflectional exponence, PPs showed the characteristic second person allomorph *-t* in the 2PRES.SG that gradually came to be replaced by the 'regular' flexive *-st* (Fertig 2019). Conversely, they are regarded as paving the way for the overarching syncretism of the 1PL and the 3PL since it first only occurred in this verb class (Birkmann 1987: 131). In ENHG, new perfect forms after the paradigm of the weak inflectional class (and the ablaut stem of the PST.PL) emerge (Schmidt et al. 2013: 252).

(10) a. *(wir) durften* (PST.PL) – *dürfen* (PRES.PL) 'may'
b. *(wir) konnten* (PST.PL) – *können* (PRES.PL) 'can'
c. *(wir) mussten* (PST.PL) – *müssen* (PRES.PL) 'must'

2.2 Inflectional classes as point of reference

Inflectional classes and properties associated with them (e.g. specific class markers or allomorphs) are a classical topic of investigation in morphology since they constitute clear evidence for its autonomy. However, the PPs show several convergencies that are connected to different grammatical domains and sharpen their profile. Most prominently, this class became to be reduced to verbs with modal meanings, leading

either to complete regularization or demise of verbs that do not match this profile. Of the 11 PPs of OHG (cf. Braune and Heidermanns 2018: 420–425), 6 still exist and all of them have modal meanings in a broader sense. This even applies to *wissen* 'know' in its ability reading, e.g. *Er weiß sich zu helfen* 'He knows how to look after himself'. Some PPs became regularized (e.g. *tugan* 'be useful'), others died out (e.g. *eigan* 'own'). Conversely, there are also neophytes like *wollen* (originally stemming from a root verb), and, most prominently, *brauchen* 'need', which is becoming integrated into the modal/PP paradigm (see Maché 2019: 176–220 for a detailed discussion). Thus, the property that singles out PPs the most is that there is a tight link between their morphological irregularity and several syntactic and semantic properties. This connection has often been noted in the relevant literature. Plank (1981: 41), for instance, speaks of the "semantically natural class of modal verbs"; in the same vein, Wurzel (2001: 149) takes it as being indicative of an "extra-morphological motivation". Simon and Wiese (2011) regard the overall development of PPs as a process of 'entropy reduction' in the sense of Ackermann and Malouf (2013), i.e. a stabilization of irregular behavior across different grammatical levels.

As discussed in Dammel and Schallert (2021), two relevant features of canonical inflectional classes (Corbett 2009) lend themselves as suitable point of reference for describing and analyzing the morphomic properties of PPs. On the one hand, their hybrid morphological irregularity can be related to distinctiveness (11a). I will argue in the following section that also umlaut and contraction add to this property. On the other hand, functional motivation of their properties (semantics) undermines independence (11b).

(11) Relevant properties of canonical inflectional classes (Corbett 2009)
   a. Distinctiveness: Canonical inflectional classes are fully comparable and are distinguished as clearly as possible.
   b. Independence: The distribution of lexical items over canonical inflectional classes is synchronically unmotivated.

3 Aspects of number fission

In this section, I take a closer look at different facets of number fission with PPs. Starting from the empirical dimension in German dialects, I discuss whether this phenomenon can be regarded as a special case of overdifferentiation. Then, I take a closer look at the genesis of morphomic umlaut and 'transcategorial number marking' as a potential functional motivation.

3.1 The empirical dimension

In order to arrive at a more precise picture of number contrasts with modals, I conducted a study on the basis of a wide array of grammatical descriptions.[2] Such descriptions are abundant in traditional dialectology and have proven to be a very useful source for studying morphological systems (see Schmidt and Herrgen 2011: 88–95, 112–115 for a historical overview on this genre and Birkenes 2014 as well as Fischer 2018 for current studies based on it). In total, 308 respective descriptions were considered, yet only a smaller portion contained sufficient information on the relevant forms for the present study (see below).

The reason for choosing *müssen* 'must' and *können* 'can' was to pick one modal with no number distinction due to ablaut (as is the case with the first verb mentioned) and one that showed such a distinction. If umlaut came indeed to be used as a device for signaling (verbal) number, there should be more pressure on *müssen* because with *können*, the number distinction is already established via ablaut. The following factors are in the center of attention:

– Spread of the umlaut to different paradigm cells. In addition to the PRES.SG and the PRES.PL also the infinitive and the PTCP were considered. In (12), the relevant forms of *müssen* 'must' are given.

(12) a. PRES.SG > PRES.PL > INF > PCPT
b. *(ich) muss – (wir) müssen > müssen > gemusst* (Standard German)

As mentioned in the introduction, older studies like Sčur (1961) or Beckmann (1990) assume that umlaut spread along the implicational scale in (12a), in particular the PRES.PL precedes the infinitive. According to the recent investigation by Dammel and Schallert (2021), which is based on a smaller sample of dialect grammars, the directionality is not as clear as previously assumed: While a larger group of dialects corresponds to this cline, there is still a non-negligible number that show the reversed pattern, i.e. umlaut in the infinitive but no umlaut in the PRES.PL. In general, it is not so easy to correctly identify relevant forms because other phonological regularities can interact with umlauting. This was one of the reasons for not considering *dürfen* 'may' because ablaut/umlaut distinctions can interact with lowering processes in certain environments. Other cases, however, are quite clear-cut, e.g. when

2 In the summer of 2018, I had the chance to use the library of the research institute *Deutscher Sprachatlas* at Marburg University to compile the sample of dialect grammatical descriptions that is used for the present paper. I want to thank Jürg Fleischer, Magnus Birkenes and Hanna Fischer for their support and providing me with detailed information on which specific descriptions are available for the respective dialect regions of German.

umlaut feeds de-rounding, which occurs quite often in German dialects (see the map in König et al. 2019: 148–149).

– The second factor is contraction, i.e. elision of stem-final elements in the PRES.SG versus PRES.PL (13a). In this context, consonant mutations can occur as well, as is illustrated by (13b).

(13) a. Zurich German: *mues* – *müe-nd* (Weber 1987)
b. Neu-Golm: *mut* – *mis-n̥* (Siewert 1912)

Contraction (and also consonant mutation) is the outcome of a complex interaction between phonological and morphological processes and shows sensitivity to factors like inflectional class or paradigmatic position (see Nübling 2000: Ch. 3 for a detailed discussion and Becker and Schallert 2021: 222–232 for case studies on MHG). Modals are among the core verb classes that show this phenomenon, with first reflexes already emerging in MHG times, e.g. *went* for *wellent* (3PL) 'want', *sün* for *süllen* 'should' (INF) or *mün* for *mügen* 'may', etc. (Paul et al. 2007: 282; Klein et al. 2018: 976, 985). Also in modern dialects, it is abundantly attested (Schirmunski 1962: 548–551).

Another aspect where fission is exploited or even deepened occurs in temporal marking. In the dialect of Mühlheim/Ruhr (Southern Low German) it also occurs with regard to temporal marking. As exhibited by the paradigm given in Table 1, the present forms use a stem ending in the cluster /r/ plus labiodental fricative (going back to Old Low German *thurban* 'need'), whereas the past forms exhibit stem-final *-s*. These forms can be related to OLG *durran* 'dare' (cf. MHG *türren*) that ceased to exist as an independent verb. Thus, we have a case of *heteroclisis*, i.e. the inflectional paradigm of this verb is amalgamized of two different stems (Stump 2006).

Umlaut, truncations and consonant mutations can lead to stem allomorphy and even suppletion and thus have a highly irregularizing effect on the inflectional system as a whole, yet they are not randomly distributed. As a rule of thumb, they are more likely to occur in forms with higher token frequency (Nübling 2001a: 66). From a functional perspective, there is a trade-off between shortness (productive economy) and distinctiveness (receptive economy; Nübling 2001a: 69). What is unclear,

Table 1: Temporal fission in the dialect of Mühlheim/Ruhr (adapted from Maurmann 1898: 77).

		PRES	PST
SG	1	*darf*	*dōs*
	2	*darfs*	*dōs*
	3	*darf*	*dōs*
PL	1–3	*dörvə*	*dōstə*

however, is whether these strategies express a categorial contrast at some diachronic stage, i.e. plurality in the verbal domain. I will return to this question at the end of this section.

Let us now have a look at the different patterns we can observe in the dialect sample. In Table 2, the sample sizes for the different factors under investigation are given. Table 3 shows the spreading of umlaut in the different paradigm cells under consideration. Both *müssen* and *können* show a strong tendency to mark umlaut in the plural versus singular forms (99/135 cases, respectively). Strikingly, the converse pattern is not attested. However, there are also systems that either generalize umlaut to the whole PRES (10/2) or do not show any traces of this phenomenon at all (31/17).

A closer look at other paradigm cells, as shown by Table 4, reveals that umlaut quite often extends beyond the PRES.PL to the INF and the PTCP, once again with both *müssen* and *können* (60/68); a typical example is given in (14a). Cases where it spreads only to the INF are also very frequent (28/52). These proportions are followed by the number of systems that show no traces of umlaut at all (15/4), see (14b). Violations of the expected pattern like (14c) and (14d) do occur, yet they are comparatively rare (5/6) (X denotes 'no umlaut', U 'umlaut'). Note that in many German dialects, de-rounding can disguise umlauted vowels, as is the case with (14a). In the present context, this complication is irrelevant since the respective vowels clearly contrast from their un-umlauted counterparts.

Table 2: Sample sizes.

Sample	*müssen*	*können*
Contraction (SG/PL)	155	150
Contraction (SG/PL/INF)	135	139
Umlaut (SG/PL)	140	154
Umlaut (PL/INF/PTCP)	126	140

Table 3: Umlaut patterns in the PRES.SG versus PRES.PL.

Pattern	*müssen*	*können*
− UL.SG ∧ + UL.PL	99	135
+ UL.SG ∧ − UL.PL	0	0
+ UL.SG ∧ + UL.PL	10	2
− UL.SG ∧ − UL.PL	31	17

Table 4: Umlaut patterns PRES.PL – INF – PTCP (minor variants ignored).

Pattern	*müssen*	*können*
Umlaut in all positions (UUU)	60	68
Partial umlaut (UUX)	28	52
No umlaut in all positions (XXX)	15	4
Violations (XUX, XXU, etc.)	5	6

(14) a. Stuttgart (Upper German): UUU
misəd, *miəsəd* – *misə*, *miəsə* – *misə*, *gmisd* (Frey 1975)
b. Wissenbach (West Central German): XXX
mun – *mun*, *murə* – *gəmusd* (Kroh 1915)
c. Ruhla (East Central German): XUX
konn(en) – *könn* – *gekonnt* (Regel 1868)
d. Mecklenburg-Vorpommern (East Low German): XXU
kãnen – *kãnan* – *künnt* (Gilow 1868)

Turning to contraction patterns, as given in Table 5, the two modals show an opposite behavior. While *müssen* favors truncation in the plural (13/0), cf. (15a), *können* is prone to short forms in the singular[3] (0/25), see (15b). This is against the background

Table 5: Contraction patterns SG versus PL.

Pattern	*müssen*	*können*
− C.SG ∧ + C.PL	13	0
+ C.SG ∧ − C.PL	0	25
+ C.SG ∧ + C.PL	3	1
− C.SG ∧ − C.PL	139	124

3 One reviewer notes that the diverging behavior of both verbs with regard to contraction could be caused by phonological processes, in particular *n*-deletion, which is quite widespread in German dialects. This could very well be the case, in particular in Alemannic. Unfortunately, a more detailed analysis of *können* in this respect is way beyond the scope of the present paper. Nübling (2000: Ch. 3) does in fact distinguish between 'regular' and 'irregular' contractions. Whereas deletion of stem-final *s* (with *müssen*) would belong to the latter group, *n*-drop (with *können*) would likely belong to the former. Let me add, however, that the fact that some contraction phenomena have a phonological base does not preclude them from being exploited for morphological purposes, so to speak. This particularly holds in contexts where there is already a morphological distinction (number ablaut).

that uncontracted forms in both the singular and the plural are by large more common (139/124), while we rarely also observe short forms in the whole PRES (3/1). With *müssen*, contraction 'conspires' with umlaut (11 cases), yet there are hardly any signs for such an interaction with *können* (2 cases).

(15) a. Breienbach (West Central German):
mùs – mie-n (Mankel 1886)
b. Nürnberg (East Upper German):
kho – khɛn-ɐ (Kalau 1984)

Regarding other positions in the paradigm (Table 6), there is robust evidence for a mirror-image behavior of the two verbs considered (C denotes 'contraction', X 'full form'). Typical examples are given in (16). Irrespective of contraction, the infinitive always patterns with the PRES.PL (5/25). In many cases, however, no truncated forms are observed in any position (*müssen*: 120, *können*: 113).

(16) a. Niederellenbach (West Central German):
mun (INF) – *mus* (SG) – *mun* (PL) (Witzel 1918)
b. Irgertsheim (Upper German):
khiĩnə (INF) – *khǭ* (SG) – *khĩnə* (PL) (Funk 1957)

Another system that is sufficiently attested in my data (7 cases) only occurs with *müssen*. In contrast to the mirror image patterns reported in Table 6, it involves contraction in the PRES.PL but a full form of the PRES.SG and the INF. This system is illustrated and analyzed in Section 4.1.

Let me summarize: Both verbs show a strong tendency to mark umlaut in the plural versus singular. What is more, umlaut can spread to the INF and the PTCP as well. Thus, the idea of umlaut as transcategorial number marking device has some diachronic plausibility in terms of its quantitative distribution (SG vs. PL). However, its spreading to other paradigm cells is clear evidence for a morphomic distribution because the INF and the PTCP are underspecified for number features. As regards contraction, we encounter a more complex situation: With *können*, it favors the SG, with *müssen*, it is the other way round, meaning that number fission is created from

Table 6: Contraction patterns SG versus PL versus INF.

	INF	PRES.SG	PRES.PL
müssen (5 cases)	C	X	C
können (25 cases)	X	C	X

different directions. Both verbs also show extensive evidence for short forms of the INF, which is once again indicative of the morphomic nature of this phenomenon.

3.2 Overdifferentiation

One possibility somewhat related to Nübling's approach is to take analogical umlaut in the context of modals as a case of overdifferentiation, i.e. "the situation where a particular lexeme (or group of lexemes) makes 'too many' distinctions, in comparison with the majority" (Corbett 2015: 157). A typical example would be the paucal in languages like Bezhta (a North Caucasian language), which only appears with a handful of nouns, e.g. *sik* 'wineskin' (SG) – *sika* (PAUC) – *sikla* (PL) (Xalilov 1985: 137; see also Corbett 2015: 158). Analogically, number could be regarded as a feature value that is only present in a subclass of verbs, along the lines of the working definition in (17).

(17) *Overdifferentiation* (based on Corbett 2015: 154, 157):
Expression of certain feature values that are not present in other lexemes of the same part of speech.

The problem with this approach is that number as a verbal inflectional feature value in German shows highly cumulative exponence, meaning that it cannot be easily teased apart from person or even tense features. This can be seen in (18) where some forms of the PRES for strong (18a), weak (18b) and modal verbs (18c) are given. In all cases, person and number information overlaps on the affixal level. Apart from umlaut in the PRES.PL of modals, some strong verbs show umlaut in the 3SG (and also the 2SG), i.e. with these verbs it is the singular that is marked by this non-concatenative strategy.[4]

(18) a. *wasch-e* (1SG) – *wäscht* (3SG) – *wasch-en* (1/3PL) 'wash'
b. *mach-e* (1SG) – *mach-t* (3SG) – *mach-en* (1/3PL) 'make'
c. *muss* (1SG) – *muss* (3SG) – *müss-en* (1/3PL) 'must'

Note that the weak verbs, the class with the highest type frequency, show syncretism between the 3SG and the 2PL, cf. *sie mach-t* (3SG) versus *ihr mach-t* (2PL). Since this type of syncretism is crosslinguistically rare, we would expect it to be a natural target for

4 Historically, strong verbs of the ablaut series VI and VII show this umlaut in the 2/3SG.PRES because the respective inflectional affixes contained *-i-* and thus an umlaut trigger (*Wechselflexion* 'alternating inflection'; Nordström 1911). In MHG, this allomorphic marking did not apply consistently and showed a high degree of variability (Paul et al. 2007: 245). In Modern German, it can still be found with 55 strong verbs (according to Nübling 2001b: 439–440).

reinforcing number distinctions.[5] However, number is always unambiguously marked via agreement rules: Only pronominal DPs trigger person and number agreement (19a) whereas full DPs always come with 3SG or 3PL (19b)/(19c), depending on the controller's number features (e.g. in coordinations or with pluralic subjects). Impersonal passives (20a) and clausal subjects (20b) necessitate the 3SG form, which is indicative of its default status (Wöllstein [Duden] 2022: 125–126; Himmelreich & Hartmann 2023, and others).

(19) a. *Ich schlaf-e* (1SG) 'I am sleeping' | *du schläfst* (2SG) 'you are sleeping' | *wir schlaf-en* (1PL) 'we are sleeping'
b. *Oliver schläft* (3SG) 'Oliver is sleeping'
c. *Oliver und Helmut schlafen* (3PL) 'Oliver and Helmut are sleeping'

(20) a. *Gestern wurde* | * *wurden ausgiebig gefeiert.*
yesterday was.3SG | were.3PL extensively celebrated
'The party yesterday was extensive.'
b. [$_{CP/1}$ *Dass die Mieten in Frankfurt hoch sind*] *und* [$_{CP/2}$ *(dass) es kaum Wohnungen gibt*]
that the rents in Frankfurt high are and (that) it hardly flats gives
ärgert |* *ärgern viele.*
annoys.3SG | annoys.3PL many
'The fact that rents in Frankfurt are high and (that) there are hardly any flats annoys many.'

As an overarching tendency we can note that there is no functional need for (transcategorial) number marking in the verbal domain because number is always unambiguously marked – either in the verbal domain itself or via agreement regularities.[6] Consider the minimal pair in (21): In (21a), verbal syncretism between 3SG:2PL is disambiguated by the subject pronouns while in (21b) it is verbal inflection that compensates for the syncretic pronoun, so to speak.

