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Edited by
Kristin Kopf
Thilo Weber

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Edited by

Kristin Kopf
IDS Mannheim/University of Mainz

Thilo Weber
IDS Mannheim

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CHAPTER 1

Free variation, unexplained variation?

Thilo Weber[1] & Kristin Kopf[1,2]
[1] IDS Mannheim (Leibniz Institute for the German Language)
[2] Johannes Gutenberg University Mainz

As Labov (e.g. 1972: 188) notes, "[i]t is common for a language to have many alternate ways of saying 'the same' thing". Such alternants can be found at the level of pronunciation (e.g. *working* vs *workin'*), they occur in lexis (*car* vs *automobile*), and they exist in morphology and syntax (*Who is he talking to?* vs *To whom is he talking?*) (all examples from Labov). Over the last two decades, grammatical – in particular, syntactic – variation has been investigated in numerous studies (see e.g. the contributions in Cornips & Corrigan 2005; Dufter et al. 2009; Dammel & Schallert 2019; Werth et al. 2021), with linguists such as Adger & Trousdale (2007: 274) or Kortmann (2010: 841) going so far as to call variation the 'core explanandum' of grammatical theory. The present volume explores questions that are fundamental to this line of research: the question of whether variation can always and completely be explained, or whether there remains a certain amount of unpredictable – or 'free' – variation, and the question of what implications the (non-)existence of this type of variation would hold for the empirical study and our theoretical models of grammar.

Linguistic variation may occur across different speakers ('inter-individual variation') as well as within an individual speaker ('intra-individual variation') (see Werth et al. 2021). Traditionally, the factors impacting variation have been separated into 'internal' and 'external' ones. Typical examples of 'external' factors include style/register, the speaker's regional or social background and the planning conditions under which an utterance takes place. Internal factors, on the other hand, may include the phonological context, length or complexity of the structure under investigation, the animacy of its referent and many others. The present volume deals with the question of whether *all* variation can, at least in principle, be explained with reference to such internal or external factors. It does so on the basis of empirically well-grounded case studies from a wide range of languages and language varieties.

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On the history of 'free variation'

The notion of free variation goes back to the Prague school of structuralism (Tubetzkoy 1969[1939]), introduced with reference to phonology. Discussing different types of 'optional phonetic variants' (i.e. sounds that can occur in exactly the same environment without a change in the lexical meaning of the word), Trubetzkoy (1969: 47–48) distinguishes a 'stylistically relevant' type from a 'stylistically irrelevant' one. Stylistically relevant variants convey emotional or social meaning. They can differentiate, for example, between an 'excited emotional' and a 'careless familiar' style, or between an 'uneducated', a 'cultured' and a 'neutral' style. One of Trubetzkoy's examples is the spirantisation of intervocalic *b* in German (as in words such as *aber* 'but') in "careless, familiar or tired speech". Stylistically irrelevant variants, on the other hand, are considered to have "no function whatever. They replace one another quite arbitrarily, without any change in the expressive or the conative function of speech" (1969: 48). Trubetzkoy's example is the pronunciation of palatal occlusives in Kabardian, which may be realised "as *k* sounds" or "as *tsch* sounds", "without noticing any difference and without thereby producing any stylistic or emotional coloration" (1969: 48). Crucially, both types of variants are considered 'optional' from a narrow, phonological perspective, as neither leads to a difference in lexical meaning, but only the 'stylistically irrelevant' variants are truly interchangeable even beyond that.

Not much later, sociolinguistics (e.g. Fischer 1958; Labov 1966a, 1966b, 1972) showed that much of what had previously been considered free variation in the sense of Trubetzkoy's 'stylistically irrelevant' type was, in fact, determined by regional, social and/or situational factors, i.e. could more appropriately be reassigned to Trubetzkoy's 'stylistically relevant' type. A famous example is the pronunciation of final and pre-consonantal *r* in New York City. Previous accounts, such as that by Hubbell (1950: 14), had described the use of *r* along the following lines:

> The pronunciation of a very large number of New Yorkers exhibits a pattern in these words that might most accurately be described as the complete absence of any pattern. Such speakers sometimes pronounce /r/ before consonant or a pause and sometimes omit it, in a thoroughly haphazard fashion.

As is well known, however, Labov's (1966) department store study showed that the pronunciation of *r* depended on social class and degree of formality. Nonetheless, even multivariate studies such as Hinrichs & Szmrecsanyi (2007), which, in addition to internal factors, also consider sociolinguistic factors such as genre and variety as well as usage-related factors such as priming, are faced with a certain residue of unexplained variation (2007: 460). This raises the question of whether this is just random noise, which, given the appropriate methodological adjust-

ments, could be eliminated at least in principle, or whether it is something systematic and, thus, something to be considered in our methodological approaches and to be accounted for in our respective models of grammar. Labov (1966b: 5) himself did not dismiss the existence of free variation entirely. He did, however, only attribute a fairly minor role to it, considering it merely to exist "in the sense of irreducible fluctuations in the sounds of a language".

Many functionally oriented linguists have been critical of the idea of free variation, as it violates the principle of isomorphism, according to which a difference in form is always connected to a difference in meaning. Bolinger's 1977 book *Meaning and Form*, for example, explicitly sets out to "reaffirm the old principle that the natural condition of a language is to preserve one form for one meaning and one meaning for one form" (1977: x). Similarly, Haiman (1980: 515) states that "[i]somorphism is so nearly universal that deviations from it require explanation". Goldberg's model of construction grammar (1995: 67), too, rejects the idea that forms could be interchangeable without any difference in meaning: according to her 'Principle of No Synonomy', "if two constructions are syntactically distinct, they must be semantically or pragmatically distinct [...]".

The important role attributed to isomorphism as expressed by many functionalists is, at least in part, to be seen as a reaction to what Bolinger (1977: 125) refers to as the 'usual notions' of then-current generative linguistics. Early transformational approaches had assumed that certain syntactic alternants, such as active and passive sentences, were derived from the same deep structure (Chomsky 1957: 77–78) and thus shared the same truth value. Bolinger (1977: ix) took issue with the idea that "an abstract structure could be converted into x number of surface structures – in either case without gain or loss of meaning. The resulting structures were the same; only the guise was different". As noted by Newmeyer (1983: 116), however, it is questionable whether such a position had truly been advocated in the first place ("Did Bolinger's generativist ever exist?"). Newmeyer suspects that the debate was more likely due to the fact that Bolinger's and most generativists' definitions of 'meaning' were considerably different from one another: while generativists usually focused on truth-conditional equivalence, "for Bolinger, anything that can make a conceivable contribution to understanding a sentence or the appropriateness of its use is considered part of its 'meaning'" (Newmeyer 1983: 116).[1]

1. Relatedly, Newmeyer (1983: 76) also notes a certain amount of confusion with respect to the term 'optional rule'. Newmeyer points out that, within the generative tradition, the 'optionality of a transformational or phonological rule is simply a formal device for expressing the possibility that two derived structures originate from one underlying structure'. Thus, even if one were to accept that, e.g, active and passive sentences were transformationally related, this would not mean that they were in free variation.

As it appears, many generativists have, in fact, been just as critical of the idea of free variation as Bolinger has. According to one approach, free variation is instead explained away as diglossia/bilingualism ('competing grammars', e.g. Kroch 1989, 1994, 2001; Zwart 1996: 245; Lightfoot 1999: 94; Moser this volume). According to another, the variants in question are being re-evaluated as not being interchangeable after all ('pseudo-optionality'; on this notion, see, e.g. Müller 2003; Anttila 2002: 218–219). As for the competing grammars approach, Kroch (2001), for example, discusses the well-known fact that many instances of syntactic change are gradual. One of his examples is the rise of periphrastic *do* in English interrogatives and negative declaratives, a pattern that went through a 300-year-phase of variable use before it eventually became obligatory. Kroch traces the variation in question back to different parameter settings,[2] which, in turn, "must reflect the co-presence in a speaker or speech community of mutually incompatible grammars" (2001: 720). In other words, there may well be free variation in the sense of the existence of interchangeable forms, but they are not considered to exist within the same grammatical system. The same view is expressed, e.g. by Zwart (1996: 245) with reference to word order variation in West Germanic verb clusters ("it cannot be excluded that the optionality [...] in fact reflects a limited form of bilingualism") and by Lightfoot (1999: 94) with regard to the variation between VO and OV order in earlier stages of English: "In general, individual grammars do not manifest optional alternations of this type. [...] Where a language has such an alternation, we say that this manifests diglossia, and that speakers have access to two grammars".

As for pseudo-optionality (Anttila 2002: 218–219; Müller 2003: 293–296), the idea is here that the interchangeability of two or more forms is only apparent, whereas on closer inspection, there is, in fact, a difference in meaning between them. According to Anttila (2002: 218), "this seems to be the favoured solution to optionality in optimality-theoretic syntax", for example. Thus, for instance, if two sentences such as *John gave a book to Mary* and *John gave Mary a book* (from Müller 2003: 289) differ in meaning after all (Müller 2003: 294 refers to accounts claiming "that dative shift can somehow create 'affectedness' of the indirect object"), this would mean that they are not alternative 'outputs' of the same 'input' and, thus, not in competition with one another. Rather, they would belong

2. Kroch views the rise of *do*-support in connection with the V-to-I-parameter (or, in more recent terminology, V-to-T), which determines whether or not lexical verbs can undergo movement from their base position to the higher, functional I position. In a nutshell, English main verbs gradually lost their ability to move to I (and higher), and the insertion of the empty auxiliary *do* in that position is seen as a strategy to compensate for that loss.

to different candidate sets, and each could be optimal among their respective competitors.

On the other hand, there are also views more readily compatible with, or even explicitly in favour of, the notion of free variation, and they, too, can be found across functional and formal orientations. From a functional perspective, Uhrig (2015: 323), for example, does agree that Bolinger's (1977) defence of isomorphism against (what he took to be) the early generative view was "justified and necessary in a cognitive linguistic approach". At the same time, however, Uhrig (2015: 335) warns that the principle of no synonymy, "if used as a hard-and-fast rule [as the corollaries in Goldberg (1995) suggest] or even as a dogma, causes more problems than it solves and – if taken at face value by researches, will stop them from observing exceptions to this general rule". An example of a construction grammar approach that challenges Goldberg's principle is Cappelle (2009). Investigating variation in the placement of verb particles in English (e.g. *Don't just throw away that wrapper* vs *Don't just throw that wrapper away*), Cappelle (2009: 187) argues against "an extreme constructionist treatment like Gries's (2003), where the two word order patterns are treated as so unique and distinct (*sui generis*) that their commonality is disregarded and even denied". Instead, he introduces the concept of 'allostructions', viz. truth-semantically equivalent but formally distinct manifestations of the same construction.

Within the generative tradition, too, there are approaches that do recognise a need for variation to be modelled within a single grammar ('variable-output-grammar', in the terminology of Seiler 2004). An example from minimalism is Adger (2006). He investigates variation in subject–copula agreement (e.g. *you was* vs *you were*) in a Scottish dialect of English, which he considers to be 'non-deterministic' (2006: 505). He traces it back to the forms of the copula being underspecified for certain values of their agreement features, which allows some pronouns to combine with either form. Similarly, in contrast to its classical version, later variants of optimality theory began to allow for the same input to be mapped onto multiple, equally grammatical outputs (e.g. Müller 2003; Seiler 2004: 385–394). This can be achieved, for example, by free (or unspecified) ranking of constraints (cf. Kager 1999: 406). An example used by Kager is vowel reduction, as in the English word *sentimentality* (sentim[en]tality vs sentim[ṇ]tality). If we assume that the variation between the non-reduced and the reduced variant is governed by the two constraints IDENT-IO ('identity of input and output'), which favours non-reduction, and REDUCE ('vowels lack quality'), free ranking of them will lead to both variants being optimal and, thus, equally grammatical.

The status of free variation and isomorphism is evaluated differently for the different levels of language structure. As described above, the idea of free variation was introduced with reference to phonology, and it was only later that it

started to be discussed in relation to morphology and syntax. An early example is Bolinger's (1956) study of the *-ra* and *-se* forms of the Spanish subjunctive (see also Rosemeyer, this volume), which – in contrast to previous descriptions – Bolinger concludes are not in free variation. Bolinger's (1977) vindication of isomorphism is largely directed at syntax. At the level of phonology, Bolinger acknowledges what appears reminiscent of Trubetzkoy's 'stylistically relevant' type of free variation, recognising differences that may mark a speaker "as an individual or as a speaker of a different dialect, but with each unit still having the same communicative value" (1977: 3). As regards morphology, Bolinger refers to different ways of marking the plural on English nouns (*geese* vs *hens*) to show that there can be difference in form without difference in meaning (1977: 3) (which, in this particular case, is of course not free but lexically determined). What Bolinger considers problematic, however, is that "[d]ifferences in the arrangement of words and in the presence or absence of certain elements are often assumed not to count", i.e. "[w]here the mischief begins is in syntax" (1977: 3).

On the whole, despite the fact that the concept of free variation has been around for decades and despite its centrality and controversial status, the discussion has, so far, been fairly fragmented: thoughts on free variation have often been embedded in publications with a different or more general overall focus; contributions with an explicit focus on free variation have been limited to individual article-length items (e.g. Bolinger 1956; Ellis 1999; Cappelle 2009). Moreover, explicitly or implicitly, the term is used differently by different linguists, particularly with respect to the question of what, exactly, the variation in question should be independent of. While probably all linguists would agree that, in order to speak of free variation, there should be no difference in 'meaning', it has already become apparent that a problem lies in the fact that the term 'meaning' itself is used differently, sometimes excluding and sometimes including factors such as, e.g. style/register or information pertaining to the speaker's regional or social background. As for the term 'free variation' specifically, Kager (1999: 404), for example, uses it in the sense that "no *grammatical* principles govern the distribution of variants" (emphasis in the original), while the distribution may still well be predictable on the basis of 'sociolinguistic' and 'performance' factors. Ellis (1999: 464), on the other hand, proposes that in order to qualify as 'free', the variation in question should be independent of those types of factors, too:

> Free variation can be held to exist when two or more variants of the same linguistic variable are seen to be used randomly by individuals with regard to all of the following: 1. the same situational context(s) 2. the same illocutionary meanings 3. the same linguistic context(s) 4. the same discourse context(s) 5. the same planning conditions.

Our volume provides the first dedicated book-length treatment of this long-standing topic, providing the opportunity to compare and contrast different definitions of and approaches to free variation in morphology and syntax, based on empirically well-grounded case studies.

Free variation: Fact or fiction?

Whether free variation actually does exist has been debated from the beginning. An explicit early opponent is Joos (1968[1959]: 185–186):

> The terms 'free variation' and 'free alternation' have been misunderstood by taking the word 'free' in the sense that it has in the romantic theory of 'free will'. Actually, the word 'free' is used in linguistics to mean merely 'not yet accounted for'. It is the technical label for whatever clearly does not need to be accounted for during the current operation in analysis; and to assume that it will never need to be accounted for in later operations would be a serious misunderstanding. A certain phenomenon might never be accounted for in your lifetime or mine, but the label 'free' does not excuse us from trying. The descriptive linguist is committed to a deterministic philosophy; without determinism, he could never have gotten started, and having put his hand to the plow he can never turn back.

The overall existence of free variation in human language is not falsifiable: even if we could account for the governing factors in all the alternating structures that have been debated up to now, there might still be phenomena that have not been studied yet, especially in under- or non-documented languages, and phenomena that may never be studied in a satisfying way because the language in which they appeared has gone extinct or has evolved into a new stage (e.g. Old English) and the surviving data from the period under consideration lack crucial contexts. We can, however, assume that, if it exists, free variation is a language-independent phenomenon and, therefore, use known phenomena as a proxy to estimate the likelihood that it exists at all. Preston (1996: 25), a decided skeptic, acknowledges that for him, a careful but fruitless search for influencing factors would be enough to assume that free variation does exist:

> I am suspicious that language variation which is influenced by nothing at all is a chimera, but I would be happy to admit to such variability if I were shown that a careful search of the environment had been made and that no such influencing factors had been found.

How careful such a search has to be is, however, up to debate. On the other hand, even if an alternation phenomenon could be completely explained by a number of factors, this simply eliminates a single phenomenon from the almost endless list of phenomena in human languages where it could be manifested; it does not show that free variation doesn't exist, which makes this assumption an equally non-falsifiable point of view, as Ellis (1999: 476) observes:

> [A]re not such researchers operating from a theoretical position that does not permit falsification? They believe that systematicity exists and that if we look hard enough we will always find it. Such a position is, I think, untenable both theoretically and methodologically.

Investigating free variation

No matter what direction linguists are coming from, free variation provides an interesting focus that demands not to be satisfied with a handful of clear influencing factors but encourages the rigorous study of the unexplained residue. We should not readily assume its existence or its nonexistence because both are an excuse to stop looking, as criticised by Fischer (1958: 48):

> 'Free variation' is of course a label, not an explanation. It does not tell us where the variants came from nor why the speakers use them in different proportions, but is rather a way of excluding such questions from the scope of immediate inquiry.

Instead, the search for free variation provides a lens that focuses on those parts of language use that are especially hard to study. This can be done with a number of empirical approaches.

Studies on grammatical variation mostly try to identify governing factors. In recent years, the predominant approach in variationist studies has been to gather potential factors and hypotheses based on previous studies and grammatical descriptions; collect a large data set of alternating variants, usually from a corpus; and analyse it with multifactorial statistical models (e.g. Sutter 2009; Szmrecsanyi et al. 2014; Röthlisberger 2018; De Cock 2020). However, such models never explain all of the variation (measured as goodness of fit). This might be due to the fact that some factors are hard to operationalise (e.g. degree of formality), due to the fact that crucial factors have been overlooked and maybe even do not exist. This last case would be the residue that we call free variation in the narrow sense.

Such an approach, however, is only possible if there are large corpora of the language under study. When working with lesser-documented languages, variation is harder to determine and often not the main focus of a study. Meyerhoff (2019: 230) puts it in the following way:

> Linguists working in the field of language documentation, too, are necessarily engaged with language variation, but from a somewhat different perspective. Instead of starting from a well-understood and well-documented language grammar, documentary linguists are using their skills to (first) extrapolate away from the inter-individual variation that characterises all speakers and every speech community in order to adequately describe the structure of a lesser-known or poorly-documented language.

This leads to the question of how variation (including free variation) can be studied in the case of poorly documented languages, varieties or historical stages of languages. In the case of living languages, we can make up for the lack of preexisting corpus data by carefully collecting our own data of different kinds, ideally tailored to the phenomenon under study, but it is much harder to get at potential cases of free variation (in this volume, Niinemägi and Yu both do this).

There are also approaches that rely on acceptability, not usage: if speakers of a language reject a certain use, they assume that there is no free variation; if they accept both variants, there might be. Such acceptability tests can range from few examples rated by a single speaker (e.g. Yu, this volume) to a large number of carefully constructed potential minimal pairs judged by a bigger group (e.g. Bader and Symanczyk Joppe, this volume). This approach tries to exclude all potential influencing factors from the start, so that the existence of free variation does not stem from a 'failure' of the statistical model to account for all of the variation. If speakers accept both forms in the same context, the only remaining conditioning influence may lie in the speakers themselves, which can, in turn, be controlled for by selecting a homogeneous group. An example of such a study can be found in Campe (1999), a comparison between the use of adnominal genitives and prepositional phrases in present-day German (genitive NP: *die traurige Nachricht seines Todes* / PP: *die traurige Nachricht von seinem Tod* 'the sad news of his death'). Her survey was answered by 70 university students who ranked the phrases in direct comparison on a four-point scale from 'very bad' to 'very good'. In a number of cases, one construction was rated as good or very good by an overwhelming majority of participants while the other was rated as bad or very bad by a similar proportion. There were, however, other cases in which both constructions were rated as good or very good (e.g. in the example given above, 60% rated the genitive as good or very good, and 80% did the same for the PP). Still, Campe does not conclude that (almost) equally acceptable genitives and PPs are

in free variation but, rather, that the participants saw the two constructions as non-equivalents with a slight difference in meaning: the genitive creates a holistic relationship between the head and its modifier, and the PP makes the relationship looser (Campe 1999: 287). However, this assumption cannot be tested empirically in her framework.

This is a crucial problem not only in acceptability studies but also in corpus studies, and not only when looking at free variation but also when looking at conditioned variation. If the two constructions are not functionally equivalent (including semantics, style and social meaning in the sense of Silverstein 2003), the search for free variation is moot, but functional equivalence is notoriously hard to determine. In addition, some studies include variation between a form and its absence (i.e. optional use of a construction) as potential free variation and, consequently, have to show that the addition of linguistic material does not add anything to the functional side of things, as this is the only way the presence and the absence of something can be fully equivalent (for example, in this volume, Symanczyk Joppe deals with the absence of phrases, Yu with the absence of morphemes and Hasse with the addition of a suffix to a fully inflected form). Other problems arising from using quantitative empirical data are, e.g. how to deal with the fact that in a large enough corpus, some structures will always be attested, while many linguists would be hesitant to say that they form part of the language (Rudnicka & Klégr encounter a similar problem in this volume). The separation of infrequent variants from errors has to be a gradual one, but the aim of accounting for all variation in the data demands a binary approach.

This volume

The contributions to this volume form three thematic sections. The papers of the first section, 'Identifying and measuring free variation', focus on the question of what it actually means for two (or more) forms to be in free variation, how to distinguish free variation from related phenomena and/or how to investigate it empirically. The second section, 'Free variation and language change', focuses on diachronic aspects of free variation, such as the question of how and why it may come into being as well as the question of its (in)stability over time. The third group of papers, 'Free variation? Look harder!' approaches the topic from a more skeptical perspective. It shows that certain seemingly free phenomena can, in fact, be explained by identifiable factors after all.

Identifying and measuring free variation

Markus Bader, in his article 'How free is the position of German object pronouns?', proposes that a distinction should be made between free variation 'in grammatical terms' vs free variation 'in an absolute sense', arguing that forms may be freely variable from a grammatical perspective without necessarily being chosen at random in actual language use. Bader's case study is word order variation in the so-called middle field of German, more specifically, the order of non-pronominal subjects and pronominal objects. Bader poses the question of whether the subject–object and the object–subject order are equally acceptable, thereby arriving at an empirically testable operationalisation of free variation. The question is answered on the basis of three magnitude estimation experiments investigating potentially influencing factors such as the position of an additional adverbial, the animacy of the subject referent and the length of the subject. The results show that where an adverbial occurs between subject and object, acceptability for the object–subject order is significantly lower than for the subject–object order, which is in line with the assumption that object pronouns may be preceded by *nothing but* a subject. Once this requirement is met, there still remain some differences in acceptability depending on the animacy and length of the subject, but they are only small and fleeting in nature. Bader therefore concludes that grammar only requires object pronouns to occur at the left edge of the middle field or, when preceded by a subject, directly thereafter, whereas the order of subject and pronominal object is left open by it. The (comparatively weak) effects caused by animacy and length are instead attributed to processing mechanisms. Consequently, the order of subject and pronominal object is concluded to be a matter of 'free but not random' variation.

Ann-Marie Moser, in her article 'Optionality in the syntax of Germanic traditional dialects: on (at least) two types of intra-individual variation', develops a typology of different kinds of 'optionality' and illustrates them using examples from non-standard varieties of West and North Germanic. 'Optionality', which thus serves as an umbrella term for different phenomena, is defined as the availability of two or more forms for the same function that are both grammatical to the speaker's grammar(s). Moser distinguishes between 'true optionality' and 'non-true optionality', with the latter, in turn, falling into two subtypes, viz. 'apparent' and 'false' optionality. Non-true optionality is characterised by preference differences between the variants in question. In the case of apparent optionality, they are sensitive to features of the utterance situation. An example is information-structurally motivated word order variation. In the case of false optionality, the preference differences are due to rules inherent to the construction itself. An example is the use vs non-use of doubly-filled-comp structures in

Upper German, which is sensitive to the length/complexity of the *wh*-phrase. True optionality, finally, is characterised by the absence of any preference differences, thus corresponding to the notion of 'free variation'. An example is the variation between simple negation and negative spread in Alemannic. Moser goes on to discuss this particular case of free variation from a diachronic perspective and against the background of the competition between the competing-grammars approach and the variable-outputs approach. She concludes that the variation may reasonably be explained in terms of grammar competition in times of language change.

Karolina Rudnicka and **Aleš Klégr**'s chapter 'Non-verbal plural number agreement. Between the distributive plural and singular: blocking factors and free variation' deals with an understudied variation phenomenon in English where one variant is clearly dominating (*Six people lost their lives/life*). The singular is used under certain conditions when a set of (mostly semantic) blocking factors is active. In some of these cases ('strong blocking factors'), plural is possible but leads to a different interpretation, which precludes us from considering the different forms as alternating. In others ('weak blocking factors'), singular and plural can vary without meaning change, and this is also the core definition of free variation used by the authors. The separation of strong and weak blocking factors is borne out by corpus frequencies. Rudnicka and Klégr classify factors for which there are only very few counterexamples as strong blocking factors, i.e. even though a handful of plural uses exist, this is not considered a case of free variation. This approach somewhat resembles that of categorising language universals into absolute and statistical (or 'near') universals (Greenberg 1966). The study focuses on two lexically filled constructions (*lose one's life*/*job*) that are expected to exhibit free variation. The results show that singulars do occur in the case of *job* in British English and in both cases in American English, albeit with single-digit frequencies. There seems to be no influence of genre (as defined by COCA). The authors also note that not all cases are necessarily in free variation, as there may always be additional contextual factors. They suggest that a corpus study in itself cannot make sure of this and that an additional questionnaire using corpus examples would be helpful to further close in on true free variation. Free variation is thus a question of both production and acceptability to Rudnicka and Klégr.

Vilma Symanczyk Joppe, in her article ''Optional' direct objects: free variation?', investigates potentially free variation in the domain of argument structure, specifically, the omissibility of direct objects in German. The main claim of the paper is that, with regard to the question of free variation in syntax, the factor of (linguistic or non-linguistic) context has not been considered systematically enough so far. In a first, theoretically-oriented section, Symanczyk Joppe reviews candidates for free variation from phonology and morphology and devel-

ops interpretation and production rules in order to distinguish free variation from other relations that may hold between two (or more) forms (e.g. allo-forms in complementary distribution or forms belonging to different contrastive units). This matrix serves as a basis for the formulation of a set of mapping rules mapping input forms onto (multiple) output forms. In an empirical section, the author carries out an acceptability rating experiment that adapts the minimal-pair method from phonology for use in syntax. Specifically, she investigates the influence of a range of factors (such as event types, verb class, temporal relations, sentence type) on the acceptability of object omission by testing pairs of sentences differing in the feature [+/– accusative object] but occurring in the same context. One of the results is that object omission is accepted in particular with activity readings. With regard to the question of free variation in syntax, Symanczyk Joppe concludes that, in certain contexts, certain forms may appear to be variants due to a partially equivalent distribution, but they do not have the status of systematically provided alternatives.

Free variation and language change

A common interpretation of conditioned variation is that it is a transitional stage in language change: a new variant arises and can be used alongside the old variant but, in the long run, either fails to gain ground or replaces the older variant (or both become independent linguistic units of their own). This is, of course, what happens in phonologisation (e.g. of umlaut variants in Middle High German; see Sonderegger 1979: 306) when conditioned allophones come into being which then turn into phonemes as the conditioning factors are lost. Semantic change exhibits something similar: when an existing word acquires a new meaning, there is always a stage of polysemy in between, where the intended meaning has to be resolved by the context. It seems logical to assume a similar development for variants that are in free variation. It may arise when both or one of two formerly distinct units extend to new contexts that lead to functional overlap, or when one unit splits into two forms which are then used (partially) interchangeably. If speakers do indeed try to avoid synonymy, such free variation should not remain stable. As with phonologisation or meaning change, one of the units is expected to win (Croft 2000), or both are expected to differentiate (as can be seen with the preterite of (former) strong verbs in Germanic languages; see Nowak 2011 for German; De Smet & Van de Velde 2020 for Dutch).

In the present volume, three case studies look at language change with special attention to free variation, one at the level of morphology (Hasse), one at the level of morphosyntax (Niinemägi) and one at the level of syntax (Nijs & Van de Velde).

In 'Variation and change in the Aanaar Saami conditional perfect', **Merit Niinemägi** investigates stability in types but change in tokens: while both Aanaar Saami conditional perfect constructions involved are retained for an extended period of time, one of them becomes much more common than the other. Using conditional inference trees, Niinemägi identifies several influencing factors and concludes that the variation isn't diachronically stable. It thus shows how a newer variant encroaches on the territory of an older variant. While the newer variant might one day replace the older variant entirely, they do coexist at the moment. The study has to contend with several challenges typical for lesser-documented languages, among them the small size of the speech community, their bilingualism involving a closely related language (Finnish), a large number of L2 speakers, the diverse nature of the available corpora and the necessary combination of older corpus data and data from a recent survey. Diverging from other studies, Niinemägi decides to include L2 data and thereby implicitly challenges the notion of the (language use of the) native speaker as the sole locus of 'true' variation.

In 'Stability of inflectional variation: the dative of the indefinite article in Zurich German', **Anja Hasse** looks at a single cell of the inflectional paradigm of the masculine/neuter indefinite article in a Swiss German variety, using the framework of canonical typology. The cell in question, the dative singular, can be filled by two forms and thus exhibits overabundance. The forms are diachronically related. The data used shows once again that lesser-documented varieties, in this case an Upper German dialect, and a diachronic perspective are a challenge for the study of free variation. Hasse combines older written sources with modern spoken data from an oral history project and a talkshow. She identifies factors that do influence the choice between the two forms but only in certain linguistic contexts. She concludes that it is very likely that the forms vary freely in other contexts. Her central argument for free variation hinges on the look at intra-individual variation: by comparing data from one and the same individual, Hasse excludes variation that might have arisen through the emergence of different individual grammars or that may be determined by individual factors that are hard to grasp. Additionally tracing the variation between individuals over a time span of almost 200 years, Hasse finds the phenomenon to be diachronically stable. She is, however, cautious to decide completely in favour of free variation, as more data would be needed to make a confident choice.

Julie Nijs and **Freek Van de Velde**, in their article 'Resemanticising 'free' variation: the case of V1 conditionals in Dutch', investigate a pair of syntactic alternants, namely, asyndetic verb-first (V1) conditionals vs syndetic conditionals introduced by the conjunction *als* 'if', over the course of Late Modern Dutch. The starting point of their study is the observation that the V1-type once was the default construction but has since lost this status to the conjunctional type. The

new construction gradually extended its contexts, while the older one seems to have retracted to a niche of tentativeness and counterfactuality. The authors investigate this assumption empirically. In the first part, they analyse the distribution of the two constructions using a logistic regression model. As measuring semantic notions such as tentativeness directly is delicate and prone to a subjective bias on the part of the researcher, the authors resort to a number of more 'tangible' factors (such as syntactic integration, presence/absence of an epistemic modal, verb tense and animacy of the subject referent) that can be used as a proxy for the semantic properties of the two alternants. In the second part, the authors focus on lexical effects, i.e. patterns of dissimilarity with respect to the kinds verbs that are typically found in the two constructions. The results are consonant with the assumption that, compared to the conjunctional type, the V1-type is more closely associated with tentative meaning. Even though a diachronic trend is not directly observable in the time span under investigation, the results are thus nonetheless compatible with the scenario in which the V1 is slowly shifting into the epistemically tentative niche.

Free variation? Look harder!

Malte Rosemeyer, in his article 'Syntactic priming and individual preferences: a corpus-based analysis', follows the premise of variationist sociolinguistics that much of what is initially believed to be free variation can be accounted for, after all, if we take into account not only linguistic factors but also social factors and ones pertaining to language use. Under this assumption, 'free variation' in actual language production is, indeed, merely unexplained variation, challenging the linguist to enhance their methodology so as to minimise this residue. Rosemeyer proposes that one way of achieving that goal is by exploring what governs individual preferences in language use. His case study, based on a corpus of semi-structured sociolinguistic interviews, is the variation between the *-ra* and *-se* forms of the Spanish subjunctive. Rosemeyer's results support the assumption that the variation in question can partly be explained by a complex interaction between individual preferences and the difference between self- and other-priming. Specifically, he finds that previous use of a variant by another speaker (other-priming) is more likely to lead to repeated use of the same variant than previous use by the current speaker (self-priming) if the speaker does not usually prefer the variant in question. Where a speaker does prefer it in general, it is the other way round. This suggests that what may seem like free variation does not simply follow from individual preferences but results from a complex interplay of the speaker's previous experience with language and social constraints.

In 'Optionality, variation and categorial properties: the case of plural marking in Yucatec Maya', **Yidong Yu** investigates data from published texts, previous literature and her own fieldwork. The phenomenon under investigation is one of optionality in the narrow sense: Yucatec nouns can be inflected for number using the plural marker *-o'ob*, but they can also be used as plurals in their uninflected form. She argues that the variation is not governed by factors brought forward in preexisting literature, i.e. animacy, argument structure and numerical quantification. The argumentation differs from the other papers in this section in that it is mostly based on contrasting individual examples, not on statistics using a large amount of data. Thus, Yu is not interested in factors that make the use of one or the other form more likely (and thereby less 'free') but in factors that allow only one possibility, completely prohibiting free variation. That none of the three factors does this is, however, not enough for Yu to assume the existence of free variation. She goes on to revisit her data and finally suggests a semantic account: she argues that all Yucatec nouns have a cumulative denotation in their bare form, which can be shown from the behaviour of generic uses. To focus on the granularity of the denoted object, *-o'ob* is added. Yu develops a formalism involving a pseudopartitive operator on the noun that enables plural adjunction. Her look at seemingly free variation thus leads to the identification of a conditioning factor and its inclusion in a formal theory.

Roser Giménez, **Sheila Queralt** and **F. Xavier Vila**, in their article 'Variation of deontic constructions in spoken Catalan: an exploratory study', investigate the distribution of five deontic verb constructions in Catalan through the lens of variationist sociolinguistics, using their study to reflect more generally on the merits and limitations of this school of linguistics with respect to the question of free variation. The authors employ decision trees to predict speakers' choices among the five constructions on the basis of a range of linguistic factors (e.g. grammatical person, sentence polarity) and sociolinguistic factors (e.g. identification with and exposure to Catalan). As the authors show, the models predict most of the tokens correctly, with *haver de* and *tenir que* even being predicted correctly up to 100% of the time. As for the variation that remains unexplained, the authors point out that it is not necessarily to be attributed to free variation, as it might well be explained by a complementary set of factors. More generally, then, while the presence of free variation can be ruled out by the variationist approach, its presence can never be demonstrated. However, even though free variation proves to be an unverifiable notion, the authors still consider it an important one (because it may serve to fuel new hypotheses), comparing free variation to the notion of dark matter in cosmology.

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SECTION 1

Identifying and measuring free variation

CHAPTER 2

How free is the position of German object pronouns?

Markus Bader
Goethe University Frankfurt

Corpus studies show that weak object pronouns in German directly precede or follow the subject, depending on properties of the subject, including weight, animacy and thematic role. Whether the same factors also affect the acceptability of sentences with object pronouns was investigated in three magnitude-estimation experiments. The results show that both orders (object pronoun before/after subject) are highly acceptable, with some small acceptability differences depending on weight, animacy and thematic roles. Based on these results, the hypothesis is advanced that the position of weak object pronouns in German relative to the subject is an instance of free variation within the grammar but choosing a specific order during language production follows general production preferences and is thus not random.

Keywords: word order, object pronouns, German, magnitude estimation, language production

1. Introduction

From a syntactic point of view, speakers of German enjoy much freedom when it comes to the order of subject and object(s). As soon as non-syntactic factors are taken into account, however, the apparent word-order freedom often disappears. Such non-syntactic factors derive from, among others, conceptual structure, information structure, and the weight of phrasal constituents. For example, when a sentence contains an agentive verb, an animate proper name as subject, and an inanimate indefinite NP as object, it is hardly possible to put the object in front of the subject within the so-called middlefield (e.g., ?? *Vermutlich pflückte einen Apfel Peter*. 'Presumably, Peter picked an apple').[1] Constraints on word

1. According to the topological model of German sentence structure (Drach 1937), the *middlefield* is that part of a sentence that starts directly after the finite verb in a verb-second clause and

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order freedom have been amply studied within theoretical, experimental, and corpus linguistics (see overview in Weskott 2021). This research has shown that, in many cases, one order can be used quite freely (typically, but not always, subject-before-object order), whereas the use of alternative orders is severely restricted.

There is one area of German syntax, however, where subject-before-object (SO) and object-before-subject (OS) order seem to be truly exchangeable: pronominal objects can freely occur before or after a non-pronominal subject. Compare the corpus examples in (1a) and (1b).

(1) a. Der Mann stürzte dadurch zu Boden, so dass *der Detektiv* **ihn**
the man fell thereby to ground so that the detective him
überwältigen und bis zum Eintreffen der Polizei festhalten konnte.
overpower and until the arrival the police detain could
'Thereby, the man fell to the ground so that the detective could overpower him and detain him until the police arrived.'
https://www.rhempfalz.de/pfalz_artikel,-kaiserslautern-ladendieb-z%C3%BCckt-messer-_arid,337877.html

b. Beim Sprung über einen Maschendrahtzaun verletzte sich der Mann,
at jump over a chain-wire fence hurt himself the man
so dass **ihn** *der Detektiv* einholen und festhalten konnte.
so that him the detective catch and detain could
'When jumping over a chain-wire fence, the man hurt himself, so that the detective could catch and detain him.'
https://www.come-on.de/luedenscheid/mann-jagt-raeuber-durchs-stern-center-luedenscheid-wegen-schutzmasken-13809523.html

The two examples in (1a) and (1b) are quite similar with regard to properties that are known to affect word order: in both sentences, the embedded clause contains an animate subject, an animate object, and an agentive verb. Furthermore, the antecedent of the object pronoun is contained in the preceding main clause, and the subject is a definite NP that refers to a detective mentioned in the preceding context (not shown here). Despite this similarity, we find SO order in the embedded clause of (1a) but OS order in the embedded clause of (1b). In both cases, switching to the alternative order seems to be possible without any change in meaning and any loss of acceptability. The impression that the order of subject and object is not subject to grammatical constraints when the object is a pronoun is reinforced by a look into the syntactic literature on word order variation in German. For example, Müller (1999) and Haider (2010, Chapter 4) provide sophisticated discussions of the conditions under which an object can precede the subject

after the complementiser in a verb-final clause, and ends directly before the verb(s) in clause-final position.

in the middlefield. Object pronouns, however, are exempted from the discussion, under the premise that the serialisation of subject and object pronoun is a matter of free variation.

As the editors make clear in their introduction to this volume, free variation can be understood in different ways. The discussion so far has considered free variation within the grammar, that is, sentences that can be realised with different word orders without any effect on the meaning of the sentence – with 'meaning' being understood in a very broad sense, including semantic, pragmatic and social aspects. Even if two word order variants are free in grammatical terms, they are not necessarily free in an absolute sense, that is, the possible orders – SO and OS in the case under consideration – are not necessarily chosen randomly during language production. As shown by corpus studies that will be reviewed in the next section, the position of object pronouns in the German middlefield is clearly not free in this absolute sense. Instead, the likelihood that one of the two orders is produced depends on a range of word order preferences that have been firmly established in typological research, including such well-known principles as 'animate before inanimate' or 'short before long'. The two examples in (1a) and (1b) come out as about equally probable when subjected to the preference rules that are revealed by corpus studies. For example, an agentive subject favours SO order, whereas a definite subject favours OS order. When a sentence contains a subject that is agentive and definite, the likelihood of producing a sentence with SO order can, therefore, be about the same as the likelihood of producing a sentence with OS order, as for example in (1a) and (1b).

In other cases, constraints jointly pull in a single direction, resulting in a strong preference for SO or OS order. For example, when the object pronoun is animate (which it was in the overwhelming majority of sentences in the corpus study of Bader 2020; see below) but the subject inanimate, a strong preference for OS order is observed, mirroring the well-known preference for 'animate-before-inanimate' orders found with non-pronominal NPs in German (see Hoberg 1981; Bader and Häussler 2010b). However, even in such cases, authentic examples for both of the two possible orders can be found, as illustrated in (2).

(2) a. Auf jeden Fall ist dem Biologen anzumerken, dass **ihn** *seine neue Arbeit* fasziniert.
'In any case, the biologist shows that his new job fascinates him.'
https://www.saechsische.de/vom-labor-ins-klassenzimmer-3485259.html

b. Im Interview gab ROLAND zu Protokoll, dass *die Rolle* **ihn** fasziniert habe
'In the interview, ROLAND put on record that the role fascinated him.'
https://schlagerprofis.de/32910/

The question that is addressed in this paper is whether SO and OS order are generally of equal, high acceptability in the case of object pronouns, or whether this only holds when both orders occur with about equal frequency in language production but not when one order strongly outnumbers the other. If no acceptability differences show up, we will be entitled to conclude that the order between pronominal object and non-pronominal subject is truly free from a grammatical perspective, with all frequency differences that have been found being a matter of language production. If, on the other hand, acceptability differences between the two orders should be found under certain conditions, drawing conclusions will be more involved. As has been discussed by many authors, differences in acceptability can reflect differences in grammaticality but they can also be caused by the processing mechanisms, stemming, for example, from differences in processing complexity (see Fanselow 2021, for a recent overview). Since it is not possible to decide a priori between grammar- and processing-based explanations of acceptability differences, a more thorough discussion of this issue must wait until the results of the upcoming experiments have been presented.[2]

The organisation of this chapter is as follows. Section 2 reviews corpus studies of the position of object pronouns in German. This allows us to identify configurations in which OS or SO order is strongly preferred to the alternative order. Based on the corpus results reviewed in Section 2, three acceptability experiments have tested whether sentences with a pronominal object differ in acceptability depending on whether the sentences occur with SO or OS order. These experiments are presented in Section 3. The paper concludes with an evaluation of the experimental results in the light of known corpus preferences in Section 4.

2. What governs the position of object pronouns?

The position of object pronouns in the German middlefield has been the subject of several corpus studies leading to converging results (Hoberg 1981; Heylen 2005; Kempen and Harbusch 2005; Bader 2020). The following summary is based on Bader (2020) because that study analysed the largest set of examples, namely, a set of 4,322 sentences containing object pronouns. All sentences were randomly drawn from the deWac corpus (Baroni et al. 2009), a large collection of internet texts of all sorts.

Based on the complete set of 4,322 examples, Bader (2020) extended the word order template of the German middlefield proposed in Hoberg (1981), resulting

2. Prescriptive biases are a further important source of acceptability variation, as shown by Vogel (2019). As far as I can see, this is of no relevance to the sentences at hand.

in the word order template shown in (3). As indicated, this template specifies the position of weak object pronouns. Object pronouns that are strong because they are focused and, therefore, accented are not constrained in the same way and can appear where other NPs can appear too. In the following, the term 'object pronoun' will always be understood as referring to weak object pronouns.

(3) Basic word order template for the German middlefield
(N/A/D = NP with nominative/accusative/dative case)

(N)	(A-D)	((N-A-D)+ani-(N-A-D)-ani)	(N, D, A)
Subject	Weak object pronouns	Non-pronominal NPs, adverbials	Idioms

According to this template, weak object pronouns immediately follow the subject when it is in the initial position of the middlefield. Because the subject can also appear in the region following the position of object pronouns, the position of object pronouns relative to the subject is variable. Object pronouns appear in the initial position of the middlefield when the subject occurs at any later position, or they directly follow the subject when it occupies the initial position of the middlefield. Later positions, in contrast, are excluded for object pronouns according to this template. The position of object pronouns within the middlefield is thus not completely free – object pronouns must occur early, but how early is a matter of variation.

This variation is not random but follows – in a probabilistic way – the major linguistic hierarchies identified in typological research to govern the choice between alternative word orders (see overviews in Siewierska 1993; Croft 2003). For the German middlefield, of particular relevance is the animacy hierarchy (animate < inanimate), but other hierarchies are also at work, including the definiteness hierarchy (definite < indefinite), the givenness hierarchy (given < new), the thematic role hierarchy (agent < non-agent) and the case hierarchy (nominative < non-nominative) (see overviews in Hoberg 1981; Lerot 1985; Müller 1999; Bader and Häussier 2010b).

For the following experiments, two hierarchies from the hierarchies investigated in the corpus study of Bader (2020) were selected for investigation. All percentages cited below are from this corpus study. The first hierarchy is the animacy hierarchy as applied to the subject NP. Overall, sentences with an animate subject occurred with OS order in 49% of all cases, whereas 85% OS order was observed when the subject was inanimate. The second hierarchy is the weight hierarchy, operationalised in terms of the length of the subject NP, measured in number of

words.[3] The rate of OS order increased with increasing subject length, from about 55% for subjects consisting of a single word to 79% for subjects made up of 10 words. The animacy hierarchy and the weight hierarchy were selected for the following reasons: first, they represent different types of information; second, they had a strong influence on the frequencies of SO and OS order; and third, they do not depend on a prior context, which makes them particularly appropriate for experiments which present isolated sentences.

In Experiment 1, the subject consists of either two or four words. An example item from this experiment is shown with an animate subject in (4) and with an inanimate subject in (5). For reasons of space, only OS order is shown. Subject length was varied by including or omitting the two-word adjective phrase in parentheses. Thus, the subject, which was always a definite NP, consisted of either two or four words. The verb was always an object-experiencer psych verb because such verbs easily take animate and inanimate subjects.

(4) Der Reporter hat gesagt, dass ihn der (äußerst erfolgreiche) Stürmer
the reporter has said that him the extremely successful striker
fasziniert hat.
fascinated has
'The reporter said that the (extremely exciting) striker fascinated him.'

(5) Der Reporter hat gesagt, dass ihn das (äußerst spannende) Endspiel
the reporter has said that him the extremely exciting) final
fasziniert hat.
fascinated has
'The reporter said that the (extremely exciting) final fascinated him.'

For sentences as investigated in the upcoming Experiment 1, the left part of Table 1 shows the percentages of OS order in the corpus study of Bader (2020). The corpus data include sentences with verbs of all kinds because otherwise, the number of observations would have been too low. For this reason, the rate of OS order may be underestimated because object-experiencer verbs belong to the class of verbs that show a preference for OS order. To address this issue, a production experiment was run using the exactly same materials as Experiment 1 (Bader, in preparation); thus, all sentences contained an object experiencer verb. The percentages of sentences produced with OS order in this production experiment are shown in the right part of Table 1. Participants first read a main clause like *Der Opa hat den Enkel beeindruckt* 'The grandpa impressed the grandson'. They then had to reproduce the main clause from memory, following a prompt like *Der*

3. The weight hierarchy is taken here as a shorthand for more refined accounts of how weight affects word order; cf. Hawkins (2004), among others.

Enkel hat gesagt, dass 'The grandson said that'. In order to fit the prompt, the main clause had to be transformed into an embedded clause containing an object pronoun, which could either precede or follow the non-pronominal subject. Thus, a main clause like *Der Opa hat den Enkel beeindruckt* could either be transformed to *dass der Opa ihn beeindruckt hat* or to *dass ihn der Opa beeindruckt hat*, both meaning 'that the grandpa impressed him'. The initial main clause and the prompt had to be read aloud. The embedded clause transformed from the main clause was produced orally.

An inspection of Table 1 shows effects of subject animacy and subject length in both the corpus data and the experimental data, with two differences. First, the rate of OS order is about 10% lower in the corpus data than in the experimental data, which can be attributed to the inclusion of verbs of all sorts in the corpus study but only object-experiencer verbs in the experimental study. Second, an additive pattern is visible in the corpus data, with an increase of about 16.5% when going from sentences with two-word subjects to sentences with four-word subjects; but an interactive pattern is visible in the experimental data, where an increase of similar size is seen when the subject is animate, whereas there is basically no length effect for sentences with inanimate subjects. Given the already high rate of OS order with short inanimate subjects, the absence of a further length effect may be a ceiling effect. How these frequency differences are reflected in acceptability ratings is tested in the next section.

Table 1. Percentages of OS order depending on the animacy and length of the subject NP. Corpus data are from Bader (2020) and experimental data from Bader (in preparation). The factors animacy and length of subject NP correspond to the conditions of Experiment 1. Note: Corpus data include both dative and accusative pronouns, experimental data include accusative pronouns only

	Corpus data		**Experiment**	
	Animate subj	**Inanimate subj**	**Animate subj**	**Inanimate subj**
Short subj (2 words)	40	60	50	82
Long subj (4 words)	56	77	67	83

3. Experiments 1–3: How the position of an object pronoun affects sentence acceptability

This section presents three experiments that have investigated the acceptability of sentences with an object pronoun either before or after a nonpronominal sub-

ject using the method of magnitude estimation. This method, which goes back to work in psychophysics by Stevens (1957), has been adapted for linguistic purposes by Bard, Robertson, and Sorace (1996) and Cowart (1997). Magnitude estimation allows participants to rate sentences on an open-ended, continuous numerical scale and can, therefore, uncover fine distinctions in acceptability. When magnitude estimation was introduced to linguistics, this was seen as a distinctive advantage of the method. Later research showed that ratings procedures that make use of discrete rating categories – Likert scales which typically range from 1–5 or 1–7, and even the binary distinction between grammatical and ungrammatical sentences – deliver acceptability measures of comparable quality (e.g., Bader and Häussler 2010a; Weskott and Fanselow 2011; see overviews in Featherston 2021; Goodall 2021). The reason for running the experiments reported in this paper using the magnitude estimation procedure was therefore a purely practical one. Because many experiments in our lab used magnitude estimation at the time when the research reported here was conducted, it was most convenient to also use this method.[4]

Experiment 1 probes how animacy and length of the subject NP affect the acceptability of object pronoun sentences with either SO or OS word order. It reveals some variation in acceptability, but overall, all sentences receive rather high acceptability ratings. In order to ascertain that the overall high acceptability observed in Experiment 1 is not due to participants being insensitive to constraints on pronoun position, Experiment 2 tests the generalisation that pronominal objects must not occur later than directly after a clause-initial subject. The final Experiment 3 investigates the effect of the subject's length more closely.

3.1 Experiment 1

As illustrated above in (4) and (5), Experiment 1 investigates two major properties of non-pronominal subjects that have been found to affect the placement of object pronouns before or after the subject – animacy and length. In all sentences investigated in Experiment 1, the object pronoun is contained in an embedded clause. The subject of this clause is a definite NP which is either animate (human) or inanimate and two or four words long (for an original experimental sentence, see (4) and (5)). In order to hold the verb constant across conditions, the verb of the embedded clause is always an object experiencer verb like *erfreuen* 'please' because these verbs allow both animate and inanimate subjects.

4. Experiment 1 has recently been replicated using ratings on a 1–7 scale, with by and large the same results.

As pointed out in the introduction, the relationship between corpus frequencies and acceptability ratings is a controversial issue, which makes it difficult to derive definite predictions. For the sake of the argument, let us make the strongest assumption according to which acceptability ratings mirror corpus frequencies in a direct manner (see Bresnan et al. 2007, for a proposal along this line). Under this assumption, the production data shown in Table 1 predict main effects of animacy and length modified by an interaction between these two factors. With a short animate subject, SO and OS order are not far apart in terms of frequency, so both should be rated as equally acceptable. When the subject gets longer or is inanimate, OS order outweighs SO order, so OS order should become more acceptable than SO order. According to the frequency data, the factors have additive effects; according to the experimental production data, they interact, so that acceptability may not go up further when an OS sentence contains a subject that is long and inanimate. However, when the interaction seen for the experimental data is due to a ceiling effect, as indicated above, the two factors should affect acceptability in an additive way because the rating scale used by magnitude estimation is an open ended scale (at least in principle; see Ellsiepen and Bader 2014 for discussion).

3.1.1 *Method*

Participants

52 students at Goethe University Frankfurt participated in Experiment 1. In this and the following two experiments, all participants were native speakers of German and naive with respect to the purpose of the experiment. Participants attended an introductory psycholinguistics course unrelated to the current experiments and received course credit for participation.

Table 2. Sample materials for Experiment 1

Inanimate	
SO	Der Opa hat gesagt, dass das (äußerst wertvolle) Buch ihn erfreut hat.
	the grandpa has said that the extremely valuable book him pleased has
OS	Der Opa hat gesagt, dass ihn das (äußerst wertvolle) Buch erfreut hat.
	the grandpa has said that him the extremely valuable book pleased has
'Grandpa said that the extremly valuable book had pleased him.'	
Animate	
SO	Der Opa hat gesagt, dass der (äußerst lustige) Enkel ihn erfreut hat.
	the grandpa has said that the extremely funny grandson him pleased has
OS	Der Opa hat gesagt, dass ihn der (äußerst lustige) Enkel erfreut hat.
	the grandpa has said that him the extremely funny grandson pleased has
'Grandpa said that the extremly funny grandson had pleased him.'	

Materials

48 sentences were constructed for Experiment 1. A complete stimulus set is shown in Table 2. Each sentence consisted of a main clause followed by an embedded clause. The main clause always started with a definite subject NP denoting a person that served as antecedent for the upcoming object pronoun. The main clause subject was followed by the verb phrase *hat gesagt* "has said" and an embedded *that*-clause. The *that*-clause in turn consisted of a definite subject NP, an object pronoun, and one of the object experiencer verbs in (6) in the perfect tense. Each verb was used in four sentences.

(6) *erfreuen* 'to please', *interessieren* 'to interest', *erstaunen* 'to astonisch', *beeindrucken* 'to impress', *stören* 'to disturb', *ärgern* 'to bother', *überraschen* 'to surprise', *enttäuschen* 'to disappoint', *erheitern* 'to amuse', *faszinieren* 'to fascinate', *schockieren* 'to shock', *verwirren* 'to baffle'

For each sentence, eight versions were created according to the three two-way factors *Animacy, Length* and *Order*. All factors applied to the embedded clause. The factor Animacy varied the animacy of the subject NP, which was either animate (human) or inanimate. The factor Length varied the length of the subject NP. A short subject was a two-word NP consisting of a definite determiner and a noun; a long subject was a four-word NP containing an adverb and an adjective between the determiner and the noun. The final factor Order manipulated the order of subject and object pronoun, which was either subject-before-object (SO) or object-before-subject (OS).

The 48 sentences were distributed onto eight lists according to a Latin Square design. Each list contained one version of each sentence and an equal number of sentences in each condition. The experimental lists were individually randomised for each participant and then interspersed in a list of filler sentences of varying structures. Different filler lists were used, containing between 50 and 75 fillers. The majority of the filler sentences was from unrelated experiments. Each participant saw only one list.

Procedure

The ME procedure used in the following three experiments closely followed the procedure described in Bard, Robertson, and Sorace (1996); Sorace (2000) and Keller (2000). Each experimental session consisted of three phases, which were run using software developed by myself. In the customisation phase, participants were acquainted with the principles of ME by judging the length of six lines presented on a computer screen. In the training phase, they judged the acceptability of ten training sentences. In the final experimental phase, they judged the acceptability of the experimental and filler sentences described in the materials section.

Each phase consisted of the following steps. First, participants read an instruction that was displayed on the computer screen. The instruction explained the ME procedure with the help of an example. At the end, the main points were repeated in the form of a list. Participants were encouraged to contact the experimenter in case there were any questions regarding the task. When participants had finished reading the instruction, they pressed a button which triggered the display of the reference stimulus (either a line or a sentence). Participants assigned a numerical value to the reference stimulus. Afterwards, the experimental stimuli were displayed one by one, and participants judged each stimulus relative to the reference stimulus. The reference stimulus, as well as the reference value assigned to it, remained visible on the computer screen while participants worked through the experimental stimuli. Participants typed their judgements using a regular keyboard. Judgements and judgement times were recorded automatically.

To enhance comparability with prior work, the reference sentence for the final experimental phase was taken almost literally from Keller (2000, sentence (B.18)/page 377). As shown in (7), the reference sentence is a sentence with a definite inanimate object preceding a definite animate subject. Such sentences (so called 'scrambling' sentences) are grammatical but of reduced acceptability, at least when presented out of context (cf. Keller 2000; Bader and Häussler 2010a).

(7) Ich glaube, dass den Bericht der Chef in seinem Büro gelesen hat.
I believe that the-ACC report the-NOM boss in his office read has
'I believe that the boss read the report in his office.'

Scoring

All statistical analyses reported in this paper were conducted using the R statistics software (R Core Team 2020). The acceptability data were analysed with linear mixed-effects models (Bates et al. 2015b). Models included the experimental factors and their interactions as fixed effects. Random effect terms were determined following the model fitting procedure proposed in Bates et al. (2015a). Fixed effects were entered into the model using effect coding (0.5 vs −0.5 in the case of two-level factors), that is, the intercept represents the unweighted grand mean and fixed effects compare factor levels to each other. Where necessary, simple contrasts were computed to compare mean values.

Computing the results for an ME experiment is somewhat involved because the numerical scores that participants assign to the experimental sentences can only be interpreted in relation to the reference value that each participant gives to the reference sentence at the beginning of the experiment. For example, if an experimental sentence is assigned a value of 100, the meaning of this value is very different depending on whether the initial reference sentence received a value of

50 (in which case the experimental sentence was judged as being twice as good as the reference sentence) or a value of 200 (in which case the experimental sentence was judged as being only half as good as the reference sentence). Therefore, the raw judgements obtained in an ME experiment have to be transformed in such a way that the value assigned to the reference sentence is taken into account. In the following, a commonly used transformation is employed which scales the individual scores of each participant directly in relation to the participant's reference value. This is achieved by dividing the score assigned to each experimental sentence by the value assigned to the reference sentence. In order to approximate a normal distribution, the resulting ratio is further transformed by taking the logarithm to base ten (cf. Bard, Robertson, and Sorace 1996).

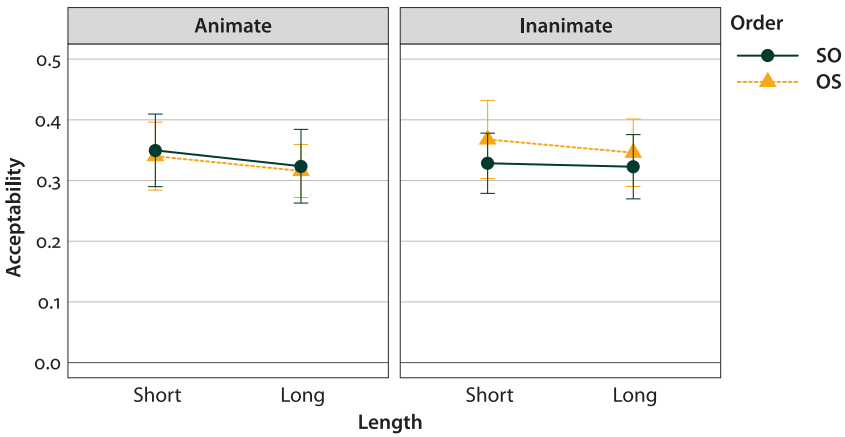

Figure 1. Mean acceptability ratings in Experiment 1

Table 3. Mixed-effects model for acceptability ratings in Experiment 1.
Formula: *response ~ Animacy*Length*Order + (1+length||subject) + (1+length||sentence)*

Contrast	Estimate	Std. Error	Df	T value	> |z|
Intercept	0.337	0.055	55	6.08	$p < 0.01$
Animacy	−0.010	0.007	2294	−1.33	n.s.
Length	0.020	0.010	45	1.93	$p = 0.060$
Order	−0.012	0.007	2298	−1.86	$p = 0.064$
Animacy × Length	0.012	0.013	2294	0.86	n.s
Animacy × Order	0.041	0.013	2298	3.03	$p < 0.01$
Length × Order	−0.007	0.013	2302	−0.56	n.s.
Animacy × Length × Order	0.018	0.027	2302	0.68	n.s.

3.1.2 *Results*

Figure 1 shows the mean acceptability ratings obtained in Experiment 1. The zero point on the y-axis in Figure 1 means 'of equal acceptability as the reference sentence'. The corresponding linear mixed-effects model is summarised in Table 3. Overall, the sentences of Experiment 1 received a mean acceptability rating of about 0.34, which is significantly higher than zero, as shown by the significant intercept in Table 3. Thus, on average, the sentences of Experiment 1 were judged as twice as acceptable as the reference sentence in (7), an OS sentence with a full definite NP preceding the subject. In addition, Table 3 reveals two marginally significant main effects and a significant interaction.[5] Sentences with a short subject were judged as slightly more acceptable than sentences with a long subject, resulting in a marginally significant main effect for Length. Since Length did not interact with any other factor, this means that sentences with a long subject appeared somewhat less acceptable to participants than sentences with a short subject, independently of the order of subject and object. The main effect of Order also reached marginal significance, but this effect has to be qualified by a significant interaction with Animacy. This interaction reflects the finding that Animacy had no effect on SO sentences (0.34 versus 0.33; $t = 1.20$, $p > 0.1$), whereas for OS sentences, an inanimate subject led to a somewhat higher acceptability than an animate subject (0.36 versus 0.33; $t = 3.08$, $p < 0.01$).

The mean judgements time was 6,051 ms, where judgement times include reading the sentence, determining an acceptability value, and typing the value into a field on the computer screen. Judgement times were also analysed statistically, but for reasons of space, the analysis is reported only in a cursory way. In addition to a main effect of length (5,532 ms for sentences with short subject versus 6570 ms for sentences with long subjects), a significant interaction between Order and Animacy was found which mirrors the interaction for the acceptability ratings. Whereas judgement times for SO sentences were not affected by Animacy (6,028 ms with animate subject versus 6,032 ms with inaminate subject), a significant difference became evident for OS sentences (6,282 ms with animate subject versus 5,862 ms with inaminate subject)

5. Following standard practice, p-values between 0.05 and 0.10 are considered marginally significant in this paper; for a critical discussion of the pro and cons of reporting marginally significant results, see Olsson-Collentine, Van Assen, and Hartgerink (2019) and references cited there.

3.1.3 *Discussion*

Experiment 1 has three main findings. First, acceptability was high in all conditions, with a mean value of 0.337 on the logarithmic scale. This means that, on average, the sentences of Experiment 1 were judged as being twice as acceptable as the reference sentence in (7) (a sentence with a scrambled definite object). Bader and Häussler (2010a) used the same reference sentence in their magnitude estimation experiments and obtained binary judgement data in addition to magnitude estimation ratings. Sentence with ratings above 0.3 on the logarithmic scale were judged as grammatical in the binary judgements task with about 90% of the time. This allows the conclusion that all sentences investigated in Experiment 1 were perceived as fully grammatical by the participants. Second, Animacy interacted with Word Order in the way expected given what has been found in corpus studies: SO and OS sentences were of equal acceptability when the subject was animate, but with an inanimate subject, OS sentences were somewhat more acceptable than SO sentences. As pointed out in the introduction, whether an observed acceptability difference should be attributed to the grammar or the processing mechanisms is often not easy to decide, and this is especially true for relatively small differences between sentences that are of overall high acceptability. A further discussion of this finding will, therefore, be postponed to the general discussion when all data have been presented. Third, in contrast to Animacy, Length did not interact with Order but only showed a marginally significant main effect, indicating that sentences with long subjects were somewhat less acceptable than sentences with short subjects, independently of the order between subject and object pronoun. This contrasts with corpus findings showing that the rate of OS order increases with increasing length of the subject NP for the length manipulation applied in Experiment 1 (2 versus 4 words). This adds to the existing evidence that highly acceptable syntactic variants can differ in terms of frequency without a related difference in terms of acceptability (see Arppe and Järvikivi 2007; Bader and Häussler 2010a), but it does not preclude that a stronger length manipulation leads to acceptability differences between SO and OS sentences. This possibility is explored in Experiment 3.

3.2 Experiment 2

In order to better appreciate the relatively small acceptability differences found in Experiment 1, Experiment 2 investigates the grammatical constraint that nothing else than a subject NP can separate a weak object pronoun from the left edge of the middlefield, as captured in the template for the middlefield of German sentences in (3). This template makes the prediction that the word order freedom

enjoyed by object pronouns is confined to a small part of the middlefield – an object pronoun must appear directly after the complementiser or, if the subject immediately follows the complementiser, directly after the subject. Later positions, in contrast, should lead to a strong decrease in acceptability.

In order to test this prediction, Experiment 2 varies the position of an adverbial that occurs in addition to subject and object. As shown in (8), an adverbial can appear in one of three positions relative to subject and object pronoun – preceding both subject and object ($ADV_{initial}$), between subject and object (ADV_{medial}), and following subject and object (ADV_{final}).

(8) a. dass *$ADV_{initial}$ *subject* *ADV_{medial} **pro** ADV_{final}… verb.
a′ dass (heute) *der Bürgermeister* (heute) **ihn** (heute) besucht.
that today the mayor today him today visits
'that the mayor is visiting him today.'
b. dass *$ADV_{initial}$ **pro** ADV_{medial} *subject* ADV_{final}… verb.
b′ dass (heute) **ihn** (heute) *der Bürgermeister* (heute) besucht.
that today him today the mayor today visits
'that the mayor is visiting him today.'