5 Haspelmath and Sims (2010: 174–176) do not regard this homonymy as a case of syncretism, yet their argumentation (based on disjunctive coordination) is not convincing, in my opinion. Even if the 3SG and 2PL do not form a natural class, such syncretisms can be found crosslinguistically, albeit rarely. In the respective chapter of the *World atlas of language structures* (https://wals.info/chapter/29, accessed on 13 March 2024), Baerman and Brown (2013) note: "The rarest type of syncretism is that where a single form combines different person values with conflicting values for another feature, typically number or gender."

6 Turning to dialectal varieties, Rabanus (2006, 2008) has shown that the pronoun system and verbal agreement are subject to a minimality requirement: Case syncretism can occur as long as distinctions in the verbal system prevent syntactic ambiguities from arising (Rabanus 2006: 312).

(21) a. *er komm-t* (3SG) 'he comes' – *ihr komm-t* (2PL) 'you come'
b. *sie komm-t* (3SG) 'she comes' – *sie komm-en* (3PL) 'they come'

One reviewer rightly notes that what distinguishes Nübling's concept of transcategorial number marking from overdifferentiation is the 'depth' of a split within a paradigm, so that "there is no need for an additional category that other verbs don't have". In this context, the paucal example is somewhat dubious because number as a category (and plural as the respective value) is not altogether missing in verbal inflection. There are only different means of how it is expressed, i.e. via additive morphs (albeit with fusion of number and person) or via stem alternations (umlaut). While I concede that overdifferentiation might be a misnomer for the situation we observe, the general question remains why number should only be reinforced in one particular verb class.

3.3 Where does umlaut with PPs come from?

Let us shortly address the question of the historical genesis of umlaut with PPs. Different previous explanations are discussed and reviewed by Nübling (2009: 212–219) so I will not refer to them in a lengthy manner. Instead, I focus on her notion of 'transcategorial plural marking' (see Section 1). The upshot is this: In diachronic terms, transcategoriality is a plausible explanation for the state of affairs in MHG. With the core modals (those PPs that still belong to this class in Modern German), umlaut in the PRES.PL is already robustly attested, yet not very frequent (Klein et al. 2018: 891–892). In some cases, this alternation is also attested in the SG (*müezen*) or in the IND.PST (*mügen*; Klein et al. 2018: 906–907). Only in ENHG there is robust evidence for umlauted infinitives but the exact directionality and chronology of this spread is unclear (see Dammel and Schallert 2021: 209 for further references). Another neat aspect of this explanation is that it fits well with what we know about areal diffusion. In Upper German, particularly Alemannic, umlaut in the nominal domain is much more frequent than in Standard German and other varieties of German (cf. Nübling 2009: 220). Basically, transcategorial number marking is an explanation that resorts to proportional analogy (Paul 1920: Ch. 5), as captured by the proportional equation in (22). Picking up the basic distinction between intra- and inter-paradigmatic analogy (Nübling et al. 2017: 79), transcategorial plural marking belongs to the latter type if we assume a broader interpretation of 'paradigm' in the sense of different lexical categories and their inflectional properties.

(22) a. Mutter (SG) : Mütter (PL) 'mother'
b. muss (SG) : X (PL) 'must'

In synchronic terms, however, transcategorial number marking fails to be a valid explanation for the occurrence of umlaut in the inflectional paradigm of PPs because it does not code for the feature 'plurality' in a consistent way. There is a substantial number of dialectal systems where it has also spread to the infinitive and (albeit less frequently) to the PTCP. Of course one could argue that there is also robust evidence for transcategoriality. In the sample of Dammel and Schallert (2021: 209), which covers all five core modals, there are dialectal systems that correspond exactly to the predicted distribution so there might be additional factors that explain the further spreading to other paradigm cells. However, there is a more general problem with functional explanations like this one: They do not conform to the standard model of scientific explanations, the Hempel–Oppenheim schema (Hempel and Oppenheim 1945). In this model, the explanandum (the respective phenomenon) is explained as the deductive consequence of the initial conditions and general or covering laws. In particular, functional explanations fail to specify the necessary/sufficient conditions (C) under which a certain morphological feature or feature value (F) is expressed (see Haider 2018: 85; Hempel 1959: 283–284).

– If C_i is necessary for F ($F \Rightarrow C$), then there should be no C_j that also fulfills F.
– If F is sufficient for C ($C \Rightarrow F$), then inference from F to C is logically invalid (abduction).

As discussed in Section 3.2, umlaut (or other strategies of *deepening number fission* with PPs) is not *necessary* because in the verbal inflectional paradigm, number is already – and unambiguously – coded by other morphological means. If it were a *sufficient* condition, we would wrongly conclude $C \Rightarrow F, F \vdash C$ because $C \Rightarrow F$ does not imply $F \Rightarrow C$ ('affirming the consequent'). Actually, this sort of inference constitutes abduction, a concept introduced by Charles Peirce (1839–1914) to model thought processes that lead to new hypotheses (Peirce 1931: 188–189). While not logically valid, abduction has proven to be powerful tool for modeling the cognitive mechanisms responsible for language change (Andersen 2017) and even the classic analogy concept may involve this kind of inference.[7]

Minnameier (2010) gives an interesting characterization of analogical reasoning. In the psychological literature on this phenomenon, it can be described as a process where schemata are transferred from a source (where the analogy is drawn) to a target domain (the domain where it is applied). This process comprises two subprocesses, matching and mapping: "[F]irst a target […] and a source […] have to be matched, then the relevant features of the source have to be mapped onto the target" (Minnameier

7 Diachronic or, more generally, historical phenomena cannot be successfully captured by the Hempel-Oppenheim schema; they necessitate other modes of scientific explanation like e.g. the practical syllogism (see Poser 2012: 57–66 for discussion).

2010: 108). Crucially, analogical reasoning involves both an inductive and an abductive step, which can for the present purposes be roughly characterized as follows:[8]

– Step 1: There is a more or less superficial relation between source and target, i.e. plurality is marked both in the nominal and verbal domain by stem alternations (umlaut in the first, ablaut in the latter).
– Step 2: Stem alternation via umlaut as a sign for 'plurality' is mapped on the target: As bridging context, the verbs OHG *muos-* 'must' and *mag-* 'like' act (cf. Nübling 2009: 210) because they have a uniform stem in the PRES.[9]

Analogy could also be responsible for umlaut in the infinitive of PPs even though its directionality relative to the PRES.PL is unclear. Sčur (1961: 216) assumes that homophony with the 3PL.SBJV.PRES in MHG emerged as the causing factor (cf. Birkmann 1987: 196). Crucially, also morphomic processes can be extended by analogy (Maiden 2005) so that an explanation along these lines seems feasible. However, I have to leave this matter open for further research. Besides their diachronic implications, there are plausible ideas how functional explanations can be made to work. They necessitate a detailed analysis of the containing system and its form-function interactions:

> […] functional ascriptions do require relativization to a 'functional fact' about a containing system, i.e., to the fact that a certain capacity of a containing system is approximately explained by appeal to a certain functional analysis. (Cummins 1975: 763)

Viewed from the angle of inflectional classes as the containing system, number fission is a bundle of irregularization strategies that has a stabilizing effect on the PPs and sharpens their profile (see Section 2.2). In particular, it strengthens distinctiveness as one feature of canonical inflectional classes.

4 Analysis

In this section, I develop an analysis of morphomic umlaut with PPs in IBM (Bonami and Boyé 2006; Bonami and Crysmann 2016; Crysmann and Bonami 2016, etc.). It constitutes an approach couched in HPSG (Pollard and Sag 1994) that uses typed

8 Minnameier (2010) describes two types of analogical reasoning that can be distinguished by how the inductive and the abductive step interact. My reconstruction of analogy corresponds to the second one (cf. Minnameier 2010: 113–117 for further discussion).

9 It is unclear to which ablaut class *mag-* belongs. Crucially, the differing theme vowel *u* seems to be a secondary development. In any case, this verb shows robust evidence for umlauted forms based on the *a*-vowel (Klein et al. 2018: 905–906).

attribute-value matrices (AVMs) as well as inheritance hierarchies for analyzing morphological structures. In terms of Stump's (2001, Ch. 1) classification, this approach subscribes to an inferential-realizational perspective (Crysmann and Bonami 2016: 313). This means that in contrast to incremental models, morphology is not characterized as information-extending; exponence does not correspond to expression or addition of morphological features. Instead, feature signatures (i.e. feature structures) as described by AVMs, license specific word forms in their morphosyntactic expression. This approach has already been applied to a range of morphological phenomena, e.g. inflectional irregularity (Bonami and Boyé 2006), the morphotactics of affix-ordering (Crysmann and Bonami 2016) or interactions between derivational morphology and syntax (Riehemann 1998). From a (micro-) typological perspective, IBM is well-suited because canonical descriptions of morphological phenomena like e.g. suppletion (Corbett 2007) can be directly translated into inheritance hierarchies – in both cases, we are dealing with Boolean lattices (Bonami and Crysmann 2016: 614; Corbett 2015: 173). More specifically, the concept of a *stem space* (Bonami and Boyé 2006; Bonami and Crysmann 2016: 643–645) offers a flexible tool for modeling stem allomorphy and/or lexical suppletion. Since HPSG and IBM use the same basic formalism, syntactically-triggered phenomena in the realm of modals like the substitute infinitive (and related constructions) can be described and analyzed in a uniform fashion (see Müller 1999: Ch. 14). In axiomatic terms, IBM is a formal, model-theoretic approach (Pullum and Scholz 2001). As discussed by Bonami and Crysmann (2016: 645–646), there are nonetheless several similarities with functional theories like construction morphology (Booij 2010), e.g. both frameworks subscribe to a word-based perspective or highlight the importance of vertical generalizations (i.e. morphological templates and the concept of inheritance). Thus, there is the chance of integrating the intuitive plausibility of functional explanations while maintaining a certain level of independence of morphological structure.

4.1 Stem spaces

The tool for capturing stem allomorphy or (weak) suppletion is the concept of *stem spaces* (Bonami and Boyé 2006): Lexemes are associated with a vector of possibly different phonological representations; they belong to the lexeme's lexical entry (24). Inflectional rules specify which coordinate in the vector is used as input. In the type logic of IBM, a morphological word is represented as an ordered list of lexemes that are stored in the attribute M-DTRS ('morphological daughters'), cf. (23). Each lexeme is

equipped with its stem space with *n* slots, as illustrated with a verbal category in (25) and (26), and inflectional rules specify which slot of the stem space is used (27).

(23) $$word \rightarrow \left[\textsc{m-dtrs} \left\langle lexeme \right\rangle\right]$$

(24) $$lexeme \rightarrow \left[\textsc{stems} \left\langle stem\text{-}space \right\rangle\right]$$

(25) $$v\text{-}lexeme \rightarrow \begin{bmatrix} \textsc{head} & verb \\ \textsc{stems} & v\text{-}stem\text{-}space \end{bmatrix}$$

(26) $$v\text{-}stem\text{-}space \rightarrow \begin{bmatrix} \textsc{slot}\,1 & phon \\ \textsc{slot}\,2 & phon \\ \ldots & \ldots \\ \textsc{slot}\,\textsc{n} & phon \end{bmatrix}$$

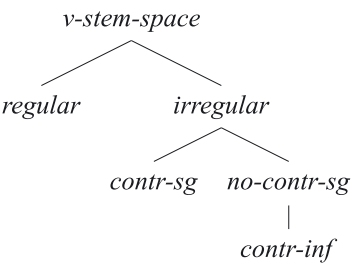
(27) $$pres\text{-}pl\text{-}v \rightarrow \left[\begin{array}{l} word \\ \\ \textsc{phon}\ \boxed{1} \\ \\ \textsc{synsem}\ \left[\textsc{head}\ \left[\begin{array}{ll} verb & \\ \textsc{tense} & pres \\ \textsc{mood} & ind \\ \textsc{number} & pl \end{array}\right]\right] \\ \\ \textsc{m-dtrs}\ \left\langle \left[\begin{array}{l} v\text{-}lexeme \\ \textsc{stems}\,|\,\textsc{slot}\,1\ \boxed{1} \end{array}\right] \right\rangle \end{array}\right]$$

Let me now explore the different stem spaces we observe with modals. A caveat: I do not address the question how inflectional affixes are analyzed because this aspect necessitates a more detailed analysis of the respective dialectal systems. In many cases, it is difficult to arrive at a clear segmentation of stem plus affix, particularly with contracted forms. In a word-based account, this poses no general problem since bound morphs do not carry semantic information per se –

structural descriptions license specific word forms.[10] In the logic of IBM, concatenative processes can be modeled via the *append* relation (⊕) that modifies the phonological shape (PHON-attribute) accordingly. This distinction in terms of modeling exponence is relevant because in several German dialects the suffixes of the INF and the PRES.PL become dissociated while still targeting the same stem level.[11] Conversely, syncretism between the two forms appears very early and can be regarded as a characteristic of the PPs in MHG times (Klein et al. 2018: 896). Note that there is a connection to the uniform PRES.PL we observe in many Alemannic and Low German varieties because the respective allomorphs *-en*/*-ed* can be either based on the old form of the 1.PRES.PL or the 3.PRES.PL (Ebert et al. 1993: 248–249; König et al. 2019: 128). This means that with the *-en* class, syncretism can extend to the INF.

For PPs, we can assume the partial hierarchy of stem spaces in (28) that models stem selection for the PRES.SG, PRES.PL and the INF; for the PST and PTCP certain adaptions would be necessary, which I do not discuss in detail.

(28)



The simplest case is presented by PP-lexemes that do not show any stem allomorphy; they represent the default specification *regular* in (28) and are described in (29), where only the content of one slot is listed (cf. Bonami and Boyé 2006: 371). The typical case would be *sollen* 'should' in Standard German. Assuming the analysis of umlaut described in Section 4.2, also *müssen* 'must' belongs to this class.

(29) $$regular \rightarrow \left[\text{SLOT 1} \;\; \langle soll \rangle = \boxed{1}\right]$$

10 Nübling (2001a: 68) notes that "phonological internal compression can lead to the dissolution of morphological structures", as is the case e.g. with colloquial German {*hab*}+{*en*} → {*ham*} 'have'.
11 The most important source of distinct forms is the strong MHG allomorph of the 3.PRES.PL *-ent* that came to be extended to PPs as well.

The next stem type, *contr-sg*, subsumes PP-lexemes with fission due to ablaut and/or contraction. In this class, the form of the infinitive always shares the phonology of the PRES.PL, yet in both cases the forms are uncontracted, cf. (30).

(30) Postelberg (East Central German):
khoō (SG) – *khenə* (PRES.PL) – *khenə* (INF) (Hausenblas 1914)

Nübling (2000: 9) regards the form of the infinitive as a distinguishing feature of the morphological class of short verbs. This cluster of verbs, among them *have*, *come* or *give*, developed highly irregular forms in most Germanic varieties due to factors like token frequency and/or analogical interactions with root verbs (i.e. verbs that do not have stem-forming elements historically). She does not regard the infinitive as the base form of the respective verbal paradigms but observes that there seems to be an implicational relationship between finite short forms in the PRES and a contracted INF. Against this background, I assume that there is a designated slot in the stem space (*bse* 'base') that is reserved for the phonology of this form and that can be targeted by morphosyntactic rules like the substitute infinitive (IPP). This slot also constitutes the interface between the stem spaces of PPs and short verbs, which share many similarities, among them analogical umlaut in the PRES.PL and other paradigm cells (see Nübling 2009: 220–223). Thus, this type has the stem space described in (31).

(31) $$\textit{contr-sg} \rightarrow \begin{bmatrix} \textsc{slot}\,1 & \langle \textit{ka} \rangle = \boxed{1} \\ \textsc{slot}\,2 & \langle \textit{kon} \rangle = \boxed{2} \\ \textsc{bse} & \boxed{2} \end{bmatrix}$$

The stem type *no-contr-sg* in (32) shows a full stem in the PRES.SG and the INF but contraction in the PRES.PL; it is illustrated with the example in (33).

(32) $$\textit{no-contr-sg} \rightarrow \begin{bmatrix} \textsc{slot}\,1 & \langle \textit{mus} \rangle = \boxed{1} \\ \textsc{slot}\,2 & \langle \textit{mu} \rangle = \boxed{2} \\ \textsc{bse} & \boxed{1} \end{bmatrix}$$

(33) Breitenbach (West Central German):
mùs (SG) – *mien* (PRES.PL) – *miesə* (INF) (Hausenblas 1914)

To model the mirror-image effect with *können* 'can' and *müssen* 'must' that is frequently attested in my sample, one additional stem type, is necessary. It is *contr-inf*, as described in (34) and illustrated by (35). It inherits the full form of the PRES.SG and the contracted form of the PRES.PL from *no-contr-sg* but shows a contracted form of the INF.

(34) $$contr\text{-}inf \rightarrow \begin{bmatrix} \text{SLOT } 1 & \langle mus \rangle = \boxed{1} \\ \text{SLOT } 2 & \langle mu \rangle = \boxed{2} \\ \text{BSE} & \boxed{2} \end{bmatrix}$$

(35) Weingarts (East Upper German):
mus (SG) – *min* (PRES.PL) – *min* (INF) (Schnabel 2000)

One may wonder, as one reviewer does, why the stem vowels in the different stem representations do not match the respective umlauted forms in the dialect examples while contraction is represented directly. This becomes clear in the following section: Umlaut is regarded as a morphophonological rule that applies to the stem space with the highest index, whereas contraction is inherently a feature of stem spaces themselves (and the selection rules specified for them). The logic behind this approach is that contraction is a synchronically less transparent rule than umlaut. It is the consequence of a diachronic process that leads to weak suppletion and the different geometries of stem spaces we observe.

4.2 Umlaut

Let us now have a closer look at the analysis of umlaut. In modern Standard German, this alternation involves the back vowels /a/, /o/, /u/ and the diphthong /aʊ̯/ that contrast with the fronted vowels *ä* /ɛ/, *ö* /ø, œ/, *ü* /y, Y/, and *äu* /ɔɪ̯/. Haspelmath and Sims (2010: 214–217) discuss several properties that distinguish purely phonological (*automatic*, in their terminology) from morphophonological alternations. While the first class can be described in purely phonological terms, this is not possible in the latter case, and German umlaut belongs here. For expository reasons, I focus on some of the criteria; a more thorough discussion can be found in Wiese (1996).

Firstly, umlaut always applies in derived environments.[12] While it can be observed in an impressive range of morphological environments, e.g. plural formation (36a), derivational processes like similatives (36b), subjunctive formation (36c), adjectival comparatives (36d), etc., there is always a base value of the respective category that does not show umlaut.

12 This connection is already explicitly stated in Wurzel (1984: 647): Umlaut "not only symbolizes different single (inflectional and word formation) categories, but is interpreted as a marker for marked categories by speakers". Thanks to one of the referees for pointing this out.

(36) a. *Mutter* 'mother' (SG) – *Mütter* 'mothers' (PL)
b. *blau* 'blue' – *bläu-lich* 'blueish'
c. *hatte* 'had' (IND) – *hätte* (SBJV)
d. *groß* (POS) 'big' – *größ-er* 'bigger' (CMPR)

Secondly, umlaut is clearly morphologically or lexically conditioned, meaning that idiosyncratic exceptions occur (Wiese 1996: 122–123). Historically, it is first attested in OHG.[13] In its first stage, it existed only as an allophonic process and was then integrated into the grammatical system in a stepwise process (Twaddell 1938). In MHG we find clear evidence of umlauted vowels while their historical triggers (*i*, *j*) were largely leveled to *e* in unstressed syllables (Salmons 2018: 206). During this period, and in particular in ENHG, umlaut spread via analogical extension to environments where it had never been phonologically triggered (see Sonderegger 1979: 297–319 for a detailed chronology).

An instructive example for the lexical/morphological dimension of umlaut is comparative morphology: It only affects a rather small range of (usually token-frequent) adjectives and only those with the stem vowels *a*, *o*, *u* (irrespective of their phonological correspondences), e.g. *hart* 'hard' – *härter*, *groß* 'big' – *größer*, *dumm* 'stupid' – *dümmer*; the diphthong /au̯/ and polysyllabic stems are exempt, the only notable exception being *gesund* 'healthy' – *gesünder* (Augst 1971). Nowak (2017: 92) concludes that adjectives corresponding to the phonotactic scheme [(C)(C)aSC] are most prone to umlauting while deviations correlate with a lower rate of this alternation (C = 'consonant', S = 'sonorant'). Note, in passing, that in contrast to automatic alternations, loans or borrowings are not systematically affected even if there are some examples like e.g. *Popo* 'butt' > *Popö-chen* (DIM); *Europa* 'Europe' > *europä-isch* 'European' (Wiese 1996: 122).

The third criterion has different facets that are closely related so that I address them together; they involve phonological coherence/distance and the creation of new segments. Morphophonological alternations are not phonologically coherent, meaning that the alternating segments do not form a natural class. Describing umlaut only in terms of e.g. a fronting rule along the lines of [+ front] is not sufficient because *a*-sounds (/aː, a/) are also raised (/ɛː, ɛ/), and for the diphthong /au̯/ additional rounding has to be assumed (Wiese 1996: 121–122). While umlauting in its first phase did indeed create new vocalic segments (fronted allophones), they later became phonematized. Thus, front vowels can also be found in stems and independently of morphological contrasts, e.g. *fühl-en* 'feel', *Schlüssel* 'key', *schön* 'beautiful', *Hölle* 'hell', etc.

For the present purposes, I assume the analysis of umlaut developed by Wiese (1996: 120–122), who treats it as a lexically-governed, phonological rule. Concretely, it can be

13 Umlaut can be observed in all Germanic languages, yet only in German (and its 'daughter' languages Luxemburgish and Yiddish) it came to be systematically used for coding morphological distinctions (cf. Nübling 2013).

regarded as a floating feature that is realized via a nonlinear linking rule, and the problems with phonological coherence can be overcome with a suitable feature geometry and redundancy rules. This approach straightforwardly reflects the 'irregular' and sometimes idiosyncratic character of this alternation. What about the morphological dimension, then? There is no denying that umlaut is employed as a morphological marker, but "the range of the categories involved comprises more or less the whole universe of morphological distinctions to be overtly marked in the German language" (Wiese 1996: 124). One might also add that this polyfunctionality even includes the morphomic level, i.e. signaling nothing more than inflectional class coherence ('distinctiveness' in Corbett's 2009 terminology). Against this background, the morphology of umlaut has more to do with the organization of stem spaces than with feature signatures.[14]

In IBM, umlauting can be implemented as follows: There is an additional slot in the stem space (UL-STEM); as lexically-governed rule, it applies to the slot in the stem space with the highest index (37). If we revisit the three irregular stem spaces from Section 4.1, here repeated as (38)–(40), we see that this analysis captures the relevant facts correctly. For the infinitival stem (BSE), we can assume that if there is an UL-STEM targeted by the UL-rule, it can also be applied to this slot (but not vice versa).

(37)
$$\begin{bmatrix} \text{STEMS} & \begin{bmatrix} \text{SLOT } 1 & \boxed{1} \\ \dots & \\ \text{SLOT N} & \boxed{n} \end{bmatrix} \\ \text{UL-STEM} & \langle \text{UL}(\boxed{n}) \rangle \end{bmatrix}$$

(38) *contr-sg* → SLOT 2 | BSE = 2

(39) *no-contr-sg* → SLOT 2 | BSE = 1

(40) *contr-inf* → SLOT 2 | BSE = 2

5 Conclusions

5.1 Main findings

In this paper, I showed that number fission with PPs is the effect of different irregularization strategies, most prominently umlaut and contraction. My observations

14 This means that umlaut has become grammaticalized/functionalized on a much deeper or abstract level in German. Thanks to Lars Bülow for pointing out this consequence.

point to the conclusion that these facets of irregularity are, synchronically speaking, morphomic because they also systematically co-occur in other paradigm cells: They serve no other purpose than signaling inflectional class coherence. A promising approach to capture these complex patterns of stem allomorphy is IBM and the concept of a *stem space* (Bonami and Boyé 2006), which allows to express implicational or directed generalizations in stem formation on a purely morphological level. In general terms, I favored a more form-based (or 'formal') account of the relevant facts. This does not mean, however, that I do not see any room for functional explanations. Which role they play in my account and how I think about them more generally is the topic of the concluding section.

5.2 General remarks: form versus function in morphology

Functional explanations have a long tradition in linguistics, particularly in the typological and diachronic branch. In the latter, for instance, the unidirectionality of grammaticalization processes or the question whether it constitutes a distinct process from reanalysis has lead to a lively and, I believe, fruitful debate (Campbell and Janda 2001; Norde 2009, and others). In the 1990s and early 2000s, an intensive discussion emerged about their general validity (Haspelmath 2000; Newmeyer 2003), yet without any negative effect on the popularity of such explanations. In Haider's (2018) opinion, this must be seen against the background of many unwarranted and ill-founded developments in mainstream generative grammar (aka the *Minimalist Program*, cf. Chomsky 1995 et seq.) and the increasing appeal of usage-based models like e.g. *Construction Grammar* (Goldberg 1995 et seq.) as their most important proponents. For capturing and explaining crosslinguistic generalizations, usage-based theories "appeal to general cognitive constraints together with the functions of the constructions involved" (Goldberg 2003: 219). In some sense, formal and functional explanations have gained axiomatic status that circle around the three autonomy theses discussed in Newmeyer (1998: Ch. 2). The most important one is Chomsky's (1965, pp. 3–4) (in)famous distinction between competence ("the speaker-hearer's knowledge of his language") and performance ("the actual use of language in concrete situations"). Most generative models accept this premise, while most usage-based models reject it (Diessel 2015). In my opinion, there are good reasons to stick with the competence-performance dichotomy, however. Several convincing arguments are presented in Newmeyer (1998: 55–77, Ch. 3) and Newmeyer (2003). Another hotly debated question is the independence of grammatical levels like syntax from semantics or, in the realm of morphology, the relative autonomy of morphological patterns (*morphomes* in Aronoff's 1994 diction).

Quite paradoxically, those debates hardly touch on the daily business of linguists working in different fields, which I regard as a good thing. Our main goal is to better understand why grammatical systems are the way they are and, more specifically, how form relates to function (and vice versa). Nobody would claim that there is a strict isomorphism between these two levels, and in order to tackle possible interactions, very different grammatical frameworks have come up with useful tools. It is in the use of these devices where many convergences can be found, some more hidden, others more readily apparent. Typed feature structures (in the form of attribute-value matrices, i.e. AVMs) and type hierarchies, for instance, were developed in head-driven phrase structure grammar, a genuinely 'generative' framework, yet they were soon carried over to construction grammar because they are a simple and powerful means for modeling grammatical dependencies. Conversely, implicational rules (usually bundled as scales) are widely used outside of the realm of functional-typological approaches where they started their career, so to speak.

More specifically, there are several functional explanations in morphological analysis that have proven to be insightful. Why should we abstain from using them as tools in more 'formal' theories, then? One example is (diagrammatic) iconicity in the guise of Bybee's (1985) relevance principle or structural iconism, as assumed in *Naturalness Theory* (Mayerthaler 1981: 25; Wurzel 2001: 22). As discussed by Newmeyer (1998: 114–118, 129–130), cognitive pressure for structure-concept iconicity is a plausible external (i.e. usage-based) force responsible for shaping grammatical structure. Another functional motivation we had a closer look at is 'transcategorial number marking' (Nübling 2009). It resorts to analogy as a cognitive factor underlying the extension of number fission, most prominently with umlaut. Even if there are problems with the synchronic validity of such an explanation, it offers a plausible scenario for the first step of this process. Viewed from the angle of inflectional classes as the "containing system" (Cummins 1975: 763), number fission is a bundle of irregularization strategies that has a stabilizing effect on the PPs and sharpens their profile with respect to the other classes (see Section 2.2). This morphomic stability can be successfully captured with the logic of typed feature structures and a suitable geometry of stem spaces.

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Abbreviations

AVM	attribute-value matrix
C	condition
CP	complementizer phrase
DP	determiner phrase
ENGH	Early New High German
F	feature value
FU	functional explanation
HPSG	Head-driven Phrase Structure Grammar
IBM	*Information-based Morphology*
IPP	*infinitivus pro participio*
MHG	Middle High German
OHG	Old High German
OLG	Old Low German
PP	preterite-present verb

Morphosyntactic glosses

1, 2, 3	1st, 2nd, 3rd person
CMPR	comparative
C	contraction
DIM	diminutive
IND	indicative
INF	infinitive
NOM	nominative
PAUC	paucal
PL	plural
POS	positive
PRES	present
PST	past
PTCP	participle

SBJV	subjunctive
SG	singular
UL	umlaut

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Explaining morpho-syntactic variation and change: the case of subjunctive II in the Bavarian dialects of Austria

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Abstract: This paper aims to explain recent empirical findings on subjunctive II formation in the Bavarian dialects of Austria from both functional and formal perspectives. For this purpose, the explanatory power of the functional principles of natural morphology (NM) is compared with the formal framework of constructional morphology (CxM). It is argued that the two approaches complement each other. Thus, it is shown that the key concepts of NM (constructional iconicity, uniformity and transparency) can easily be adapted in terms of CxM. These adjustments are needed to explain the ongoing changes in subjunctive II formation in the Bavarian dialects of Austria. This is due to the well-documented shift towards the use of periphrastic constructions (with the *täte*- and *würde*-auxiliary) that are located at the interface between morphology and syntax.

Keywords: constructional morphology; natural morphology; subjunctive II; Bavarian dialects in Austria; iconicity

1 Introduction

German dialectology has increasingly addressed morpho-syntactic variation since the 1980s (e.g. Fleischer 2004; Scheutz 2005; Weiß 1998, 2004; Weiß and Strobel 2018), and a particular focus in recent dialectological research has been on the formation of subjunctive II in the Bavarian dialects of Austria. Several empirical studies have been carried out on this topic, finding not only significant linguistic but also social and spatial factors of variation and change of this phenomenon (e.g. Breuer and Wittibschlager 2020; Edler and Oberdorfer 2022; Niehaus et al. 2022; Stöckle 2020; Stöckle and Wittibschlager 2022; Vergeiner and Bülow 2022). However, despite these research efforts, the available studies are predominantly descriptive. Consequently,

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there are hardly any formal and very few functional accounts (Bittner and Köpcke 2010; Vergeiner and Bülow 2022) connecting the empirical findings on subjunctive II in Bavarian dialects with a more general theoretical framework. Such an endeavour, however, would be desirable in many respects. Not only would it increase the understanding of ongoing change in the respective dialects, but, more so, authentic dialect data are also the ideal "testing ground" to examine and review the claims of any particular grammatical theory (e.g. Weiß 1998).

The aim of this paper is to address this desideratum by explaining comprehensive findings on subjunctive II formation in the Bavarian dialects of Austria from both functional and formal perspectives. To this end, we selected two morphological theories *claimed* to be suitable to account for actual language variation and change: the well-established theory of natural morphology (NM; e.g. Dressler 1987; Mayerthaler 1981; Wurzel 1984) and the more recently developed theory of construction morphology (CxM; e.g. Booij 2010a; Masini and Audring 2018; van der Spuy 2017).

In this paper, we will demonstrate that the functional explanations of NM alone are not sufficient to account for the variation and change of subjunctive II in the Bavarian dialects of Austria. As will be argued in greater detail, this is due to the rigid concept of morphology presumed by NM. Therefore, we examine whether bringing together functional explanations of NM with formal explanations of CxM provides a better understanding of recent data and findings. To avoid any misunderstandings, we must briefly clarify what we mean by "formal" and "functional". We refer to Newmeyer (2003, 2016), who convincingly argues that the hypothetical division between functional and formal linguistics is above all a "rhetorical conflict" (Newmeyer 2016: 129). There are neither purely functional nor formal theories but only theories drawing more or less heavily on functional and formal explanations. Based on this understanding, a formal explanation is an explanation "in which principles governing the organisation of grammars are said to play a central role", whereas a functional explanation "refers crucially to properties of language users, in particular to their interest in producing and comprehending language rapidly, to their states of consciousness, or to aspects of their behaviour" (Newmeyer 2003: 18). We will use the terms "formal" and "functional" in this exact sense (i.e. a formal explanation is not required to draw on a theory generally considered as formal, such as generative grammar; Newmeyer 2016: 134). Accordingly, formal explanations can also be found in theories that are usually understood as functional.

In what follows, it is argued that the functional explanations of NM, which ultimately draw on speaker and listener psychology (Mayerthaler 1981; Wurzel 1984), fail to fully explain language change regarding subjunctive II formation in the Bavarian dialects of Austria, i.e. the recent shift from synthetic to analytic forms (Vergeiner and Bülow 2022). This is because of NM's narrow understanding of morphology. Thus, a different model of the organisation of grammar is needed to adequately account for the change. More specifically, it is necessary to clarify how morphology and syntax are

linked to explain how synthetic structures can be replaced by analytic structures. At this point, CxM comes into play; we argue that the *formal* assumptions of CxM[1] on the organisation of grammar, along with the *functional* principles of NM, allow for a better understanding of the phenomenon under consideration.

In what follows, we first present the current state of research on subjunctive II formation in the Bavarian dialects of Austria by reviewing the findings of recent empirical studies (Section 2). Subsequently, we introduce NM and examine whether it can explain these findings (Section 3). In the next step, we address CxM and consider its formal modelling of the research outcomes (Section 4). Finally, we discuss whether CxM is compatible with NM and whether a complementary approach allows for a better explanation of recent research outcomes (Section 5).

2 Subjunctive II in the Bavarian dialects of Austria

Although subjunctive II formation, such as morpho-syntactic variables in general, has been largely neglected by traditional dialectology in Austria for a long time, there has been increased interest in this phenomenon since the 2000s. Evidence for this increased interest is found in numerous studies dealing with subjunctive II formation in the Bavarian dialects in Austria (e.g. Breuer and Wittibschlager 2020; Edler and Oberdorfer 2022; Lenzhofer 2017; Niehaus et al. 2022; Quehenberger et al. 2022; Stöckle 2020; Stöckle and Wittibschlager 2022; Vergeiner and Bülow 2022). These studies focus particularly on the variation of different formal variants for expressing subjunctive II. The manifold functions of subjunctive II in Bavarian dialects are demonstrated in detail in Donhauser (1992) and Glauninger (2008, 2010). In this article, we focus primarily on variation and change in the use of the various subjunctive II variants against the background of functional and formal explanations – a key desideratum, as has already been shown above (see Section 1). Therefore, we will first explain the different variants that are used in the Bavarian dialects of Austria to express subjunctive II (Section 2.1), and then we briefly summarise the most important findings from recent empirical studies to provide insights into key trends of ongoing change (Section 2.2).

2.1 The formation of subjunctive II in Bavarian

Despite the loss of the preterite in the Upper German dialects (cf. Fischer 2018), which potentially withdraws the preterite basis of subjunctive II formation (cf. Bittner and

1 However, this does not mean that we consider CxM a formal theory.

Köpcke 2010; Nübling 1997), Bavarian dialects are characterised by a particular richness of variants to form subjunctive II compared to other German dialects (cf. Saltveit 1983; Stöckle 2020). The inventory of forms consists of synthetic forms (1), which operate on the word-internal level, and periphrastic forms (2), which operate on the phrasal level.

The synthetic variants can be either strong, weak or mixed in their formation (Merkle 1993: 71–72): strong by using the preterite stem (usually with ablaut and/or umlaut) (1a), weak by means of the suffix *-at* attached to the present stem (1b) and mixed with the *-at*-suffix attached to the preterite stem (1c).

(1) a. *Wonn's des ned do olle wieder tatn!*
'If they would not do that again!'
(DiÖ, PP02 corpus)[2]

b. *Wonn i's do ned so oft brauchat!*
'If only I would not need it so often!'
(DiÖ, PP02 corpus)

c. *Wonn a's moi nahmat.*
'If he would take it.'
(DiÖ, PP02 corpus)

The suffix *-at*, which does not appear in Standard German, is a characteristic of Bavarian dialects. It has developed from the weak Old High German preterite suffix *-ôt*(*a*) (Schönbach 1899: 236) and was later – probably in connection with the decline of the preterite in Middle High German and Early New High German (cf. Pickl 2022) – reanalysed as a subjunctive II marker in the Bavarian dialects. The subjunctive II suffix *-at* is placed between the stem and the inflectional suffix for person and number (Wiesinger 1989: 60). Table 1 shows the prototypical

Table 1: Inflection paradigms for synthetic subjunctive II forms in (Central) Bavarian dialects.