The starred adverbial positions in (8) are those that are banned according to the template in (3). If this template correctly captures the grammatical knowledge of speakers of German, the predictions listed below follow. These predictions are put to an empirical test in Experiment 2.

- Adverbial in final position:
  Acceptability should be high for both SO-Adv and OS-Adv order because the pronoun precedes the adverbial in both cases.
- Adverbial in medial position:
  Acceptability should be high for O-Adv-S order where the pronoun precedes the adverbial but low for S-Adv-O order where the pronoun follows the adverbial.
- Adverbial in initial position:
  Acceptability should be low for both Adv-SO and Adv-OS order because the pronoun follows the adverbial in both cases.

The constraint that weak object pronouns have to appear in front of adverbials in the German middlefield is probably a consequence of a more general ordering principle according to which given and backgrounded elements should appear in early positions in the middlefield whereas new and focused elements should appear in late positions (e.a. Lenerz 1977; Diesing 1992). Like in Experiment 1, the subject NP is always a definite NP in the sentences investigated in Experiment 2 (see Table 4). In contrast to weak object pronouns, definite NPs are allowed to

either precede or follow the adverbial, but their preferred position is in front of the adverbial. This predicts that acceptability should be lower when subjects follow the adverbial, although not to the same extent as expected for object pronouns.

Table 4. Sample materials for Experiment 2

Final adverbial position	
SO	Der Opa hat gesagt, dass das Buch ihn **schon** erfreut hat.
	the grandpa has said that the book him indeed pleased has
OS	Der Opa hat gesagt, dass ihn das Buch **schon** erfreut hat.
	the grandpa has said that him the book indeed pleased has
Middle adverbial position	
SO	Der Opa hat gesagt, dass das Buch **schon** ihn erfreut hat.
	the grandpa has said that the book indeed him pleased has
OS	Der Opa hat gesagt, dass ihn **schon** das Buch erfreut hat.
	the grandpa has said that him indeed the book pleased has
Initial adverbial position	
SO	Der Opa hat gesagt, dass **schon** das Buch ihn erfreut hat.
	the grandpa has said that indeed the book him pleased has
OS	Der Opa hat gesagt, dass **schon** ihn das Buch erfreut hat.
	the grandpa has said that indeed him the book pleased has

3.2.1 *Method*

Participants

42 students at Goethe University Frankfurt participated in Experiment 2. None of the participants had already participated in Experiment 1.

Materials

30 sentences from Experiment 1 were modified in the following way to serve as materials for Experiment 2 (see Table 4 for a complete stimulus example). First, only the versions with a short inanimate subject were retained. Second, a modal adverb/particle (see (9) for the full list) was inserted into the embedded clause at one of three possible positions: before both subject and object, between subject and object, and after subject and object. Thus, each sentence in Experiment 2 occurred in six conditions according to the factors Order (SO or OS) and Adverb Position (initial or medial or final).

(9) *schon* 'already', *doch* 'after all', *eigentlich* 'rather', *aber* 'however', *eben* 'just'

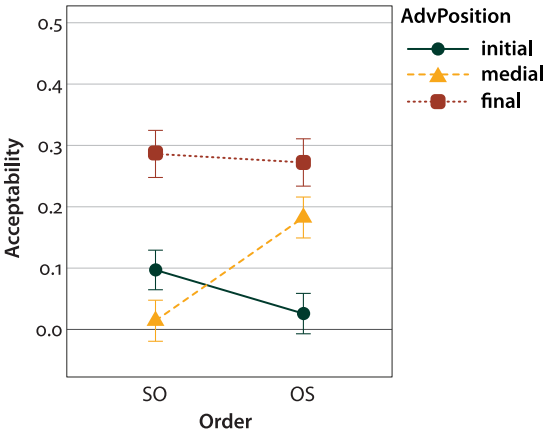

Figure 2. Mean acceptability ratings in Experiment 2

Table 5. Mixed-effects model for acceptability ratings in Experiment 2.
Formula: *response ~ AdvPosition*Order + (1|participant) + (1|sentence)*

Contrast	Estimate	Std. Error	Df	T value	> |z|
Intercept	0.146	0.032	43	4.64	< 0.01
AdvPosition1	0.181	0.012	1184	14.98	< 0.01
AdvPosition2	0.037	0.012	1184	3.06	< 0.01
Order	−0.028	0.010	1184	−2.82	< 0.01
AdvPositionl × Order	0.182	0.024	1184	7.55	< 0.01
AdvPosition2 × Order	−0.239	0.024	1184	−9.91	< 0.01

Note. AdvPositionl = final vs. medial; AdvPosition2 = medial vs. initial

Procedure

Experiment 2 used the same procedure as Experiment 1.

3.2.2 *Results*

Figure 2 shows the mean ratings for the sentences tested in Experiment 2. For the three-level factor Adverb Position, two pairwise contrasts were defined, one comparing the level with the highest rating to the level with the intermediate rating (final versus medial) and one comparing the level with the intermediate rating to the level with the lowest rating (medial versus initial). Table 5 shows the corresponding linear mixed-effects model. All main effects as well as all interactions turned out to be significant. As can be seen in Figure 2, the relationship between SO and OS order is different in each of the three adverbial conditions.

(i) With a final adverbial and thus both subject and object preceding the adverbial, acceptability is high and there is no significant difference between SO and OS (0.29 versus 0.27, $t = 0.82$, n.s.). (ii) When the adverbial occurs between subject and object, it precedes the pronoun with SO order but follows it with OS order. With this adverbial position, acceptability is high for OS order but low for SO order (0.18 versus 0.01, $t = 9.86$, $p < 0.01$). As also shown in Figure 2, although the pronoun in OS sentences precedes both a final and a medial adverbial, acceptability is higher with a final than with a medial adverbial (0.27 versus 0.18, $t = 5.26$, $p < 0.01$). Thus, as predicted, acceptability decreases when the subject follows the adverbial, but the reduction is substantially smaller than in the case of a pronoun following the adverbial. (iii) An initial adverbial precedes both subject and object, which should lead to reduced acceptability. As can be seen in Figure 2, this prediction is borne out, but the reduction in acceptability is less pronounced for SO than for OS sentences (.09 versus 0.03, $t = 4.16$, $p < 0.01$).

The judgement time analysis revealed a significant effect of word order on sentences with a medial adverbial with longer judgement times for OS than for SO sentences. At first glance, this seems counter-intuitive, because judgements times are higher for sentences with higher acceptability ratings than for sentences with lower acceptability ratings. However, as shown by Bader and Haussier (2010a), judgement times and acceptability ratings are not monotonically related to each other in the magnitude estimation task. Instead, judgement times are typically fastest for low and high acceptability values and slowest for acceptability values in the middle range. This is in accordance with the finding of faster judgement times for SO sentences with medial adverbial (low acceptability) than for OS sentences with medial adverbial (mid-level acceptability).

3.2.3 *Discussion*

The major result yielded by Experiment 2 is the strong drop in acceptability caused by putting an object pronoun behind an adverbial. When the object pronoun preceded the adverbial, sentences were judged as being about twice as acceptable as the reference sentence (unless the subject followed the adverbial, leading to an independent decrease in acceptability). This replicates the findings from Experiment 1 for sentences without an adverbial. When the pronoun immediately followed the adverbial, in contrast, sentences were judged as of about equal acceptability as the reference sentence. That is, a sentence with a pronoun after an adverbial is of about equal acceptability to a scrambling sentence out of context. Such sentences are, thus, not plainly ungrammatical but heavily marked. In particular, given that sentences were presented visually, readers may have assigned an implicit prosody with an accent on the pronoun, thereby making the pronoun strong so that it was exempted from the positional constraints on weak object pronouns.

An additional finding of Experiment 2 was that sentences in which the subject followed the adverbial were also reduced in acceptability, but the reduction was not as strong as the one found for the pronominal object. In comparison to sentences with a final adverbial, which received a mean acceptability rating of about 0.28 and can thus be taken as a fully acceptable baseline, putting the subject behind the adverbial (order O-Adv-S) resulted in an acceptability value of 0.18, but putting the object behind the adverbial (order S-Adv-O) in a much lower acceptability value of 0.01.

In summary, the results yielded by Experiment 2 confirm the prediction that an object pronoun has two acceptable positions: directly after the complementiser or, in cases where the subject immediately follows the complementiser, directly after the subject. Later positions, in contrast, lead to a strong decrease in acceptability. The finding that all sentences in Experiment 1 received high acceptability ratings, with only small variation due to animacy, does not, therefore, reflect a general insensitivity of native speakers with regard to the position of object pronouns in the middlefield. Instead, the high acceptability values in all conditions of Experiment 1 must be attributed to the fact that in the first experiment, the object pronoun always occurred in one of the two positions reserved for weak object pronouns.

3.3 Experiment 3

In Experiment 1, the weight of the subject NP, operationalised in terms of length measured in number of words, did not affect SO and OS sentences in different ways, as one could have expected given the effect that weight has on production frequencies. Experiment 3 tests whether a stronger length manipulation leads to acceptability differences between SO and OS sentences. To this end, Experiment 3 investigates subject NPs of three different lengths, as shown in (10) (for reasons of space, only the SO variant of each sentence is shown).

(10) a. Der Opa hat gesagt, dass *das Buch* ihn erfreut hat.
the grandpa has said that the book him pleased has
'Grandpa said that the book pleased him.'

b. Der Opa hat gesagt, dass *das äußerst wertvolle Buch* ihn erfreut hat.
the grandpa has said that the extremely valuable book him pleased has
'Grandpa said that the extremely valuable book pleased him.'

c. Der Opa hat gesagt, dass *das Buch*, *das äußerst wertvoll war*, ihn erfreut hat.
the grandpa has said that the book which extremely valuable was him pleased has
'Grandpa said that the book which had been extremely valuable pleased him.'

The subjects in (10a) and (10b) are identical to the subjects in the short and long condition of Experiment 1 and thus contain two and four words, respectively. The subject in the new condition in (10c) is a definite NP modified by a relative clause consisting of four words, for a total subject length of six words. Lengthening the subject NP by means of a relative clause does increase its weight not only in terms of number of words, but also in terms of syntactic and prosodic structure. Although different measures of phrasal weight are heavily confounded (see Wasow 2002), increasing weight in several dimensions guarantees that there is a substantial weight increase when going from two-word subjects to six-word subjects.

3.3.1 *Method*

Participants
101 students at Goethe University Frankfurt participated in Experiment 3. None of the participants had participated in either Experiment 1 or 2.

Materials
For Experiment 3, 30 sentences of Experiment 1 were modified as follows. First, all sentence versions with an animate subject in the embedded clause were removed, leaving only inanimate subjects. Second, a third level was added to the originally two-way factor Length. Besides subject consisting of either two (Det N) or four words (Det Adv A N), subjects consisting of six words were created by embedding the adverb and the adjective of the four-word condition into a relative clause following the noun. In addition to the adverb and the adjective, the relative clause contained an initial relative pronoun and a final finite copula. The relative clause was thus always made up of four words, which together with the definite article and the head noun resulted in a total subject length of six words. As a result of the two changes made to the materials of Experiment 1, each sentence of Experiment 3 appeared in six versions according to the two factors Order (SO or OS) and Length (two, four or six words).

Procedure
The same procedure was used as in the preceding experiments.

3.3.2 *Results*

Figure 3 shows the mean acceptability ratings obtained in Experiment 3. Factor coding followed the procedures of the preceding experiments. The corresponding mixed-effects model is summarised in Table 6. As in all conditions of Experiment 1 and in Experiment 2 with an adverbial in final position, acceptability is relatively high throughout. Also as in Experiment 1, Figure 3 shows a small decline in acceptability with increasing length. In contrast to Experiment 1, however, acceptability

decreases with length in a more pronounced way for SO than for OS sentences. As a result of this, SO sentences are judged somewhat less acceptable than OS sentences for longer subjects (four and six words), whereas acceptability for SO and OS sentence is almost identical for short subjects (two words).

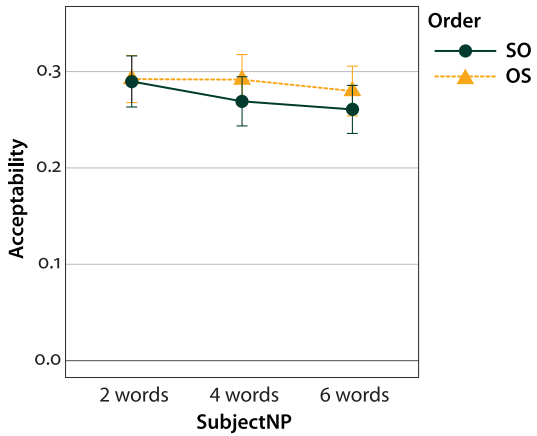

Figure 3. Mean acceptability ratings in Experiment 3

Table 6. Mixed-effects model for acceptability ratings in Experiment 3.
Formula: *response ~ SubjectNP*Order + (1|participant) + (1|sentence)*

Contrast	Estimate	Std. Error	Df	T value	> |z|
Intercept	0.281	0.025	104	11.24	< 0.01
SubjectNP1	0.011	0.006	2895	1.74	0.082
SubjectNP2	0.010	0.006	2895	1.66	0.098
Order	−0.015	0.005	2895	−2.95	< 0.01
SubjectNP1 × Order	0.020	0.012	2895	1.63	0.10
SubjectNP2 × Order	−0.003	0.012	2895	−0.27	0.79

Note. SubjectNP1 = 2 words vs. 4 words; SubjectNP2 = 4 words vs. 6 words

As shown in Table 6, only the main effect of Order was fully significant. The small drops in acceptability caused by lengthening the subject NP, in contrast, only resulted in a marginally significant effect. Furthermore, the interaction visible in Figure 3 between Order and the first two levels of Length (two words versus four words) even failed to reach marginal significance. Pairwise comparisons testing the effect of Order separately for each level of Length, however, revealed a difference between sentences with a two-word subject and sentences with either four- or six-word subjects. Order had no effect on sentences with a 2-word subject

(0.30 versus 0.29; $t = 0.29$, $p > 0.1$) but on sentences with a four-word subject (0.27 versus 0.29; $t = 2.60$, $p > 0.1$) and on sentences with a six-word subject (0.26 versus 0.28; $t = 2.22$, $p > 0.1$).

The analysis of the judgement times for Experiment 3 showed only significant effects of length, with faster judgements times for sentences with 2-word subject than for sentences with 4-word subjects, and faster judgements times for sentences with 4-word subject than for sentences with 6-word subjects.

3.3.3 *Discussion*

Experiment 3 provides weak evidence that the weight-based ordering principle 'short before long' (that is, Behagel's fourth law) affects the perception of sentences as more or less acceptable. With long subject NPs (four- or six-word subjects), acceptability was lower for sentences with SO order, which are dispreferred according to this law, than sentences with OS order. The evidence is only weak, however, for two reasons. First, the observed effects were small. Second, the statistical analysis reached full significance only in the pairwise comparisons but not in the full model. This is in contrast to findings from language production, for which robust effects of length have been found both in corpus studies (Heylen 2005; Bader 2020) and in experimental investigations (Bader, in preparation). Possible conclusions to be drawn from the observed discrepancy between accessibility and production data are considered in the general discussion.

4. General discussion

The starting point of this paper was the observation that the order of a non-pronominal subject and a pronominal object within the German middlefield seems to be a case of free variation. That is, even when sentences are matched with regard to features that are known to affect word order – in particular, features related to lexical semantics (e.g. animacy, thematic roles), discourse structure (e.g. givenness) and weight (e.g. number of words) – still both orders are produced, as revealed by corpus studies. However, as also revealed by corpus analyses, the odds of selecting either one or the other of the two possible orders varies strongly depending on the particular combination of features. This raises the question of whether the observed differences in production frequencies are mirrored by corresponding differences in acceptability. This paper has presented three experiments that addressed this question.

The experiments yielded the following main findings. First, acceptability was always high when the object pronoun appeared in the first position of the middlefield or the subject occurred in the first position and the object pronoun

immediately thereafter. In contrast, when the object pronoun occupied a later position, as it did in some conditions of Experiment 2, acceptability was substantially reduced. This finding is in accordance with the corpus-based word order template of the German middlefield given in (3). Second, although acceptability was generally high when the object pronoun occurred in one of the two positions allotted to it in the template in (3), some variation of acceptability depending on the animacy and length of the subject was still found. In Experiment 1, a small order-independent decrease in acceptability for sentences with longer subjects was observed, as was a small increase in acceptability for OS sentences with an inanimate subject in comparison to OS sentences with an animate subject. In Experiment 3, acceptability again decreased somewhat with increasing subject length, but in addition there were indications that the decrease was more pronounced for SO than for OS sentences.

As pointed out in the introduction, a difference in acceptability can be caused by differences in grammaticality, by processing differences, or by a combination of both. In the remainder of this paper, I will argue that the small acceptability differences revealed by Experiments 1 and 3 should not be attributed to the grammar but to the processing systems. There are two main reasons for this hypothesis. First, the observed differences were small, especially when compared to the drop in acceptability when an object pronoun followed an adverbial in Experiment 2. For example, in Experiment 1, a significant difference between sentences with animate and inanimate subjects was observed for OS sentences: inanimate subjects resulted in a rating of 0.357 on the logarithmic scale, but animate subjects resulted in a rating of only 0.328. This contrasts with a drop in Experiment 2 from 0.272 for OS sentences with a final adverbial to 0.026 for OS sentences with an initial adverbial. Furthermore, the effect size due to word order for sentences with an inanimate subject is about the same as the order-independent decrease in acceptability for sentences with long subjects in Experiment 1, which was from 0.346 for sentences with a short subject to 0.327 for sentences with a long subject. Second, the observed differences were not fully reliable. For example, the significant difference between SO and OS sentences with an inanimate subject was not replicated in Experiments 2 and 3. Furthermore, while Experiment 1 revealed only an order-independent effect of length, Experiment 3 found that acceptability decreased with increasing subject length more for SO than for OS sentences.

Given the widespread recognition that grammaticality itself is not a binary property but comes in grades that reflect weighted constraints (see Goodall 2021, and references cited there), small differences in acceptability do not per se exclude an account in terms of grammar. However, together with the fleeting nature of the differences observed in Experiments 1–3, it seems unlikely that we are dealing with differences encoded in the grammar. Consider, for example, the acceptabil-

ity differences related to length. Effects of this kind are a classic case for an explanation in terms of processing mechanisms (e.g. Gibson 2000). Given that both order-dependent and order-independent effects of length were found, it is most parsimonious to attribute all length effects to the processing mechanisms.

In conclusion, the experimental results reported in this paper support the claim that the relative order of non-pronominal subject and pronominal object is truly a matter of free variation within the grammar. The grammar requires object pronouns to occur at the left edge of the middlefield, or, when the subject occupies the first position of the middlefield, directly thereafter, but the grammar favours neither of these two positions. Thus, whether an object pronoun occurs in middlefield-initial position or immediately after a midfield-initial subject does not have any bearing on meaning or acceptability. It is, therefore, left to the language production mechanisms to decide in which of the two positions allowed by the grammar an object pronoun is produced. Since this decision is subject to the usual probabilistic constraints on linearisation, the order of object pronoun and non-pronominal subject observed in language production is a matter of free, but not random, variation.

A question that cannot be answered from the currently available evidence is whether our language production mechanisms select a position for an object pronoun in the middlefield in a non-random or in a deterministic way. For example, in the corpus study of Bader (2020), a logistic regression model based on a number of word-order hierarchies predicted the observed order in 76.7% of all cases. By taking factors into account that were not included in this corpus study – for example, factors related to the preceding context and factors related to individual properties of writers – this value can likely be improved, but will it approach 100% or will a certain random element remain, even if all relevant factors have been taken into account? My guess is that a certain amount of randomness will remain. This would be in line with other cognitive processes for which it is commonly assumed that choices are modulated to some degree by random noise (e.g. Anderson 2009).

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CHAPTER 3

Optionality in the syntax of Germanic traditional dialects

On (at least) two types of intra-individual variation

Ann-Marie Moser
Universität Zürich

While micro-variation, i.e. variation between dialects or among speakers, has been established and proven in recent years as a research discipline in its own right in (also theoretically informed) linguistics, variation within a speaker that cannot be attributed to sociolinguistic variables has, so far, hardly been studied. We call this form of variation – the occurrence of two different structural options for one function – 'optionality'. We focus on optionality in syntax and identify at least two different types of optionality: while context or co-text plays a role in the first type, neither constraint seems to be relevant to the choice of one option or the other in the second type.

Keywords: micro-variation, optionality, intra-speaker variation, syntax, Germanic

1. Introduction

Over the last twenty years, the study of syntactic variation among and within closely related varieties has become an independent and very productive research field, both in variationist (socio)linguistics and theoretical linguistics.[1] Variation, however, is found not only among speakers but also within speakers. While research on syntactic variation normally focuses on variation among speakers, *syntactic variation within a speaker* is still a desideratum for research or, at least, a

1. See, e.g. the Wiki on dialect syntax, which includes, among other things, an overview on past and ongoing projects (cf. http://www.dialectsyntax.org/wiki/Projects_on_dialect_syntax). The Wiki is maintained at the Meertens Institute and was initiated by Edisyn (European Dialect Syntax), an ESF-funded project which ran from 2005 to 2010/2012.

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rather understudied and little-noticed data source: so far, there has been only very little research that exclusively tackles the question of so-called intra-individual variation[2] in syntax and, by doing so, excludes sociolinguistic variables as relevant predictors (but see Adli 2006, Cornips 2009, and Lundquist et al. 2020). At the same time, it is undoubtedly the case that the study of intra-individual variation can help us improve our knowledge relating to relevant questions in syntax theory and beyond (see Weiß 2013: 172).

In our paper, we will focus on one aspect of intra-individual variation – intra-individual syntactic variation where sociolinguistic values can be very probably excluded as a (main) trigger – and we will call this aspect 'optionality'.

There have been, basically, two different perspectives on optionality: while the one perspective denies the possibility of one input being mapped onto two forms (cf. Bolinger 1977: preface: x), the other argues in favour of it (see Seiler 2005; Adli 2006). Explicit definitions of what, exactly, optionality is can be found in the framework of Optimality Theory, with optionality being defined as "a single input being mapped onto two outputs, each of which is grammatical" (Kager 1999: 404). However, this does not necessarily mean that optionality is not predictable at all; it only indicates that no grammatical principle governs the distribution of the variants (cf. Müller 2000: 189–224; Kager 1999: 404). Similar is the definition in Weiß (2013: 172), according to which optionality means that one speaker has more than one structural option for the same communicative intention. In what follows, we take 'optionality in syntax' (to be understood here as an umbrella term and working definition for various types of optionality we propose) to mean the possibility that a speaker has two forms available for one (more or less similar) function. We will not specify here whether these two forms are to be thought of as a 'within-grammar approach' (i.e. underspecification within one grammar) or as a 'between-grammar approach' (i.e. switching between two grammars/registers), but see for a discussion of these competing schools of theory, e.g. Lundquist et al. (2020) or Eide & Åfarli (2020). It is possible that one of the two forms is preferred to the other, but both forms must be grammatical in the speaker's grammar(s).[3] Triggers for the variants can be context, co-text, or neither. Sociolinguistic factors, on the other hand, do not matter; they do not fall in under our definition of 'optionality' as mentioned above.

2. Other termini for intra-individual variation would be intra-speaker variation; cf. e.g. Cognola et al. (2019) or idiolectal variation (cf. Cornips 2009).

3. The restriction to two structural options is a mere empirical generalisation and has no deeper theoretical reasons.

Note that this definition of optionality differs significantly from other definitions, such as the one by Ulbrich & Werth (2021), who use the term "non-conditioned intra-individual variation" to describe "variation that occurs under maximally similar conditions" (p. 18) (they do not use the term 'optionality'). However, while Ulbrich & Werth (2021) include "performance errors", that is, "slips of the tongue, false starts and changes of mind as long as they are not meaningful" (p. 19), we only consider structural options attested by more than one speaker so that any performance errors can be excluded. Furthermore, we focus on optionality in syntax, which is hardly mentioned in Ulbrich & Werth (2021) – perhaps because of the lack of sociolinguistic studies on variation in syntax in contrast to a great number of studies on phonological variation (cf. Cheshire et al. 2005: 136) and/or because of the fact that "syntactic forms are less likely to function as sociolinguistic marker" (Cheshire et al. 2005: 139). This, in turn, makes the study of intra-individual variation in syntax (i.e. optionality in syntax) even more relevant and, of course, interesting: does optionality in syntax exist, and if so, are there different types?

We propose that optionality in syntax (Level 1) can be divided into at least two subtypes (Level 2), with one of the two subtypes being subdivided again (Level 3):

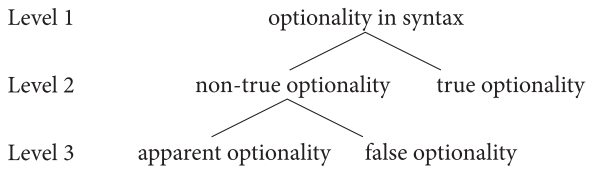

Figure 1. A classification of optionality in syntax

Apparent and false optionality are quite similar but not identical, and that is why we classify them as subtypes to non-true optionality (Level 2). Non-true optionality (Level 2), on the other hand, is quite different from true optionality, so that it is on the same level as this type ('co-types').

Important for our classification is the knowledge and use of the terms 'context' and 'co-text': context is to be understood as "the relevant features of the situation of utterance" (Lyons 1995: 271), whereas co-text is defined as "the relevant surrounding text" (ibid.), that is, the sentence *per se*, without situational value. By context, then, we mean the discourse-context with coherence, cohesion and relevance (cf. Lyons 1995: 271), and we do not understand by context, e.g. register or speech style – both were already excluded as possible triggers for variation in the definition of 'optionality'.

Each type is illustrated and empirically supported with examples from different Germanic varieties. The examples come mainly from the linguistic literature; in one case, the data were collected by the authors themselves. In any case, these are already published data. The examples are examples of intra-individual variation in syntax, and there should be not significant social correlations, i.e. age, gender and education/occupation should not play a role. The last point, of course, depends on the extent to which this is explicitly mentioned in the examples taken from literature. We have tried to pick out examples that are as clear as possible. The dialect speakers from whom the examples are taken are, of course, all native speakers.

We will also use the term 'markedness'. By this we mean that the preference for one or the other type of optionality can be influenced by (a) the context, (b) the co-text or (c) neither.[4] In this last case, we find 'true optionality'. Here, preference is also possible in the sense that the two variants do not necessarily have to be equally represented in a 50–50 way.[5] This 'preference', however, cannot be explained by context, co-text or sociolinguistic influence. Behind this is the assumption that grammaticality is not only the categorical distinction between 'well-formed' and 'ill-formed' but also includes nuances: well-formedness can have different nuances/grades of acceptability, while an ungrammatical form is either grammatical or not grammatical (and not more or less ungrammatical) (see also the concept of 'graded grammaticality'; cf. Adli 2005).[6]

Specifically, then, our questions are: is optionality in syntax conditioned, and if so, by what? What different types can we identify? A more general point that we will touch on briefly in answering the above questions are the number of grammars in a speaker (in doing so, we adopt a diachronic perspective), mainly in the case of true optionality.

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4. The editors point out that the term 'markedness' is very complex and has various meanings, so that it might be better to not use it at all (see Haspelmath 2006). Instead, they suggest to simply replace the term 'markedness/(un)marked' with 'preference/(dis-)preferred'. However, we believe that the term 'preference' is at least as polysemous as the term 'markedness' (see Noel & Smith 2022 on the different notions/theories of linguistic preference). Furthermore, from a conceptual point of view, our work is embedded in markedness theory and naturalness theory, with 'preference' being one dimension of meaning of it (in a similar vein, see Dressler 1999). We therefore consider it more appropriate to use the term 'markedness' while at the same time clearly defining what we mean by it.

5. I owe the idea that both variants must be present (or not) in a 50–50 way to an anonymous reviewer.

6. We are aware that this idea requires more elaboration but will not further address this in this article. All we care about at this point is that the reader knows that a form can be more or less preferred and can still be grammatical in the speaker's grammar.

The article is organised as follows: we start with non-true optionality and the two subtypes. First, we introduce apparent optionality (2.1) and illustrate this type with examples (2.2). After a short summary (2.3), we move on to the second subtype, i.e. false optionality (2.4); this type is again supported or explained with examples (2.5). This is followed by a brief discussion and an interim summary of the two types (2.6). In Section 3, we discuss the second type (at Level 2) we distinguish: true optionality. Again, the type is explained with the help of examples (3.1). This is followed by a discussion of the type from a diachronic perspective and the question of how many grammars true optionality has (3.2). The article concludes with a short summary of the most important findings (Section 4).

2. Non-true optionality (Level 2)

In the case of non-true optionality, both variants are well-formed and correct according to the established rules of grammar in the relevant variety. However, the two patterns are not exactly identical in the sense of doublets because there are differences in the speaker's evaluation of each pattern: the speaker differentiates between the two patterns in terms of markedness (unmarked and marked). The difference in the speakers' evaluation of each pattern depends on the context and co-text; that is, non-true optionality (Level 2) can be observed at the syntax–discourse interface. More precisely, in the case of apparent optionality, the context determines the choice of the preferred form, whereas in the case of false optionality, the co-text constrains which of the two variants represents the unmarked form. In the latter case, the variation is thus correctly not to be found at the syntax–discourse interface but in syntax.[7]

2.1 Apparent optionality

Apparent optionality can be represented in the form of the following table, with four different options: in a given context x, option a is unmarked and option b is marked. That is, option a is preferred over option b in this context, even though option b is grammatically correct but just unusual. In context y, on the other hand, option b is the unmarked variant, while option a is the marked form. That is, the context decides which form is preferred.

7. Or, within minimalism, in the lexicon or at the level of phonological form; cf. Weiß (2013: 189–201).

	Option a	Option b
context x	unmarked	marked
context y	marked	unmarked

Figure 2. Apparent optionality

2.2 Evidence of apparent optionality

Apparent optionality can be observed in OV/VO alternation in sentences with a complex tense in Mòcheno. Mòcheno is a German minority language spoken by about 600 inhabitants in three villages in the Fersina valley of the Trentino/Italy (cf. Cognola et al. 2019: 2). The language contact situation can be best described as triglossic, with Trentino and Mòcheno being the lower varieties (a situation of bidialectalism) and with the regional Italian being the high variety; Standard German is a foreign L2 language (cf. Cognola et al. 2019: 2). The following examples stem from a questionnaire that was orally presented to selected informants (45 in total) (cf. Cognola et al. 2019: 9).

In a sentence with a complex tense, the lexical verb can appear at the end of the sentence, as in German (cf. Cognola & Moroni 2018: 81):

(1) a. Mòcheno
De mama hòt de sai' kamaròtten pakemmp. [OV]
the mother has the her friends met

b. German
Die Mutter hat ihre Freunde getroffen. [OV]
the mother has her friends met
'The mother has met her friends.' (Cognola & Moroni 2018: 81)

The lexical verb can also appear after the auxiliary verb and before the object, as in Italian:

(2) a. Mòcheno
De mama hòt pakemmp de sai' kamaròtten. [VO]
the mother has met the her friends

b. Italian
La mama ha incontrata i suoi amici. [VO]
the mother has met the her friends
'The mother has met her friends.' (Cognola & Moroni 2018: 81)

Note that the attested variation in the OV/VO word order in (1) and (2) is an example of intra-individual variation (cf. Cognola & Moroni 2018: 83); the second example shows OV/VO alternation inside one speaker grammar again:

(3) a. Mòcheno
Gester hòt-er sushi gèssn [OV]
yesterday has-he sushi eaten
b. German
Gestern hat er Sushi gegessen [OV]
yesterday has he sushi eaten
c. Mòcheno
Gester hòt-er gèssn sushi [VO]
yesterday has-he eaten sushi
d. Italian
Ieri ha mangiato sushi [VO]
yesterday has eaten sushi
'Yesterday he ate sushi.' (Cognola et al. 2019: 2)

The different word orders are traditionally explained in terms of a conservative/traditional pattern and an innovative pattern (cf. e.g. Rowley 2003): while the traditional pattern with OV corresponds to German word order, the innovative pattern with VO is explained by language contact with the Italian/Trentino variety (cf. Cognola et al. 2019: 2; Cognola & Moroni 2018: 80). This would imply that the attested optionality goes back to two different grammars (conservative and innovative pattern; cf. Cognola et al. 2019: 2, referring to Kroch's double-base hypothesis). Cognola & Moroni (2018), however, convincingly argue that the attested variation in the OV/VO pattern can be explained in terms of information structure. This means that both options are grammatically well-formed in Mòcheno, but there is a difference in markedness, as one of the two options is better suited to a particular context.