Ps. num.	Weak verb (weak inflection) ***sagen*** 'to say'	Strong verb (mixed inflection) ***kommen*** 'to come'	Strong verb (strong inflection) ***kommen*** 'to come'
1. sg.	*sōg-at-ø*	*kam-at-ø*	*kam-ø*
2. sg.	*sōg-at-st*	*kam-at-st*	*kam-st*
3. sg.	*sōg-at-ø*	*kam-at-ø*	*kam-ø*
1. pl.	*sōg-at-n*	*kam-at-n*	*kam-an*
2. pl.	*sōg-at-s*	*kam-at-s*	*kam-ts*
3. pl.	*sōg-at-n*	*kam-at-n*	*kam-an*

2 For detailed information on the corpus see Vergeiner and Bülow (2022: 15–18).

inflectional paradigms (weak, mixed and strong) for the synthetic subjunctive II forms in the Bavarian dialects for both a weak verb (*sagen* 'to say') and a strong verb (*kommen* 'to come').

Regarding the periphrastic variants, a distinction must be made between those with the *täte*-auxiliary (2a)/(2b) and those with the *würde*-auxiliary (2c)/(2d). Both auxiliaries can also be formed with the *-at*-suffix (2b)/(2d):

(2) a. *Wenn a wos eftas sogn tat!*
'If he would say something more often!'
(DiÖ, PP02 corpus)
b. *Wonn a ma's amoi glaum tatat!*
'If he would believe me!'
(DiÖ, PP02 corpus)
c. *Wenn i des net so gonz oft brauchen wiad!*
'If I would not need that so very often!'
(DiÖ, PP02 corpus)
d. *Ja, da wuata[t] i scho d'Lehrering a weng segieren.*
'Yes, I would tease the teacher a little bit.'
(example taken from Breuer and Wittibschlager 2020: 145)

It is important to note that while the *würde*-auxiliary is also widely used in Standard German, the *täte*-auxiliary is not. The *täte*-auxiliary – although widespread in the dialects – is stigmatised in Standard German (e.g. Langer 2001; Lotze and Gallmann 2009: 235; Schwarz 2009).

Recent studies on the formation of subjunctive II in Bavarian dialects of Austria suggest ongoing changes affecting both synthetic and periphrastic variants (Breuer and Wittibschlager 2020; Edler and Oberdorfer 2022; Niehaus et al. 2022; Stöckle and Wittibschlager 2022; Vergeiner and Bülow 2022). The most important findings of these studies are summarised in the following section.

2.2 Recent findings

Drawing on different datasets and various apparent-time studies, it can be said that the most important change is the decrease of synthetic variants in favour of periphrastic variants. This change is affected by geographical, linguistic and social factors.

In what follows, the results from four studies with different methodological approaches are presented and compared: 1) a study by Stöckle (2020), who analysed data of the *Wörterbuch der bairischen Mundarten in Österreich* (WBÖ, 'Dictionary of the Bavarian Dialects in Austria') from the first half of the 20th century; 2) an

apparent-time study by Vergeiner and Bülow (2022), who used a traditional dialect survey to investigate rural dialects; 3) an apparent-time study by Breuer and Wittibschlager (2020), who used language production experiments to investigate subjunctive II formation in the city of Vienna and eleven rural locations, and 4) an apparent-time study by Edler and Oberdorfer (2022), who examined conversational data from the cities of Vienna and Graz. In contrast to the study by Stöckle (2020), which is based on data from the first half of the 20th century, the apparent-time studies analysed more recent data collected between 2017 and 2019 as part of the SFB project (FWF F060) "German in Austria".

1) Making use of historical data, Stöckle (2020: 157–161) shows that synthetic forms predominate in the dialects (90 % of 1,987 occurrences), with greater differences depending on the verb class. For example, the *-at*-suffix prevails especially with weak verbs (97 % of 820 occurrences) but also occurs frequently with strong verbs (61 % of 472 occurrences). With highly irregular verbs (for example, *sein* 'to be', *haben* 'to have' and *gehen* 'to go'), however, it occurs only in about 23 % of cases (158 of 689 occurrences). Regarding the few periphrastic variants (198 occurrences), the *täte*-auxiliary clearly predominates at 77 %, while the *würde*-auxiliary is only used in 19 % of cases at the beginning of the 20th century.[3]
2) In a study by Vergeiner and Bülow (2022), 163 participants from 40 rural locations throughout Austria were interviewed using a traditional dialect survey. The results show that the ratio between synthetic and periphrastic variants is more or less balanced.[4] Synthetic variants are used in 47 % of the cases (1,573 of 3,350 occurrences), of which variants with *-at*-suffix prevail, with 64 % (1,007 of 1,573 occurrences). Strong synthetic variants appear in 36 % of the cases (566 of 1,573 occurrences). Among the periphrastic constructions, which are used in 53 % of all instances (1,777 of 3,350 occurrences), the *täte*-auxiliary clearly predominates with 95 % (1,689 of 1,777 occurrences), whereas the *würde*-auxiliary is only used in 5 % of the periphrastic variants (88 of 1,777 occurrences). In addition to geographical differences – the synthetic forms with *-at*-suffix are predominantly used in conservative dialect regions in a broader region between Linz and Innsbruck (see Figure 12 in Vergeiner and Bülow 2022: 30) – verb-specific differences are particularly evident. Highly irregular verbs, such as *sein* 'to be', *haben* 'to have' and *tun* 'to do', are formed most frequently with strong synthetic forms. For most weak and strong verbs, such as *kaufen* 'to buy' or *lesen* 'to read',

3 The remaining 4 % of cases are classified by Stöckle (2020: 162) as special cases, which we will not discuss here.

4 Note that multiple responses of participants were weighted accordingly so that the percentages given (Vergeiner and Bülow 2022: 20) refer to n = 3,350 cases out of a total of 3,430 coded cases.

however, periphrastic variants with the *täte*-auxiliary prevail (Vergeiner and Bülow 2022: 22).

3) Using language production experiments (see for this method Breuer and Bülow 2019; Lenz et al. 2019) in eleven rural locations and Vienna, Breuer and Wittibschlager (2020) found that periphrastic variants (68 %, 768 of 1,124 occurrences) significantly outnumbered synthetic variants (32 %, 356 of 1,124 occurrences). Among the synthetic variants, the *-at*-suffix is used only in 37 % of cases (133 occurrences), while strong synthetic forms account for 63 % (223 occurrences). Among the periphrastic variants, the *würde*-auxiliary appears in 48 % of cases (367 of 768 occurrences). Accordingly, the *täte*-auxiliary accounts for 52 % of periphrastic variants (401 occurrences).
4) A clear distribution in favour of periphrastic variants (especially with the *würde*-auxiliary) is shown in the study by Edler and Oberdorfer (2022). Here, conversations in formal and informal settings were analysed for the cities of Vienna and Graz, as well as their surrounding areas. In contrast to the participants from rural Austria, where speakers use the entire range of variants (see Section 2.1), "urban speakers exhibit a much narrower range" (Edler and Oberdorfer 2022: 67). Only subjunctive II of the verbs *haben* 'to have' and *sein* 'to be' is formed almost exclusively with strong synthetic forms. In contrast, weak and strong verbs form subjunctive II in the vast majority of cases with the *würde*-auxiliary.

In all three apparent-time studies, an older generation (60+ years) of participants was compared with a younger generation (18–35 years). For these studies, it is remarkable that a similar apparent-time effect is found, although the setting (rural vs. urban) varies and different methods have been used. Compared to the older participants, the younger participants not only used more periphrastic variants but also more *würde*-auxiliaries. Note, however, that the proportion of the *würde*-auxiliary compared to the *täte*-auxiliary is still very low in the study by Vergeiner and Bülow (2022), almost balanced in the study by Breuer and Wittibschlager (2020) and dominant in the study by Edler and Oberdorfer (2022).

To sum up, in comparison with the data from the first half of the 20th century (Stöckle 2020), the three apparent-time studies outlined above indicate a change concerning the reduction of synthetic variants in favour of periphrastic variants, with the *täte*-auxiliary still dominating in the rural areas and the *würde*-auxiliary prevailing in the cities of Vienna and Graz. Since the cities, especially Vienna, have a special impact on further dialect change, it can be predicted that the *würde*-auxiliary will also continue to expand in rural areas (see also findings in Breuer and Wittibschlager 2020). In what follows, we link the empirical findings with two theoretical

frameworks: first, with the functional explanations of NM (Section 3) and second, with the formalism of CxM (Section 4).

3 Natural morphology

Variation and change in subjunctive II in Upper German dialects, such as Bavarian and Alemannic, have already been discussed a couple of times regarding the fundamental principles of the theory of NM (e.g. Bittner and Köpcke 2010; Nübling 1997; Vergeiner and Bülow 2022; Wilde 2015). These principles include constructional iconicity, uniformity, transparency, word length, token frequency and type frequency. In the following sections, the key assumptions of NM will be explained in more detail (Section 3.1) before the findings presented in Section 2.2 will be discussed against the background of these assumptions (Section 3.2).

3.1 Key assumptions

NM explains and predicts the development of linguistic structure on the basis of fundamental insights into speaker and listener psychology (cf. Dressler 1987; Mayerthaler 1981; Wurzel 1984). According to these insights, certain linguistic structures are easier for speakers and listeners to produce and decode than others. Degrees of simplicity are equated with degrees of (un-)markedness and naturalness. Consequently, the more natural a morphological phenomenon is, the less marked it is, and the less natural it is, the more marked it is. Markedness/naturalness form a scale from maximally marked/minimally natural to minimally marked/maximally natural (cf. Wurzel 1984: 21). According to Mayerthaler (1981: 22), morphological structures are maximally natural when they are constructionally iconic, uniform and transparent; otherwise, they are more or less unnatural.

Linguistic structures are transparent if they are constituted by monofunctional operations (Mayerthaler 1981: 35), i.e. if one function corresponds to one morpheme. They are uniform if exactly one form can be assigned to one function. Consequently, uniform linguistic structures form paradigms that are free of allomorphy and syncretism (Mayerthaler 1981: 34–35). Linguistic structures are constructionally iconic if out of (at least) two related phenomena, the semantically more complex one is also formally encoded with more distinctive features. For example, the grammatical categories plural, preterite and subjunctive II are semantically more complex than the categories singular, present and indicative, which is why, according to NM, they should also be encoded with more distinctive features on the form side. Morphological change should lead to the reduction of

markedness and the optimal – i.e. maximally iconic, uniform and transparent – symbolisation of morphological structures.

However, despite thousands of years of morphological changes, marked morphological structures are present in German varieties. The morphology of German is neither completely transparent nor uniform nor maximally iconic. Quite the contrary, we can observe a great deal of allomorphy and syncretism in the paradigms. This is explained by the fact that the principles of NM and natural phonology are diametrically opposed as forces of language change. Naturalness in phonology is often equated with ease of articulation and the concomitant reduction of morphological material. Thus, naturalness in phonology is primarily due to speaker needs, whereas naturalness in morphology is constrained by listeners' needs for perceptual ease (Wurzel 1984: 33). Furthermore, we must acknowledge that German does not only mark grammatical information morphologically. Many categories, such as passive voice, are encoded purely syntactically; others, such as grammatical tense or mood, are encoded both morphologically and syntactically, as can be seen in the synthetic and periphrastic formation of subjunctive II.

In a more modern conception of NM, notably coined by Wurzel (1984), morphological change is also explained by preferences or frequent types of inflectional classes within a language system. Wurzel (1984: 72) points out that inflectional classes can have a different status for speakers within individual languages. Thus, measured by type frequency, they can have different degrees of normality (Wurzel 1984: 73). This means, for example, that the weak inflection in German would be more normal than the strong inflection because the class of weak verbs has significantly more members. In this sense, normality is a criterion for explaining morphological change within a language system because inflectional classes that have a higher degree of normality in a language system are preferred over other inflectional classes in language change. In terms of type frequency, larger inflectional classes thus seem to expand at the expense of smaller ones.

However, in view of the numerous examples of irregularity in German, NM was subsequently complemented by arguments that explain irregularity. This includes, for example, the notion of token frequency in explaining morphological change: High-frequency verbs, which are also usually shorter, seem to be more resistant to changing inflectional classes. Thus, token frequency is an important factor in explaining morphological developments, especially when it comes to more irregularity or suppletion (e.g. Nübling 1997, 2000; Werner 1987).

In addition to the criticism that NM is too much oriented towards the type frequency of morphological patterns and the reduction of markedness (Nübling 1997, 2000; Werner 1987), it has also been emphasised that processes of change that require syntactic encoding are neglected. For the typological development of German, for example, a decrease in morphological marking in favour of a syntactically organised

coding of (certain) grammatical categories has been noted (e.g. Nübling et al. 2017: 331; Roelcke 2011: 129). However, this does not mean that German is generally developing into an analytical language (see Nübling et al. 2017: 354; Roelcke 2011: 267), and, in principle, change can also go in the opposite direction. One can observe, for instance, that auxiliaries frequently become bound affixes through grammaticalisation – one prominent example is the grammaticalisation of the weak preterite suffix *-te* based on the preterite of the (West-)Germanic auxiliary **dōn* 'to do' (see Szczepaniak 2011: 112–116). Depending on the degree of grammaticalisation, such constructions can be more or less transparent in the sense of NM (for a detailed discussion, see Bülow 2017). In the following section, we will discuss how the fundamental principles of NM, such as constructional iconicity, uniformity, transparency, word length, token frequency and type frequency, might affect the development of subjunctive II formation in the Bavarian dialects of Austria.

3.2 Applicability of the data

As pointed out in Section 2.2, for the formation of subjunctive II in the Bavarian dialects of Austria, three aspects of change have to be discussed with regard to the premises of NM: a) Which verbs and verb classes prefer which variant(s) and why? b) Why do periphrastic variants displace synthetic variants? c) Does the *würde-* or the *täte*-auxiliary prevail for periphrastic subjunctive II formation and why?

If we first look at the synthetic variants, we see that they are formed either weakly with the *-at*-suffix attached to the present stem, strongly with the preterite stem or mixed with the *-at*-suffix attached to the preterite stem (see Table 1). In the course of the change, the *-at*-suffix, which was originally restricted to the class of weak verbs, was extended to both the class of strong and irregular verbs. The use of the *-at*-suffix for all verb classes is, for instance, evident in the early 20th century data analysed be Stöckle (2020) and is still present in recent rural dialect data, as Vergeiner and Bülow (2022) show (see Section 2.2). Thus, the *-at*-suffix extended its scope and is not restricted to use within a particular verb class today (Bittner and Köpcke 2010: 40). Therefore, Vergeiner and Bülow (2020) argue that the strong–weak distinction in subjunctive II has become more or less obsolete in Bavarian dialects of Austria.

Considering the premises of NM, synthetic variants with the *-at*-suffix have clear advantages over the variants formed with ablaut or umlaut. The *-at*-suffix is a transparent and uniform subjunctive II marker that is short but easy to distinguish and does not compete with other suffixes. It is also constructionally iconic since the more complex category (subjunctive II) is marked additively (*-at*-suffix). Furthermore, the use of the *-at*-suffix is very regular and therefore easy to acquire and learn,

and it does not result in syncretism. Thus, according to the principles of NM, the *-at*-suffix seems to be the optimal symbolisation strategy for at least the weak and strong verbs that have no high token frequency (which would allow for more irregularity; see Section 3.1). Consequently, according to NM, Bittner and Köpcke (2010: 41) predict that the *-at*-suffix clearly outperforms the other variants in the long run.

However, even if the *-at*-suffix is still well-established in the rural Bavarian dialects, the real-time comparison and apparent-time effects shown in Section 2.2 indicate a decrease in the degree of normality for the *-at*-suffix. Thus, the assumptions of Bittner and Köpcke (2010) do not fit the empirical findings. Rather, the more recent dialect data indicate a decrease in synthetic variants (both with and without *-at*-suffix) in favour of periphrastic variants for both weak and strong verbs, which aligns well with the development of subjunctive formation in Standard German, where we also see a shift towards periphrastic variants (Roelcke 2011: 129). It is very likely that the decrease in strong synthetic forms and the increase in periphrastic variants are interdependent, as the increase in periphrastic variants fosters the levelling of the inflectional class distinction (Dammel 2011: 173). This, in turn, results in weaker lexical anchoring of the strong and irregular subjunctive II forms, which cannot be predicted from other forms because of possible vowel changes by ablaut and/or umlaut. Consequently, if the subjunctive II forms of these verbs can no longer be accessed (or are no longer acquired from the input during language acquisition), it is quite likely and comprehensible that speakers will use the more type-frequent and regular *-at*-suffix or choose a periphrastic variant. Nevertheless, it is significant that the strong synthetic forms still dominate among the irregular verbs *sein* 'to be', *haben* 'to have' and *tun* 'to do', which have high token frequencies.

While NM, which is essentially a morphological theory of change, can explain the spread of the *-at*-suffix nicely, it cannot explain its decline in favour of periphrastic variants that follow a syntactic principle. Since NM allows only very limited predictions about the development of periphrastic phenomena, it is also only of marginal use in explaining or predicting the competition between the two periphrastic variants (*täte-* vs. *würde*-auxiliary). In the following section, we will examine and discuss whether the framework of CxM is helpful in dealing with phenomena that are located between morphology and syntax, such as subjunctive II formation.

4 Construction morphology

In this section, we discuss the concept of morphology presumed by CxM. In doing so, we focus on the formal framework provided by CxM, i.e. the theory's understanding of the form of basic morphological units and processes. Although CxM might not be

considered a "formal theory" (which is a problematic notion anyway; see Section 1 and Newmeyer 2016), its formal conceptions and explanations are highly relevant to account for phenomena that are located in between morphology and syntax. We illustrate this, first, by introducing the key assumptions of CxM (Section 4.1), and second, by showing their applicability to our data (Section 4.2).

4.1 Key assumptions

CxM is based on the general framework of construction grammar (CxG), a family of interrelated theories centred around the view that language structure consists of constructions (cf., e.g. the different theoretical approaches in Hoffmann and Trousdale 2013). Following Goldberg's (1995: 4) influential definition, a construction can be understood as "a form-meaning pair" whose form and/or meaning is not predictable from either its components or other constructions. In addition, one can assume that "patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency" and thus become conventionalised (Goldberg 2006: 5; for discussion cf., e.g. Hilpert 2019: 12–14).

Constructions may have different levels of abstraction (Hoffmann and Trousdale 2013: 2). Some are fully specified (e.g. idioms like *Hang on!*),[5] while others are either partially or fully schematic (e.g. idioms such as *The X-er the Y-er*, with X and Y being open slots, or the ditransitive construction consisting of just four open slots: *Subj V Obj$_1$ Obj$_2$*). Constructions are stored in the so-called "constructicon" (Fillmore 1988), which is a structured network of interconnected constructions (Hilpert 2019: 57–68). Another key idea shared by most constructional approaches is that "it is constructions all the way down" (Goldberg 2006: 18). This is to say that constructions are found on all structural levels (i.e. in the lexicon, in morphology and in syntax) with no clear boundaries between these levels ("lexicon-grammar continuum"; cf. Booij and Audring 2017; Goldberg 2006: 220; Jackendoff 2008: 15). For this reason, CxG and CxM are "particularly useful for modelling phenomena that straddle the boundary between syntax and morphology" (Masini and Audring 2018: 365).

CxM has been developed by Geert Booij and others (e.g. Booij 2010a, 2010b, 2013, 2016; Booij and Audring 2017; Masini and Audring 2018; van der Spuy 2017). Its main focus has been on word formation (Masini and Audring 2018: 365), but there are some accounts of inflection as well (e.g. Booij 2010a, 2013: 265–268, 2016: 439–444; Masini and Audring 2018: 384–385; van der Spuy 2017). Unlike NM, CxM is not morpheme-based but word-based. Hence, words are taken as starting points of

5 Sometimes only schematic constructions are counted as constructions, while specific structures (e.g. idioms and words) are labelled as constructs (cf., e.g. van der Spuy 2017: 61).

morphological analysis (resulting in a word-and-paradigm approach to inflection; cf., e.g. Blevins et al. 2018). Proponents of CxM argue that morphemes are not in themselves meaningful but only within larger structures (Booij 2010a: 15, 2016: 428) – either within concrete word forms (3) or within abstract schemas (4) (the formalisation is based on Booij 2010a; van der Spuy 2017: 61). Only within these structures does CxM "recognize morphemes as secondarily derived units of analysis" (Masini and Audring 2018: 368).

(3) /mɔx-ɐt/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] DO'

(4) /X_i-ɐt/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i'

The example in (4) represents an abstract schema for subjunctive II formation with *-at*. The formal side of the construction is displayed on the left side of the arrow and the semantic side on the right. Regarding its form, the schema consists of a variable (X, which is a variable for a verb stem) and a constant (/ɐt/); thus, it is a constructional idiom, "a (syntactic or morphological) schema in which at least one position is lexically fixed, and at least one position is variable" (Booij 2013: 258). A schema is built up as a generalisation from fully specified constructions, such as (3) for *mochat* ('would make'), which are said to instantiate the schema. Schemas have two main functions: First, they motivate existing word forms, and second, they are used as templates for conjoining new word forms (e.g. Booij 2016: 427): "Schemas are the generative engine in word formation and inflection, whereas fully specified constructions tell us which words are actually instantiated […]. Both words and schemas are pieces of linguistic knowledge stored in the constructicon" (Masini and Audring 2018: 372; see also Booij 2016: 430, 440).[6]

As already mentioned, the constructicon is conceptualised as a structured network of interrelated constructions. It consists, for example, of (vertical) "inheritance links", connecting high-level schemas with low-level instantiations (and sometimes subschemas in-between). Via inheritance links, instantiations can inherit predictable properties from their dominating schema; for example, (3) inherits its properties from (4). However, there is only a "default inheritance", and low-level constructions can have non-predictable properties if this is specified in the lexical entry. CxM also allows for multiple inheritance, connecting, for example, one word form to several schemas (Booij 2016: 440; Masini and Audring 2018: 373–374).

6 This is not to say that for every word all inflected forms are listed in memory since this is "not realistic" for "languages with rich inflectional systems" (Masini and Audring 2018: 384). It is, however, realistic that some regularly inflected forms are stored in memory, in particular "principal parts" (e.g. Blevins et al. 2018: 269, 278–282), which allow to identify the inflectional class and to compute the other forms of the paradigm (e.g. Masini and Audring 2018: 384–385; Booij 2013: 267).

Another important part of the constructicon comprises (horizontal) links connecting same-level constructions, for example, word forms within the same paradigm (e.g. Booij 2010a: 31–36; Hilpert 2019: 84–86; Masini and Audring 2018: 384–385). Paradigmatic relationships can be symbolised with ≈ as in (5) or (6). While (5) links two fully specified constructions (accounting for the suppletion with regard to *san* 'to be'), (6) is an example of what Booij (2010a: 31–36) calls a "second order schema", which means that it links different schemas ((6) connects the schemas for subjunctive II formation with *-at* in the 2nd person singular and the 2nd person plural).

(5) /san/$_{[V\ Inf.]}$ ↔ 'BE' ≈ /va:/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] BE'

(6) /X_i-ɐt-st/$_{[V\ 2.P.Sg.\ Sbj.]}$ ↔ '[2. pers. sg.] [sbj] X_i' ≈ /X_i-ɐt-s/$_{[V\ 2.P.\ Pl.\ Sbj.]}$ ↔ '[2. pers. pl.] [sbj] X_i'

An important advantage of CxM is that "the model requires no special machinery" to account for periphrastic constructions because "stored forms in a paradigm are constructions and constructions can be morphological as well as phrasal" (Masini and Audring 2018: 385). Consequently, periphrastic constructions can be modelled as constructional idioms. The schema in (7) shows this for periphrastic subjunctive II formation with the *täte*-auxiliary.[7] As displayed, in periphrastic constructions, the auxiliary is lexically fixed, and the non-finite form, in (7) the infinitive, is a variable (e.g. Booij 2016: 443–444).

(7) /ta:t X_i-n$_{[V\ Inf]}$/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i'

Notably, periphrastic constructions are constructions par excellence because of their non-compositionality (Booij 2010b: 553, 2013: 267–268, 2016: 443–444). In (7), the verb form *tat* does not express the meaning 'to do' but a grammatical meaning of modality in combination with the infinitive. The grammatical meaning is a property of the whole construction, not of its individual parts.

4.2 Applicability of the data

Based on the key assumptions of Section 4.1, the different variants of subjunctive II in Bavarian can be modelled. With regards to strong synthetic forms, one has to remember that these variants are highly irregular (e.g. when it comes to ablaut patterns, see, e.g. Vergeiner 2022a). Consequently, there is no uniform constructional schema for strong synthetic forms, and most individual forms must be captured by

7 With regard to the infinitive ending, we ignore allomorphic variation between /n/, /ɐ/ and Ø in different Bavarian dialects (e.g. Vergeiner and Wallner 2022 for this allomorphic variation). For the treatment of allomorphy in CxM cf. e.g. Booij (2010a).

fully specified constructions, such as (8) (for *kena – kant* 'can') or (9) (for *tuan – tat* 'do').

(8) /kɛn-ɐ/$_{[V\ Inf.]}$ ↔ 'CAN' ≈ /kant/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] CAN'

(9) /tuɐ-n/$_{[V\ Inf.]}$ ↔ 'DO' ≈ /ta:t/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] DO'

Only in some cases is it possible to assume low-level schemas for strong synthetic forms. For example, (10) models the strong synthetic forms without ablaut in verbs like *woin – woit* 'want' or *soin – soit* 'should'.

(10) /X_i-n/$_{[V\ Inf]}$ ↔ 'X_i' ≈ /X_i-t/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i', where /X-n/ = {*woin*, *soin* …}

The schema in (10) states that /n/ in the infinitive form is replaced by /t/ in subjunctive II form within verbs, such as *woin* or *soin*.

To capture subjunctive II formation with a weak synthetic ending, the situation is less complicated. The second-order schema in (11) simply states that subjunctive II is formed by replacing the infinitive ending *-n* with *-at* (e.g. *moch-n – moch-at* 'make').

(11) /X_i-n/$_{[V\ Inf]}$ ↔ 'X_i' ≈ /X_i-ɐt/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i'

To account for mixed synthetic forms, it is crucial to remember that CxM allows for multiple inheritance, for example, via unification, a "binatory mechanism that merges a construction with another construction" (Masini and Audring 2018: 374). For example, to account for subjunctive forms, such as *woin – woitat* 'want' or *soin – soitat* 'should', the schemas in (10) and (11) can be unified into (12).

(12) /X_i-n/$_{[V\ Inf]}$ ↔ 'X_i' ≈ /X_i-t-ɐt/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i', where /X-n/ = {*woin*, *soin* …}

As already noted in Section 4.1, periphrastic variants can be modelled as constructional idioms in which the auxiliary is lexically fixed and the infinitive is a variable. The schema in (13) shows this for the periphrastic variant with *täte*, and the schema in (14) shows this for the periphrastic variant with *würde*.

(13) /X_i-n/$_{[V\ Inf]}$ ↔ 'X_i' ≈ /ta:t X_i-n$_{[V\ Inf]}$/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i'

(14) /X_i-n/$_{[V\ Inf]}$ ↔ 'X_i' ≈ /vʊɐt X_i-n$_{[V\ Inf]}$/$_{[V\ 1/3.P.Sg.\ Sbj.]}$ ↔ '[1/3. pers. sg.] [sbj] X_i'

In sum, this section has shown that the formal framework of the CxM allows accounting for the different subjunctive II variants in the Bavarian dialects of Austria, in both synthetic and periphrastic forms. However, the formalism of CxM does not explain why there is a change from synthetic to periphrastic forms. In what follows,

we discuss whether CxM is complementary to NM and whether this complementary approach allows us to explain this change.

5 Bringing together natural morphology and construction morphology

Recent studies on variation and change in the use of subjunctive II variants have revealed two major developments in the Bavarian dialects of Austria (see Section 2). In particular, the *-at*-suffix, which was originally restricted to the class of weak verbs, has been extended to the class of strong and irregular verbs. This process was already well advanced in the first half of the 20th century (Stöckle 2020). Since then, however, the *-at*-suffix has been largely replaced by periphrastic variants that dominate present day's dialects (Breuer and Wittibschlager 2020; Edler and Oberdorfer 2022; Vergeiner and Bülow 2022).

Section 3 indicates that NM can account for the first process, but due to its narrow understanding of morphology, NM allows for only very limited predictions about the development of periphrastic phenomena. To account for such phenomena, a more flexible and formal framework of morphology is needed. CxM provides such a framework (Masini and Audring 2018: 365). In what follows, we discuss, first, whether the fundamental principles of NM can be integrated into the framework of CxM and, second, how to explain the change from synthetic to periphrastic variants.

NM is a morpheme-based theory, while CxM is word-based. Consequently, the fundamental principles of NM relate to morphemes, whereas CxM recognises morphemes only within word forms or constructional schemas (Masini and Audring 2018: 368). Therefore, the fundamental principles of NM, such as constructional iconicity, uniformity and transparency (Mayerthaler 1981), need to be reformulated in a way in which they relate to constructional schemas. This is possible because the principles of NM concern the relationship between form and meaning, and constructions are defined as form-meaning pairs as well (Goldberg 1995: 4). Iconicity[8] thus refers to the form-meaning ratio of two related constructions. The construction with the more complex meaning also needs to be encoded in a more distinctive way on the form side (i.e. that the formal side of the construction consists of more phonological material). The principles of uniformity and transparency can also be reformulated very simply. A construction is uniform if there are no homonymous constructions and one form corresponds to just one meaning. In turn, a construction

8 Our notion here is based on Mayerthaler (1981), but there are other definitions of iconicity as well (e.g. Haiman 2000); notably, the very concept itself is sometimes disputed (e.g. Haspelmath 2008).

is transparent if there are no synonymous constructions and one meaning corresponds to just one form.[9] Other principles such as length, token frequency and type frequency can be used without significant modifications. As a result, all relevant NM principles are consistent with the CxM framework.

While this complementary approach obviously allows us to explain the extension of the *-at*-variant, the question remains as to why the *-at*-construction will be replaced by periphrastic constructions. The main difference between the *-at*-construction and the periphrastic constructions, besides the fact that only the former operates at the word-internal level, is the more complex or rather longer form of the latter. Consequently, based purely on the principle of length, periphrastic constructions would not be ideal, since their symbolisation strategy entails longer cognitive processing time compared with the *-at*-construction. In addition, formal complexity also relates to the principle of iconicity. Based on the definition above, complex meanings such as subjunctive mood should be encoded to be more complex than basic meanings such as indicative mood. Importantly, the *-at*-construction already fulfils this principle, and in comparison, the periphrastic constructions, in a certain way, even overfulfil it, given the existence of the formally more ideal *-at*-construction. Consequently, regarding the periphrastic constructions, one must deal with their 'extra-iconicity', i.e. their overabundance of iconicity that is organised on a phrasal level, to explain its spread. Especially in language and variety contact situations, extra-iconicity is a factor in explaining change. This needs to be elaborated.

For this purpose, some background information on the linguistic situation in Austria might be helpful. The most important direction of change in today's Austrian dialects is convergence due to variety contact, both with standard varieties and among the dialects themselves (e.g. Auer 2018; Bülow 2019; Bülow et al. 2019). This is particularly evident in the East-Central Bavarian dialects of Austria, where periphrastic constructions are the most widespread (Vergeiner and Bülow 2022). In several studies, the East-Central Bavarian dialect region has been shown to be strongly affected by levelling processes, which are presumably induced by the urban varieties of Vienna. In addition, there is a high dynamic of change in the Southeast, where the traditional South (or South-Central) Bavarian dialects tend to adopt East-Central Bavarian dialect features in the course of a broader restructuring process (cf. Vergeiner 2022b). In contrast, synthetic forms are most strongly preserved in those (rather remote and mountainous) areas in the west where variety contact has less of an impact on dialects (cf. Vergeiner and Bülow 2022).

9 Notably, some proponents of CxG have already formulated similar principles for syntactic structures (e.g. Welke 2020: 36).

These facts relate to the observation that extra-iconicity is a factor in a variety of contact situations and that "analyticization is favoured by language contact" (Haspelmath and Michaelis 2017: 15). Haspelmath and Michaelis (2017: 16) explain this tendency with their "Extra-Transparency Hypothesis", suggesting that

> [i]n social situations with many (or even mostly) adult second-language speakers, people need to make an extra effort to make themselves understood – they need to add extra transparency. This naturally leads to the overuse of content items for grammatical meanings, which may become fixed when more and more speakers adopt the innovative uses.

The term "transparency" in the quote must not be confused with its definition above. Instead, it relates to the notion of "extra-iconicity" we used before. Periphrastic constructions are overly iconic because they employ a comparatively longer constructional schema with an auxiliary that is connected to the free lexeme it originated from via a "subpart link".[10] Given the intense dialect-standard contact within Austria,[11] this constructional schema might be a better symbolisation strategy because only its rather "extra-iconic" form might be sufficient to symbolise the more complex meaning of subjunctive mood. Eventually, although the *-at*-construction is the unmarked (most natural) variant among L1 speakers, it is marked in today's high-contact scenario since its form is too inconspicuous to be recognised as a subjunctive construction (for the situation in Vienna, see Glauninger 2008, 2010).

While this interpretation mainly concerns ease of perception, the word-based framework of CxM suggests that periphrastic constructions have some advantages for speakers with imperfect dialect competence. While the *-at*-construction requires speakers to identify the verb stem (for example, by decomposing the infinitive form),[12] periphrastic constructions do not require this condition (see the constructional schemas in Section 4.2). Therefore, periphrastic constructions, such as those presented in examples (13) and (14) (see Section 4.2), have the advantage of being easy to use, learn and remember, in particular with less frequent verbs (cf. also Wilde 2015: 199). Speakers only have to know the infinitive of a given verb and combine it with the auxiliary, whose subjunctive forms are stored holistically in the constructicon. Only the subjunctive forms of some other frequent verbs, such as *sein* 'be'

10 Subpart links "relate constructions that show either formal or semantic overlap but which do not allow the classification of one construction as an instance of the other" (Hilpert 2019: 62). Thus, for example, the construction with the *täte*-auxiliary is linked with the lexeme *tun* 'do'.

11 Note that there is also language contact in some regions such as Carinthia and Burgenland with regional minority languages (most importantly Slovenian, Hungarian and Croatian). In addition, there is contact with immigrant minority languages such as Turkish in more urban communities. However, the impact of this language contact on traditional dialects has hardly been researched.

12 This might be a problem because of allomorphic variation, for example, with regards to the infinitive ending (e.g. Vergeiner and Wallner 2022).

or *haben* 'have', should also be memorised as a whole and thus be less affected by analyticisation, which is exactly what we observe (Vergeiner and Bülow 2022: 22).

Although other factors might play a role as well – for example, the general tendency to consolidate the analytical principle within German (e.g. Roelcke 2011: 129) – intense variety contact and the related problems for language users are most probably the main causes for the spread of the periphrastic variants during the last decades. The finding that the *würde*-auxiliary prevails over the *täte*-auxiliary among younger speakers in urban areas (see Section 2.2) can also be explained by variety contact. Especially in cities like Vienna and Graz, the influence of the standard, in which subjunctive II formation with the *würde*-auxiliary for weak and strong verbs predominates today (Edler and Oberdorfer 2022: 80), is particularly strong. In a nutshell, dialect-standard contact favours the spread of periphrastic constructions. They have the disadvantage of length but the advantage of being much easier to produce and comprehend. As shown in this section, merging the functional explanations of NM and the formalism of CxM allows for a better and complementary understanding of this process.

6 Conclusions

The aim of this study was to explain the empirical findings on subjunctive II formation in the Bavarian dialects of Austria from both functional and formal perspectives. For this purpose, we compared the explanatory power of the functional and widely established principles of natural morphology (NM) with the more recent formal framework of constructional morphology (CxM). As argued in this paper, the two approaches relate well to each other, with key ideas of NM (constructional iconicity, uniformity and transparency) being easily adaptable in terms of CxM. These adjustments in the spirit of a word-based CxM framework allow us to explain the well-documented shift towards the use of periphrastic constructions, which is, regarding subjunctive II formation in the Bavarian dialects of Austria, located at the interface between morphology and syntax.