The following example illustrates this: an OV word order is preferred, with the object being in the focus of the sentence (see (4a)); (4b) is grammatical, too, but unusual in this context due to informational-structural reasons:

(4) Mòcheno
(Bos hòt se kaft de mama?)
what has she bought the mother
('What has she bought the mother?')
a. *De hòt a puach kaft.* [OV]
She has a book bought
b. #*De hòt kaft a puach.*[8] [VO]
She has bought a book
'She has bought a book.'
(Cognola & Moroni 2018: 84; see Cognola 2014: 18 in slightly modified form for (b))

Also, in Example (5), the variation in OV/VO can be explained using information-structural reasons: the OV position is restricted to contexts in which the object forms the focus or belongs to the focus (cf. Cognola & Moroni 2018):

(5) Mòcheno
a. #*S puach hòt se en de sai´moa´m gem* [OV]
the book has she to the his aunt given
b. *S puach hòt se gem en de sai´moa´m* [VO]
the book has she given to the his aunt
'The book she gave to her aunt.' (Cognola & Moroni 2018: 82)

Cognola & Moroni (2018) conclude that both options have specialised for a certain discourse function: the OV pattern serves to code focus, which means that the object provides the new information and has the main accent of the intonation phrase. In the case of a VO distribution, the focus is not on the object. The OV-/VO-distribution does not go back to language contact but can be interpreted as an 'autonomous internal development of Mochèno itself' (Cognola & Moroni 2018: 112),[9] Finally, the OV/VO alternation is attested in both younger and older speakers (cf. Cognola et al. 2019: 8), which can be seen as an additional hint that the two speech communities possess similar grammars and that there is not one conservative and one innovative grammar (in the same speaker).

Further evidence for apparent optionality comes from Övdalian, a North Germanic variety spoken in a small district in the north of Sweden. In Övdalian, a simple clause with and without subject doubling is possible:

(6) Övdalian
a. *Eð far sakt raingen nų.*
it begins to rain-INF now
b. *Eð far sakt* ***eð*** *raingen nų.*
it begins to it rain-INF now
'It begins to rain now.' (Rosenkvist 2015: 115)

In (6a), there is no subject doubling, i.e. *eð* 'it' only occurs once in the sentence, while in (6b), the subject is doubled and placed a second time in front of the infinitive form *raingen* 'rain'. The doubling construction is a syntactic device to express "the speaker's assessment of how the proposition relates to the discourse context" (Rosenkvist 2015: 116). More specifically, it serves to emphasise the truth of the proposition it appears with (polarity focus) (cf. Rosenkvist 2015: 115–119).

8. We use '#' to indicate that this pattern is unusual but grammatically correct.

9. Note that the information-structural constraints apply to NPs of any type (cf. Cognola & Moroni 2018: 83).

Övdalian is only one of a few languages in which subject doubling "appears to have a similar pragmatic function" (Rosenkvist 2015: 118). This function is attested in our example from Övdalian both by older and younger informants, which suggests that the optionality of this pattern goes back to similar internalised grammars and not to language contact with Swedish (cf. Rosenkvist 2015: 118).[10]

2.3 Interim summary

We hope to have shown that apparent optionality is only apparent, since on closer inspection, it is determined by the discourse or context:[11] depending on the context, one variant or the other is preferred by the speaker. Furthermore, apparent optionality is situated at the syntax–discourse–interface, characterised by a syntactically true optionality: there is no syntactic device that governs the distribution of the one or the other option, but with a difference in meaning as regards the discourse-context.

2.4 False optionality

In contrast to 'apparent optionality', 'false optionality' does not depend on a certain discourse-context but on rules inherent to the construction itself: by this we mean that here, the co-text plays a role. There is a rule at the level of syntax that should be respected. If the rule is not respected, then the variant is still grammatically correct, but is judged by the speaker to be marked (not preferred). We can thus predict – based on the co-text – which pattern is less marked to the speaker. False optionality can be easily mistaken for true optionality, and that is the reason why we call it 'false optionality', with the idea of a 'false friend' in mind: the two options are not what they seem to be at first sight.

The type is summarised in the following table, with option a being unmarked if z (the rule(s) inherent to the construction or the co-text) is respected; option b is, similarly, unmarked if z is respected.

10. There are also a few younger informants providing an interpretation of the doubling pattern similar to the Swedish doubling pattern so that "it is plausible that the responses of these speakers are cases of inference from the Swedish doubling construction" (Rosenkvist 2015: 118–119).

11. Note that we use 'context' and 'discourse' as synonyms in this article.

	Option a	Option b
if: z respected	unmarked	unmarked
if: z not respected	marked	marked

Figure 3. False optionality

2.5 Evidence of false optionality

The following example shows an embedded question sentence with interrogative pronoun and the optional conjunction *dass* 'that' in Bavarian (also known as a doubly-filled COMP construction; cf. Weiß 2016; Schallert, Dröge & Pheiff acc. because it violates the doubly-filled COMP filter proposed by Chomsky & Lasnik 1977):[12]

(7) Bavarian
a. #*I woaß ned, wea dass do gwen* is
I know not who that there been is
b. *I woaß ned, wea do gwen is*
I know not who there been is
'I do not know who has been there.' (Weiß 2013: 198)

For a long time regarded as completely optional, recent research has shown that there is a slight difference in markedness between the two options in that (7a) is more marked than (7b) (cf. Weiß 2013: 198 for this example). The two options are not completely syntactically free, and the difference in markedness can be explained by a rule: the longer the *wh*-word is (one or two syllables vs a whole phrase), the more obligatory the additional *dass* 'that' is (cf. Bayer & Brander 2008; Weiß 2013; 2017; Schallert, Dröge & Pheiff acc.). In our example, the *wh*-word is quite short (*wea* 'who'); longer *wh*-phrases would be e.g. *wos fiar an Schmarrn (dass)* 'what for a nonsense (that)':

(8) Bavarian
a. *Es is erschdaunle, mid wos fiar an Schmarrn dass ma Geid vodein ka*
it is amazing with what for a nonsense that one money earn can
b. #*Es is erschdaunle, mid wos fiar an Schmarrn ma Geid vodein ka*
it is amazing with what for a nonsense one money earn can
'It is amazing with what for nonsense one can earn money.'
(Weiß 2013: 172)

12. The same phenomenon is attested in (Bernese) Alemannic, too: "Bernese German displays an unrestricted distribution of interrogative element/adjunct particle + *dass*" (Bader & Penner 1988: 10, cited after: Bayer & Brandner 2008: 10).

Example (8b) is more marked than (8a) and, therefore, less preferred in the speaker's grammar. So, we can summarise that in both Examples (7) and (8), there are two options that seem to be completely optional at first sight. At second glance, however, it is obvious that one of the two options is marked in each case, regardless of the context. Instead, the co-text determines which option is marked for the speaker: an option is marked if z is not respected. Specifically, in our examples, the rule z means that the longer the *wh*-word/phrase, the more necessary an additional *dass* 'that' is.

Doubly-filled COMP constructions are also attested in other languages. In Danish, for example, the variation attested in the (relative) markers in C° (*som, der, at* and nothing at all) depends on the conditions for proper government of IP-spec from C° (cf. Vikner 1991).[13]

The following examples from Dutch show variation in the sequence of the argument and the adverbial in the inner field[14] (we are interested here in the answers of speaker B; speaker A serves for embedding in the context). Displacement of the object is also called 'scrambling'.[15]

(9) Dutch

Speaker A: *Wat is er met het boek gebeurd?*
what is it with the book happened
'What happened to the book?'

Speaker B: a. *Ik heb het boek gisteren verkocht.* [NP – AdvP]
I have the book yesterday sold

b. #*Ik heb gisteren het boek verkocht* [AdvP – NP]
I have yesterday the book sold
'I sold the book yesterday.'

(10) Speaker A: *Wat heb je gisteren verkocht?*
What have you yesterday sold
'What did you sell yesterday?'

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13. However, it is not explicit from Vikner (1991) whether we are dealing here only with variation between dialects, or with variation within a speaker; the variation that is attested between dialects does not necessarily have to be identical to variation within a speaker. The situation is similar for evidence from Dutch, where several complementisers can occur in a recursive manner, too, and where rules inherent to syntax determine the output (cf. Hoekstra 1993).

14. By 'inner field', we understand the sequence of phrases that may occur between the finite and infinite verb in the main clause or between the subordinating conjunction and the finite verb in the subordinate clause.

15. Scrambling is understood as syntactic movement.

Speaker B: a. *Ik heb gisteren het boek verkocht* [AdvP – NP]
I have yesterday the book sold
b. #*Ik heb het boek gisteren verkocht verkocht* [NP – AdvP]
I have the book yesterday sold sold
'I sold the book yesterday.' (Molnárfi 2002: 1122)

In the first example, the question of what happened to the book is followed by the unmarked sequence NP–AdvP (see (9a.)). In the second example, when asked what s/he sold yesterday, speaker B answers with the reverse sequence, AdvP–NP (see (10a.)). The other sequences (AdvP–NP or NP–AdvP) are grammatical too, but unusual in this discourse-context. Molnárfi (2002), from whom the examples are taken, argues that the alternation of the argument and adverbial phrase is linked to the defocusing of the direct object. Both patterns are grammatical, but one pattern is marked in a certain discourse context. Scrambling, however, is constrained by rules inherent to the construction itself, as it is only possible with definite NPs in Dutch (cf. Broekhuis & Den Dikken 2012). For this reason, this example belongs to 'false' optionality: a certain co-text must be fulfilled for this form of variation to be possible at all.

A final example of 'false' optionality is given in (11) from Bavarian: two definite objects (*teacher* and *secretary*) can be used in different orders.

(11) Bavarian
a. *wia's da Lehrarin de neia Sekretärin vorstäin woid*
as-she the teacher-DAT the new secretary-ACC introduce wanted
[NP_{dat} – NP_{acc}]
b. *wia's de neia Sekretärin da Lehrarin vorstäin woid*
as-she the new secretary-ACC the teacher-DAT introduce wanted
'because she wants to introduce the new secretary to the teacher' [NP_{acc} – NP_{dat}]
(Weiß 2001: 23)

While the NP *de neia Sektretärin* 'the new secretary' in (11a) follows the NP *da Lehrarin* 'the teacher', in (11b), it is the other way round, and *da Lehrarin* 'the teacher' follows *de neia Sektretärin* 'the new secretary'. Both (11a) and (11b) are grammatical; the alternation of the argument structure is governed by focus. In (11a), the teacher is unfocused, and in (11b), it is the new secretary that is unfocused (cf. Weiß 2001: 23). Again, the alternation is only possible with definite NPs (cf. Weiß 2001) and can, therefore, be classified as 'false optionality'.

2.6 Discussion and interim summary

In this section, we have provided very clear, unambiguous cases of 'false optionality' such as the example of the doubly-filled COMP construction: if a particular

rule z is respected, then the variant is unmarked. The same applies to the examples regarding variation in the middle field. However, things are a bit more complicated here because optionality is not determined solely by a rule z (e.g. only definite NPs): different readings arise based on context, too. This is not present in the case of doubly-filled COMP (Examples (7) and (8)), at least as far as we know. In other words, as regards the Examples (9)–(11), applying the definition of false optionality (see Table 2) is not about markedness but whether the form is possible at all. Even if the co-text initially decides that optionality is possible, context also plays a role. Therefore, in this case, we propose the following table (see Table 3), which is a two-step procedure: first, the rule z must be applied before the context decides which derivation is unmarked.

		Option a	Option b	
1.	**if: z respected**	possible	possible	
	if: z not respected	ungrammatical	ungrammatical	
	2.	unmarked	marked	**context x**
		marked	unmarked	**context y**

Figure 4. False optionality (two steps)

3. True optionality

There is still a gap in the proposed classification, and this gap is to be filled by a type called 'true optionality':[16] true optionality is constrained by neither the context nor the co-text (or any sociolinguistic influence), that is, the preference of one variant over the other cannot be explained by context or co-text. Each of the two patterns is always available and interchangeable with the other without any loss of meaning. Moreover, it is even possible that there is no 'preference' at all but simply two variants for the same function. Here, both variants would be equally present in a 50–50 way; however, from an empirical perspective, it seems rather unlikely that one would find evidence of this type with a 50–50 split between the variants. True optionality can be summarised as follows:

16. One question that must be left open at this point is that of a possible relationship between language change/stability and the type 'true optionality': does 'true optionality' represent an example of ongoing syntactic change or not?

	Option a	Option b
context x	not relevant	not relevant
context y	not relevant	not relevant
co-text	not relevant	not relevant
co-text	not relevant	not relevant

Figure 5. True optionality

3.1 Evidence of true optionality

We will now discuss some examples of what we consider true optionality. Wurmbrand (2004) discusses two-verb clusters in Germanic. We are now interested in those sequences that are not rigid (i.e. either 1–2 or 2–1)[17] but are variable in their word order, i.e. where both 1–2 and 2–1 are possible in an otherwise identical construction. This is the case for modal-infinitive constructions in Swiss German, for both modal-infinitive and auxiliary-participle constructions in Dutch (when number '1' is finite) and for auxiliary-participle constructions in Dutch (when '1' is non-finite) (cf. Wurmbrand 2004: 44–45). Empirical evidence of true optionality in verb clusters is given for Swiss German (Alemannic) (cf. Wurmbrand 2004): based on a survey, it could be shown that in Swiss German constructions of the type 'modal$_{fin}$ – infinitive' (e.g. *lösen kann/soll* 'solve can/shall') are indeed variable (cf. Wurmbrand 2004; see also Seiler 2004).

As for variation in (dialectal) Dutch verb clusters, we have empirical evidence, too: Cornips (2009) shows that intra-individual variation is attested for both modal-infinitive and auxiliary-participle construction (when number '1' is finite). The following example shows intra-individual variation in verb cluster variation: in (12a), the verb order is 2–1; in (12b), 1–2.

(12) Heerlen Dutch[18]

a. *du die een beetje* lezen kunnen [2–1]
thus those a bit read.INF can
'thus those can read a bit'

b. *die dat…* redelijk *kunnen* opbrengen [1–2]
those that reasonably can yield.INF
'those that can reasonably yield' (Cornips 2009: 206)

17. Often, the different verb forms are given a number for better orientation, or the number sequences alone are used to refer to a certain sequence type. The finite form is numbered 1. Type 1–2 thus means 'finite verb form before infinite verb form', while 2–1 means 'infinite verb form before finite verb form'.

In the case of the modal-infinitive construction, Cornips (2009) assumes that there is one basic structure (1–2) while the other pattern has to be derived by movement. She argues that, for the majority of speakers (55), there is categorical use of 1–2. Only in 12 speakers (out of 67 in total) are both 1–2 and 2–1 attested (with a 'preference' for 1–2). Regardless of the question of what is now base-generated and what is moved,[19] it is sufficient for our purposes in this article to assume that, on the surface, both structures are possible and are used by the speakers, independently of constraints on the context or co-text. Sociolinguistic values such as education/occupation or age do not determine the word order alternation, and speech style can be excluded, too (cf. Cornips 2009: 206–208).

The second example we would like to discuss stems from a translation task with speakers of Alemannic in Alsace (cf. Moser 2021a: 97–112). Alemannic is spoken in the southwest of Germany, in Switzerland, in the westernmost part of Austria (Vorarlberg) and in the eastern part of France (Alsace), close to the German and Swiss border. The language contact situation in (German-speaking) Switzerland and Alsace can be best described as diglossic (in the extended definition of diglossia; cf. Fishman 1967); in Germany, there is a dialect–standard continuum. The language situation in Vorarlberg is more ambiguous, as it is described both as diglossic (cf. Ammon 2003: 164) and similar to a dialect–standard continuum (cf. Schönherr 2016).

The translation task was part of a questionnaire that was sent to L1 Alemannic informants in 2017/2018. Following the data collection method of the 'Syntaktischer Atlas der Deutschen Schweiz' (SADS) (cf. Glaser 2021), a short context was provided before the translation task, as this increases willingness to translate the sentence (cf. Glaser & Frey 2007: 1).[20] In (13), we now first provide the given sentence, that is, the sentence to be translated. The sentence is formulated in the standard variety, Standard German. In (14), we show the informant's translation into Alemannic.

18. Heerlen Dutch is a regional standard variety spoken in the province of Limburg in the southeast of the Netherlands (cf. Cornips 2009: 205).

19. We do not want to go deeper into the theoretical discussion at this point, but we are aware that the analysis is, of course, dependent on the syntax model one adopts.

20. The following context was provided for the translation task (cf. Moser 2021a: 179): Lena's cat has been leaving food uneaten out in the morning for quite some time. Lena suspects that the neighbour is giving her something to eat. So, she goes to the neighbour and asks her if she is feeding her cat. The neighbour answers (and this had to be translated).

(13) Standard German (to be translated) [simple negation]
Ich habe deiner Katze ***nie etwas*** *gegeben*
I have your cat never something given
'I never gave your cat anything.'

As Example (13) shows, in the standard variety, only the simple negation is possible (cf. also Wöllstein & Dudenredaktion 2016: 925): after the negative indefinite *nie* 'never' follows a 'positive' indefinite *etwas* 'some/-anything'. It would be ungrammatical in the standard variety to use negative spread, i.e. *nie nichts* 'never nothing'. Informants typically propose one of two Alemannic translations for the standard German sentence using either negative spread (*nie nix* 'never nothing') or – in the brackets – simple negation (*nie ebs* 'never some-/anything'); see (14):

(14) Alemannic [Alsace] [negative spread]
Ich hâb däinarä Kåtz nie nix (oder nie ebs) gänn
I have your cat never *nothing* (or never anything) given
'I never gave your cat anything.'

In the next example, (15), another speaker of Alemannic switches between the two structural options, too. First, the informant uses a simple negation:

(15) Alemannic [Alsace] [simple negation]
Esch hob e dinnere Kàtz noch nea *ebs ze frasse gaa*
I have to your cat still never anything to eat given
'I have never given your cat anything to eat.'

Then, in the second part of the task, the same informant as in (14) answers with the negative spread option. The context is similar: Lena is not totally convinced that the neighbour is not feeding her cat, and she goes to ask her friend living close to the neighbour; her friend replies (with the sentence to be translated).

Again, we first indicate the given sentence (that is, the sentence to be translated; see (16)) with simple negation (*nie etwas* 'never some-/anything'). In (17), we show the informant's translation into Alemannic: the informant does not use the simple negation but the negative spread option with *nea nix* 'never nothing':

(16) Standard German (to be translated) [simple negation]
Die Nachbarin hat nie deiner Katze etwas gegeben, das weiß ich genau.
the neighbour has never your cat some/anything given that know I for sure
'The neighbour never gave anything to your cat, I am quite sure.'

(17) Alemannic (Alsace) [negative spread]
D' Nochbere hett e dinere Kàtz noch nea nix gaa […]
the neighbour has at your cat still never nothing given
'The neighbour has never given anything to your cat […].'

The alternation between simple negation and negative spread can be observed in Alemannic in Vorarlberg, too. The data stems from spontaneous speech, with recordings from the 1950s. The recordings were made by Arno Ruoff (1955–56) and aimed, in the same way as recordings by Zwirner (1955–1972, cf. IDS Mannheim),[21] to study the natural spoken language (the base dialect) of the informants. The following speaker (Ruoff: XI/316) first uses negative spread (*nia nicks* 'never nothing'):

(18) Alemannic [Vorarlberg] [negative spread]
a. *ab'r im Summ'r då hem-m'r eigentli nia nicks tiaf'küahlt's*
but in summer there have-we PART never nothing frozen
'but in summer we never have anything frozen'

Then, in a maximally similar context, the same speaker (Ruoff: XI/316) uses a simple negation with only one negative indefinite (*nie was* 'never some-/anything'):

(19) Alemannic [Vorarlberg] [simple negation]
b. *so am Summ'r durch då git's gär nia was g'fråras.*
so in summer through there give-it PART never anything frozen
'so in summer there is never anything frozen'

We think it is plausible to assume that in Alemannic, spoken in Alsace and Vorarlberg, the simple negation/negative spread alternation is truly optional: the alter-

21. The Zwirner recordings consist of interviews in mostly monological form, which were conducted under the direction of Eberhard Zwirner in the old federal states of Germany (time period: 1955–1972). The aim was to record the language used by the speaker in everyday life, i.e. the language at home or at his/her workplace (cf. Zwirner & Bethge 1958: 19). The recordings are available, also in transcribed form, via the 'Datenbank für Gesprochenes Deutsch' of the 'Institut für Deutsche Sprache' (cf. IDS Mannheim).

Arno Ruoff, based at the later so-called Tübinger Arbeitsstelle 'Sprache in Südwestdeutschland', wanted to expand and condense the recording network (the density of recordings) of Zwirner for the Alemannic language area (without Switzerland), cf. Ruoff (1973: 19–21). The data of the Examples (18) and (19) comes from hitherto unpublished data material, made available by Oliver Schallert (see in the references under Ruoff 1955–1956).

nation is neither determined by context nor co-text.[22] Furthermore, one can very probably exclude influence from the standard variety (German) as the evidence stems from native speakers (since birth) of Alemannic. Other sociolinguistic factors such as occupation, age or register can also be excluded (for the selection of the informants, see Ruoff 1973 for Vorarlberg, and Moser 2021a for Alsace).

3.2 The simple negation/negative spread alternation from a diachronic perspective

True optionality should be unstable, from a diachronic perspective:

> As far as change is concerned, however, this intra-speaker existence of multiple grammars has been considered diachronically unstable, in the sense that over iterated generational learning interactions, grammar competition leads, ultimately, to a stable state of dominance by some single grammar. […] [A]ll morphosyntactic variation between two forms competing for a single function results, over time, in either the extinction of one form, or a functional specialisation of the two forms by which the competition is escaped (Kroch 1994; Wallenberg 2016). (Kauhanen 2019: 264)

If this assumption is right, we could predict that the simple negation/negative spread alternation in Alemannic is very unstable and will change into a more stable construction, either by extinction of one or specialisation of the two forms. As one structural option, simple negation, is identical to the standard German pattern (the high prestige variety), the extinction of the negative spread pattern would be more plausible. Furthermore, from a typological perspective, it is unusual that negative spread only – without negative doubling – is attested in Alemannic (cf. Moser 2019, 2021a): according to Haspelmath (1997: 217) and Zeijlstra (2004: 63) there is a correlation between negative doubling and negative spread, with both types depending on each other. Furthermore, Giannakidou (2000: 460) mentions: "[A]lmost none of the NC [negative concord] languages that have been thoroughly studied in the literature makes exclusive use of negative spread." The idea that negative spread in Alemannic might soon disappear is, thus, not so unreasonable.[23]

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22. This might be the case for Swiss German, too: Hodler (1969: 145) mentions in his very detailed grammar on Bernese German, an Alemannic variety spoken in Switzerland, that negative spread is not obligatory.

For more information on negative spread in Vorarlberg, see Moser (2021a: 40–44).

23. Depending on the perspective, negative spread can be either classified as innovation or as more conservative pattern: it represents an innovation compared to the 'original' state of negative concord where we find both negative doubling and negative spread. Negative doubling is

Whereas apparent and false optionality go back to rules internal to one grammar, the pattern 'two forms and one function' is often explained with the double-base-hypothesis (cf. Kroch 1994), that is, two competing grammars (in the mind of one speaker) in times of language change. If this is right, we should have a conservative and an innovative option in the simple negation/negative spread alternation. We could now assume that negative spread in Alemannic is an innovation[24] because it represents negative doubling without negative spread: negative indefinites only, without a sentential negation particle. In Bavarian, negative spread is already possible, too – but only if the speaker also makes use of negative doubling (cf. Moser 2021a). The following examples illustrates this: the same speaker (ZW: E_01388) first uses negative spread (*kein NP … keiner* 'no … no one'), then negative doubling (*kein NP nicht* 'no NP not'):

(20) Bavarian [Germany]

a. *Kein Rassevieh wird keiner haben bei uns.* [negative spread]
no breed cattle will no one have with us
'No one will have a breed cattle with us.'

b. *Da habe ich keinen einzigen Erdapfel nicht habt.* [negative doubling]
there have I no single potato not had
'I have not had a single potato.'

Most of the speakers of Bavarian, however, still use negative doubling only, even if there is a possible context for negative spread: another speaker (ZW: E_01457) uses negative doubling (*kein NP nicht* 'no NP not'):

(21) Bavarian [Germany] [negative doubling]

a. *Ja, wir haben ja keine Maschine nicht gehabt, nichts, nicht, überhaupt nichts.*
yes we have PART no machine not had, nothing, not, absolutely nothing.
'Yes, we didn't have a machine, nothing, absolutely nothing.'

… and then again negative doubling (*kein … kein NP nicht* 'no … no NP not'):

lost in German base dialects (cf. Moser 2021a; Weiß 2016), with negative spread surviving as an innovation.

Negative spread can be, on the other hand, the more conservative pattern if we compare it to the negation in Standard German (where negative concord is not possible or, we could argue, negative concord is completely lost; but see, for possible reasons for this loss, Moser 2021a, 2021b).

24. Compared to negative doubling; see also Footnote 23.

(22) Bavarian [Germany] [negative doubling]
b. *Alle Jahre eins, daß keins noch kein Jahr nicht alt gewesen ist.*
every year one that no one still no year not old been is
'Every year one, so that none has been a year old.'

Further evidence supporting the hypothesis that negative spread is the innovative pattern comes from Hessian, a variety spoken in Central Germany: in Hessian, negative doubling is reduced, and negative doubling is only possible if the same speaker also accepts negative spread (cf. Weiß 2016: 453). The results of the Syntactic Atlas of Hessian Dialects (cf. Fleischer et al. 2016; Weiß 2016) provide evidence of the fact that negation in Hessian is more innovative than in Bavarian but less innovative than in Alemannic. So, to put it simply, we have three varieties, with different constellations of negative concord:

– Alemannic: negative spread, negative doubling unattested.
– Bavarian: negative spread only if also negative doubling.
– Hessian: negative doubling only if also negative spread.

These three varieties relate to each other as follows: Alemannic > Hessian > Bavarian in a cline of innovation.[25] We can, therefore, conclude that there is indeed some evidence in favour of the hypothesis that negative spread is – from a diachronic perspective – the innovative pattern, and negative doubling the conservative one.

One aspect has not been mentioned so far: according to Kroch (2001) the relation between the competing grammars is a diglossic one, with an *innovative* vernacular and a *conservative* literary language (cf. Kroch 2001: 723). In our case, it would/could be the other way round (see also Footnote 23): the literary language could be considered more innovative if a particular pattern is lost in the literary language (negative spread is lost in Standard German) but retained in the vernacular (i.e. in Alemannic). And in Alsace (where the translation tasks have been conducted), we do indeed observe this diglossic situation, with Alemannic as vernacular and Standard German as literary language. As regards the evidence from Vorarlberg, there is still an ongoing discussion if the language situation in Vorarlberg resembles more a diglossia or a dialect-standard-continuum (cf. Schönherr 2016). Schönherr's assumption of a dialect-standard-continuum is based on data from the 21st century, while older research literature tends to assume a diglossic situation. It is, therefore, plausible that the language situation of Vorarlberg was more similar to a diglossia in the 20th century (and our data stems from the mid-20th century) than it is today: the change from a diglossia to a

25. We owe the idea for this helpful hierarchy to an anonymous reviewer.

dialect-standard-situation takes place as a gradual process, with different progress in different speech communities (cf. Auer 2005).

Returning to the findings in Section 3.1., it seems probable that the speakers of the simple negation/negative spread alternation have two competing grammars. This would explain our empirical finding of two structural options, being always available and interchangeable with each other without any loss of meaning. There is, however, one counterargument that is often mentioned in the context of the two-grammar model (cf. Bresnan & Deo 2001; Seiler 2004): in case of competing grammars, we had to assume one new grammar for each existing combination of doublets, resulting in an exponential growth of grammars in the mind of one speaker (see Bresnan & Deo 2001: 39). If this argument is right, we could then argue that we only assume grammars-excerpts (and not complete grammars). Furthermore, it would be possible to assume that there are only very few cases of true optionality (due to economy). Due to the exponential growth, however, even a few cases of optionality would be enough to increase the number of grammars significantly: "If the number of independent grammatically determined variable outputs is only 10, the number of competing grammars required is over one thousand" (Bresnan & Deo 2001: 39). A model that elegantly avoids the question of the number of grammars (or that, rather, integrates variation into its theoretical model) can be found in Stochastic Optimality Theory (cf. Boersma 1998; Boersma & Hayes 2001; Bresnan & Deo 2001). One of its premises is the fact that constraints (which are called 'rules' in other grammar theories) are violable. Furthermore, grammaticality is not measured using an ordinal scale but a graded scale.[26]

4. Summary

This paper has addressed optionality in syntax. We argued that optionality represents one aspect in intra-individual variation, namely, the aspect of variation which is not determined by sociolinguistic factors. We defined 'optionality' as the possibility that a speaker has two forms available for one (more or less similar) function. It is possible that one of the two forms is preferred to the other, but both forms are grammatical in the speaker's grammar(s). Triggers for the variants can be context, co-text or neither. We then suggested that optionality in syntax can be divided into at least two subtypes (non-true optionality and true optionality), with one of the two subtypes (non-true optionality) being subdivided again

26. There are also other, non-derivational grammar theories such as Construction Grammar which do not have the 'problem' of the number of grammars inherent to a speaker (cf. Cappelle 2009).

(apparent and false optionality). Two constraints – context and co-text – determine to which type the attested optionality belongs to: they can be identified by markedness, that is, the speaker's preference for one form or the other. This markedness is either a reflection of context where one option is preferred over the other in a specific discourse context (apparent optionality) or due to the syntactic constraints on the co-text (false optionality).

Preference is also possible in cases of true optionality. In contrast to non-true optionality (i.e. false or apparent optionality), however, neither context nor co-text seems to be responsible for this intra-individual variation.

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CHAPTER 4

Non-verbal plural number agreement. Between the distributive plural and singular

Blocking factors and free variation

Karolina Rudnicka & Aleš Klégr
University of Gdańsk | Charles University in Prague

Unlike Slavic languages, such as Polish and Czech, English is assumed to prefer distributive plural agreement between the plural subject and the noun in the predicate part of the sentence. The aim of this paper is to verify this claim and (since this preference is apparently not without exceptions) provide an overview of scenarios in which the tendency for the distributive plural is overruled. We start with a classification of factors blocking the use of the plural and enabling the use of distributive singular. The preference is tested by reviewing the occurrences of two constructions, *lose one's life* and *lose one's job*,[1] in the BNC[2] and COCA,[3] In view of the distributive singular cases in the dataset, the chapter investigates the possibility of the distributive plural and singular cases being in a free variation and proposes a new condition for them to be seen as such: they need to have a similar distribution across different genres.

Keywords: non-verbal number agreement, distributiveness, plural concord, free variation, genre, corpus linguistics, English

1. They were chosen as typical examples where Polish/Czech and English differ.

2. The British National Corpus (from Oxford University Press). Available online at https://www.english-corpora.org/bnc/.

3. The Corpus of Contemporary American English (COCA). Available online at https://www.english-corpora.org/coca/.

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1. Introduction, structure and relevance of the chapter

Interestingly, English appears to differ from Slavic languages like Polish and Czech[4] by preferring the distributive plural in non-verbal agreement between the subject and the noun (typically an object) in the predicate part (e.g. *Six people lost their lives yesterday*).[5] The difference is potentially of typological importance, but before a full-scale contrastive research is embarked on, a pilot study of the actual situation in English is needed. To achieve this goal, the present chapter discusses the scenarios in which the general tendency for the distributive plural is overruled and investigates the possibility of some of the distributive plural and singular cases being in free variation.

As a first step, we review the literature on the subject, then summarise the factors blocking the distributive plural suggested by Sørensen (1985). Section 2 introduces the concept of free variation as a possible explanation for the alternative forms. Two English corpora, the BNC and COCA, are harvested for the data on the distributive plural and singular occurring in the two constructions under study. The data are analysed in Section 3, specifying the methodology and presenting the results. Section 4 outlines the results of genre and free variation investigation. The findings are assessed in Section 5.