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A modal account of syntactically non-integrated *von wegen* in contemporary German

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Abstract: This study aims to account for the German expression *von wegen* (literally 'of ways') when used outside of the sentence structure. Drawing on corpus data for written and spoken German, we show that there are two types of syntactically non-integrated *von wegen*: (i) illustrating/exemplifying *von wegen* and, (ii) opposing *von wegen*. By combining both a formal and a functional perspective, we claim that these two types can be analyzed as modal expressions. In fact, from a formal point of view based on Werner Abraham's classification in lexical and grammatical forms of modality, both illustrating/exemplifying and opposing *von wegen* encode a quotative/evidential meaning, whereas only the second type expresses an epistemic modal value. Nevertheless, *von wegen* does not belong to the prototypical forms of modality described by Abraham as it does not occupy a structural position within the sentence and therefore does not fall into any of the classes proposed by Abraham. For this reason, we also need to integrate the formal perspective with a functional one by defining modality not only structurally but also semantically. In doing so, we account for the modality of *von wegen* in that we assume the existence of a third strategy of modalization that is specific to syntactically non-integrated expressions and operates at the discourse level.

Keywords: modality; quotative marker; evidentiality; epistemicity; formalism; functionalism

For the formal definition of scholarly responsibility, as required by the Italian academic system, we declare that Manuela Caterina Moroni is responsible for Sections 1, 2, and 4, and Ermenegildo Bidese for Sections 3, 5, and 6.

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1 Introduction

In contemporary German, *von wegen* (literally 'of ways'), as a causal adposition, has restricted use, and typically appears either as a preposition in formal and literary texts (1) or as a circumposition in phraseological collocations, for example in legal documents (2):

(1) *Ich auf genagelten Stiefeln,* ***von wegen*** *des Schwemmkieses*
I on nailed boots of because the.GEN alluvial.gravel.GEN
'I was wearing hobnailed boots because of the alluvial gravel.'
(dwds.de; Mann, *Herr u. Hund*, 9,581)

(2) *In den nachstehenden Fällen endet der Arbeitsvertrag* ***von***
in the following cases ends the contract of
Rechts ***wegen****:*
law.GEN because
'In the following cases, the employment contract shall end by operation of the law:'
(dwds.de)

As a non-prepositional element, *von wegen* is syntactically non-integrated and has a quotative function (see Bücker 2008: 26). It can illustrate a previous utterance like *Und bitte keine Ausreden* in (3), exemplifying this with a reference to prototypical claims, which refer to common knowledge or common state of affairs. Furthermore, in specific contexts, *von wegen* expresses the speaker's negative assessment[1] of the reported content, as in (4):

(3) *Und bitte keine Ausreden* ***von wegen*** *"ich weiss auch nicht immer alles, was an der Türe passiert".*
'Please don't make excuses like "I don't always know what's going on at the door".'
(*St. Galler Tagblatt*, 27.09.1999; cited from Bücker 2008: 2)

1 For the purposes of the present paper, we use the terms "negative assessment" and "disagreement" interchangeably. Nevertheless, they emphasize two different aspects of the same phenomenon. With the term "assessment", we capitalize on Abraham's modality theory (see Section 3 below), assuming that modality can be described as the expression of different types of speaker's assessment. By extending the category of modality to *von wegen*, we claim that this expression also encodes a modal evaluation. The term "disagreement", on the other hand, refers to the pragmatic effect conveyed by *von wegen* at the functional level.

(4) *Nur die Innerrhödler können feiern?* ***Von wegen****!*
'Only the Innerrhödler can celebrate? No way!'
(*St. Galler Tagblatt*, 04.09.2000; cited from Bücker 2008: 2)

When used as a non-prepositional and syntactically non-integrated item, see (3) and (4), *von wegen* does not have a causal meaning but seems to convey a modal value. Syntactically non-integrated expressions do not traditionally belong to the linguistic expressions of modality, and thus pose a crucial challenge to grammar theory. In what follows, we argue that both a formal and a functional approach can help in grasping the linguistic nature of elements like *von wegen*. By formalism in modality research, we understand structural descriptions such as Abraham's (2020), which focuses on hierarchical relations between grammaticalized and structurally integrated categories, such as modal verbs and modal adverbs (see Axel-Tober and Gergel 2016 and also Narrog 2009: 7). By adopting a functional view, we take the semantics of modality as a starting point for our analysis. This allows us to extend the notion of modality to syntactically non-integrated forms, which have so far been neglected (see Aijmer 2016: 496–497). Expressions like *von wegen*, which are outside the sentence structure, belong to those forms; their modality crucially operates at the discourse level. In the present paper, we intend to investigate the use of *von wegen* as a non-canonical modal expression and show how it can fit into the formal account by Abraham (2020), thus helping to refine our understanding of modality in language. Furthermore, our aim is to shed light on how modality can be expressed differently depending on the context, speech activities and text types (cf. Aijmer 2016; Newmeyer 2010, 2017).

Our contribution is structured as follows. Section 2 provides a general overview of the different usages of *von wegen*, both as an adposition and as a syntactically non-integrated item, based on previous research and lexicographic resources. In addition, historical data are discussed and related to *von wegen* in present-day German. In Section 3, we introduce Abraham's (2020) theory of modality; we also clarify our understanding of evidentiality as a dimension of modality for the present study. In a further step (Section 4), data from written and spoken German are presented and discussed with the aim of proposing a general account of *von wegen*. In Section 5, we explore the question of how our description of *von wegen* can be integrated into Abraham's theory. Finally, we propose the hypothesis that a theory of modality also needs to take syntactically non-integrated items such as *von wegen* into account. In contrast to prototypical modal expressions, the modal value of *von wegen* is pragmatic in nature, because it is triggered by the information structural environment in which *von wegen* is embedded (Section 6).

2 State of the art and objectives

2.1 Prepositional *von wegen*

According to lexicographic resources (dwds.de, duden.de), the adposition *von wegen* can have two different meanings. The first is typically causal. In this case, *von wegen* appears either as a preposition, cf. (1) above, here repeated as (5), or as a circumposition, cf. (2) above, here repeated as (6). In both sentences, it takes the genitive case.

(5) *Ich auf genagelten Stiefeln,* ***von wegen*** *des Schwemmkieses*
I on nailed boots of because the.GEN alluvial.gravel.GEN
'I was wearing hobnailed boots because of the alluvial gravel.'
(dwds.de; Mann, *Herr u. Hund*, 9,581)

(6) *In den nachstehenden Fällen endet der Arbeitsvertrag* ***von*** *Rechts* ***wegen****:*
in the following cases ends the contract of law.GEN because
'In the following cases, the employment contract shall end by operation of the law:'
(dwds.de)

In its second meaning, *von wegen* is a preposition of pertinence, very similar to *betreffend* 'regarding' or *bezüglich* 'concerning', as in (7):

(7) *Ich rufe dich* ***von wegen*** *der Sache an*
I call you of because the.GEN thing PRT
'I am calling about that thing'
(duden.de, item "wegen")

Diachronically, *wegen* in *von wegen* is the dative plural of the Middle High German *wec* (see Modern German *Weg*, 'street', 'path'), which, in Middle German/Middle Low German, can also refer to 'place', 'spot', 'side' (dwds.de). According to Vernaleken (1861: 249), the forms *von … wegen* (circumposition) and *von wegen* (preposition) were used in the chancellery language of the German Empire with the meaning 'on behalf of', as in (8):

(8) […] *Solchs alles versprechen wir aufrichtig zu halten, darwider nichts zu thun gestatten. Friedrich herzog zu Sachsen etc. persönlich.* ***Von wegen*** *des erzbischofs zu Cöln, Johann von Reichenstein.* ***Von wegen*** *des erzherzogs v. Osterreich, Heinrich graf zu Hardeck.* ***Von*** *der prelaten* ***wegen****: Johann apt von Salmanßweiler* ***von*** *sein selbs* ***wegen****.*
'We sincerely promise to keep all this and to not allow anything to be done against it. Friedrich duke of Saxony etc. personally. On behalf of the archbishop of Cologne Johann von Reichenstein. On behalf of the archduke of Austria, Heinrich count of Hardeck. On behalf of the prelates: Johann abbot of Salmanßweiler on behalf of himself.'
(Vernaleken 1861: 249–250)

In addition, *von wegen* can be found in historical legal texts with the meaning 'with regard to', as in (9), which is taken from a conciliar protocol from Bozen (today South Tyrol in Italy) drawn up in 1472. In this text, different provisions are listed, and *von wegen* is used at the beginning of a new paragraph to introduce a new provision.

(9) *Dann* ***von wegn*** *des artzt ist furgenom*(*en*) *mit ratt mitsambt dem zusatz Sigmund Rom*(*er*)*, Anthoni Mynig* […]
Dann ***von wegen*** *des wassers runst, der nit gerawmbt sey,* […][2]
'Then with regard to the medical officer, it is decided by the council together with the associated councilors Sigmund Rom(er), Anthoni Mynig […]
Then with regard to the water channel that is not cleared, […]'

In a recent study, Bücker (2022: 320–321) has shown that both these usages of *von wegen* are attested from the 13th century onwards. Furthermore, he also provides an example of *von wegen* with a causal meaning (see also Vernaleken 1861: 249) going back to same period, cf. (10):

(10) *ſi ift von beiden ſvon gv̊tlich/vnd einmv̊tlich verzigen auf allen den ſauf al der* ***von*** *deſ Chrieges* ***wegen****/biz auf diſen tac hivte ift giſchehen*
'so both sides amicably and consensually waive the compensation for the damage that has been done till this day due to the war'
(1284, *Corpus der altdeutschen Originalurkunden II*, Doc. No. 673, lines 19–20; cf. Wilhelm and Newald 1943: 86; and see Bücker 2022: 320)

2 Conciliar protocol (*Ratsprotokoll*), 27.02.1472, https://stadtarchiv-archiviostorico.gemeinde.bozen.it/bohisto/archivio/manoscritto/dettaglio/506-von-wegen-des-artzt-provision-und-gehorsam-a-von-wegen-des-wassers-undter-der-cappellen-trinitatis-zu-raewmen-b-von-den-die-an-der-unee-sitzen-c (accessed 14.03.2024).

To summarize, in German historical texts, *von wegen* means either 'due to', 'on behalf of', or 'with regard to'. In contemporary German, prepositional uses of *von wegen* with a causal meaning, as in (5) and (6) above, appear to be related to the historical use illustrated in (8), 'on behalf of', and coexist as marginal forms together with the more common causal preposition *wegen*. According to Di Meola (2003: 210), the causal preposition *wegen* "is derived from the discontinuous prepositional phrase *von … wegen* 'on the part of', with the loss of the preposition *von* 'from'". Instead, Bücker (2022: 320, Footnote 7, 2023: 406) argues that prepositional *wegen* could possibly be derived from the complex preposition *von wegen* due to the drop of *von*, and not necessarily from the circumposition. According to Bücker (2023: 406), *von wegen*, in turn, loses its productivity from the 17th through to the 19th century, and undergoes a reanalysis process, acquiring a quotative value or becoming an interjection (see below, Section 2.2).

2.2 Syntactically non-integrated (non-prepositional) *von wegen*

As already mentioned above (cf. Section 1), present-day German also has extensive use of non-prepositional *von wegen*, which is outside of the sentence structure. This syntactically non-integrated use of *von wegen* was first investigated by Bücker (2008, 2013, 2022, 2023), who classified it as a "quotative *von wegen*", semantically connected with the old preposition of pertinence (see Bücker 2022: 321). In this case, *von wegen* is no longer a preposition, because it does not govern a phrase but introduces or refers to reported speech or to common knowledge. Two examples are presented in (11) and (12), taken from Bücker's works:

(11) *und ich hab da auch angerufen,* ***von wegen****, hören Sie mal, was soll das hier? Wie fangen Sie eigentlich Ihre Kunden? Hab ich gesagt, ne?*
'and I called to say, like listen, what's that supposed to mean? How are you trying to catch your customers? (That's what) I said, right?'
(*Audio-Datenbank lAuDa*; cited from Bücker 2008: 17–18)

(12) ***Von wegen*** *uralter Brauch: Der Adventskranz ist nach Überzeugung der wissenschaftlichen Volkskunde ein Paradebeispiel für falsche Vorstellungen rund um Bräuche.*
(*Frankfurter Rundschau*, 27.11.1999; cited from Bücker 2008: 21)
'So much for ancient custom: according to the science of folklore, the Advent wreath is a prime example of misconceptions about customs.'

Example (11) is taken from a long narrative sequence in which the speaker restages a dialogue using *von wegen* to introduce a fictive example of what he actually said as

direct speech. In (12), *von wegen* introduces a quotation (*uralter Brauch* 'ancient custom') that refers to the common assumption that Advent wreaths go back to an ancient tradition. At the same time, *von wegen* indicates that the writer distances him/herself from the utterance and its meaning. In both examples, *von wegen* introduces reported speech and is syntactically non-integrated (see Bücker 2008).

Furthermore, the Duden Online Dictionary documents another use of the isolated *von wegen*, namely, as a substandard expression for *auf keinen Fall*, meaning 'no way'. This usage is illustrated by example (4) above, repeated here as (13):

(13) *Nur die Innerrhödler können feiern?* ***Von wegen****!*
'Only the Innerrhödler can celebrate? No way!'
(*St. Galler Tagblatt*, 04.09.2000; cited from Bücker 2008: 2)

In (13), *von wegen* also refers to an utterance (*Nur die Innerrhödler können feiern?*), thus characterizing this as a quotation, but here, unlike in (11), it constitutes a speech act in itself, expressing disagreement with respect to a supposed characteristic of the inhabitants of Innerrhoden in Switzerland. Bücker (2022, 2023) classifies *von wegen* in examples like (11) as a special kind of adverbial connective that introduces a quotation (Bücker 2023: 392–393) and in examples like (12) and (13) as an interjection which expresses the speaker's distance or disagreement. According to this analysis, the interjection developed from *von wegen* as prepositional head without complement (see Bücker 2022).

In light of this variation, our aim is twofold:

(i) to classify the different uses of syntactically non-integrated *von wegen* by drawing on corpus data of written and spoken German and
(ii) to understand how *von wegen* can be explained by combining Abraham's formal notion of modality with a functional/semantic perspective on it.

3 Abraham's theory of modality

In line with Abraham (2020), we understand linguistic modality to be a universal semanto-pragmatic competence, which allows human beings to express an evaluation of a proposition by providing information about (i) its source and/or (ii) the speaker's assessment of it. Evaluations about the source of a proposition usually pertain to the category of evidentiality, whereas those about the speaker's assessment are considered to belong to the category of epistemicity.

As pointed out in the previous section, *von wegen* can (i) introduce reported speech, cf. (11), or (ii) refer to quotations, cf. examples (12) and (13). In both these cases, it refers to an external source of information and can thus be classified as an evidential marker. In linguistics, evidentiality is understood as a semantic-functional

domain which indicates that what the speaker is referring to is grounded in a specific source or piece of evidence (see Diewald and Smirnova 2010: 1). Prototypical high-grammaticalized evidential systems can be found in non-Indo-European languages, including, for instance, Tariana, cf. (14), a language of the Arawak family spoken in Amazonia (see Aikhenvald 2003), and Wanka Quechua, cf. (15), spoken in Peru:[3]

(14) a. *Juse irida di-manika* ***-ka***
José football 3SGNF-play -REC.P.VIS
b. *Juse irida di-manika* ***-mahnka***
José football 3SGNF-play -REC.P.NVIS
c. *Juse irida di-manika* ***-nihka***
José football 3SGNF-play -REC.P.INFR
d. *Juse irida di-manika* ***-sika***
José football 3SGNF-play -REC.P.ASSUM
e. *Juse irida di-manika* ***-pidaka***
José football 3SGNF-play -REC.P.REP
'José has played football (we saw it/we heard it/we infer from visual evidence/we infer this on the basis of what we already know/we were told)'
(see Aikhenvald 2004: 2–3)

(15) a. *Chay-cruu-**mi** achka wamla-pis walashr-pis alma-ku-lkaa-ña*
this-LOC-DIR.EV many girl-too boy-too bathe-REFL-IMPF.PL-NARR.PAST
'Many girls and boys were swimming (I saw them)'
(Aikhenvald 2004: 43, see also Floyd 1999: 48)
b. *Daañu pawa-shra-si ka-ya-n-**chr**-ari*
field finish-PART-EVEN be-IMPF-3-INFR-EMPH
'It (the field) might be completely destroyed (I infer)'
(Aikhenvald 2004: 43, see also Floyd 1999: 48)
c. *Acha-p-**shi** wa'a-chi-nki wamla-a-ta*
too.much-GEN-REP cry-CAUS-2 girl-1.POSS-ACC
'You make my daughter cry too much (they tell me)'
(see Aikhenvald 2004: 43, see also Floyd 1999: 48)

As can be seen in (14) and (15), prototypical evidential markers encode the way in which the speaker has access to the proposition (= *p*) (see also Plungian 2010: 17). In

3 Grammatical labels used in (14) and (15): ACC = accusative, ASSUM = assumed, CAUS = causative, DIR = directive, EMPH = emphasis, EV = evidential, EVEN = eventive, GEN = genitive, IMPF = imperfective, INFR = inferred, LOC = locative, NARR = narrative, NVIS = non-visual, P = past, PART = participle, PL = plural, POSS = possessive, REC = reciprocal, REFL = reflexive, REP = reported, SGNF = singular non-feminine, VIS = visual.

contrast, reportive elements like the German verb *sollen* (see below, Table 1) and syntactically non-integrated *von wegen* refer to the source of *p*, indicating that it is different from the speaker, but without specifying its type. For this reason, *von wegen* does not represent a "proper evidential marker" in itself but needs to be regarded as an "evidentiality strategy" (see Anderson 1986: 289; Squartini 2008: 219; see also Aikhenvald 2003), which may have developed through an extension of the core meaning of the original preposition of pertinence.

Even though the modal status of evidentiality is still controversial in research (see, among others, Auwera and Plungian 1998: 86), in what follows, we classify modal linguistic expressions on the basis of evidentiality and epistemicity, as the two major dimensions of modality. In particular, we draw on Abraham's (2020) classification of the types of modality expressions in German, which we summarize in Table 1.

Two main types of modality expression are described in Table 1, namely lexical and grammatical. In Abraham's approach, they correspond to two different types of displacement/shifting from the speaker's perspective, that is, his/her natural *origo* (i.e., the here and now), in Bühler's (1934) sense. Lexical modality expressions are modal adverbs such as *offensichtlich* 'obviously/as it can be seen' and *vermutlich*/

Table 1: Types of modality expressions according to Abraham (2020: 65–69).

	Modality expressions	**Examples**	**Source of *p* (evidentiality)**	**Speaker's assessment of *p* (epistemicity)**
Lexical	*offensichtlich* 'obviously', 'as it can be seen'	Haider ist offensichtlich betrunken gewesen 'Haider was obviously drunk'	+	–
	vermutlich/wahrscheinlich 'probably'	Haider ist vermutlich/wahrscheinlich betrunken gewesen 'Haider was presumably drunk'	–	+
Grammatical	*sollen* 'to be said to'	Haider soll betrunken gewesen sein 'Haider is said to have been drunk'	+	+
	ja 'as we know'	Haider ist ja betrunken gewesen 'Haider was drunk, as we know'	+	++

wahrscheinlich 'presumably'. They can encode either the source of the information (such as *offensichtlich*) or the speaker's own assessment (as in the case of *vermutlich*/*wahrscheinlich*). In the case of *offensichtlich*, the source of the proposition is characterized as available, that is inferable, while no speaker evaluation is expressed. Conversely, the epistemic adverbs *vermutlich* and *wahrscheinlich* express the speaker's point of view regarding the truth of the proposition, without providing any information about its source or the evidence to support it. In summary, *offensichtlich* indicates evidential modality, while *wahrscheinlich* and *vermutlich* convey epistemic meaning. In both cases, the modal adverbs unfold a simple displacement from the *origo*.

In contrast, grammatical modality expressions, such as modal verbs and modal particles, are semantically more complex in that they operate at both the evidential and the epistemic level. For example, the modal verb *sollen* in *Haider soll betrunken gewesen sein* 'Haider is said to have been drunk' indicates that the source of the proposition is the context, not the speaker, and that the speaker evaluates the truth value by relying on an external source. As a result, *sollen* instantiates a reportive function. In this sense, epistemic modal verbs such as *sollen* denote a double displacement from the speaker's *origo*, "one according to the source of *p*, and another one according to the speaker's assessment of *p*" (Abraham 2020: 67). Finally, modal particles are semantically even more complex than modal verbs because they also refer to the addressee's perspective regarding the proposition *p*. For example, the modal particle *ja* in *Haider ist ja betrunken gewesen* 'Haider was drunk, as we know' invites the addressee to compare his/her knowledge about *p* to that of the speaker (see Abraham 2020: 222).

As shown previously in Section 2, cf. examples (11), (12) and (13), *von wegen* mainly refers to a quotation, and thus operates at the evidential level. As a result, it is semantically connected to evidential adverbs such as *offensichtlich* and the reportive modal verb *sollen*, according to Abraham's classification. In contrast to these modal expressions, however, *von wegen* is syntactically non-integrated. Syntactically non-integrated elements such as *von wegen* have traditionally been neglected in research into the category of modality (see among others Abraham 2009, 2020; Dietrich 1992; Kratzer 1981; Portner 2009) for two reasons. In the first place, due to their syntactic disintegration, they do not operate at a propositional level but rather at the level of discourse, and secondly, their semantics (pertinence in the case of *von wegen*) is not properly connected in itself to the typical core modal meanings such as necessity/possibility and epistemicity. This is the reason why *von wegen* does not usually play a role in theories of modality such as that of Abraham (2020). As will become clear below, *von wegen* conveys epistemicity not in itself but in interaction with its information structural context. In the following section, we present a corpus analysis, based on which we will attempt to integrate *von wegen* into Abraham's model.

4 Corpus data, analysis, and classification

Our data are derived from FOLK (*Forschungs- und Lehrkorpus Gesprochenes Deutsch* 'Research and Teaching Corpus of Spoken German'), which is the largest digital corpus of contemporary spoken German, and from DeReKo (*Deutsches Referenzkorpus* 'German Reference Corpus'), which is the largest digital corpus of written German. We analyzed all the occurrences of *von wegen* appearing in the conversations in FOLK (86 occurrences) and 100 occurrences in DeReKo taken from the German newspaper *Süddeutsche Zeitung*.[4] All these occurrences are examples of non-prepositional, syntactically non-integrated *von wegen* and can be classified into two main types: (i) exemplifying/illustrating and (ii) opposing *von wegen*. This distinction is based on a semanto-pragmatic criterion, that is, the kind of relation present between *von wegen* and its context: whether it just introduces a quotation/common knowledge, or whether it also expresses disagreement regarding the quotation/common knowledge. In addition, the two main types of *von wegen* also differ in their information structural status and their role in the information flow, as we will show in this section. The two types of *von wegen* are also distributed differently in the written and spoken data.

4.1 Syntactically non-integrated *von wegen* in spoken and written data

In the spoken data, we observed that *von wegen* was mainly (75 out of 86 cases) used to introduce information that illustrates/exemplifies what has previously been said. This information can be encoded in terms of utterances that involve three different levels of syntactic complexity:

(i) *von wegen* + XP without case and determiner, cf. (16),
(ii) *von wegen* + subordinate clause, cf. (17), and
(iii) *von wegen* + dialogic sequence, cf. (18).

(16) RG: *Ja, ich glaub, ich muss mich hier eh'en bisschen äh WÄRmer AUSstatten so* ***von wegen*** *äh MÜtze und WEIß ja nich*
'Yes, I think, I need to dress kind of a bit warmer, with a cap or I don't know'

4 In our view, 100 occurrences are sufficient to detect how *von wegen* is used in journalistic texts. A more extensive data set does not seem to lead to further insights since other random samples from DeReKo show a similar tendency. Furthermore, we decided to rely on data taken from the *Süddeutsche Zeitung* since this is one of the most important newspapers in Germany and its language can be considered representative of today's Standard German.

CS: *ja, is schon Unterschied glaub ich da von der Rheinebene und dann da hoch nach Berlin, des glaub ich schon echt en Temperatursturz also da is schon meistens glaub ich zehn Grad kälter als bei uns oder fünf mindestens*
'well, I think there's a difference from the Rhine plain and then up there to Berlin, I think it's a real drop in temperature, so I think it's usually ten degrees colder there than here, or five at least'
(FOLK_E_00392 Telefongespräch)[5]

(17) RW: *Soll ich die Sabine oder der Matze anrufen ähm* ***von wegen*** *dass ma einfach am Montag SCHLÜSselübergabe machen?*
'Should I call Sabine or Matze, um, about simply handing over the keys on Monday?'
TI: *äh ja, am Montag, na na ja, geht ja wahrscheinlich net anders*
'well, ok, on Monday, there is probably no other way'
(FOLK_E_00119 Tischgespräch)

(18) AM: *Damit kann ich mich einfach nich äh anfreunden, nein, aber des sind einfach so die Voraussetzungen so irgendwie die bei euch da ganz anders sind,* […]
Ich meine, einfach diese EINstellung dazu, ***von wegen****: Wir zeigen dir, was du MAchen musst, und wir geben dir total die GeSETze vor, und wir erwarten, dass du dein ganzes Geld da REIN investierst*
'I just can't get to grips with that, no, but that's just the way the conditions are, which are completely different for you, […]
I mean, just that attitude sort of/like, we'll show you what to do, and we'll totally lay down the law for you, and we expect you to put all your money into it'
(FOLK_E_00047 Tischgespräch)

In example (16), the speaker illustrates the fact that she needs to dress more warmly after moving from the Rhineland to Berlin; she mentions *Mütze* 'cap' as an example of warm clothing and adds the expression *weiß ja nich* 'I don't know' to refer to other warm clothing in general (see Bergmann 2017: 148–149).[6] *Mütze* is preceded by *von*

5 The examples taken from FOLK are reproduced in literary transcription for better readability, and not following the FOLK transcription conventions. In the *von wegen* utterances we mark accented syllables with capital letters.

6 Following Bergmann (2017), we argue that this expression marks the previous utterance containing *Mütze* as pragmatically irrelevant, in the sense that it should be taken as one example among others, since other warm clothing is possible.

wegen and constitutes a bare noun without any case marking. In this case *von wegen* introduces *Mütze* marking it as a quotation from common knowledge.

With regard to (17), *von wegen* illustrates what the speaker might say to Sabine or Matze with regard to handing over the keys. In this case, *von wegen* precedes a subordinate clause that exemplifies possible general statements in such a context. Example (18) stems from a long sequence in which the speaker criticizes the behavior of a private university (*Damit kann ich mich einfach nich äh anfreunden* 'I just can't get to grips with that'). To reinforce her criticism, she gives an example of the typical attitude of private universities by reporting a fictional dialogue sequence that illustrates this kind of behavior. The exemplifying dialog sequence is crucially introduced by *von wegen*.

In (16)–(18), *von wegen* precedes information of differing syntactic complexity to exemplify a previous utterance and refers to an inferential meaning based on a common ground (see Squartini 2001). In fact, the majority of examples of illustrating *von wegen* occur with deictic expressions such as *diese Einstellung* 'that attitude' or pragmatic markers such as *weiß ja nich* 'I don't know', which suggest that the information is to be taken as an example only since both speaker and addressee can understand what is meant drawing on their common knowledge.

All these usages of *von wegen* can be defined as exemplifying or illustrating *von wegen*. It predominates in the spoken data and is mainly (53 out of 75 cases) used to introduce dialogic sequences. It also appears in the written corpus, as in (19):

(19) *Also habe ich ein Praktikum in einem kleinen, renommierten Hotel in Blankenese gemacht und in den zwei Monaten, die ich dort war, alle Bereiche kennengelernt. Auch in den Restaurants, die zum Hotel gehören, habe ich ausgeholfen, oft im Schichtdienst, manchmal bis zwei oder drei Uhr nachts. Das war anstrengend, aber es gab immer Leute, die einem den Rücken gestärkt haben. Die Gäste haben mich oft gelobt* ***von wegen****: Toll, dass du da bist, man merkt, dass du das mit Freude und einem Lächeln machst.*
'So I did an internship in a small, well-known hotel in Blankenese and got to know all the different areas in the two months I was there. I also helped out in the restaurants that belong to the hotel, often working shifts, sometimes until two or three o'clock in the morning. It was exhausting, but there were always people who had your back. The guests often praised me, saying things like: it's great that you are here, you can tell that you do it with joy and a smile.'
(*Süddeutsche Zeitung*, 08.03.2019, p. 23; *Mit einem Plan B fange ich gar nicht erst an*)

Example (19) stems from an interview with a young girl, who after graduating from high school started an apprenticeship in a hotel. In this case, *von wegen* introduces

examples of compliments that hotel guests pay to the girl (*Toll, dass du da bist, man merkt, dass du das mit Freude und einem Lächeln machst* 'it's great that you are here, everybody can see that you do it with joy and a smile'). According to this interpretation, (19) is an example of illustrating *von wegen*.

With regard to the written data, two other uses of *von wegen* prevail, which we subsume under the label "opposing *von wegen*". As it will become clear later, the main difference between the two uses regards the position of *von wegen* with respect to the utterance it refers to. In the first case, *von wegen* precedes the utterance (cataphoric), in the second one it follows it (anaphoric). The first use of opposing *von wegen* is illustrated in (20) and occurs in 58 out of 100 cases:

(20) ***Von wegen*** *gefällt mir. Facebook steht derzeit wegen eines Datenskandals unter gewaltigem Druck.*
'So much for liking it. Facebook is currently under tremendous pressure because of a data scandal.'
(*Süddeutsche Zeitung*, 23.03.2018, p. 16; *Facebook: Wie das Netzwerk seine Nutzer schützen will und welche Möglichkeiten sie selbst haben*)

Von wegen characterizes the following utterance, *gefällt mir* (literally, 'I like it'), as being common knowledge. In fact, *gefällt mir* refers to the use of 'likes' on the social network site Facebook. From an information structural point of view, *gefällt mir* is an aboutness-shift topic (in the sense of Frascarelli and Hinterhölzl 2007), as it introduces a new topic. In addition, *von wegen* signals that the writer distances him/herself from the utterance and its positive meaning. What follows, namely the reference to the data scandal concerning Facebook, explains why the speaker/writer distances him/herself from the expression introduced by *von wegen*, and assesses it negatively.

The second type of opposing *von wegen* encodes a negative assessment of the previous utterance, which is typically a question. This pattern is usually found in journalistic texts, especially in headlines and leads and cannot be regarded as typical of German everyday conversation. In our sample from the *Süddeutsche Zeitung*, we found 36 out of 100 occurrences of this pattern. An example is presented in (21):

(21) *Alles gut also in der Währungsunion?* ***Von wegen****! Griechenland drücken noch immer hohe Schulden.*
'So, all is well in the monetary union? No way! Greece still has a lot of debt.'
(*Süddeutsche Zeitung*, 24.05.2018, p. 15; *Euro*)

In (21), *von wegen* expresses a negative assessment of the preceding question, 'So, all is well in the monetary union?'. The same holds true for the case in (22), which is derived from our spoken corpus.

(22) PA: *Der Ischiasnerv, des was Ekliges, sag ich euch* […] *Es tut richtig weh und du kannst, weißt, dann denkst du, du legst dich hin, dann ist es en bissle entspannt, dann tut es vielleicht nimmer so weh.* ***Von wegen!*** […] *Das war wirklich unangenehm.*
'The sciatic nerve, it sucks, I tell you […] It really hurts and then, you know, you think you can lie down, then it's a bit relaxed, then maybe it doesn't hurt so much. No way! […] That was really unpleasant.'
(FOLK_E_0006 Gartengespräch unter Freunden)

Similarly to (21), *von wegen* here also refers to a preceding utterance, in which the speaker reports a common opinion, "if you lie down and relax you are going to feel better", by distancing himself from it. In examples (21) and (22), not only does *von wegen* constitute a speech act in itself, but it also builds a focus-phrase, which refers to a topic that is retrievable from the preceding context.

4.2 Analysis

In what follows, we systematize our results by relating them to their information structure on the one hand and to prosody on the other. Drawing on our spoken data, we observe that opposing *von wegen* in occurrences like (22) always bears a pitch accent on the syllable *we-*, as can be seen in Figure 1, where the fundamental frequency displays a clear pitch accent in correspondence with *von wegen*.[7]

Examples such as (20) above (*Von wegen gefällt mir* 'So much for liking it') are attested just once (23) in the spoken data of FOLK:[8]

(23) KA: *Von WEgen wir horten.*
'So much for hoarding.'
(FOLK_E_ 00132 Spielinteraktion zwischen Erwachsenen)

Extract (23) is part of a conversation in which the participants are playing the board game "Thurn und Taxis". The aim of the game is to build postal routes connecting the highest number of cities. To do this, the players must collect city cards. Participant KA plays together with a friend (AM) against two other friends (JA and PA). At an earlier point in the game/conversation, JA complains that KA and AM are collecting (German *horten*) a lot of city cards and will probably win. However, later on in the game, JA

7 We found six further examples of this pattern in FOLK. In all these cases, the pitch accent seems to fall on *we-* in *von wegen*. However, this observation is based only on hearing, and cannot be verified with *Praat* because *von wegen* overlaps with another participant's conversational turn.

8 For a more extensive description of this extract, see Bücker (2022: 317–319). Bücker also takes *von wegen* in the extract to be accented.

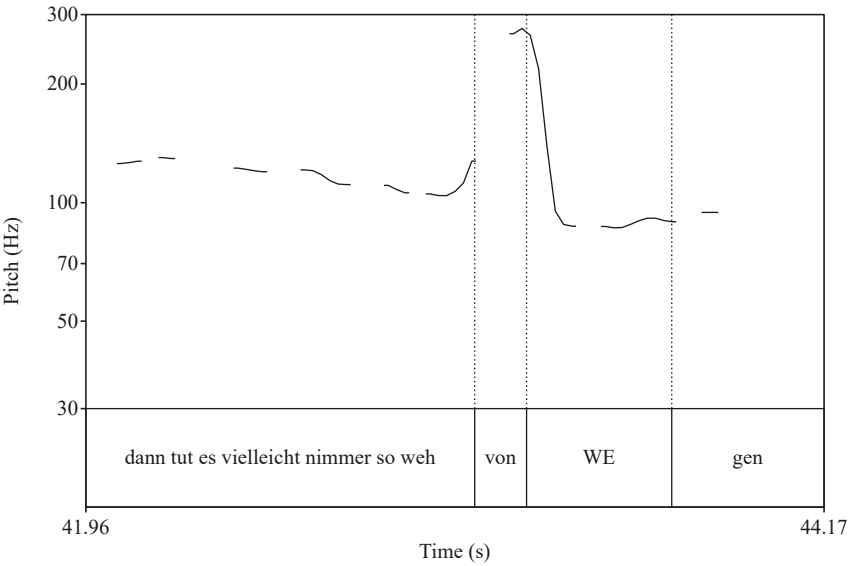

Figure 1: Praat graphic of the fundamental frequency of example (22).

and PA gain more points than expected. In reaction to this, KA refers back to JAs claim that he and his mate AM were collecting many cards (*Ihr hortet!*) and expresses his disagreement. Unfortunately, *von wegen* in (23) overlaps with the following comment by participant AM, meaning that we could not verify the presence of a pitch accent on *we-* in *von wegen*. Nevertheless, it seems plausible to us that *von wegen* also bears the focus accent of the utterance. Although a prosodic analysis of the written examples cannot be carried out, we can still observe that the written data display the same information structure as (23) with *von wegen* introducing an aboutness-shift topic, as shown in (20), repeated here as (24):

(24) ***Von wegen*** *gefällt mir. Facebook steht derzeit wegen eines Datenskandals unter gewaltigem Druck.*
'So much for liking it. Facebook is currently under tremendous pressure because of a data scandal.'
(Süddeutsche Zeitung, 23.03.2018, p. 16; *Facebook: Wie das Netzwerk seine Nutzer schützen will und welche Möglichkeiten sie selbst haben*)

In (24), the negative assessment conveyed by *von wegen* constitutes the informational focus, whereas *gefällt mir* belongs to the background of the information since it is part of the common knowledge and has a quotative nature. Thus, structures like (21), (22), (23) and (24) can be regarded as variants of the same information structure, with *von wegen* constituting the focus phrase. The only difference is that in the one case

the topic precedes the focus, while in the other it follows it, as schematically represented in (25):

(25) Variants of *von wegen* as a focus phrase
a. Examples (21)–(22) Topic [*Von wegen!*]$_{\text{Focus}}$
b. Example (23)–(24) [*Von wegen*]$_{\text{Focus}}$ Topic

If we compare these results with the occurrences of exemplifying/illustrating *von wegen* in the spoken data, we can observe that *von wegen* displays a flat contour and is always part of the background of the information, cf. (17) above, reproduced here as (26). (26) is taken from a conversation about the participants moving to a new flat. In this context, the handing-over of the keys can be regarded as part of the common knowledge.