1.1 Distributive plural in the literature

The concept of distributiveness in English has been mentioned by several authors. Aarts et al. (2014: 126) note that "[d]istributive plural concord is common in expressions such as *The children all had such eager faces* (where, naturally, each child had only one face), but a distributive singular is often possible, e.g. *They all had such an eager expression*". Similarly, Quirk et al. (1985: 768) say that "[t]he distributive plural is used in a noun phrase to refer to a set of entities matched individually with individual entities in another set", as in (1):

(1) Searchers have lost their lives trying to save others; helicopters have gone down. (COHA: 2005; MAG)

What is less known, however, is the actual distribution of the distributive plural. To begin with, it may occur with nominal clause elements in various functions,

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4. Not only Slavic languages seem to be different in this regard: German, too, has less preference for the distributive plural than English. The authors of the present chapter are in the process of preparing a typological study of the problem.

5. The Polish translation of this sentence features the use of the distributive singular: *Sześć osób straciło wczoraj życie*; similarly, the version in Czech: *Včera přišlo o život šest lidí*.

typically objects and subject complements, but also adverbials (see (2)) and even the modifiers of these elements. Schibsbye (1970: 107) reports on coordinated pre- or postmodifiers implying plurality and gives the following examples: *countless words were adopted in the sixteenth and early seventeenth centuries/boys between the ages of 14 and 18*.

(2) Drivers stayed in their vehicles as volunteers placed the groceries in the trunk or back seat. (NOW: 2020)

In our study, for purposes of manageability and clarity, we only focus on the subject–object agreement and examine the use of the distributive plural on objects. We see the subject–object non-verbal number agreement as a prototypical and quintessential relation; thus, studying it is a necessary first step before one looks into other functions listed in the paragraph above.

Sørensen (1985: 338) and many others (e.g. Quirk et al. 1985: 768; Koïchi 2012: 101) claim that the tendency towards a distributive plural object is the general norm in the English language. Dušková (2006: 430) adds that, in this respect, English differs from Czech. This means that a typical English sentence with a plural subject is likely to have nouns in object position in the plural as well, i.e. there is a relation of 'correlative distribution' between subject and object. Still, as Sørensen (1985: 338) notes, observations and claims that the distributive plural is the norm are frequently accompanied by hedging expressions such as *probably, most likely, normally, usually*, etc.; cf. Zandvoort (1957: 263), Scheurweghs (1961: 11) and Schibsbye (1970: 107). This is due to the fact that the use of singular nouns in the predicate part of the clause, or the *distributive singular*, is often also acceptable (see (3) and (4)) or, in some cases, even strongly preferred (see (5)). Consequently, the chapter investigates the interplay between distributive plural and singular objects.

(3) I can understand why people in my administration are anguished over the fact that people lost their life. (COCA: 2004; NEWS)

(4) You're telling them they have to put that aside or risk losing their job. (COCA: 2001; SPOK)

(5) Centuries later, many sushi eateries have made their way across the United States and St. Louis. (COCA: 2012; BLOG)

Generally speaking, distributive plural agreement tends to be seen as the norm in modern English. According to Koïchi (2012: 101), "Where more than one individual are being spoken of, pluralisation will take place of things of which they (usually) possess only one instance (head, heart, soul, name, life, etc.)". This statement goes in line with what Zandvoort (1957: 263), Schibsbye (1970: 11), Sørensen

(1985: 338), Quirk et al. (1985: 768) and Dušková et al. (2006: 430) claim: in English, there is a strong tendency towards the distributive plural, but the use of the singular is, at least at times, also acceptable. The formulation of the exact 'rules' governing the principles of noun–noun number (or distributive plural) agreement does not seem to be an easy task, causing unease to writers on good English usage such as Vallins (1960: 163), who even concludes that there is no rule governing the agreement. Along similar lines, Casagrande (2013) claims that "what's sometimes called subject–object agreement isn't as well known – quite possibly because it's futile to even think about".

1.2 The distributive plural – the general norm and blocking factors

In spite of the doubts expressed by Vallins (1960: 163), the paper by Sørensen (1985) attempts to provide rules as to when the use of the distributive plural is blocked and thereby identify the scope of the distributive plural in English. Among the various blocking factors, he lists (Sørensen 1985: 347): (i) avoidance of ambiguity; (ii) fossilisation (invariability force); (iii) singularisation; and (iv) countability-related factors (uncountable nouns offer no choice but the singular; some nouns are both countable and uncountable; some countable nouns are *singularia tantum*, dispreferring the plural). Two more factors can be added to this list, namely, (v) the wish to indicate joint possession (Rappaport 2017) and (vi) the wish to convey ideas of figurative, abstract or universal kind (Follett 1998; also Koïchi 2012: 110). The six subsections below (1.2.1 to 1.2.6) elaborate on and give examples of the different blocking factors listed above. Section 1.2.7 discusses whether the presence of these factors always blocks the use of the distributive plural.

1.2.1 *Avoidance of ambiguity*

Sørensen (1985); Quirk et al. (1985) and, more recently, Rappaport (2017) note that occasionally, the use of the singular might be necessary if the use of the plural form happens to be too ambiguous. The example Rappaport provides is given in (6). If the plural form (*animals*) were used, the children might hesitate over whether they should name only one animal or many different animals. The wish to avoid ambiguity can also be understood as the intention of the writer to underline the fact that, e.g. a group of people has to deal with one concrete common problem; see (7) below:

(6) We asked the children to name their favourite animal. (Rappaport 2017)

(7) Whatever he'd intended to communicate, Jamal thought, he was done with it, and if humans were too dense to figure it out, that was their problem. (COCA: 2007; FIC)

1.2.2 *Fossilisation/the force of invariability*

Fossilisation occurs with invariable set phrases or idiomatic expressions such as, for instance, *at the end of one's tether*, which are used in the singular regardless of their singular and plural reference (Sørensen 1985: 342–343). The process of fossilisation and the state of being fossilised is reflected in the division of idioms into syntactically frozen idioms and syntactically flexible idioms (cf. Gibbs & Gonzales 1985; Yusifova 2013; and others). Idioms belonging to the former group cannot undergo a change with regard to the number of the noun functioning as object, e.g. *turn a deaf ear* (**ears*), *fall on deaf ears* (**ear*), while idioms of the latter group allow for some variability of the form, e.g. *strike at the root/roots of the evil*.

Enlarging on this observation, Sørensen (1985: 342) points to the fact that among the examples of set phrases which do not change their form, many expressions containing anatomical terms as objects or complements can be found; for instance, *to keep an eye on something; to take somebody under one's wing; to lift a finger*. For illustrative sentences, see (8) and (9).

(8) In the 1950s, feminism had not yet freed women from the home and so men didn't need to lift a finger. (GloWbe: Great Britain)

(9) Considering the inquisition and many of the popes having mistresses they don't have a leg to stand on. (GloWbe: United States)

1.2.3 *Singularisation to achieve generalisation*

Singularisation can be understood as the action of switching the viewpoint – from a plural to a singular perspective. Forsyth (1970: 174, quoted in Sørensen 1985: 345), defines singularisation as "the presentation of a recurrent action [...] by selecting one occasion, one complete performance, and holding this up as a sample of the recurrent phenomenon. This practice of quoting an instance may conveniently be called *singularisation* of a multiple action". With regard to nouns, Wood (1957: 289) argues that singularisation might be used to achieve generalisation (or generic reference), as it is likely to take place when the plural noun is to represent the whole group or the whole species "so that what is said of all applies to each one" (see (10) and (11)).

(10) They come to play checkers. If they need a haircut, they come to me. (COCA: 2012; SPOK)

(11) Infants can suck on their bottle or pacifier to help ease the pressure. (COCA: 2006; MAG)

1.2.4 *Countability-related factor(s)*

Sørensen (1985) mentions several instances where countability interferes with the distributive plural. Uncountable nouns, such as *information, sunshine* or *fertility*, invariably have a singular form, do not take an indefinite article (e.g. Clutterbuck 2000: 10) and cannot be pluralised. Apart from uncountables, there are also words which can be used in both a countable and uncountable sense, depending on the context. An example Sørensen (1985: 339) provides is the word *organisation:* it may refer to the *process of organising* something (an uncountable sense) or an *organised body* (a countable sense), and the distributive plural is then applied accordingly. He also mentions (1985: 341) the subclass of countable *singularia tantum* – nouns which behave like countables in the singular and take the indefinite article, but most usually do not undergo pluralisation. Sørensen's examples include words such as *lifetime, prey* and *airing. Disgrace* and *nuisance* are likely to behave in the same way. Sentences (12) and (13) provide examples from language corpora.

(12) Both parties are a disgrace to this country. (GloWbe: United States)

(13) People who long to be rich are a prey to temptation. (GloWbe: United States)

1.2.5 *The wish to indicate joint possession*

It applies to cases in which two or more individuals share a singular thing (see (14) and (15)).

(14) We had planned to make a run to visit Bruce and Frances at their house – Lighthouse Animal Rescue. (COCA: 2012; BLOG)

(15) While traveling together, the two women got lost and consulted their map. (Rappaport 2017)

1.2.6 *The wish to convey ideas of a figurative, abstract or universal kind*

This factor is very close to that of singularisation (1.2.3). According to Follet (1998: 211), the noun in the predicate part of the sentence "remains in the singular when what is plurally possessed is universal, abstract, or figurative". Along very similar lines, Koïchi (2012: 110) also recognises that the language users are more likely to use the distributive singular, if the meaning conveyed by the object is of a universal kind: "Our life = human life in general, life whosesoever it may be – 'life' has no plural in this sense. Our lives = my life, your life, his or her life – distributive". Another example given by Koïchi (2012: 111) is the use of the rhetorical plural pronoun, the so-called *royal we* or *editorial* or *authorial we;* see (16) for an example.

(16) So long as our heart is beating, yours is too. (COCA: 2002; NEWS)

1.2.7 *Do blocking factors always block?*

A cursory look into the Corpus of Contemporary American English reveals that the blocking factors listed in 1.2.1–1.2.6 above seem to be of very different strengths.

A few preliminary searches in COCA show that e.g. with regard to fossilised or invariable idiomatic phrases (described in Section 1.2.2) such as *to make one's way* or *to lift a finger*, the use of the distributive plural is almost completely blocked. By way of an exploratory search, we entered the phrases *made their way* and *made their ways* into the online search engine of COCA. The raw frequency of the former is 1624, whereas for the latter, the frequency equals three; furthermore, two of these three cases are from the same source. For illustrative sentences, see (17) and (18).

(17) As she and Sally had made their way through the airport, Kate had spotted plenty of tall, dark-haired men who obviously saw no reason to spend a hundred dollars at a fancy salon. (COCA: 2014; FIC)

(18) Darlene blushed at another peal of laughter, as Britt, Ryan, and Erin made their ways to their cars. (COCA: 2003; FIC)

Even if we consider the fact that some of the 1624 cases of *made their way* may exemplify the use of the singular *they* (singular *their* in particular), the prevalence of the distributive singular is really dramatic. In (18) the distributive plural seems to have been chosen to emphasise the individuality of the people spoken about – e.g. the fact that they had one car each; and the cars were parked in different spots. Still, the rarity of such cases shows this does not seem to be a common practice. Whether one could term this usage as non-standard, an exception or simply writer's creativity remains open to question and does not constitute the subject of this chapter. All in all, the presence of invariable, fossilised phrases can be seen as a very strong blocking factor.

The wish to avoid ambiguity (Section 1.2.1) and the indication of joint possession (Section 1.2.5) also appear to be relatively strong blocking factors, but for different, probably very pragmatic, reasons. Logically, if the writer (or the speaker) wants to hint at the fact that a singular object is shared by, e.g. two people, they are likely to use the distributive singular to indicate this fact. Otherwise, the desired meaning will not be conveyed. Similarly, with regard to cases in which the author aims at being especially precise to achieve their purpose and to avoid ambiguity, the use of the distributive singular seems to be a conscious rhetoric strategy, serving a specific purpose.

The situation is, again, different with regard to the blocking factor described in Section 1.2.4, namely the presence of a *noun not (strictly) countable*. As corpus

searches in COCA show, uncountable nouns such as *knowledge*,[6] do seem to undergo pluralisation in certain contexts; see (19) and (20). So, sometimes both the distributive plural and the distributive singular appear to be possible – depending on the exact meaning the writer or the speaker intends. Also, Sørensen (1985: 340) notes that "The problem of deciding whether a noun is countable or uncountable is (…) rather a tricky one" and that dictionaries do not always reflect current usage and the latest development. All in all, the very fact that a noun is labelled uncountable need not fully block the application of the distributive plural, especially when the plural form involves a shift in meaning (*sunshines* standing for *joys*).

(19) (…) urban working class with roots in the labour movement, are able to articulate their knowledges within a shared frame of environmental justice. (COCA: 2010; ACAD)

(20) The world ain't all sunshines and rainbows. (COCA: 2006; MOV)

The picture gets even more complicated with regard to *singularisation used to achieve generalisation* (Section 1.2.3). Sørensen (1985: 347) gives two example sentences: one shows singularisation at work (see (21)), while the other is a counterexample (see (22)). The first one is taken from Wood (1957); the second one from the Longman Dictionary of English Idioms (LDEI: 1979). Both seem to be perfectly acceptable. Exploratory searches in COCA confirm the existence of cases in which both forms are possible; see (23), (24), (25) and (26).

(21) Ostriches bury their head in the sand. (Wood 1957)

(22) Referring to the belief that OSTRICHES bury their heads in the sand when they are in danger. (LDEI: 1979: 347)

(23) Animals make their homes with the resources they find around them. (COCA: 2012; MAG)

(24) Some animals make their home in it. (COCA: 2011; MAG)

(25) These results support previous studies which found that Hispanic women have difficulties behaving assertively (…). (COCA: 2001; ACAD)

(26) Children with autism have difficulty understanding context, connecting new information to previously stated information (…). (COCA: 2014; ACAD)

6. Collins Dictionary Online, s.v. *knowledge*, retrieved on Novemver 6, 2020, from https://www.collinsdictionary.com/dictionary/english/knowledge.

Also in the case of the *wish to convey ideas of a figurative, abstract or universal kind* factor (see Section 1.2.6), there does not appear to be any mutual exclusivity between the distributive singular and the distributive plural. Sentences like (27) and (28) seem to be, from the reader's perspective, equally acceptable. How sure can we be that the author of (27) does not wish to convey any idea of universal kind? Similarly, how sure can one be that the distributive singular used in (28) indicates the author's intention to refer to *life* in a figurative, abstract or universal sense? These questions cannot be answered with the tools and methods of corpus linguistics. Even if it were possible to ask the authors, they might be unlikely to remember the exact intention they had in mind, as both of the examples probably instantiate spontaneous production – they are taken from the *spoken* genre.

(27) Those two men lost their lives and according to the Iraqi government so did two others from the Muslim family living nearby. (COCA: 2009; SPOK)

(28) More than 65 people lost their life after a cruise ship sunk outside of the islands of Paros. (COCA: 2000; SPOK)

All this seems to suggest that unlike the others, these two factors, *the wish to convey ideas of a figurative, abstract or universal kind* (Section 1.2.6) and *singularisation used to achieve generalisation* (Section 1.2.3), represent the weaker type of blocking factors, as in actual usage both the distributive plural and the distributive singular are possible. Importantly, in these cases, neither the use of the distributive plural nor the use of the distributive singular will make a given sentence unacceptable. It is, therefore, quite plausible to see these two factors as *enabling* the use of the distributive singular rather than *blocking* the use of the distributive plural because the use of the distributive plural is not truly blocked. Instead, using the distributive singular is a viable option, as a result of which both choices are acceptable and attested in language corpora, as exemplified by COCA; see (21)–(28).

1.2.8 *Classification of blocking factors according to their strength*

To sum up, after surveying the blocking factors identified by Sørensen and others, we come to the conclusion that three of them, *avoidance of ambiguity* (Section 1.2.1), *fossilisation* (Section 1.2.2) and *the wish to indicate joint possession* (Section 1.2.5) may be viewed as strong blocking factors (with very few or no exceptions). The countability-related factor(s) (Section 1.2.4) could also be seen as a relatively strong blocking factor; however, since the gradient and context-dependent nature of countability makes the assessment of the blocking force somewhat tricky, we may speak of strong contingent blocking factor(s). In contrast to that, we believe the two remaining factors, *singularisation used to achieve generalisation* (Section 1.2.3); and

the wish to convey ideas of a figurative, abstract or universal kind (Section 1.2.6) are factors enabling the use of the distributive singular without making the distributive plural unacceptable, inasmuch as in these cases, the difference between the use of the plural and the singular gets blurred. As a result, speakers have two options with apparently little or no discernible difference between them.

Table 1 presents the factors and our division of them according to their strength as discussed above.[7]

Table 1. The distributive plural blocking factors divided according to their strength

Strong blocking factors	**Strong contingent blocking factor**	**Weak blocking factors (enabling distributive singular)**
– Avoidance of ambiguity (Section 1.2.1) – Fossilisation/the force of invariability (Section 1.2.2) – The wish to indicate joint possession (Section 1.2.5)	– Countability-related factors: noun(s) not (strictly) countable (Section 1.2.4)	– Singularisation used to achieve generalisation (Section 1.2.3) – The wish to convey ideas of figurative, abstract or universal kind (Section 1.2.6)
Note: the use of the distributive plural is mostly blocked; there rarely are exceptions.	Note: the use of the distributive plural is mostly blocked, but sometimes there are exceptions.	Note: the use of the distributive singular is enabled, but the use of the distributive plural is still possible.

2. Free variation

The occurrence of both plural and singular objects with the two constructions in clauses with plural subjects and the uncertainty expressed by authors about the rules governing number preference in objects following plural subjects naturally raise the question of free variation between the distributive plural and singular in English. Free variation is very simply defined as "variation in which [...] forms can be used without any contrast or change of meaning" (Brown & Miller 2013: 170). As might be expected, the problem is to determine the limits of contrast or meaning change beyond which we can speak of free variation.

Given the existence of weak blocking factors which make the use of both the distributive plural and singular in a particular sentence possible, apparently without a significant difference in contrast and meaning, serious consideration of free variation is clearly warranted. With regard to sentences such as (21) – (28), it is

7. Nevertheless, it needs to be stressed that the list may not be complete and that there may be other blocking or enabling factors which were missed by the authors we refer to.

not possible to say which sentence in each sentence pair is, at first sight, more *acceptable, correct* or simply *better*. This makes the problem of deciding whether one should use the distributive plural or the distributive singular somewhat tricky. The fuzzy borders between the domains of the distributive plural and the distributive singular lead to conclusions such as Casagrade's (2013) "So what's the correct choice? There isn't one".

Casagrande makes a point of the importance of subjectivity and personal preference. Also, Sørensen (1985: 349) writes about "vacillation between 'change gear' and 'change gears'" and observes the usage sanctioning the distributive plural in some cases, the distributive singular in others, and cases in which both options appear to be equally good. It is those cases that seem equally acceptable with both the distributive plural and the distributive singular; see, e.g. (21) and (22) above, which argue for potential free variation in non-verbal number agreement.

A focused attempt to "factor out" *free variation*, also referred to as *free choice* in grammar, was made by Cappelle (2009: 19), who defines free choice as "the availability in a given discourse situation of two (or more) options none of which a calculation based on an exhaustive set of factors singles out as clearly the most appropriate in that situation". In his research on positional variability of verbal particles in English (see (29) and (30)), as a possible case of free variation, Cappelle (2009) mentions a few distinctions which might play a role in deciding whether a given case represents free variation or involves functional alternatives.

(29) Don't just throw away that wrapper. (Cappelle 2009: 83)

(30) Don't just throw that wrapper away. (Cappelle 2009: 83)

Among these distinctions there are, e.g. (i) the establishedness (entrenchment) vs newness (novelty) of a given phrase and (ii) literalness (transparency, compositionality) vs idiomaticity (opacity, non-compositionality) of a combination. In his analysis, he refers to Lohse et al. (2004) and Gries (2003), who both claim that idiomatic phrases split less easily than non-idiomatic ones. This finding bears similarity to what we see when we look at invariable idioms/fossilised phrases in which the number of their components does not change easily (see discussion in 1.2.2). Cappelle's conclusion is that free choice is "not an illusion in some cases", however awkward that may be for variational linguistics. He recognises both the possibility that two options simply cannot be factored out (true free choice) and the fact that a 'wrong' choice is sometimes made by a speaker, although the factors predict otherwise. He accounts for these possibilities by pointing out that determining factors are "seldom hundred per cent compelling" and typically operate as statistical tendencies. Also, the seemingly free choice may sometimes be the outcome of the "opposing influences of different factors" (Cappelle 2009: 19).

One of the aims of the present study is to examine whether at least some of the cases in which both the distributive plural and the distributive singular are acceptable might be seen as instantiations of free variation in grammar. The natural candidates for this are situations subject to the operation of what we term *weak blocking factors* or *distributive singular-enabling factors* (see Table 1). In these cases, the use of the distributive singular is enabled, but the use of the distributive plural is also possible, i.e. (21) and (22), or (23) and (24) very likely display free variation. On the other hand, we are disinclined to see (17) and (18) as instantiations of free variation, as the former exemplifies the generally accepted, substantially more frequent way of using the construction in question (the form *made their way* occurs 1624 times in COCA, whereas *made their ways* has a raw frequency of three). It is crucial that any case of potential free variation is acceptable by the language users and attestable in reliable language sources, such as corpora of the English language, containing authentic texts.

In order to put our discussion of free variation in the context of non-verbal plural number agreement on a firm basis, we have collected sufficient data to help us understand the picture more clearly. Data collection and analysis are described in the following sections.

3. The distributive plural and singular displayed by selected expressions in English corpora

To determine the actual incidence of the distributive plural and singular in the two constructions under examination, two corpora of the English language – the BNC and COCA – were consulted. The distributive plural form was expected to be much more frequent than the distributive singular. The question was how much more frequent it is, whether there are differences with regard to the regional variety of English represented by the two corpora and whether genre was a factor, too.

The two expressions, *lose one's life* and *lose one's job*, chosen for analysis as typical examples clearly revealing the different tendencies in using the distributive plural and singular in English compared to other languages, are structurally similar, but presumably differ in idiomaticity. The first one was chosen for being a recognised idiom both in dictionaries of idioms (e.g. Cowie, Mackin & McCaig 1983) and general dictionaries, such as the Cambridge Dictionary Online,[8] which defines it as 'to die suddenly because of an accident or violent event'. Example (31) is taken from a corpus:

8. Cambridge Online Dictionary, s.v. *lose your life*, retrieved on November 13, 2020 from https://dictionary.cambridge.org/dictionary/english/lose-your-life.

(31) He might lose his life and save his soul. (COCA: 1996; SPOK)

The status of the construction *lose one's job* (32) in general dictionaries, on the other hand, is not so clear. It does not have a separate entry in the Cambridge Dictionary Online, so it is considered non-idiomatic, though, e.g. Merriam-Webster[9] lists it as fixed. It can be best regarded as a strong collocation.

(32) So even if they lose their jobs, they still will be covered. (COCA: 1991; SPOK)

The two constructions were selected precisely because it is claimed that they show different degrees of fixedness or fossilisation (a strong blocking factor), which could have a bearing on how much the use of the distributive plural will be blocked. The indication of joint possession (Section 1.2.5), another strong blocking factor, seems to be relatively well controlled for – *life* and *job* being rarely literally shared by a large number of individuals. On the other hand, both *life* and *job* may be interpreted as having a figurative, abstract or universal meaning (Section 1.2.6), which could favour a change in the perspective leading to singularisation to achieve generalisation (Section 1.2.3). Accordingly, we may expect these two distributive singular-enabling factors to be at work, and the two phrases, being predisposed to be used with both the distributive singular and plural, to be good candidates for the study of potential free variation.

3.1 Methodology

The extraction of data is described by the following list of consecutive steps:

- The interactive online search engine at https://www.english-corpora.org is used for both the BNC and COCA.
- Two queries for *lose one's life* are: (1) [lose] _app* life and (2) [lose] _app* lives. The [lose] part comprises all inflected forms of the verb *to lose*. The symbol _app* refers to all possible possessive pronouns.
- The query for *lose one's job* is [lose] _app* [job].
- Both singular and plural subject cases are collected.
- The BNC dataset consists of 632 hits, the COCA dataset is sixteen times larger – 10,144 hits.
- Manual qualitative assessment is applied with *their* before singular object, e.g. *lost their life* or *losing their life*, to distinguish between cases of authentic plural subjects having singular objects and cases in which *their* was used to refer to pronouns such as *anybody, somebody, everybody*.

9. Merriam-Webster, s.v. *lose one's job*, retrieved on November 13, 2020 from https://www.merriam-webster.com/dictionary/lose%20one%27s%20job.

- Care was taken to remove the cases containing the noun phrase *life savings* and not just *life* (5 instances in the BNC; 37 instances in COCA), such as *lost their life savings* or *lost her life savings*, from the datasets.
- For the variants containing the possessive pronoun *your*, manual assessment of data was conducted. Most of the cases turned out to unambiguously refer to the second-person singular. Sentence (33) provides an example. Still, in some of the cases, both the singular and the plural object might be possible, depending on the interpretation.

  (33) (...) but it's better to lose the engine than lose your life... and the lives of those with you in the car. (COCA, 2012)

- The data analysis is conducted with the use of R,[10] with its integrated development environment RStudio,[11] Due to the meticulous visual exploration and manual qualitative assessment of the data (described above), it is expected that the precision is very high.

3.2 Results

3.2.1 *Results: The BNC*

Table 2 presents the summary of the results for the two constructions in question divided into raw frequency of cases with (i) singular subject and singular object; (ii) plural subject and plural object; (iii) plural subject and singular object. In the dataset, there are no cases in which a singular subject would take a plural object. As we can see, the phrase *lose one's job* is, in general, more frequent than *lose one's life*.

Table 2. Summary of the BNC results

Group	*lose one's life*	*lose one's job*	Total
Plural subject; (distributive) plural object	94	241	335
Plural subject; (distributive) singular object	0	19	19
Singular subject; singular object	62	216	278
Singular subject; plural object	0	0	0
Total	**156**	**476**	**632**

10. **R** Core Team (2013). **R**: A language and environment for statistical computing. **R** Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

11. RStudio Team. 2020. RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL http://www.rstudio.com/.

Table 3 contains results for the subset of data which are the focus of the present study. All in all, there are 260 cases of the *lose one's job* phrase with a plural subject. The majority, 92.7% (241), contain a plural object, while 7.3% (19) contain a singular object. For the phrase *lose one's life*, there are no cases in which there would be no correlative distribution – 100% of the distributive plural cases (94) have a plural object.

Table 3. Summary of the results for the BNC plural subject cases

Group	*lose one's life*	*lose one's job*
Plural subject; (distributive) singular object	0	19 (7.3%)
Plural subject; (distributive) plural object	94 (100.0%)	241 (92.7%)

3.2.2 *Results: COCA*

In the COCA data, there are 10,143 instances of the two constructions (2,326 of the *lose one's life* construction and 7817 of the *lose one's job* construction). Table 4 presents the summary of results obtained from the corpus for each of the constructions.

Table 4. Summary of the COCA results

Group	*Lose one's life*	*Lose one's job*	Total
Plural subject; (distributive) plural object	1394	2868	4262
Plural subject; (distributive) singular object	47	284	331
Singular subject; singular object	882	4651	5533
Singular subject; plural object*	3	14	17
Total	**2326**	**7817**	**10143**

* An example sentence from this category is *I just hope that nobody lost their lives from this tornado* (COCA: 2013; SPOK).

The table shows that COCA contains 4,593 cases with distributive (singular or plural) objects, which is 45.3%, i.e. almost half of the total of 10,143 instances of the two constructions in the corpus. Leaving singular subject cases out of the discussion (they are added to give an idea of the overall distribution of these two constructions), we can see that 4,593 distributive object cases comprise 4,262 distributive plural object cases (92.8%) and 331 distributive singular object cases (7.2%). Also, the relative proportions of the two constructions with distributive objects in COCA differ: the *lose one's life* construction represented by 1,394 sen-

tences forms only one third (32.7%) of the total, compared to the *lose one's job* construction (2,868; 67.3%).

More importantly, there is a clear difference between the two constructions in the incidence of the distributive singular objects: the *lose one's life* construction with the total of 1,441 plural subject sentences occurred with the distributive singular object in only 47 cases (3.3%). By contrast, the 3,152 *lose one's job* construction sentences with plural subjects exhibited 284 cases of distributive singular objects (9.0%), i.e. 2.7 times more than the *lose one's life* construction. Table 5 contains a summary of results for the cases with a plural subject.

The COCA results appear to be, in general, similar to the BNC results; however, given the fact that COCA is a larger a corpus, we find more instances of the constructions we search for. Still, in the BNC we had no cases of the *lose one's life* construction with a plural subject and a singular object, so the correlative distribution was absolute for this phrase. Here, in the COCA dataset, we do see there is a certain (relatively small) percentage of cases in which there is a singular object for a plural subject.

Table 5. Summary of the results for the COCA plural subject cases

Type	*lose one's life*	*lose one's job*
Plural subject; (distributive) singular object	47 (3.3%)	284 (9.0%)
Plural subject; (distributive) plural object	1394 (96.7%)	2868 (91%)

3.3 Comparison of the datasets: Implications for the two varieties of English and free variation

The results shown in 3.2.1 and 3.2.2 give us some first impressions of how frequent the use of the distributive singular is, compared to the general norm in the two corpora and, consequently, in the two varieties of English with regard to the two constructions selected for the study.

In the BNC data for the *lose one's life* type, we see a 100% correlative distribution when it comes to the number of the subject and the object – there are no cases instantiating the distributive singular. The situation is somewhat different for the *lose one's job* type: although there is a visible tendency for the subject to take an object of the same number, in 7.3% of the cases with a plural subject, there is a singular object. Interestingly, these findings are at odds with the assumption that *lose one's life* is a more fixed (fossilised) construction than *lose one's job* and, therefore, less amenable to a formal change. If we see the distributive plural as a context-dependent feature, then there is much less (COCA) or no (BNC) singular form

occurrence detected for *lose one's life*, which is not consistent with the claim made in dictionaries that its degree of idiomaticity is higher.

The COCA results seem very similar with regard to *lose one's job* (9.0% of plural subjects have a singular object). A more marked difference between the two datasets, however, is *lose one's life*. In COCA, 3.2% of the cases containing a plural subject have a singular object. This number is not large, but compared to 'no such instances' in the BNC, it does call for an explanation.

These results are hardly enough to warrant a sweeping generalisation with regard to regional variation; we can only tentatively guess that in American English, the distributive plural tendency is slightly weaker than in British English.

The number of plural subject/singular object sentences in the two corpora is 350, i.e. 7.1% of the total of 4,947 plural subject sentences containing *lose one's life/job* in both corpora. The question is, how many of the singular objects in these 350 sentences can be freely replaced by distributive plural objects? The precise answer would require an extensive survey of the questionnaire type involving native English speakers. However, in terms of (weak) blocking factors, there is a certain proportion of cases which are likely to instantiate free variation. Below, there are three cases taken from the distributive singular dataset of COCA (see (34–36)). In all of them, the distributive singular could be replaced with the distributive plural without a very significant change in meaning or without risking unacceptability; see (37–39).

(34) How many people that trusted you lost their life today because you were doing your job? (COCA: 2002; TV)

(35) Sad for those who lost their life. (COCA: 2004; NEWS)

(36) They made it very clear beforehand that we will lose our job if we did violate this rule. (COCA: 2012; SPOK)

(37) How many people that trusted you lost their lives today because you were doing your job?

(38) Sad for those who lost their lives.

(39) They made it very clear beforehand that we will lose our jobs if we did violate this rule.

By the same token, such a replacement would be highly unlikely in cases like (40), compared to (41), because of the presence of *it* at the end of the main clause, denoting the assumed number of the noun standing in the focus. One could change the number of *life* in (40) to plural, but only if the singular number *it* was changed to plural *them* simultaneously, which is more than one needs to do in sentences (37–39).

(40) We are to lose our life so that we may find it, give our life so we might save it.
(COCA: 2012; BLOG)

*(1) We are to lose our lives so that we may find it (...)[12]

It is quite possible, though, that even the questionnaire survey might not offer a definitive answer and resolve the issue, with some respondents going along with the general trend (and insisting on the distributive plural), some observing the blocking factors (and using the singular, claiming there is free variation) and some simply making an error as predicted by Cappelle (2009: 19).