(26) *Soll ich die Sabine oder der Matze anrufen ähm* ***von wegen*** *dass ma einfach am Montag SCHLÜSselübergabe machen?*
'Should I call Sabine or Matze, um, about simply handing over the keys on Monday?'
(FOLK_E_00119 Tischgespräch)

In this case, *von wegen* introduces a piece of information, which is characterized as belonging to the common knowledge of the participants. Figure 2 shows the fundamental frequency contour of the utterance in (26), in which *von wegen* is part of a flat segment. This kind of prosodic embedding is in line with the results in Bücker (2008) about those occurrences of *von wegen* that introduce dialogic sequences/reported speech. In these cases, the focus accent is assigned within the following utterance introduced by *von wegen*.[9]

4.3 Summary and interim conclusions

To summarize, there are two main types of syntactically non-integrated *von wegen* in our data: the exemplifying/illustrating *von wegen*, which introduces an utterance illustrating something previously stated, and an opposing *von wegen*, which can either precede or follow the utterance about which it is expressing disagreement. As described above, these two uses of *von wegen* are distributed differently in our spoken and written data. Exemplifying/illustrating *von wegen* dominates in spoken data from FOLK, whereas opposing *von wegen* is mostly used in written journalistic texts. It needs to be pointed out, however, that our sample of written data cannot be

9 Even though the pitch contour in Figure 2 has been smoothed in Praat, there still seems to be a miscalculation in correspondence with *Schlüsselübergabe*. This is due to the fact that the FOLK audio data is taken from spontaneous conversations, which can lead to unclear results. However, what is important here is the contour in correspondence with *von wegen*, which is undoubtedly flat.

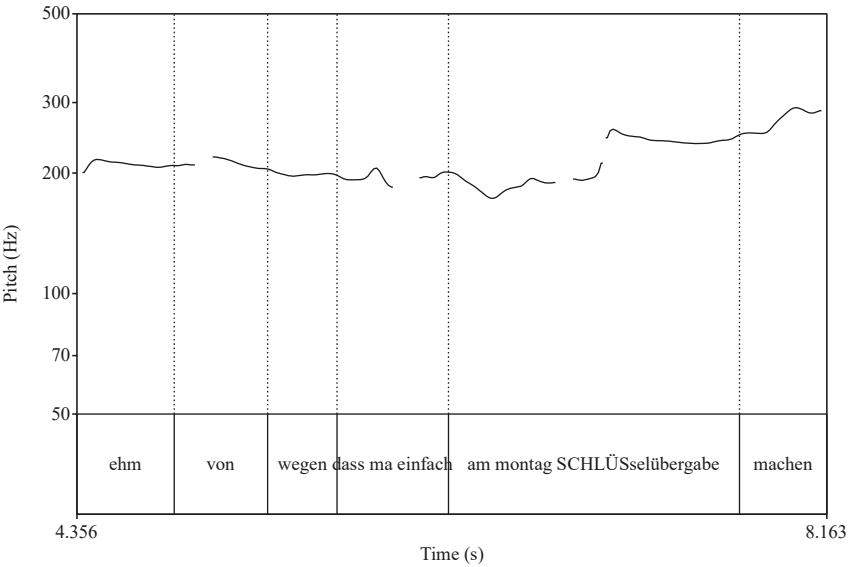

Figure 2: Praat graphic of the fundamental frequency of example (26).

regarded as fully representative of standard written German, as it is taken from a specific text genre (journal article and headlines/leads). In this respect, the analysis of more data from other text types would be relevant.

Table 2 gives a detailed overview of the distribution of our occurrences.

Exemplifying/illustrating and opposing *von wegen* differ with regard to both (i) their information structural status and (ii) their role in Abraham's theory of modality. As for (i), we have shown that exemplifying/illustrating *von wegen* is always part of the background and refers to common knowledge. In contrast, opposing *von wegen* constitutes a focus phrase and refers to a preceding or following informational topic.[10] However, more spoken data, especially for examples like (23), needs to be collected and analyzed to corroborate our analysis.

10 Like the present paper, Bücker (2022) proposed an analysis of opposing *von wegen* that also takes information structure into account. Furthermore, he pointed out that *von wegen* expresses disagreement and can be embedded in two different structures, which correspond to our examples in (20) and (21)/(22), respectively. According to Bücker (2022), opposing *von wegen* is nowadays an interjection that goes back to a former hanging topic. Our variants (25a) and (25b) are described in Bücker (2022: 319) as (i) *von wegen* followed by a counterclaim that reinforces and explains the disagreement and (ii) *von wegen* followed by "a quotative index that reestablishes a preceding speech act *von wégen* is reacting to". In our view, both analyses are compatible. However, we also consider the utterance(s) preceding *von wegen* in Bücker's variant (i), which we take to be a topic.

Table 2: Number of occurrences of *von wegen* types in spoken and written data.

	Exemplifying/illustrating *von wegen*			**Opposing *von wegen* (*von wegen* as a focus phrase)**		**Non-evaluable**	**Sum**
	***von wegen* + XP without case and determiner**	***von wegen* + subordinate clause**	***von wegen* + dialogic sequence**	**[*Von wegen*]$_{\text{Focus}}$ topic**	**Topic [*Von wegen!*]$_{\text{Focus}}$**		
FOLK (spoken data)	18	4	53	1	6	4	86
Süddeutsche Zeitung (written data)	2	0	4	58	36	0	100

With regard to (ii), the relationship of *von wegen* to Abraham's theory of modality, both types of *von wegen* express a reference to a source of *p* that constitutes evidentiality. Nevertheless, there is a difference between the two types: while the exemplifying/illustrating *von wegen* introduces constituents/utterances of differing complexity without encoding any assessment by the speaker, the opposing *von wegen* expresses the speaker's negative assessment. This means that the illustrating/exemplifying *von wegen* does not encode any epistemic meaning, whereas the opposing *von wegen* does.

Table 3 provides an overview of the different types of *von wegen* in our data.

Table 3: Types of syntactically non-integrated *von wegen* and their modal content.

Subtypes		Text/discourse structure Reference	Information structure Focus phrase	Modality	
				Source of *p* (evidentiality)	Speaker's assessment of *p* (epistemicity)
Exemplifying *von wegen*	(i) *von wegen* + XP	Cataphoric	–	+	–
	(ii) *von wegen* + sub. clause				
	(iii) *von wegen* + dialogic sequence				
Opposing *von wegen*	(i) *von wegen* + aboutness-shift topic	Cataphoric	+	+	+
	(ii) *von wegen* as speech act in itself	Anaphoric	+	+	+

5 Discussion

As observed previously, two types of *von wegen* appear in our data. The first, the illustrating *von wegen*, introduces an example, which is characterized as a quotation. This type seems to recall the old use of *von wegen* with the meaning 'in regard to', as illustrated in the historical example in (9) (*Dann von wegn des artzt* […]. *Dann von wegen des wassers runst*). With regard to its relationship to modality, it must be stressed that the exemplifying *von wegen* only expresses the availability of the

proposition, without any speaker's evaluation of it. With respect to Table 1, exemplifying *von wegen* only encodes a simple displacement from the natural *origo*.

In contrast, opposing *von wegen* is semantically more complex because it assesses a proposition negatively and thus conveys a judgment about its truth. In contrast to the illustrating *von wegen*, which in our view – as already pointed out – traces back to the preposition of pertinence, the connection between opposing *von wegen* and the other types attested historically (meaning 'on behalf of', 'due to', or 'in regard to') seems obscure at first glance. In this respect Bücker (2022) argues that opposing *von wegen* goes back to recurring hanging topic usages of *von wegen* as a preposition of pertinence, which occurred in negative reactions to prior utterances. One example in point is (27) from Bücker (2022: 328, ex. [12]):[11]

(27) *Aber* ***von wegen*** *der XXXII* [Kronen, J.B.] *solden, so dem houptman sollen noch uszstan, daran tragend wir dhein schuld, dann wir haben alle monat unnsere XI.* [Kronen, J.B.] *sold abgericht, daran nut uffgeschlagen.*
'But regarding the XXXII [Kronen, J.B.] pay that are to be due to the bailiff, we are not responsible for this as we delivered our XI. [Kronen, J.B.] pay completely every month, did not delay in that.'
(1532, *Geschichte der Basler Reformation VI*, Doc. No. 202, lines 22–25; cf. Roth 1950: 161)

In (27), *von wegen* is used as a preposition of pertinence meaning 'regarding' and has an NP with a relative clause as a complement (*der XXXII* [Kronen, J.B.] *solden, so dem houptman sollen noch uszstan*). It is a hanging topic (cf. Altmann 1981 and more recently Catasso 2022), that is, in German, a constituent (i) that is placed in the outer area of the left periphery of a sentence that is not affected by word-order restrictions such as V2 (cf. Catasso 2022: 12 and the works cited therein) and (ii) that is resumed by an element (in [27], *daran* 'for this') within the sentence.

After the *von wegen* hanging topic, which refers to a previously mentioned speech act (in [27], the request of the bailiff of Zurich to receive payments from Basel), a reaction of disagreement follows. Bücker (2022) maintains that through reanalysis, the negative meaning conveyed by the sentence following the hanging topic diachronically became part of *von wegen* itself. In addition, reanalysis also led to the removal of the restriction of *von wegen* to case-marked noun phrases, and finally to the possibility of using *von wegen* in isolation. According to Bücker (2022: 329), an accent on *von wegen* must have occurred very frequently as a typical feature of emphatic challenges to a prior speech act, meaning that it must have been reanalyzed as an inherent feature of *von wegen*. Thus, in Bücker's account, the accent derives

11 "J.B." in the example stands for Jörg Bücker himself.

from the role of the *von wegen* utterance in historical texts as an emphatic reaction, whereas the negative assessment comes from the recurring contexts of use.

In our view, an alternative account is possible according to which the negative assessment (i.e., the epistemic interpretation of *von wegen*) might be triggered by the presence of the focus accent and the status of *von wegen* as a focus phrase (cf. Figure 1), which never appear with the illustrating *von wegen* (cf. Figure 2). The accentuation of the functional element *von wegen* focalizes its basic meaning, namely 'pertinence'/'exemplification', and characterizes it as a contrastive focus. In fact, the proposition introduced or followed by *von wegen* is revealed to be inappropriate in the given context. Through the focalization of *von wegen,* the speaker marks the proposition to which *von wegen* refers as being in contrast to the context. Let us now illustrate how the opposing *von wegen* operates by reconsidering example (20), reproduced here as (28), in contrast to (19), reproduced here as (29):

(28) **[*Von wegen*]$_{\text{Focus}}$** *gefällt mir. Facebook steht derzeit wegen eines Datenskandals unter gewaltigem Druck.*
'So much for liking it. Facebook is currently under tremendous pressure because of a data scandal.'
(Süddeutsche Zeitung, 23.03.2018, p. 16; *Facebook: Wie das Netzwerk seine Nutzer schützen will und welche Möglichkeiten sie selbst haben*)

(29) *Also habe ich ein Praktikum in einem kleinen, renommierten Hotel in Blankenese gemacht und in den zwei Monaten, die ich dort war, alle Bereiche kennengelernt. Auch in den Restaurants, die zum Hotel gehören, habe ich ausgeholfen, oft im Schichtdienst, manchmal bis zwei oder drei Uhr nachts. Das war anstrengend, aber es gab immer Leute, die einem den Rücken gestärkt haben. Die Gäste haben mich oft gelobt* ***von wegen****: Toll, dass du da bist, man merkt, dass du das mit Freude und einem Lächeln machst.*
'So I did an internship in a small, well-known hotel in Blankenese and got to know all the different areas in the two months I was there. I also helped out in the restaurants that belong to the hotel, often working shifts, sometimes until two or three o'clock in the morning. It was exhausting, but there were always people who had your back. The guests often praised me, saying things like: it's great that you are here, you can tell that you do it with joy and a smile.'
(*Süddeutsche Zeitung*, 08.03.2019, p. 9; *Mit einem Plan B fange ich gar nicht erst an*)

In contrast to (29), *von wegen* in (28) is a focus. Since it is a function word, it does not have any focus projection (see Uhmann 1991: 197–198) and establishes a narrow contrastive focus. According to current theories, focalization activates a set of

contextually given or retrievable alternatives (see Rooth 1992). As a focus, *von wegen* is marked as an unexpected choice among many other possible function words. The unexpectedness is interpreted as a negative assessment of the following utterance (in [28], *gefällt mir*). In many cases, the reason for the negative assessment can be made explicit through an explanation, such as *Facebook steht derzeit wegen eines Datenskandals unter gewaltigem Druck* 'Facebook is currently under tremendous pressure because of a data scandal', as in (28). By comparing (28) and (29), it becomes clear that the negative assessment, that is, the epistemic value of *von wegen*, emerges due to an information structural factor (focalization), and is therefore pragmatic in nature.

The anaphoric opposing *von wegen* can also be analyzed in the same way as the cataphoric usage in (28). Let us reconsider example (22), repeated here as (30):

(30) PA: *Der Ischiasnerv, des was Ekliges, sag ich euch* […] *Es tut richtig weh und du kannst, weißt, dann denkst du, du legst dich hin, dann ist es en bissle entspannt, dann tut es vielleicht nimmer so weh.* ***Von wegen!*** […] *Das war wirklich unangenehm.*
'The sciatic nerve, it sucks, I tell you […] It really hurts and then, you know, you think you can lie down, then it's a bit relaxed, then maybe it doesn't hurt so much. No way! […] That was really unpleasant.'
(FOLK_E_0006 Gartengespräch unter Freunden)

As in (28), *von wegen* also constitutes a focus phrase, triggering a negative assessment. Unlike (28), the utterance to which the negative assessment refers precedes *von wegen* in (30) (*dann denkst du, du legst dich hin, dann ist es en bissle entspannt, dann tut es vielleicht nimmer so weh* 'and then, you know, you think you can lie down, then it's a bit relaxed, then maybe it doesn't hurt so much').

To summarize, the epistemic *von wegen* always constitutes a focus phrase and encodes a negative assessment. In the first case, cf. example (28), it is cataphoric in that it modalizes the following utterance. In the other situation, cf. example (30), it is anaphoric in that it modalizes the preceding utterance.

In conclusion, our analysis reveals that opposing *von wegen* displays all the semantic dimensions of the grammatical modal expressions of German, namely modal verbs and modal particles (see Table 1 above), as it encodes both the source of *p* (quotation shared/inferable knowledge) and the speaker's assessment.[12] Thus, opposing *von wegen*, like all grammatical modality expressions in Abraham's model, denotes a double displacement from the natural *origo* by conveying two meanings: a quotative/evidential meaning and an epistemic one. However, unlike the other

12 Whether *von wegen* displays the same modal complexity as modal particles, which also encode the hearer's perspective, remains an open question, which we cannot deal with in the present contribution.

modality expressions (both lexical and grammatical), *von wegen* is a syntactically non-integrated element, which can be cataphoric or anaphoric.

In light of its syntactic disintegration, *von wegen* has some features in common with discourse markers, such as, for instance, German *ja* 'yes' and *äh* 'uh' at the beginning of a turn, or prepositional phrases like *zum Beispiel* 'for example' (see Blühdorn et al. 2017). While discourse markers typically encode procedural meanings (see Heine 2013) in that they contribute to the organization of the discourse (i.e., the interaction between speakers), modality expressions convey information about the speakers' attitude regarding the proposition *p*. In view of the examples illustrated in this paper, we hold that *von wegen* should not be considered as a discourse marker, but rather as a modality expression, albeit not a prototypical one.

6 Conclusion

As a last remark, we would like to clarify to what extent we can capture the modal nature of *von wegen* by drawing on both a formal and a functional perspective, in the sense illustrated in the introduction (see Section 1). Through our analysis, we were able to show that both perspectives are needed in order to account for the complexity of modality. From a formal perspective, modality is rooted in the sentence structure and in a system of grammaticalized expressions, like that described by Abraham (2020; see also Axel-Tober and Gergel 2016). By adopting a functional perspective, we took as a starting point the semantics of modality, showing that modal meanings can also be conveyed by syntactically non-integrated items like *von wegen* in interaction with the information structure and pragmatic factors. This allows us to integrate the classification of modality expressions as sentence-internal lexical and grammatical items by suggesting the existence of a third strategy of modalization that operates at the discourse level. Moreover, the functional perspective makes it possible to discover how the two modal uses of *von wegen* are exploited differently depending on the type of communicative situation and the text genre. In this respect, we observed that exemplifying *von wegen* is typical of spoken interaction, while opposing *von wegen* seems to be used more in journalistic texts.

By exploiting the original meaning of pertinence, *von wegen* developed into two modal expressions: (a) exemplifying *von wegen*, which serves as a quotative and expresses evidential modality (simple displacement), and (b) opposing *von wegen*, which expresses both evidentiality and epistemicity (double displacement). From our perspective, it is the status of *von wegen* as a focus phrase that triggers the activation of possible alternatives with regard to the conventional meaning of the proposition, thus giving rise to a modality strategy. As to when and how this strategy

arose in the history of German, this remains, in our view (but see Bücker 2022), a matter of debate and needs to be further investigated in future research.

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