4. Genre and free variation

Another variable to be explored is the *genre* of the texts containing the instances of the distributive singular to find out whether their occurrence is genre-bound. These cases are compared with the control group of randomly selected distributive plural cases. The assumption behind this comparison is that if the cases in which the singular is used, are to be seen as potential free variation, the genre-related distribution should also be similar to the distribution of the control group – randomly selected instances containing the more frequent form of the distributive plural. A scenario in which the genre-related distribution is completely different speaks against the possibility that the two variants can be seen as true alternatives. To the best of our knowledge, there are no other studies concerning the potential influence of the factor genre on free variation; thus, we see our work as proposing a new condition for two alternatives to be seen as such: they need to have a similar distribution across different genres. Genre analysis was made only on the COCA data because of the uneven genre representation in the corpora.[13]

In COCA, the texts come in eight genres, *TV and Movies subtitles* (TV/MOV), *spoken* (SPOK), *fiction* (FIC), *popular magazines* (MAG), *newspapers* (NEWS), *academic journals* (ACAD), *blog* (BLOG) and *web pages* (WEB). The genres are almost equally represented (12.5% each on average), which makes the comparison of subject–object distribution across genres meaningful.

12. The asterisk is used here to indicate that the example contains an incorrect sentence.

13. No comparison for the BNC dataset is offered, as (i) the different structure of the corpus and uneven proportions of the genres included and (ii) the relatively low number of the distributive singular instances detected (19 instances for *lose one'job*, no instances for *lose one's life*) are likely to make the analysis very hard in terms of manageability and skew the results.

Given that there are only 47 distributive singular instances of the *lose one's life* construction in COCA, the random control sample of the same size would be too small. Therefore, it was decided to use a control sample three times as large, and the same goes for the *lose one's job* instances.

The present section offers a close-up look at the COCA dataset, namely:

i. all 47 instances of the *lose one's life* construction with a plural subject and a singular object (=distributive singular) and a control group of 150 random cases with a plural subject and a plural object (=distributive plural), for details on the dataset see Section 4.2;
ii. all 284 instances of the *lose one's job* construction with a plural subject and a singular object (distributive singular) and 850 random cases containing a plural subject and a plural object (distributive plural).

Figure 1 presents the comparison between the distributive singular and the distributive plural cases for the *lose one's life* construction; Figure 2 does the same with regard to the *lose one's job* construction.

The random cases for both control groups were selected using the sample function of the COCA interactive interface. The queries entered for each of the phrases were [lose] _app* lives and [lose] _app* jobs. The instances were manually assessed to assure that each case really represents the distributive plural.

As we can see in Figure 1,[14] the distributive singular dataset and the distributive plural control group have very similar distributions across genres. For both the former and the latter, the majority of instances are found in the *spoken* genre. Furthermore, the genres of *blog* and *web* also seem to be good sources of the *lose one's life* phrase with a plural subject and both singular and plural object. No case of *lose one's life* with plural subject and singular object has been attested in the *magazine* genre. Furthermore, some differences between the datasets can be seen with regard to the frequency of each variant in the genres of *academic texts* and *news*. These genres seem to have a certain preference for the distributive plural; however, the usage of distributive singular is attested in each of them.

All in all, the distribution across genres in the bottom chart of Figure 1 seems to be somewhat more balanced than in the case of the top chart, which could be a result of the fact that the control dataset is more than three times larger than the distributive singular dataset.

The situation appears to be similar in the case of the *lose one's job* phrase; see Figure 2. Here, too, the distribution of cases in the two datasets seems rather similar. For both forms, the highest number of cases can be found in the *spoken* genre. Still, in the distributive plural dataset, the *spoken* genre is followed by the

14. The graphics are created in the ggplot2 package.

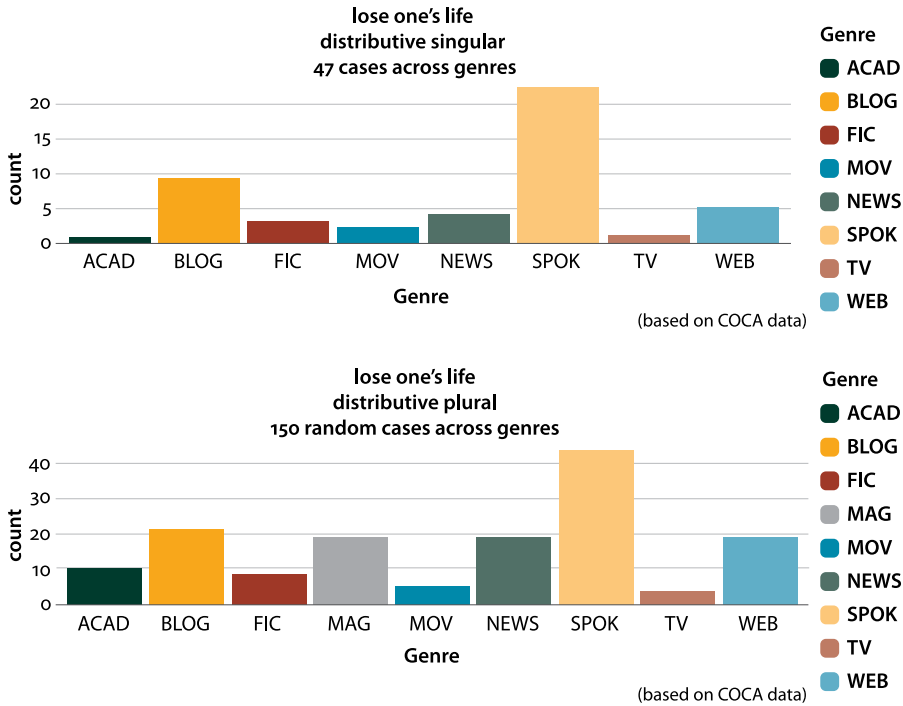

Figure 1. *Lose one's life* – the distributive singular and the distributive plural across genres

news genre, which is not the case in the distributive singular dataset. In the case of *blog, web, academic journals, TV and Movies subtitles*, the overall distribution seems similar.

To summarise, for both phrases, the general tendencies observed in the four datasets tend to be rather similar. For both phrases, the genres with the highest rate of occurrence of both variants (the distributive singular and the distributive plural) are *spoken, blog* and *web*, except for the control group of *lose one's job*, where it is the genre of *news* (followed by *spoken, blog* and *web*). Interestingly, the three genres probably contain textual material of rather informal and personal kind, and some of it may be seen as representing spontaneous production. The high frequency of *lose one's job* in the *news* genre might probably be explained by the fact that unemployment seems to be a regular topic on the news. It is also possible that, because of this, the distributive plural form has been conventionalised in the news genre (which could explain the relatively low frequency of the distributive singular variant).

The section shows that the distributive singular cases do not differ from their distributive plural counterparts in terms of the genre in which they occur (see Figure 1 and Figure 2). This fact can be seen as an argument in favour of

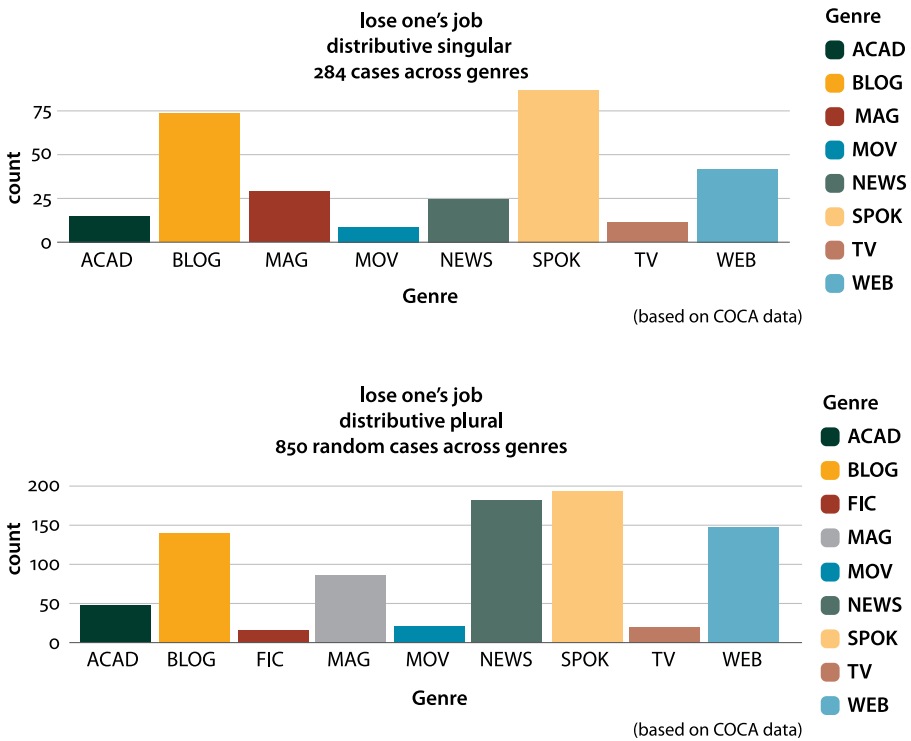

Figure 2. *Lose one's job* – the distributive singular and the distributive plural across genres

the hypothesis that in certain scenarios, such as in the presence of distributive singular-enabling factors (see Table 1), the distributive singular and the distributive plural can be seen as true equivalents. If the genre-related distribution was, for both variants, completely different, we would interpret it as a not-yet-detected constraint on the use of the distributive number form.

5. Conclusions

The corpus data confirms the presence of numerical concord between the plural subject and the object in the two studied expressions. We believe that we can reasonably expect them to reflect the general tendency as to the proportion of the distributive plural and singular in other such English constructions, which warrants a comparison with languages held to display preference for the distributive singular. The incidence of distributive singular object cases in *lose one's life* and *lose one's job* (with a plural subject) vary from 0–3% for the former to 7%–9% for the latter phrase (the BNC vs COCA). The differences between the British and the American datasets could result from regional variation; however, they might also be due to the differences between the corpora. As the genre analysis shows, the two phrases exhibit a certain tendency to appear in informal genres, such as *blog, spoken* and *web* (not found in the BNC).

The possibility of free variation, i.e. free choice in distributive number, seems to be due to the 'weak' factors among those blocking the use of the distributive plural. At least two of the scenarios described (Section 1.2) can be considered 'good candidates' for allowing free variation, namely, singularisation serving to express generalisation and the wish to convey ideas of a figurative, abstract or universal kind (they are referred to as *distributive singular-enabling factors*). In contrast, the remaining factors are not conducive to free variation since the use of the distributive singular is, in these cases, crucial to conveying the desired meaning or for being grammatically and pragmatically acceptable. The expressions under study show some degree of idiomaticity, and so the fossilisation factor cannot be completely ruled out, although they can be used in the two 'good candidate for free variation' scenarios.

The study assumes that, with potential free variation, both distributive plural and singular object variants should be acceptable to language users and attested in reliable language sources, such as corpora of English. Indeed, for both constructions, the singular–plural variant seems to be an option in the COCA, albeit relatively infrequent and marginal. The BNC contains fewer instances of the distributive singular, and in the case of *lose one's life*, no instances at all.

Based on the findings, some of the distributive singular cases of *lose one's life* and *lose one's job* can be reasonably interpreted as instances of free variation on account of (i) quantitative corpus evidence of sentences with objects in both plural and singular; (ii) the existence of weak blocking factors that allow both distributive forms; and (iii) a similar distribution of the distributive singulars and plurals in different genres, suggesting a general pattern without genre-specific or other constraints than those following from blocking factors. The data, however, does not answer the question of how much free variation there is in non-

verbal number agreement. This would require careful, individual assessment of sentences with a particular construction or a particular group of constructions, taking into account all the blocking factors (free variation is dubious in, e.g. fossilised/invariable idioms). Finally, by analogy, some of the distributive plural cases may actually represent free variation as much as the distributive singular cases.

Also, the phenomenon of free variation itself raises questions such as 'How big a role does subjectivity play?' or 'Are our assumptions and calculations of the most probable choices and most suitable versions always reliable?'. According to Cappelle (2009), the answer to this latter question might actually be *no*. Free variation seems to follow its own path – it can manifest itself even if we clearly see (or calculate), given all the constraints and assumptions, that one particular form should most likely be chosen over another form. The "expected" form is sometimes "not the form that is actually chosen by the speaker" (Cappelle 2009: 19). Furthermore, he claims that "[even an] exhaustive list of determinants may never be able to completely rule out a speaker's freedom of choice" (2009: 20).

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CHAPTER 5

‘Optional’ direct objects: Free variation?

Vilma Symanczyk Joppe
Heinrich-Heine-Universität Düsseldorf

While the existence of free variation is widely acknowledged in phonology, it has often been denied for lexicon and syntax. Syntactic variation, according to the consensus among many, is never truly free; apparent counterexamples are just cases of undetected complementary distribution. Among these phenomena suggesting free variation are optional objects in German, which can be and have been described as valency alternatives of individual verbs.

In this paper, linguistic units – phonemes as well as lexemes and syntactic configurations – are uniformly modelled as interpretation and production rules of different strengths, allowing for redundancies due to the licensing of the same structure on different linguistic levels. Introductory examples from phonology are extended to morphology and eventually to the aforementioned ‘optional’ direct objects. Based on a large acceptability rating study, it will be shown that most of the phenomena in question are neither cases of free variation nor of complementary distribution; instead, they are the result of partially equivalent distribution systematically arising from the conflict of rules of different degrees of specificity on different linguistic levels.

Keywords: valency, constructions, null instantiations, direct objects, free variation, complementary distribution, partially equivalent distribution, acceptability judgements

1. Human behaviour, flying saucers and the afterlife, or: Is there free variation in syntax?

More than sixty years ago, Bolinger (1956:345) wrote on free variation (FV): “Two linguistic theories are in conflict here. One, old and well established, is that there is no such thing as an exact synonym. […] The second is a recent borrowing from phonology: that it is possible to have two or more forms in ‘free variation’”. Bolinger then argues that an apparent case of FV (inflectional endings in Spanish) actually exhibits a clearly systematic distribution and concludes: “Free variation

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has proved itself in phonology. It has not proved itself at higher levels, and [...] one may well question it wherever it has been applied in syntax".

Since then, positions have not fundamentally changed. There is still no consensus about FV in syntax. When its existence is denied, the argumentation is often theory-driven (e.g. Goldberg's 1995 Principle of No Synonymy). Although several empirical case studies in favour of FV phenomena do exist (e.g. Cappelle 2009), none of these has led to an eventual common acknowledgement of syntactic FV.

How can that be? In accordance with basic principles of empirical research, a hypothesis H1 stating the non-existence of a phenomenon P must be denied at the point at which clear instances of P are witnessed. While H1 cannot be verified, its counterhypothesis H2 may be made implausible on grounds of probability ('If P existed, it should be known by now'). Consequently, doubt between H1 and H2 should only arise when P is either not accessible (e.g. the question of extraterrestrial life in other galaxies, the afterlife, or human behaviour in possible alternative worlds) or when methods are not (yet) sufficient for a conclusive approach (e.g. the 18th century neptunism-plutonism debate in geology or the 1930s/1940s discussion of whether communication between neurons is electrical or chemical). But why is it that phonology – with the same object of research, i.e. human language – could so easily dispense with the problem while it has remained acute for decades in syntax?

My approach to this question is that the problem lies in an unsystematic treatment of context. In this paper, I will firstly (Section 2) make some proposals how variation – free as well as context-dependent – could be modelled in a uniform way, discussing some uncontroversial, standard examples of variation (or non-variation) in phonology. I will then proceed to a phenomenon between lexicon and morphosyntax (variation between a compound and the unspecified head of the compound) and show how the choice depends on the context and which mechanisms are necessary to explain how the 'variants' are chosen and interpreted, suggesting that it represents a third type of variation: variants in partially equivalent distribution. In Section 3, I will introduce the phenomenon of optional verb complements – in my case, direct objects – with examples from the literature, showing where the variation lies and how it can be modelled with the same toolbox as the phenomena in Section 2. The following examples[1] illustrate the kind of variation central for this paper (and also suggest some of the contextual limitations that are involved):

1. Examples (25e), (27b) and (45a) in the paper.

(i) *Hast du schon (Mittag) gegessen?*
have.2SG 2SG already lunch[ACC] eat:PTCP
'Have you already eaten lunch?'

(ii) *Sie haben (etwas) gelesen.*
3PL have:3PL something[ACC] read:PTCP
'They were reading something.'

(iii) *(Das Getränk) gut gekühlt trinken.*
the[ACC] beverage[ACC] well chill:PTCP drink:INF
'Drink this beverage well chilled.'

I will then argue for acceptability judgements – with strict control of all relevant factors – as an adequate method to investigate those variants (Section 4) and discuss some data from an extensive acceptability rating study of my own, connecting them to the proposals made in Section 3. In my conclusion, I will try to contribute to the initial question: is there any FV in syntax, and is it different from variation in phonology or morphology?

2. Modelling variation

To treat variation in a uniform way suitable for all linguistic levels, I will make use of the following strategy: I will decompose linguistic structures, types as well as tokens, into rules, i.e. instructions to map (or assign) a form to a meaning and vice versa. This is essentially a question of perspective. If such a rule is restricted to certain formal or meaning contexts, these contexts are included in the input of the rule. I will also suggest that these rules can have different strengths, which will become relevant for variants in partially equivalent distribution, which I will introduce in Subsection 2.2.

2.1 Rules for allophones in free and complementary distribution

Disregarding the details, the formal requirements for a pair of linguistic structures to qualify as FV can be defined as follows:

> DEFINITION OF FREE VARIATION
> If, in a language L, a form F_1 can be substituted by a form F_2 in a context C, without a change of meaning of C (indicating incompatibility with the semantic-pragmatic context M_C) or a loss of well-formedness of C (indicating incompatibility with the linguistic-formal context F_C), both F_1 and F_2 are in free variation.

This definition can be interpreted in a broad or in a narrow sense (cf. e.g. Meibauer 2015: 87f.). In the narrow definition, individual speakers of a language L with two variants F_1 and F_2 actually use both F_1 and F_2 (intra-speaker variation). In the broad definition, two variants F_1 and F_2 are acceptable and interpretable within a language L, but individual speakers of L will either use F_1 or F_2 (inter-speaker/intra-system variation). Often, the choice for F_1 or F_2 can be attributed to speaker groups constituted by regional or sociological criteria. For the remainder of this paper, I will not investigate the choices of individual speakers but only focus on what is possible and interpretable in a language system. This is mainly for methodological reasons: in the design of my study (cf. Section 4), it is not possible to capture what an individual speaker really does, only what they judge as acceptable.

If one of the conditions from the definition of FV is not fulfilled, F_1 and F_2 are not free variants but instances of other phenomena. Table 1 shows the combinations which are possible for two distinct forms, based on the parameters F, F_C and M_C. M – 'meaning' or 'meaning contribution' – is coloured grey, because for these examples, it is a reflex of M_C. The examples are well discussed in the introductory literature (e.g. Ramers 1998: 46–50; Lüdeling 2009: 54–60; Meibauer et al. 2015: 85–88).

Table 1. Phonemes and allophones in equivalent and complementary distribution (examples from Ramers 1998)

	Same sign, same context		Different signs, same context	Same sign, different contexts	Different signs, different contexts
Signs	**Allophones in free (mere intra-system) variation ([R]/[r])**	**Allophones in free (intra-speaker) variation (FV) (alveolar [t] vs dental [t])**	**Phonemes (same distribution, e.g. /k/ and /p/)**	**Allophones in complementary distribution ([ç]/[x])**	**Phonemes (in complementary distribution, e.g. [h] and [ŋ])**
F	2	2	2	2	2
M	1	1	2	1	2
F_C	**1**	**1**	**1**	**2**	**2**
M_C	**1**	**1**	**2**	**(1)**	**(2)**

For a more general treatment of FV, I have replaced the classic values 'category' and 'meaning' with 'context form' (F_C) and 'context meaning' (F_M). F_C refers to the set of linguistic contexts in which F can be inserted and produce a well-formed structure of the respective language – with the idea in the back of the mind

that the 'meaning side' of linguistic categories (like natural classes in phonology, parts of speech, etc.) as second-order observations[2] should be more or less identical with the distribution of the respective forms.[3] Correspondingly, M_C (substituting the classic 'atomic' meaning of the form in question) is based on the idea that the meaning of a form can be equated with its meaning contribution in a set of contexts.[4] This approach has the obvious benefit that the allophonic/phonemic level can be categorised with the same toolbox as the levels 'above': allophones in free variation – e.g. different realisations of /ʀ/ in onset position in German – can be viewed as slots in their contexts (words and morphemes) in which one or the other is inserted, never changing the meaning of the respective context and, therefore, making the same contribution to meaning.[5] This is the ontological ground on which the well-known second-order observation of grouping the different realisations (here, phones) together to the same class (here, phoneme) can be carried out.

Allophones in complementary distribution, on the other hand – e.g. the well-established example of German [x] vs [ç] – can be identified as belonging to the same class on similar grounds. Of course, due to the differences in formal (here, phonological) distribution, F_1 and F_2 are never truly interchangeable: [x] occurs only after back vowels,[6] while [ç] occurs morpheme-initially and after front vowels and consonants. Their identical contribution to meaning, however, is revealed in allomorphs: in German, nouns with back-vowels as nuclei (like in *Bach* [bax] 'small stream', *Loch* [lɔx] 'hole', *Buch* [bu:x] 'book' or *Bauch* [baʊx] 'belly') have *Umlaut* allomorphs, which are chosen in certain morphological contexts, e.g. plural suffixes or the diminutive suffix *-lein* (as in *Bäche/Bächlein, Löcher/Löchlein, Bücher/Büchlein, Bauch/Bäuchlein*). The nuclei of those *Umlaut* allomorphs are occupied by [ɛ], [œ], [ʏ] and [ɔɪ] instead of [a], [ɔ], [u] and [aʊ],

2. A term borrowed from general systems theory, here meaning 'not elements of language but elements of the description of language'.

3. This, of course, is more a desideratum than a fact due to the complexity of natural languages. Accordingly, in linguistic practice, we often abstract away from that principle if we treat those categories (esp. N, V, P, etc.) like linguistic primitives; as a result, we have the descriptive benefit of a handier set of elements, paid for by descriptive inadequacies because the resulting rules often tend to overgeneralise.

4. Cf. Firth's (1957) saying, "You shall know a word by the company it keeps".

5. This is a case of FV in the broad sense, as the choice of F_1 or F_2 can be attributed to regional and social factors (cf. Kohler 1995: 165f.).

6. Often, an additional subdifferentiation is made: [x] occurs only after tensed high back vowels and [χ] after the other back vowels (cf. e.g. Pompino-Marschall 2003: 265). In this overview, I adhere to the model presented in Ramers (1998); Lüdeling (2009) and Meibauer et al. (2015) for the sake of simplicity.

thereby crossing from the context relevant for [x] to the context relevant for [ç] with a consistent meaning of the stem (and, therefore, an identical meaning contribution M). Sounds in complementary distribution which do not occur in allomorphs, such as [h] (only syllable-initial) and [ŋ] (only syllable-final and ambisyllabic), are accordingly classified as belonging to different phonemes.[7]

In Table 2, I describe the linguistic signs from Table 1 – phonemes and allophones – in a form that I will use for the remainder of the paper, namely, as pairs of production and interpretation rules. As suggested above, M on the phonological level is not a classic meaning but the meaning contribution a phoneme has in a morpheme or lexeme.

Table 2. The linguistic units from Table 1, formalised as production and interpretation rules

Linguistic units	**Production rules**	**Interpretation rules**
phonemes (e.g. /k/ and /p/)	M: /k/ -> F: [k] M: /p/ -> F: [p]	F: [k] -> M: /k/ F: [p] -> M: /p/
phonemes (in complementary distribution, e.g. [h] and [ŋ])	M: /h/ -> F: [h] M: /ŋ/ -> F: [ŋ]	F: [h] -> M: /h/ F: [ŋ] -> M: /ŋ/
allophones in free (inter-speaker) variation ([R]/[r])	System A: M: /ʀ/ -> F: [ʀ]	System A: F: [ʀ] -> M: /ʀ/ F: [r] -> M: /ʀ/
	System B: M: /ʀ/ -> F: [r]	System B: F: [ʀ] -> M: /ʀ/ F: [r] -> M: /ʀ/
allophones in free (intra-speaker) variation (FV) (alveolar [t] vs dental [t])	M: /t/ -> F: $[t]_{+dent}$ v $[t]_{+alv}$	F: $[t]_{+dent}$ -> M: /t/ F: $[t]_{+alv}$ -> M: /t/
allophones in complementary distribution ([ç]/[x])	M: /ç/ ∧ $F_{C:}$ $(V_{[+back]\_\_\_})_{\mu}$ -> F: [x] M: /ç/ ∧ $F_{C:}$: ¬ $(V_{[+back]\_\_\_})_{\mu}$ -> F: [ç]	F: [x] -> M: /ç/ F: [ç] -> M: /ç/

7. The latter argumentation is essentially a top-down explanation (as associated with Construction Grammar). A bottom-up explanation would necessarily have to leave the realm of meaningful units as well as that of linear order and argue with motoric properties of sounds (distinctive features): strong similarities between the allophones in complementary distribution vs weak similarities between the phonemes in complementary distribution (cf. e.g. Ramers 1998: 48f.).

The production rules can be seen as instructions for how the respective meaning M can be (linguistically) expressed; the interpretation rules, as instructions for how the respective form must be interpreted. Now, several observations can be made:

Quite obviously, only phonemes are symmetrical when formalised as rules. For the allophones in inter-speaker/intra-system free variation, there is one production rule standing opposite two interpretation rules: though a speaker does not produce the respective allophone, they can interpret it. For the allophones in intra-speaker free variation, there is also one production rule opposing two interpretation rules. Furthermore, the input side of the corresponding production rule embeds alternatives and is, therefore, not identical with the input sides of the interpretation rules. Please note that the production rule M: /t/ -> F: $[t]_{+dent}$ v $[t]_{+alv}$[8] might as well be represented as two production rules with identical input sides. To capture the difference between these rules and the production rules for different phonemes, I adopt a popular idea from usage-based grammar/neuronal networks (that frequency plays a role in the psychological implementation of rules; e.g. Goldberg 2006) and combine it with an idea from optimality theory[9] (that rules can be ranked in a hierarchy and can be violated if this prevents the violation of a higher-ranked rule; e.g. Kager 1999). In other words, I suggest assigning a strength to each rule, based on its relative frequency:[10] the number of

8. The representation as a single rule with alternatives is based on the idea that FV can be seen as a slot in a larger context for which there is more than one choice. In this, it resembles the very general distributional categories (like V and C in phonetics or N, V and P in syntax); these categories and the templates built up from them can be seen as generalisations over contexts which have a concatenable meaning $M_{C(1 \ldots n)}$ in a language L (or parts of such contexts). This most general meaning condition only draws a line between the set of motorically produced sounds which are linguistic in L and those which are not.

9. Please note that this is not an OT approach in a strict sense: in OT, a weaker rule in conflict with a stronger rule would never apply (to prevent the stronger rule from a fatal violation), but the weaker rule might apply in this model, though with a lower probability.

10. The basic idea of the model presented here – namely, that relative frequencies of language tokens can be captured as rules of different strengths – is known from suggestions by Labov (1972) as well as neural network models based on Hebb rules and probabilistic learning models like naïve discriminative learning (e.g. Baayen 2011). Here, it is a way of capturing the structural coupling of linguistic systems, i.e. the communicative system based on a language L and consisting of language tokens (with relative frequencies), which are in turn the input for the cognitive systems consisting of the mental representation of these frequencies in the form of production/interpretation rules, which in turn produce more language tokens with relative frequencies determined by the rules. Diachronically, this structural coupling will result in certain feedback effects leading to the weakening (and, ultimately, the reduction) of the weaker rule in a pair of competing rules describing free variants (either with different results for speaker groups or for

instances when the rule applied is divided by the number of instances in which the rule or its variants (i.e. the rules sharing its input side, but not its output side) are applied. In this way, each of the variant-licensing rules will be assigned a value between 0 and 1; the sum of the values assigned to the variant-licensing rules will be 1. Rules without variants – like those for different phonemes – will, consequently, also have a strength of 1. In this view, the rules constituting allophones in inter-speaker/intra-system free variation, like [r] and [R], represent only an extreme case in which one of the rules has a strength of 1 and the other one has a strength of 0 for individual speakers.

Completely different are the allophones in complementary distribution: as the production rules do not share their input sides (neither with each other nor with other rules), they both have a strength of 1. However, the rules constituting them are asymmetrical as well because the input side of the production rule is not identical with the output side of the corresponding interpretation rule: while the former is specified as a conjunction of M and F_C, the latter is only specified for M.[11]

To sum up, both types of variation can be associated with a different constellation of rules. For variants in complementary distribution (CD), the M on the input side is split up into two different categories by the complementary contexts to which the variants are bound, resulting in two non-violable rules with strength 1. For variants in FV, the input sides of the respective production rules are identical, resulting in violable, conflicting rules, which may lead to the reduction of the variant licensed by the weaker rule.

There is, however, a third constellation which looks like FV but in which the variants are licensed by rules with slightly differing input sides, resulting in different (though overlapping) application areas. This constellation will be introduced in the following.

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the system as a whole, i.e. reduction of FV – the latter, I suggest, is typical for FV with different articulatory costs). Cf. e.g. Keller (2014: 140–143) for articulatory economy as a driving force of language change; cf. Keller (2014: 138–146, after Levin 1988) for a stochastic model of language change of equally distributed variants without additional factors.

11. For the phonemes in complementary distribution, the rules are completely analogous to the phonemes in equivalent distribution, which means that they are also symmetrical. There is a difference between both pairs, though, but only when it comes to the (formal) rules connecting sounds and syllables.

2.2 Polysemy, polymorphy and partially equivalent distribution

In German, there are several complex words with *Karte* 'card' as their grammatical and semantic head, a selection of which is given in (1):

(1) a. F: *Spielkarte* -> M: 'playing card'
b. F: *Speisekarte* -> M: 'menu'
c. F: *Visitenkarte* -> M: 'business card'
d. F: *Landkarte* -> M: 'map'
e. F: *Ansichtskarte* -> M: 'postcard'

Karte is not only the head of the lexical items in (1) but also their hyperonym:

(2) F: *Karte* -> M: 'card' (rectangular flat object made of paper or cardboard)

Contrary to the examples in Table 1, we are dealing with forms which can be assigned a relatively stable, context-independent meaning; the question now is whether this meaning is necessarily identical with its meaning contribution in contexts or not. I will argue that, while the former may be the case for the lexemes in (1), it is not the case for (2) (meaning that M and M_C, unlike the examples in Table 1, are different here).

There are certainly contexts in which the lexemes in (1) are indeed used in their full form, as in the examples in (3) and also in formal written language.

(3) a. [calling a print shop]
Drucken Sie auch Spielkarten / Speisekarten / Visitenkarten / Landkarten / Ansichtskarten?
'Do you also print playing cards/menus/business cards/maps/postcards?'
b. *Stell dir vor, gestern hatte ich eine Spielkarte / Speisekarte / Visitenkarte / Landkarte im Briefkasten.*
'Imagine: yesterday, I had a playing card/menu/business card/map in my mailbox.'

In the natural environment of playing cards, menus, business cards and maps, on the other hand, it seems more natural to refer to these things by dropping the modifier, realising only the head of the compound:

(4) a. [during a game of cards]
Du bist dran, zieh eine Karte.
'It's your turn, draw a (playing) card.'
b. [at the restaurant]
Ist was auf der Karte, das Sie empfehlen können?
'Is there something on the menu that you can recommend?'

c. [on a business occasion]
Rufen Sie mich gerne an, hier ist meine Karte.
'Please call me, here is my (business) card.'
d. [trekking tour]
Ich glaube, wir haben uns verlaufen – lass uns mal auf die Karte schauen.
'I think we've lost our way – let's take a look at the map.'
e. [conversation between friends]
A: *Ich fahre eine Woche nach Schweden.*
B: *Toll! Schreib mir eine Karte, ja?*
A: 'I'm going to spend a week in Sweden.'
B: 'Great! Write me a postcard, will you?'

That the compounds in (1) with *Karte* as their head can be substituted by *Karte* (as in 4) may not be surprising: playing cards, business cards and menus, etc. can all be seen as cohyponyms with *Karte*, the more general expression, as their hyperonym; ergo, the expressions in (1) should all be substitutable by *Karte* without ever changing the truth conditions of the respective sentence (definitional sentences being an exception). That the contexts in (3) become less informative if the compounds are replaced by *Karte* also fits into its status as a hyperonym (which has at least one feature less than each of its hyponyms) – in neutral contexts, this is probably a violation of Grice's maxim of quantity (being less informative than appropriate).

However, there is something that cannot be explained by hyperonym-hyponym relations: that *Karte* is not only possible in the contexts in (4) but, in fact, the more natural expression, while the hyponyms (especially in a, d and e) would seem hyperspecific and cumbersome. This is not the case for other hyponyms/hyperonyms in which the additional feature of the hyponym is provided by the context:

(5) *Egon ist professioneller Reiter. Sein derzeitiges Tier/Pferd ist ein 5-jähriger Wallach namens Caruso.*
'Egon is a professional rider. His current animal/horse is a 5-year-old gelding named Caruso.'

In (5), the context (*rider, gelding*) clearly provides the information that Caruso is a horse; nevertheless, *Tier* ('animal') is not a better expression than 'horse'.[12] This contrast can be interpreted as follows:

Karte in the contexts in (4) has not the status of a hyperonym of the more specific hyponyms *Landkarte, Ansichtskarte*, etc. but of a polymorphous variant (of

12. Actually, the most valid argument in favour of the hyperonym would be to avoid repetition for stylistic reasons in journalistic or belletristic genres.

each hyponym) which is limited to a certain semantic context M_C (here, probably 'frame') and can be triggered by elements of that context (here, probably frame elements). This means that the meanings of 'map', 'postcard', etc. have each two variants, F_1 and F_2, and F_2 is a formal reduction of F_1. There is also a logical conversion of that constellation (resulting from the fact that the reduction leads to deletion of the modifier and the remaining head is identical): *Karte* is polysemous with the form F and the meanings M_1, M_2 etc., with a complementary distribution of the meanings by their M_Cs. This polysemy, of course, is exactly the opposite constellation of the polymorphy of the complementary distributed allophones and allomorphs, in which a single M is split up into forms F_1, F_2 (…) due to their assignment to different formal contexts F_{C1}, F_{C2} (…). For both the polysemous and the polymorphous variants, it holds that they (a) share formal features and (b) are disambiguated by context, making context a part of their meaning/category.

Two questions remain. Firstly, why is it that the longer variants in the example above (more precisely, those on the polymorphy level) are not eliminated (which should be the case according to articulatory economy approaches as well as the Principle of No Synonymy)? Why can both *Karte* and the corresponding compounds (*Landkarte, Speisekarte*, etc.) occur in the contexts in (4) (though the longer form seems to be unnecessarily specific in some of those)? The reason, I would suggest, is that the reduction is locally bound to (or assigned to) the respective M_Cs (in traditional, but less precise terminology: their distribution is partially equivalent). Only in those M_Cs is there something like 'free variation' (though certainly with the odds against the longer form due to articulatory economy). In the other contexts, e.g. those in (3), the specific form is the appropriate choice – admittedly, *Karte* is not as wrong in these cases as a completely different lexeme like *apple* would be, but nevertheless, it is not informative enough. This may be explained by its status as a hyperonym to the compounds with *Karte* as their head – or with some additional theoretical assumptions, which are discussed in the context of the second remaining question.

The second question is: where do those polymorphous variants (here, *Karte* for all the compounds in (1), in a certain context) come from? Are they produced ad hoc, following soft constraints (like conversational maxims), or in a deterministic manner, following fixed information rooted in lexicon or grammar? I suggest that both are the case: because the possibility to 'delete' the modifier of a compound is present in the language system, it can be applied ad hoc in new situations.

Above, I suggested some kind of fusion for the word *Karte* due to the formal variants of the meanings for 'map', 'menu', etc. (whether they be ad hoc or lexicalised). *Karte* is polysemous, meaning that it can be described by a rule as the following:

(6) F: *Karte* -> M: 'map' v 'menu' v 'business card' v 'playing card' v 'postcard' v (hyperonym/underspecified) 'rectangular flat object made of paper or cardboard'

Parallel to that, there are several non-ambiguous rules as those in (7):

(7) a. F: *Landkarte* -> M_1: 'map'
b. F: *Speisekarte* -> M_2: 'menu'
...

If this was everything, *Karte* would hardly ever be used in any situations but characterising sentences ('a card is a flat rectangular object, usually made of paper') or in situations in which somebody is lacking more specific information ('I think he is holding some kind of card, but I can't see more from the distance') or referring to a group which contains more than one subtype of cards ('this print shop also produces different sorts of cards') – i.e. hyperonym contexts. Otherwise, *Karte* would always be less precise than the respective compound (and thus suboptimal). That *Karte* can, in fact, be used in specific situations denoting one of the subtypes is, as I argued, due to the fact that the representation is as in (8):

(8) a. M_{C1}: orientation context ∧ F: *Karte* -> M_1: 'map'
b. M_{C2}: restaurant context ∧ F: *Karte* -> M_2: 'menu'
...

The result is that, in these contexts, a speaker who wants to express the meaning M_1: 'map' has two formal options:

(9) a. M_{C1}: orientation context ∧ M_1: 'map' -> F_1: *Karte*
b. $M_{C:}$ [X] ∧ M_1: 'map' -> F_2: *Landkarte*

The idea, of course, is that rules like those in (6), (7) and (9b) have an M_C value that is an open slot or a variable; as such, they are valid options in all situations.

To sum up, the argumentation for these polymorphous variants is that they are each licensed by different rules: (9b) is a lexical rule in which context is not specified (made up of all the instances in which the meaning 'map' is expressed), and (9a) is a context-bound lexical rule with no variables.

One aspect of the proposed model remains to be discussed at this point: in addition to the interpretation rules in (8), which describe a CD constellation, there must also be a context-free interpretation rule with the hyperonym reading of *Karte*, as in (10):

(10) M_C: [X] ∧ F: *Karte* -> M: 'card'

Now take a look at the conversation in (11):

(11) [In einer Buchhandlung. Kunde A spricht mit Buchverkäufer B.]
[At a book shop. Customer A is talking to bookseller B]
A: *Ich plane einen Wanderurlaub im Süden von Wales. Ich würde gerne eine Karte kaufen.*
'I am planning a hiking trip in South Wales. I would like to buy a [M: #card/map].'

Along the line of argumentation above for the polymorphous variants *Karte*/*Landkarte* licensed for the orientation context (as explained above, one of the variants is licensed by a more general rule and one by a more specific one), one should think that, analogically, both interpretational variants should be valid options: one of them licensed by the more specific rule in (9b), the other one (the underspecified hyperonym reading) licensed by the general, context-independent rule in (10). This, however, is not the case: if the bookseller B offers some sort of card (but not a map) to customer A, A will be completely irritated.

These effects, of course, have been explained by Grice's conversational maxims: the salesperson B might go through an interpretational process which includes the idea that A thinks the information about the planned vacation is relevant, and that this must mean that A wants to buy a map for her hiking trip; ergo, he should not offer her a postcard, playing cards or a simple piece of cardboard (though all of these might be available in a German bookshop). Indeed, an explanation like that might be appropriate for a non-conventionalised ad-hoc deletion, but not for the example in (11): while the salesperson might wonder which of his products exactly might be the most appropriate for a hiker, the meaning 'map' should be directly in his mind in this conversation, without any absurd reasoning whether the customer might actually want a rectangular piece of cardboard or something like that.

An explanation might be the following: in the model suggested here, signs are conceptualised as bundles of directed rules. As suggested above, a constellation of rules mapping an identical input into two possible outputs should either result in differentiation/complementary distribution or in the reduction of one of the rules. An exception would be the case I suggested above: two rules get into conflict because of different degrees of generalisation on the input side; such a conflict is necessarily locally limited to the rule with the more specific input (partially equivalent distribution). Outside of the limitation of the more specific rule, only the more general rule will apply. Inside of the limitation, both rules are in conflict (i.e. the objects that they license are in variation), and the reduction, which should take place due to articulatory economy, is counteracted by the dominance of the more general rule outside of the limitation.

Now, as suggested in the previous subsection, I assign a value to the conflicting rules indicating their strength and apply it to the example above. The

hyperonym interpretation of *Karte* does not arise in the limited context: real hyperonym readings for *Karte*, as explained above, are rare. This means that, while the production rule (12a) is stable (with, in theory, a strength of 1), the corresponding interpretation rule (12b) is weak and outranked by the stronger interpretation rule (12c).

(12) a. M: 'card (rectangular flat object of paper or cardboard)' -> F: *Karte*
b. F: *Karte* -> M: 'card (rectangular flat object of paper or cardboard)'
c. F: *Karte* ∧ M_C: [hiking/orientation] -> M: 'map'

Outside of the limitation, (12c) does not apply, and (12b), disregarding its strength, can prevail.

This model may look circular at first glance; it is certainly based on redundancies. However, it correctly predicts the variant chosen in different contexts. Moreover, the resulting partially equivalent distribution settings also open a door for language change: in the overlapping application areas, innovations can be made, because here, a stable rule with a larger application area may be attacked and weakened (while the strengthened innovative rule might attack on the next level, etc.). This model is in accordance with many things we find in language change/grammaticalisation processes. For example, 'irregular forms' (i.e. forms built by non-productive patterns or suppletive forms) among regular forms (i.e. those built after a productive template) are usually preserved in especially frequent lexemes (cf. Hooper 1976; Bybee 1985; Bybee & Thompson 1997; Phillips 2001; Bybee 2002). These irregular forms may be preserved because they are built after a lexical rule R_1 with the strength 1. The rival productive pattern following a more general rule R_2 with an open slot instead of a concrete lexeme may have a high value, but as the instances of R_1 weaken R_2, its strength must be less than 1 and therefore ruled out in the limitations given by R_1 (here, the respective 'irregular' lexeme). This constellation is only threatened when instances of R_1 become infrequent: then, there will be individual speakers who cannot generalise R_1 and, consequently, will use R_2 as the only accessible rule, which will in turn introduce variants to R_1 and weaken it for other speakers as well, leading to the 'regular' reduction of the weaker variant that is associated with free variation.[13]

13. This is a slightly different perspective on the established observation that type frequency, not token frequency, is decisive for the productivity of a certain pattern (cf. Bybee 1985, 1995): a high frequency of a lexeme feeds a lexical rule to a higher degree than it feeds a more abstract rule.

3. Valency, constructions and optional complements

In Section 2, two central ideas were elaborated: firstly, that variation could be described in a model of production and interpretation rules; secondly, that linguistic alternatives which look like free variation can actually be rooted in different levels of linguistic description. These rules can co-exist because their areas of application are not identical (partially equivalent distribution).

In the following, I will transfer these ideas to my object of research: direct objects which can be omitted under certain circumstances. Many of these were classified as 'optional' in traditional literature on valency, i.e. as free variants (object realised vs object not realised) in the lexical entries of the respective verbs (cf. Helbig & Schenkel 1971). Newer research on valency led to the conclusion that many 'omission phenomena' were actually limited to certain contexts (cf. Jacobs 1993, 1994a; Blume 1993). Current 'hybrid' approaches try to combine lexical and constructional models (cf. Jacobs 2008; Welke 2011, 2019; Fischer 2013; Engelberg et al. 2015; Ágel 2017); however, it is not yet established how this division of labour between both approaches should be organised[14] (cf. Symanczyk Joppe et al. 2020).

In the next subsection, I will give a short sketch of valency in the approach suggested here before turning to 'optional' direct objects. I will give examples which have been treated in the literature as clear cases of construction- or template-driven omissions (topic drop, 3.2.1) as well as lexically-driven omissions ('lexical ellipses', 3.2.2) and analyse them with the instruments developed so far. I will then turn to the cases which will be central to the empirical study in 4 (definite and indefinite null instantiations, 3.2.3, and sentence type templates, 3.2.4) and elaborate the templates on which the test templates in Section 4 will be based.

3.1 Verbs between polysemy and polymorphy

In German – as well as in other languages – the implementation of verbs as a part-of-speech category is essentially based on their morphological distribution, namely, the ability to combine with certain verbal prefixes and inflectional suffixes. When it comes to the syntactic distribution of verbs, they do not constitute a uniform class. This mismatch can be compensated by the idea of valency: the category of a verb, i.e. the context in which it can be embedded, is conceptualised as requirements that are attached to the verb and that have to be saturated during the

14. Examples range from Höllein (2020), who suggests a "Primat der Valenz" ('primacy of valency'), to Jacobs (2009), who suggests prototypes for lexical and constructional analyses which grammarians might use as decision-making tools, to Herbst (2011); Herbst & Uhrig (2019) and Ziem et al. (2019), who regard lexicon and grammar as a continuum.

process of syntactic derivation. This is a way to capture the fact that a verb like *schlafen* 'to sleep' is not substitutable by a verb like *schlagen* 'to beat' or *schenken* 'to make a present': *schlafen* only requires a complement in the nominative (subject) to produce a well-formed sentence; *schlagen* requires complements in the nominative and accusative; *schenken* nominative, accusative and dative complements. This means that [*schenken*$_{\backslash nom\backslash acc\backslash dat}$ + dative complement] has the same category as *schlagen* (namely, $V_{\backslash acc\backslash nom}$), and [*schenken*$_{\backslash nom\backslash acc\backslash dat}$ + accusative complement + dative complement] has the same category as [*schlagen*$_{\backslash nom\backslash acc}$ + accusative] as well as *schlafen* (namely, $V_{\backslash nom}$). This categorial information is essentially the same as F_C in the model proposed here.

In older literature on valency, the syntactic dimension was often conceptualised as parallel or derived from a semantic dimension of valency; the complements a verb required were thought to be mirror images of the argument structure of the predicate which the verb denoted. Newer literature on valency, however, showed that dimensions of syntactic and semantic valency do not necessarily coincide. Jacobs (1994b, 2003) proposes between four and seven essential dimensions of valency; but, while he can show that many verbs do not have valency requirements in all those dimensions, he also argues for an implicational hierarchy between some of them in which requirements in one of the syntactic dimensions (i.e. obligatoriness and formal specifications like case) imply that there are also semantic requirements (argument status of the referent of the respective complement) and that the objects of those (arguments and complements) are linked.[15] The reverse does not hold: a verb like *zubeißen* 'bite (somebody)' only requires one complement (actually, only allows one complement), the biter, while the other argument, the bitten entity, is not expressed in the syntax.[16]

In the perspective suggested here, valency is essentially the information about which F_Cs and M_Cs a specific lexeme of the category V[17] may combine with – and the information on how elements of its F_C may be linked to elements of its M_C. The linking rules, however, are actually not directly rules over lexical items but rules over syntactic and semantic constellations, with the verb as a limitation of the syntactic side. I will give two examples (13–14) to make this clear.

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15. For further implications between dimensions of valency, cf. Jacobs (2003, esp. p. 365).

16. At least if *zu-* is not interpreted as an unspecified *patiens* of the biting, as a reviewer notes. This course of argumentation is essentially taken by Ágel (2000: 220), who, following Pasierbsky (1981: 162f.), distinguishes between 'microvalency' for morphemes filling valency requirements and 'macrovalency' for valency requirements which are saturated in the syntax.

17. … or P or, in some cases, even N or Adj.

(13) Lexical rule for the interpretation of *fällt* ('fells' vs 'falls') in a 'wood' M_C / CD, differentiation by F_C

a. F: $fällt_{3SG}$ ∧ F_C: X_{nom1} ___ ∧ M_C: entity that $falls_1$ (object), entity that causes the $fall_2$ (object or event) -> M_1: 'falls down'

b. F: $fällt_{3SG}$ ∧ F_C: X_{nom1} ___ X_{acc2} ∧ M_C: entity that $falls_2$ (object), entity that causes the $fall_1$ (object or event) -> M_2: 'causes to fall down'

(14) Lexical rules for the interpretation of transitive *wirft* 'gives birth'/'throws (an object)'/ CD, differentiation by M_C[18]

a. F: *werfen* ∧ F_C: V/nom_1/(acc_2) ∧ M_C: a $birther_1$ (animal, typically bitch) gives birth to its offspring (young animals, typ. $pups)_2$, which means that they change their location from inside the birther's body to outside the birther's body -> M_1: 'give birth'

b. F: *werfen* ∧ F_C: V/nom_x/(acc_y) ∧ M_C: $thrower_x$ (x: living entity with hands, typically human being) in a position (u) throws an entity (y: object) with the result that y flies through the air before usually landing on the ground in a position (w) again. Often the change of position is the purpose of the throwing, sometimes also a maximal distance between u and w -> M_2: 'throw (object)'

In (13), the difference between the polysemous variants M_1 and M_2 is licensed by different F_Cs. Sentences like (15) in which the different F_Cs are realised lead to the respective interpretations.

(15) a. F: *Der* *Baum* *fällt.*
the.M[NOM.SG] tree(M)[NOM.SG] fall\3SG:PRS.3SG
|rule (13a) -> M: 'The tree falls down.'

b. F: *Der* *Sturm* *fällt* *den*
the.M[NOM.SG] storm(M)[NOM.SG] fell.PRS.3SG the.M.ACC.SG
Baum
tree(M)[ACC.SG]
|rule (13b) -> M: 'The storm fells the tree.'

In (14), the difference between the polysemous variants M_1 and M_2 is licensed by the M_Cs; sentences like (16), in which the interpretation of the words filling the argument position evoke different M_Cs, again lead to the assigned interpretations.[19]

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18. In the representation of the F_Cs in these examples, there are complement positions in brackets which shall suggest optionality of these complements – and, therefore, polymorphous variants. I will come to this later and show that this is an inappropriate (or at least reductionist) interpretation.

19. The meaning of a verb in this concept is some kind of event structure plus the verb's potential to evoke certain frames.

(16) a. F: *Die* *Hündin* *hat* *drei*
the.F[NOM.SG] bitch:F[NOM.SG] have.PRS.3SG three[ACC]
Junge *geworfen.*
young(N):ACC.PL throw:PTCP
|rule (14a) -> M: 'The bitch gave birth to three pups.'

b. F: *Die* *Athletin* *hat* *den*
the.F[NOM.SG] athlete:F[NOM.SG] have.PRS.3SG the.M.ACC.SG
Speer *geworfen.*
javelin(M)[ACC.SG] throw:PTCP
|rule (14b) -> M: 'The athlete threw the javelin.'

Again, as in the examples in Section 2, weaker and less specific rules may be generated over valency rules like (13–14) by introducing variables (e.g. weak and general rules for the interpretation of a lexeme by introducing a variable for M_C). In addition, rules of a higher order than a rule R may be created, in which the F_Cs and the M_Cs of R become input and output of a new rule (with F_Cs and M_Cs on its own). Some examples are given in (17):

(17) F: V_i, nom_x -> M_1: ACT_i ($agens_x$)
F: V_i, nom_x -> M_2: $BECOME_\neg$ (BE_{STATE}($theme_x$)
F: V_i, nom_x, acc_y -> M_1: CAUSE (BECOME(BE_{STATE}(y)))

Those rules can be conceptualised as above, as the argument structure constructions[20] that Goldberg (1995) suggests, or as the sentence structure signs formulated by Ágel & Höllein (2021). Essential is the thought that (a) they are generalisations over sentences and their meaning[21] and (b) their M is not identical with frames but a possibility to highlight parts of frames: the frames are the dough; the F_s of rules like those under (17) are the cookie cutters; M is the cookies.

In other words, if a speaker wants to describe a constellation in the world that can be captured by semantic knowledge (frames), the M side of the argument structure rules offers packaging units, which can be mapped onto syntactic structures. Knowledge about how to produce a sentence would then include knowledge about which packaging units could be used to put a semantic constellation into words and which syntactic template would be associated with it.[22] These rules, of

20. If slots on the F-side of such constructions are filled, the rule should become less general and stronger.

21. Their uniformity is an effect of verbs having the same valency requirements – and vice versa.

22. This does not necessarily mean that a speaker first has the complete semantic configuration conceptualised and then maps it onto a structure; they might as well start with a contextually prominent part of the constellation (like topic/theme), realise (and hear) it (which results in a reduced possibility of choices how to continue), choose one of them and have, perhaps, one choice left.

course, do only cover the linking part. What is also involved are generalisations over semantic contexts, e.g. about which frame element can be associated with which frame (rules with variables for F and F_C) and generalisations over syntactic configurations like phrase structure rules, which describe with which categories another category can be combined (rules with variables for M and M_C).

In most cases, the linking of a sentence should be redundantly encoded, namely, by the lexical rules based on a verb (its syntactic and semantic valency requirements plus linking) and the syntactic rules (construction) which directly assign semantic constellations to syntactic constellations (direction of rules depending on whether production or interpretation shall be described).

Ágel & Höllein (2021) give examples for sentences in which marginal valency structures are realised that cannot be generalised to productive templates but must be based on lexical rules. For German, this is the case for verbs which require genitive complements as in (18a). The opposite case is (18b), in which a structure is only licensed by an abstract linking rule (or argument structure construction) but not by a lexical rule of the verb that is involved (*niesen* 'to sneeze' only requires a nominative complement, referring to the person who sneezes).

(18) a. *Sie gedenken ihrer Verstorbenen.*
3PL[NOM] commemorate:PRS.3PL POSS.3PL:GEN.PL deceased:GEN.PL
'They are commemorating their deceased.'

b. *Sie niest das Taschentuch*
3SG.F[NOM] sneeze:PRS.3SG the.N[ACC.SG] handkerchief(N)[ACC.SG]
vom Tisch
of.the.M.DAT.SG table(M)[DAT.SG]
'She sneezes the handkerchief off the table.'

Sentences like (18b) have often been discussed in the literature (e.g. Clark & Clark 1979; Goldberg 1995; Engelberg 2009), sometimes as instances of "coercion" (Pustejovsky 1995). Höllein (2019, 2020) and Ágel & Höllein (2021) use this term for any "productive" use of a verb which cannot be attributed to its valency requirements – a view that is quite compatible with the explanations suggested here.

If an abstract linking rule R as in (17) is used productively (in the sense of Ágel & Höllein (2021): with a verb V which does not have a valency requirement F_C and M_C corresponding to F and M of R) and this use is conventionalised by frequent use, the result is a polymorphous and polysemous differentiation of V. Note that variables may be restricted by sortal or even lexical specifications with the result of partial productivity. This is probably the case with some 'marked' valency patterns like $V_{/nom/dat}$: Blume (2000) shows that these exist cross-linguistically, typically with certain communication verbs (like *schreiben* 'to write'/*faxen* 'to fax'/*telegraphieren* 'to telegraph', etc.). Recently borrowed verbs like *mailen* 'to

write an e-mail' show that the pattern is productive, but it also has sharp sortal restrictions (the dative object referring to the addressee; the V being a specific way to write or communicate, expressed by the verb; and the direct object, if overtly expressed, referring to the message (its realisation potentially involving the same stem as the verb – fax, telegram, e-mail, etc.).

3.2 Optional direct objects

In traditional valency dictionaries (e.g. Helbig & Schenkel 1971), complements are noted as optional if they can be omitted in certain contexts. Excluded are only those contexts that can be attributed to certain verb forms like the morphological imperative (identified with an omission of the addressee-subject) or the valency alternation associated with passives (cf. Jacobs 1994a, 2009; "structural valency realisations" in the terminology of Ágel 2000: 215ff.). Such a notation as optional suggests that complement realisation and non-realisation could be viewed as free variants; however, Jacobs (1993, 1994a) and Blume (1993) show that the apparent optionality is limited to certain contexts relevant for groups of verbs, while, in other contexts and for other verbs, the respective complement would be obligatory.

In the following, I will give several examples for direct objects that are collected from the literature and systematise them as bound by F_C, or assignments to M – either on the lexical or the constructional level.

3.2.1 *'Topic drop': PED, lexical rules vs template rules bound by F_C*

A classic example[23] for this constellation – construction-specific non-obligatoriness in Ágel 2000 – is topic drop of topical subjects (19b) and direct objects (19a) in colloquial speech.[24]

(19) a. [A: *Egon ist tot.*
Egon is dead.]

i. B: *(Das) hab ich auch gehört.*
that.N[ACC.SG] have.PRS.1SG 1SG[NOM] too heard:PTCP

ii. *Ich hab *(das) auch gehört.*
1SG[NOM] have.PRS.1SG that.N[ACC.SG] too heard:PTCP
'I have heard that, too.'

23. Cf. Fries 1988; Trutkowski (2016); in the context of optional complements, Jacobs (1993, 1994).

24. In (19), there are indicators of colloquial speech such as the reduced forms *ne* for the feminine indefinite article *eine* and *hab* for *habe* (first-person singular indicative of *to have*).

b. [A: *Warum ist Roswitha im Gefängnis?*
Why is Roswitha in jail?]

i. B: *(Sie) hat ne Bank überfallen.*
3SG.F[NOM] have.PRS.3SG a:F.ACC bank(F)[ACC.SG] rob:PTCP
'She has robbed a bank.'

ii. *Weil *(sie) ne Bank überfallen hat.*
because 3SG.F[NOM] a:F.ACC bank(F)[ACC.SG] rob:PTCP have.PRS.3SG
'Because she has robbed a bank.'

This construction is bound to a specific syntactic constellation, namely, the position before the slot occupied by the finite verb. It is independent from concrete lexical material,[25] which means that it must be assigned above the lexical level in the form of an abstract template. By a template, I understand a multi-word unit with at least one filler slot, covering constructions in the sense of Construction Grammar (i.e. form-meaning pairs) as well as multiword units which are not bound by a specific meaning but, e.g. by the F_C (in the case presented here, colloquial speech).

The topic-drop template has several sub-templates with slight differences in interpretation. First consider cases like (20) in which the non-realised argument of the verb can be interpreted unambiguously because of its agreement with the finite verb (as also in (19a):

(20) A: *Solln wir in die Mensa gehen?*
'Shall we go to the canteen?'

a. B: *Nee, (ich) hab keinen Hunger.*
no 1SG[NOM] have.PRS.1SG no:M.ACC.SG hunger(M)[ACC.SG]
'No, I'm not hungry.'

b. A: *(Du) hast wohl keinen*
2SG[NOM] have.PRS.2SG DISCOURSE PARTICLE no:M.ACC.SG
Hunger?
hunger(M)[ACC.SG]
'So you're not hungry?'

This is clearly a case of redundant information which should give rise to reduced variants because the non-expressed argument can be interpreted unambiguously (21a).[26]

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25. Trutkowski (2016) argues that the conditions are different if personal pronouns that are unambiguously reconstructable by their agreement with the finite verb are left out.

26. Rule (21a) is responsible for examples like (19a(i)) and (20a). For (20b), there should be an analogous rule in which the non-expressed argument is interpreted as the speaker and in which the finite verb has a second-person singular inflectional ending. For (19a(ii)), still another rule (with topic/DNI interpretation) must be postulated.

(21) a. F: $((V_{fin\ +1Psg}/_{n}\text{\_\_\_\_\_}n)_{V/nom(x)})_{S}$
-> M: λx [PREDICATE (x)] (SPEAKER)
b. M: λx [PREDICATE (x)] (SPEAKER) ∧ F_{C}: colloquial speech
-> $((V_{fin\ +1Psg}/_{n}\text{\_\_\_\_\_}n)_{V/nom(x)})_{S}$
c. M: λx [PREDICATE (x)]
-> $((V_{fin\ +1Psg}/_{n}\text{\_\_\_\_\_}n)_{V})_{S}$

The input of the interpretation rule (21a) is a sentence, its first position a finite verb with inflectional ending for first-person singular, which may be followed by additional complements (depending on the verb's valency). The valency slot of the subject is syntactically non-saturated; in the output, the argument position that is linked with the open nominative slot of the verb must be interpreted as referring to the speaker of the sentence.

There are two complementary production rules: the rule licensing topic drop is opposed by the lexical rules of the verbs involved that require a nominative complement in the syntax. Both variants only share a small set of possible contexts (e.g. colloquial speech) to which the conflict of rules is limited; outside of the limitation, only (21c) applies.[27]

F and M of the rules in (21a, b) are nearly identical with (and possibly related to) rules limited to diary contexts as F_{C} (diary drop, e.g. Haegemann 1990). Analogous rules must be postulated for second-person pronouns (and slightly different for dropped topics in general). A fusion of the three rules results in the deletion of concrete inflection endings on the formal side of the rules and a deletion of the information on which communicative role (speaker, addressees) is used to convert the lambda variable on the meaning side. This information, consequently, must be bound by M_{C}. If M is the meaning of a concrete sentence, this means the concrete local meaning context which is created from referents, denotations and – above all – frames of the expressions used in the context.[28] Examples are given in (22).

27. It is not impossible that individual lexemes might be associated with additional rules, e.g. Ágel (2000) suggests that certain *verba dicendi et sentiendi* should allow for a higher possibility of topic drop.

28. Ziem (2014) for a proposal of how more than just the expressed elements can be evoked and become active in a text or conversation; Sperber & Wilson (1986) on the interplay of logically based and pragmatical inferences which can be made responsible for the creation of a local context with differentiations in its own right.

(22) [Two people in a driving car, downtown.]
A: *Look, there is Egon, in front of the cinema! Among the people queuing for 'Dune'.*
i. B: *Hab ich auch gesehen. Sah gelangweilt aus.*
have.PRS.1SG 1SG[NOM] also see:PTCP look.PST.3SG bore.PCPT VERB.PARTICLE
'I saw him, too. He was looking bored.' ('dropped topic': Egon)
ii. B: *Hab ich auch gesehen. Ziemlich langweilig.*
have.PRS.1SG 1SG[NOM] also see:PTCP quite boring
'I watched that one, too. It was quite boring.' ('dropped topic': the film)

This ambiguity (and M_C-dependent meaning differentiation), however, is not unique to topic drop but also applies to (regular) third-person pronouns: if they are not unambiguously interpretable, they must be disambiguated elsewhere in M_C.

3.2.2 *'Lexical ellipses': PED, lexical rules vs lexical rules bound by M_C*

Ágel (1991) and Jacobs (1994a) give several examples of individual lexemes which allow reductions, but only with certain interpretations (*sich benehmen* 'to behave'; without adverbial = 'to behave well', etc.). An example is the card game reading of *geben* 'give' (23):

(23) a. *Roswitha gibt ihren Mitspielern die Spielkarten*
Roswitha(F)[NOM.SG] give.PRS.3SG POSS.F.3SG:DAT.PL CO-player(M):DAT.PL the.ACC.PL playing.card(F):ACC.PL
'Roswitha is dealing.'
b. *Wer gibt (seinen Mitspielern) (die Spielkarten)?*
who(M)[NOM] give.PRS.3SG POSS.M.3SG:DAT.PL CO-player(M):DAT.PL the.ACC.PL playing.card(F):ACC.PL
'Who is dealing?'
c. **Roswitha gibt ihren Mitspielern.*
Roswitha(F) give.PRS.3SG POSS.F.3SG:DAT.PL CO-player(M):DAT.PL
'Roswitha is dealing (cards) to her co-players.'
d. **Wer gibt seinen Mitspielern?*
who(M) give.PRS.3SG POSS.M.3SG:DAT.PL CO-player(M):DAT.PL
'Who is dealing (cards) to their co-players?'

Two ingredients should be essential for the lexicalisation of such a reduced variant depending on a verb. Firstly, this type of reduced variant is lexicalised in M_Cs which are highly restricted for their central elements and the actions that can be

performed on the latter. Secondly – and trivially – this constellation must arise for different constellations of people, different times and repeatedly, with the same parameters (scripts). Otherwise, the reduced variant(s) would probably occur but would not be lexicalised.

(24) M_C: card game ∧ M: 'X gives out playing cards to their co-players, concealed and in turns'
-> F: *X gibt*

Examples for other M_C-bound[29] lexical variants include the following:

(25) a. [M_C: restaurant, guest to waiter:]
Wir würden gerne (unser Essen)
1PL[NOM] would:PRS.1PL gladly POSS.1PL[N.ACC.SG] food(N)[ACC.SG]
bestellen.
order:INF
'We would like to order (our food).'

b. [M_C: exam, instructor to candidates:]
Sie müssen in fünf Minuten
2PL.HON[NOM] must:PRS.2PL.HON in five[DAT] minute(F):DAT.PL
(Ihre Arbeiten) abgeben.
POSS.2PL.HON:F.ACC.PL test(F):PL.ACC give.over:INF
'In five minutes, you must hand over (your tests).'

c. [M_C: birth, midwife to mother:]
Du kannst jetzt anfangen (dein
2SG[NOM] can:PRS.2SG now start:INF POSS.2SG[N.ACC.SG]
Kind aus deinem Körper) zu pressen.
child(N)[ACC.SG] from POSS.2SG:M.DAT.SG body(M)[DAT.SG] to push:INF
'You can start to push (your child out of your body) now.'

d. [M_C: soccer match, commentator:]
Angerer hat (den Ball)
Angerer[NOM.SG] have.PRS.3SG the.M.ACC.SG ball(M)[ACC.SG]
abgegeben / eingeworfen /geschossen / gehalten.
pass:PTCP throw.in:PTCP shoot:PTCP hold:PTCP
'Angerer has passed/thrown in/shot/held (the ball).'

e. [M_C: lunchtime, one colleague to another:]
Hast du schon (Mittag) gegessen?
have.PRS.2SG 2SG[NOM] already lunch(M)[ACC.SG] eat:PTCP
'Have you already eaten (lunch)?'

29. The M_Cs are described informally here. Alternatively, they could be described as frames or scripts (e.g. the M_C of (25c) could be noted as the Gebären-frame in German Frame Net & Constructicon; cf. https://gsw.phil.hhu.de; Berkeley-FrameNet-1. 7: Giving_birth).

As Jacobs (1994a) notes, the context-dependency of these reduced variants does not only result in specific interpretations of the 'null instantiations' but often also in an interpretation of the predicate itself which is more specific than the context-less interpretation (its hyperonym): *give* in (23) means to distribute in rounds one or (at most) two cards, face down, per player; *bestellen* in (25a) means to tell the waiter which meal from the menu you want to eat (instead of clicking through an order formula on a website or subscribing to something); *pressen* 'to push' in (25c) means to activate one's abdominal muscles extremely strongly in intervals; and so on. A typical feature seems to be that the non-expressed argument has only one possible interpretation in the situation that is described.[30] For some of the examples in (25), the variant in which the direct object is realised seems to be worse than the objectless variant;[31] this would suggest that the rule for the 'lexical ellipsis' is much stronger than the lexical rule licensing the full variant (this is especially the case for (25c)). Note that the point at which the more general rule is ruled out in the shared application area, we would have a CD constellation (instead of PED).

Some reductions seem to imply others: the 'omission' of the accusative complement in (23) implies that the dative complement must also be omitted, but not vice versa; the omittable complements in (25c) must be omitted simultaneously or not at all. This can be explained by directly assigned templates (cf. Subsection 3.2.3) with either both complements or none as their subparts (alternatively, cf. Jacobs 1993, 1994a and 2003: 6.2 for an explanation via general valency laws).

3.2.3 *'DNI' vs 'INI': PED, lexical rules vs lexical rules bound by M_C vs directly assigned (argument structure template) rules (M_C-bound)*

Fillmore (1986) argues that the option not to express a complement C of a verb V depends on the linguistic or situational context, combined with lexical (valency) rules: certain verbs, such as *to accept*, would only allow omissions if the respective argument had been introduced in the context. The interpretation of the non-expressed argument would then necessarily be definite (DNI: definite null instantiation); if overtly expressed, it would be by personal pronouns. Other verbs, e.g. *to*

30. A reviewer has the impression that the examples in (25) are event-focused rather than lexically driven in that "the predicate is focused, which allows the complement to be shaded". While this is certainly true, the possibility to do so is nevertheless bound to individual verbs (sometimes, as in 25d, groups of similar verbs) and M_Cs, with the resulting limitations on the interpretation of the non-expressed argument as well as the verb meaning (cf. Ágel 1991; Jacobs 1993, 1994).

31. While it is not downright ungrammatical, it seems cumbersome and complicated as for some full forms of the compounds with *Karte* as their head (Subsection 2.2).

read, would only allow indefinite interpretations; possible interpretations of these INI (indefinite null instantiations) would be 'something', 'people' or 'stuff' (depending on the respective verb). Corresponding phenomena do exist in German:

(26)	a.	[A: *Was ist mit dem Vertrag?* 'What about the contract?']	verb: *unterschreiben*
		B: *Sie haben unterschrieben.* 3PL[NOM] have:PRS.3PL sign:PTCP	'to sign'
		-> 'They have signed it/the contract.'	DNI reading
		*'They have signed something.'	INI reading (not possible)
	b.	[A: *Was ist mit dem Aufsatz?* 'What about the paper?']	verb: *lesen* 'to read'
		B: *Sie haben gelesen.* 3PL[NOM] have:PRS.3PL read:PTCP	
		*'They have read the paper.'	DNI reading
		-> 'They were reading something.' [conversational implicature/maxim of relation: 'That might have been the paper.']	INI reading (possible, though marked)
(27)	a.	[A: *Was haben sie gemacht, als du reinkamst*? 'What were they doing when you came in?']	verb: *unterschreiben*
		B: *Sie haben unterschrieben.* 3PL[NOM] have:PRS.3PL sign:PTCP	'to sign'
		*'They have signed it.'	DNI reading (not possible)
		??'They have just signed something.'	INI reading (not possible)[32]
	b.	[A: *Was haben sie gemacht, als du reinkamst?* 'What were they doing when you came in?']	verb: *lesen* 'to read'
		B: *Sie haben gelesen.* 3PL[NOM] have:PRS.3PL read:PTCP	
		*'They have read it.'	DNI reading
		-> 'They were reading (something).'	INI reading (possible)

32. This reading might be possible if the referents of the subject are known to describe things on a regular basis, as part of their work on a director's board, etc. My introspection: even then, this reading is marked.

Jacobs (1994a) objects that readings classified as INI are not necessarily indefinite but neutral in definiteness; the implicit argument can be interpreted as coreferential with someone or something present in the discourse.[33]

This seems to be true for sentences like (28):

(28) a. *Egon kaufte sich das neue Buch seiner Lieblingsautorin. Fröhlich kehrte er nach Hause zurück und las.*
'Egon bought the new book of his favourite author. Cheerfully, he turned back home and read.'

b. *Das Steak, das der Kellner vor Roswitha hinstellte, sah exzellent aus. Strahlend nahm sie Messer und Gabel und aß.*
'The steak the waiter placed in front of Roswitha looked excellent. Beaming, she picked up her knive and fork and ate.'

Indeed, the default interpretation of both sentences is that the 'implicit argument' has been introduced into the discourse: Egon, in (28a), is reading the book that he has bought; Roswitha, in (28b), is eating the steak that the waiter has placed in front of her. Consider, though, the acceptability of the sentences if combined with time-span adverbials as *innerhalb von einer Stunde* 'within an hour' and time-frame adverbials as *eine Stunde lang* 'for one hour':

(28′) a. *Egon kaufte sich das neue Buch seiner Lieblingsautorin. Fröhlich kehrte er nach Hause zurück und las* (**innerhalb der nächsten zwei Tagen/die nächsten zwei Tage*).
'Egon bought the new book of his favourite author. Cheerfully, he turned back home and read (*within the next two days/for the next two days).'

b. *Das Steak, das der Kellner vor Roswitha hinstellte, sah exzellent aus. Strahlend nahm sie Messer und Gabel und aß* (**innerhalb von zehn Minuten/während der nächsten zehn Minuten*).
'The steak the waiter placed in front of Roswitha looked excellent. Beaming, she picked up her knive and fork and ate (*within ten minutes/for the next ten minutes.)'

What to make of this effect? The concept of definiteness has been argued to subsume several features: the (pragmatic) feature that the referent must have been introduced in the context or present in the situation, and the (semantic) feature that a definite entity is conceptualised as "bounded" (Jackendoff 1991) or "inclusive", referring to a totality (Lyons 1999). It is the latter function that has been shown to interact with verbal aspect (cf. e.g. Verkuyl 1972, 1989; Dowty 1991; Krifka 1998; Leiss 2000; Borer 2005). The sentences in (28′) are combined with

33. Jacobs' (1994a) argumentation is based on an example with the verb *heiraten* 'marry', which is more complex and only explainable by additional assumptions.

two well-known kinds of temporal adverbials. Time-span adverbials are thought to be compatible only with potentially atelic events, and time-frame adverbials only with potentially telic ones.[34] In transitive structures, the direct object gives rise to a telic interpretation of the event if it is definite or quantified, and to an atelic interpretation if indefinite and not quantified.

For (28), the following conclusion may be drawn: the unexpressed argument may be definite in the pragmatic-anaphorical sense (as suggested by Fillmore 1986 and Jacobs 1994a) but not in the boundedness-inclusiveness sense. That the structures in (28) cannot be coerced into the telic reading by the time-frame adverbial (28′) suggests that, though there is a referent with fitting sortal features in the context that might serve as an obvious candidate for an eating event, this referent is not conceived as a direct object referring to the property 'bounded' – Roswitha is not eating *das Steak* 'the steak', but *an dem Steak* 'at the steak' or *von dem Steak* 'of the steak'; Egon doesn't read *das Buch* 'the book', but *in dem Buch* 'in the book'. In other words, it is not implied by a certain formal configuration that the unexpressed argument, in the course of the event that is conceptualised, crosses from a state on one side of a context-relevant bipartition to the state on the other side.

The aforementioned, sortally fitting entity may fill the gap left by the object, but this is rather an effect of encyclopedic knowledge – frames in the sense of Fillmore (1982) and Ziem (2008, 2020) – and conversational maxims than of semantic implication. (28″) shows that the interpretation that the steak is eaten and the book is read are indeed cancellable (one of the features that Grice 1975 suggests for conversational implicature):

(28″) a. *Egon kaufte sich das neue Buch seiner Lieblingsautorin, kehrte nach Hause zurück und las, allerdings etwas anderes, weil er sich das neue Buch für den Urlaub aufsparen wollte.*
'Egon bought the new book of his favourite author, turned back home and read, but something different, because he wanted to save his new book for his holidays.'

b. *Das Steak, das der Kellner vor Roswitha hinstellte, sah exzellent aus. Strahlend nahm sie Messer und Gabel und aß – allerdings nur die Beilagen, denn sie war Vegetarierin.*
'The steak the waiter placed in front of Roswitha looked excellent. Beaming, she picked up her knive and fork and ate – but only the potatoes and vegetables, as she was a vegetarian.'

Consider also the following examples:

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34. *Potentially* because it might be precisely those adverbials which favour or disambiguate telic or atelic readings.

(29) a. *Sie zeichnete den Präsidenten innerhalb*
3SG.F[NOM] draw:PST.3SG the.M.ACC.SG president(M):ACC.SG within
von einer Stunde.
of a:F.DAT.SG hour(F):DAT.SG
'She had drawn the president within an hour.'

b. *Sie zeichnete den Präsidenten eine*
3SG.F[NOM] draw:PST.3SG the.M.ACC.SG president(M):ACC.SG a:F.ACC.SG
Stunde lang.
hour(F):ACC.SG long
'She was drawing the president for an hour.'

c. **Sie zeichnete innerhalb von einer Stunde.*
3SG.F[NOM] draw:PST.3SG within of a:F.DAT.SG hour(F):DAT.SG
'She had drawn within an hour.'

d. *Sie zeichnete eine Stunde lang*
3SG.F[NOM] draw:PST.3SG a:F.ACC.SG hour(F):ACC.SG long
'She was drawing for an hour.'

Zeichnen 'to draw' (exactly like *malen* 'to paint') can be realised with or without a direct object. Rappaport-Hovav & Levin (1998) (similar suggestions are made by Brisson 1994 and Rapp 1997) postulate that these verbs belong to a special group that they call *manner verbs* (Borer 2005, more neutral with respect to their semantics, calls them variable behaviour verbs) and which focus on the way something is done, while *result verbs* like *break* focus on the result of an action and are associated with a complex accomplishment structure ([[ACT X] CAUSE [BECOME [Y STATE]]] or similar), contrary to the simple activity structure of manner verbs ([X ACT Y]). Manner verbs are thought to be more flexible because their simple templates can be augmented by inserting them into larger templates, e.g. the manner verbs, if a state/resultative and an object are added to them, can become part of a more complex event structure. Rappaport-Hovav & Levin (1998) also note that the difference might alternatively be conceptualised as the property of the syntactical configurations they appear in rather than of lexical items. This view is elaborated by Borer (2005), who attributes the variable behaviour of the respective verbs directly to the syntactic structures into which they are inserted. However, neither approach captures the fact that semantically similar verbs (e.g. *essen* 'to eat' vs *verschlingen* 'to devour'; or *schreiben* 'to write' vs *verfassen* 'to write/to author' are not equally compatible with objectless structures (cf. Külpmann & Symanczyk Joppe 2015). In the following, I will try to show that lexical rules and template rules (here, rules assigning constructions in the sense of Goldberg 1995) can interact, giving rise to a more differentiated picture.

The examples in (29a–b) show that *zeichnen* 'to draw' (as well as *malen* 'to paint' and other verbs from this class) can also be conceptualised as telic, though no resultative is added. Yet there is a difference in verb reading and in the inter-

pretation of the direct object, which is so slight that you might not have noticed it: at least in my intuition, in (29a), *the president* is conceptualised as 'an image of the president' which is created during the drawing process; in (29b), it evokes the interpretation of the president as a person, either sitting model or existing in the inner eye of the artist.

Both interpretations are covered by encyclopedic knowledge. Frame and instantiations of frame elements are compatible in (29a) and (29b), the only exception being the adverbial. Both direct objects are definite. The obvious interpretation is that the different meanings must indeed depend on two different templates, at least in the case above, because neither the verb nor its M_C can be responsible for the difference.

So what is the semantic contribution of a time-frame adverbial like *innerhalb von einer Stunde* 'within an hour' by which it can be distinguished from a time-span adverbial like *eine Stunde lang* 'for an hour'? It is, as has often been noted, that the former conceptualises events as telic (i.e. with a terminal point, e.g. a location or a state), while the latter conceptualises them as atelic (i.e. the event has a homogeneous structure without a culmination point; cf. Pustejovsky 1991, 1995). In a constellation with a direct object, the culmination point is that the direct object is usually conceptualised as crossing from the state one side of a relevant bipartition to the state on the other side.[35] For (29a), only the incremental-theme reading, in which the picture of the president comes into existence, is compatible with the structure evoked by the time-frame adverbial, while the reading in which a real or imaginative president serves as a model for a picture is not.

Most crucial for the argumentation here is that the telic structure, which would require a definite or quantified internal argument, is not a possible interpretation for the objectless variant (29c): there is no 'inaudible' object that could identify the argument which changes its state; in the absence of the object, the structure is not available.

The explanation which Levin & Rappaport-Hovav (1998) suggest – membership of verbs in different classes are associated with different event structures – can explain the contrast between (29c) and (29d). It cannot, however, explain the contrast between (29a) and (29b). This means that we should indeed attribute the effects in (28)–(29) to productive argument structure template rules of the form in (30):

(30) a. $\text{M: CAUSE}_{\text{MEANING CONTRIBUTION VERB}}\text{(x) (BECOME(y) (STATE (z)))}$
$\text{-> F: } V_{+\text{active}}\ X_{\text{nom}}\ Y_{\text{acc}}$

b. $\text{M: ACT (X) -> F: } V_{+\text{active}}\ X_{\text{nom}}$

35. This is with respect to verbs with ACT as a subevent predicate; for, e.g. motion verbs, the argumentation is similar but not identical.

For a verb to be inserted in the (telic) transitive template in (30a), the fillers (verb and complements) and M_C must evoke a frame which fills certain conditions that might be roughly described this way:

a. the frame contains an element X that is (or can be conceptualised as) a cause by its actions or existence,
b. the meaning contribution of the verb V is (or can be conceptualised as) associated with the STATE, possibly but not necessarily specified by an adverb or part of the verb meaning,
c. the frame contains an element Y that is (or can be conceptualised as) caused to cross to another state,
d. the state must be relevant according to conventional assumptions (or be conceptualised as relevant in the larger context),[36]
e. the crossing of Y to another state is conceptualised as a result of the meaning contribution of the verb (which can, but need not, be an action) (b.).

The subpart DO/ACT seems to be a necessary part of the template for many authors. In my opinion, it is not a part of the template but an effect of the standard interpretation of the frame in the case of many verbs: if something becomes eaten, there must be someone who has eaten it, and this is the same entity that caused the being eaten.

The STATE in (30) can be expressed by the particle of the matrix verb (*auf*machen 'to open'), if V is derived from an adjective, it is interpreted as this adjective (*klären* 'to clear', *töten* 'to kill'), it can be equalised with a perfect participle form which is derived from the verb (*gegessen* 'eaten', *zerbrochen* 'broken'), by an adjective incorporated by the verb (*kaputtmachen* 'to destroy') or by a phrase (*in kleine Stücke reißen* 'to tear into small pieces').

If the first part of the verb is a resultative, the second part is associated with the modifying 'MEANING CONTRIBUTION' slot, implying that the result was achieved by an action (*kaputtmachen*) or even a specific sort of action (*totschlagen, in kleine Stücke reißen*). In other words, these verbs are non-atomic fragments of argument structure because they explicitly activate STATE arguments and should, therefore, not be compatible with structures like (29b)/(30b).[37]

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36. In the sense suggested by Kratzer (2000) and Maienborn (2009), who show how an *ad hoc* conceptualisation of the interpretation of certain perfect participles as relevant states allows them to be used as state passives in German, though the verbs from which they are derived are usually not categorised as perfective (e.g. *Diese Katze ist gestreichelt* may be an acceptable state passive in a scientific experimental setting in which the results of being stroked or not are investigated).

37. Unless, of course, they have an idiomatic reading like *totquatschen* 'talk to death', in which *tot* 'dead' is used as an intensifier as in the following example:

Of course, the M of the structure in (30a) above does not represent every meaning aspect of a sentence which is built after this template; it works more like a cookie cutter in that it cuts out a meaning from the richer dough of encyclopedic knowledge, in an established and conventionalised form. That it is difficult to draw without drawing something like a picture or fragments of a picture is a property of frames, of encyclopedic knowledge and of linguistic knowledge about which pieces of frames and encyclopedic knowledge can be associated with certain linguistic forms. It is not a part of the meaning of sentence structures. After all, in an interpretation of (29b) with the president as a model for drawing, there is an accusative object present; nevertheless, the incremental theme (the result emerging from the drawing process) is not expressed. If there is something, it is not quantified, not definite, not syntactically active, and not referring. In other words, there is no valid reason to assume that there is something like an INI in sentences like (29d) at all.[38] What is there is a *drawing*-frame evoked by the verb *zeichnen*, and there is a structure evoking an agent who does something for a certain time span (which, combined with the *zeichnen*-frame, is conceptualised as someone who is drawing).

Conditions for frames which can be combined with the production rule in (30b) (assigning a unergative structure to an activity event) are simpler:

a. the frame contains an agent (or an entity which is conceptualised as such).
b. The frame is conceptualising an atelic action.

Those verbs and verb phrases with a non-idiomatic resultative part (*kaputtmachen, totschlagen, in Stücke reißen*) should not be compatible with (30b), because these verbs have their own non-atomic structure, in which a predicate STATE, like preassembled building blocks of argument structure, is combined with the verb stem. The result is that these verbs are only compatible with templates which contain a STATE predicate on their meaning side.[39] A similar effect may be attributed to parti-

(i) *Er hat mich zwei Stunden lang totgequatscht.*
'He talked to me incessantly for two hours.'

Because of the non-idiomatic interpretation of *totquatschen, tot* in (i) is not interpreted as a STATE, and the direct object *mich* 'me' is not interpreted as crossing a border into another state but as the (somehow affected, but not dramatically changed) addressee of an event of excessive talking. Cf. Smirnova & Mortelmans (2020).

38. Cf. Ziem (2014) for suggestions how meaningful elements of a text or conversation can be evoked exclusively by an activated frame.

39. This does raise the following question: why is the accusative object possible as an augmentation of the template in (30b)? There are several potential answers to this question; at this point, I cannot decide which one is the most plausible. One idea would be that it is a purely syntactic decision based on the overgeneralisation (meaning a weaker rule that contains an additional vari-

cle verbs (like *ab*schneiden 'to cut off', *aus*schalten 'to switch off') and, though probably weaker because of their higher idiomaticity, to prefix verbs (like *ver*fassen 'to write/to author').

To sum up, constructional variants with 'INI' are licensed by an argument structure template in which they have no function but that of a modifier of the action: in a similar fashion to how *Holz* 'wood' in *Holztür* 'wooden door' restricts the set of possible referents to those doors that are made of wood, the direct object in an activity template like (31) restricts the set of possible events from those in which somebody reads to those in which somebody reads a book.

(31) a. *Jemand hat gerade (ein Buch)*
somebody[NOM] have.PRS.3SG just a[N.ACC.SG] book(N)[ACC.SG]
gelesen.
read.PTCP
'Somebody has just read (a book).'

b. *Jemand hat gerade (einen Baum)*
somebody[NOM] have.PRS.3SG just a:M.ACC.SG tree(M)[ACC.SG]
gezeichnet.
draw.PTCP
'Somebody has just drawn (a tree).'

This means that we have an additional, augmented argument structure template:

(32) M: ACT (X)$_{\text{MEANING CONTRIBUTION OBJECT}}$ -> F: $V_{+active}\ X_{nom}\ Y_{acc}$

This makes $V_{+active}\ X_{nom}\ Y_{acc}$ polysemous, with the input sides of (30a) and (32) as the variants. They may be bound by M_C, but they can also be disambiguated, e.g. by time-span and time-frame adverbials (and possibly other temporal structures), which coerce one of the variants and exclude the other. Another possibility among several is to combine the verb stem with a resultative like *fertig* 'finished, done' as an

able) of the productive template $V_{+active}\ X_{nom}\ Y_{acc}$: if a frame element must be introduced, it should receive accusative case by default. Another possibility is that it is introduced by overgeneralisation of the individual lexical valency rules which assign the accusative to the frame element that might change state by the action evoked by the verb; such an overgeneralisation/weak rule could be responsible for the abstract semantic role *patiens* (something on which an action is performed); the heterogeneity of this role (cf. Dowty 1991) would be a result of the overgeneralisation). Another idea is that the possibility is introduced by a polysemy of the participle due to the ambiguity of the copula/auxiliary *werden* in passive sentences like the following:

(i) *Das Buch wird gelesen.* 'Now or in the near future, the book crosses into the state of being read completely.'

(ii) *Das Buch wird gelesen.* 'At this moment, the action of reading is performed on the book.'

explicit state marker (*fertig gelesen* 'read$_{PTCP}$ completely') for the accomplishment reading. Yet another way to ensure an activity reading of a sentence is to dislocate the direct object by *und zwar* (roughly equivalent with English *namely*), which is sometimes used as a test for the distinction between adjuncts and complements.

(33) a. **Sie zeichnete innerhalb von einer Stunde, und*
3SG.F[NOM] draw:PST.3SG within of a:F.DAT.SG hour(F):DAT.SG and
zwar den Präsidenten.
namely the.M.ACC.SG president(M):ACC.SG
'She had drawn within an hour, and it was the president that she had drawn.'

b. *Sie zeichnete eine Stunde lang, und zwar*
3SG.F[NOM] draw:PST.3SG a:F.ACC.SG hour(F)[ACC.SG] long and namely
den Präsidenten.
the.M.ACC.SG president(M):ACC.SG
'She was drawing for an hour, and it was the president that she was drawing.'

c. *Sie zeichnete, und zwar den Präsidenten.*
3SG.F[NOM] draw:PST.3SG and namely the.M.ACC.SG president(M):ACC.SG
'She was drawing, and it was the president that she was drawing.'

The explanation for INI, now, is very simple: in most cases, the augmentation of the activity template by an indefinite expression like *Sachen* 'things' or an indefinite pronoun would be redundant. Contrary to an indefinite pronoun in the accomplishment template, it is not required by the activity template, and the typical meaning contribution of direct objects in that frame (restricting the interpretation of the activity) is not possible (the information that something is painted is already contributed by the verb *zeichnen* 'to paint'). However, what is omitted is not an object but the unnecessary augmentation of a sentence by redundant material.

Now, what about DNI? In this context (lexically bound DNI), I will only make a few remarks on them.

Firstly, there are indeed cues that there is an 'inaudible form' in that context, as can be concluded from the following examples:

(34) a. (Die Vertragsbedingungen wurden ihr erläutert.)
(The conditions of the contract were explained to her.)
Sie akzeptierte innerhalb von wenigen Minuten.
3SG.F[NOM] accept:PST.3SG within of few.F.DAT.PL minute(F):DAT.PL
'She accepted within a few minutes.'

b. (Der Vertrag wurde ihm vorgelegt.)
(The contract was presented to him.)
Er unterschrieb innerhalb von wenigen Sekunden.
3SG.M[NOM] sign\PST[3SG] within of few.F.DAT.PL second(F):DAT.PL
'He signed within a few seconds.'

(35) a. (Die Vertragsbedingungen wurden ihr erläutert.)
(The conditions of the contract were explained to her.)
??*Sie hat unverändert akzeptiert.*
3SG.F[NOM] have.PRS.3SG unaltered accept:PTCP
'She accepted it unaltered.'

b. (Der Vertrag wurde ihm vorgelegt.)
(The contract was presented to him.)

i. ?*Er hat in zweifacher Ausführung unterschrieben.*
3SG.M[NOM] have.PRS.3SG in twofold.F.DAT.SG Version(F).DAT.SG sign:PTCP
'He has signed it in duplicate.'

ii. ??*Er hat in Papierform unterschrieben.*
3SG.M[NOM] have.PRS.3SG in paper.form(F).DAT.SG sign:PTCP
'He has signed it in paper form.'

The test for telicity via a time-frame adverbial seems to work – but not very well, as the interval must be very short. In (35), it seems that the unexpressed argument is not able to control a secondary predicate.[40] It is certainly relevant that the verb *akzeptieren* 'to accept' (and probably *unterschreiben* 'to sign' as well) belongs to a small, semantically homogenous class of verbs which are used to describe situations in which a person positions themselves with respect to a proposal, a statement or the like which requires accepting or rejecting it. All these verbs (with the exception of *unterschreiben*, for obvious reasons) can be used as performative verbs with a declarative illocution, meaning that the positioning towards the proposal, statement, etc. is binding in the setting. Jacobs (1994a) notes that the objectless use of *akzeptieren* is limited to proposals and the like, using the following example:

(36) a. *Er hat (den Vertrag) akzeptiert.*
3SG.M[NOM] have.PRS.3SG the.M.ACC.SG contract(M)[ACC.SG] accept:PTCP
'He has accepted (the contract).'

b. *Er hat *(seine Mitmenschen) akzeptiert.*
3SG.M[NOM] have.PRS.3SG POSS.3SG.M:ACC.PL with.human(M):ACC.PL
accept:PTCP
'He has accepted *(his fellow human beings).'

40. The ability to control a secondary predicate would suggest that there is a covert but syntactically empty pronoun (*pro*, Rizzi 1986).

c. *Er hat *(seine Behinderung) akzeptiert.*
3SG.M[NOM] have.PRS.3SG POSS.3SG.M:F.ACC.SG handicap(F)[ACC.SG] accept:PTCP
'He has accepted (his handicap).'

This limited interpretation concerns not only the non-expressed object but also *akzeptieren* itself: it only allows the reduced variant if used in this declarative-illocution reading (36a), not if it is associated with internal states of the subject, as in (36b)–(c).

Other semantically similar verbs – though with differences in their semantic valency – are introduced in (37):

(37) a. *Er widersprach (dem Vorschlag) vehement.*
3SG.M[NOM] object\PST[3SG] the.M.DAT.SG proposal(M)[DAT.SG] vehemently
'He objected (to the proposal) vehemently.'

b. *Sie stimmte (dem Vorschlag) begeistert zu.*
3SG.F[NOM] agree:PST.3SG the.M.DAT.SG proposal(M)[DAT.SG] enthusiastically VERB.PARTICLE
'She agreed (with the proposal) enthusiastically.'

c. *Er sagte sofort ja (zu dem Vorschlag).*
3SG.M[NOM] say:PST.3SG immediately yes to the.M.DAT.SG proposal(M)[DAT.SG]
'He immediately said "yes" (to the proposal).'

d. *Sie lehnte (den Vorschlag) brüsk ab.*
3SG.F[NOM] reject:PST.3SG the.M.ACC.SG proposal(M)[ACC.SG] briskly VERB.PARTICLE
'She briskly rejected (the proposal).'

e. *Er gab (dem Vorschlag) seine Zustimmung.*
3SG.M[NOM] give\PST[3SG] the.M.DAT.SG proposal(M)[DAT.SG] POSS.3SG.M:F.ACC.SG consent(F)[ACC.SG]
'He gave his consent (to the proposal).'

(37) suggests that these verbs all instantiate the same frame, in which a person expresses their position towards a proposal.[41] Interestingly, while the non-

41. Cf. the Reaktion_auf_Vorschlag-frame in the German FrameNet & Constructicon (https://gsw.phil.hhu.de; BFN-1. 7: Respond_to_proposal).

expressed arguments are semantically homogenous, they are syntactically heterogeneous, realised as dative, accusative and prepositional objects.

I would suggest that the reductions in (37) cannot be explained (like DNI) with respect to an argument structure template[42] but by the overgeneralisation of a specific, typical use in contexts like those above:

(38) a. *Ich* *widerspreche!*
1SG[NOM] object:PRS.1SG
'I object!'

b. *Ich* *stimme* *zu!*
1SG[NOM] agree:PRS.1SG VERB.PARTICLE
'I agree!'

c. *Also, ich* *sage* *ja!*
Well 1SG[NOM] say:PRS.1SG yes
'Well, I say "yes"!'

d. *Ich* *muss* *leider* *ablehnen.*
1SG[NOM] must[PRS.1SG] unfortunately reject:INF.
'I'm afraid I must decline.'

e. *Ich* *gebe* *meine* *vollste*
1SG[NOM] give:PRS.1SG POSS.1SG:F.ACC.SG fullest:F.ACC.SG
Zustimmung.
consent(F)[ACC.SG
'I give my full consent.'

In this explicit performative use with the first-person pronoun, a speaker positions themselves towards a proposal up to debate. Probably, it is licensed not only by the frame as a configuration of certain elements but also by scripts, i.e. knowledge about which communicative actions are appropriate at a certain point of a situation or process. These reductions, indeed, are lexical and bound by M_C. Noticeable is that the 'DNI' is somewhat ambiguous in the examples with verbs which do not subcategorise it as an accusative.

Similar (though not generalised to other persons) is the objectless use of certain *verba dicendi et sentiendi* with the immediately preceding proposition or turn as its referent.

42. If the rules in (30) were responsible for the polymorphous with and without direct object variants in (37), they should display the respective variable behaviour with respect to (a)telicity – but, as a reviewer remarks, the examples in (37) are all telic, regardless of the presence of an overt direct object.

(39) a. [A: *Kommt Roswitha auch?*
come:PRS.3SG Roswitha(F)[NOM.SG] also
'Will Roswitha come as well?']
B: *Ich meine / glaube / denke / fürchte / hoffe / schätze (dass sie kommt).*
1SG[NOM] mean:PRS.1SG believe:PRS.1SG think:PRS.1SG fear:PRS.1SG hope:PRS.1SG guess:PRS.1SG that 3SG.F come:PRS.3SG
'I think/believe/am afraid/hope/guess she will.'

b. [A: *Roswitha war damals übrigens auch da.*
Roswitha(F)[NOM.SG] be.PST.3SG at that time besides also there
'Besides, Roswitha was also there at the time.']
B: *Ich weiß/ erinnere mich (dass sie da war).*
1SG[NOM] know:PRS.1SG / remember:PRS.1SG REFL.1SG that 3SG.F[NOM] there be.PST.3SG
'I know/remember (that she was there).'

I will not discuss the difference between DNI and ellipsis at this point – I am not sure that there is one for these examples. Because of the concrete situations to which they are limited, however, it is hard to construct a sentence in which there isn't an antecedent. An exception might be (40):

(40) a. M_C: contrastive and generic
(*Sie ist weder ein übermäßig harter noch ein übermäßig nachgiebiger Verhandlungspartner.*
'She is neither an excessively hard nor an excessively lenient negotiator.')
Manchmal akzeptiert sie innerhalb kurzer
sometimes accept:PRS.3SG 3SG.F[NOM] within short:F.DAT.SG
Zeit, manchmal bittet sie sich
time(F)[DAT.SG] sometimes request:PRS.3SG 3SG.F[NOM] REFL.3SG
Bedenkzeit aus.
reflection time(F)[ACC.SG] VERB.PARTICLE
'Sometimes she accepts something in a very short time, sometimes she asks for a reflection period.'

b. M_C: generic, not contrastive
(*Sie ist ein recht nachgiebiger Verhandlungspartner.*
'She is a quite lenient negotiator.')
?*Oft akzeptiert sie in sehr kurzer Zeit.*
often accept:PRS.3SG 3SG.F[NOM] in very short:F.DAT.SG time(F)[DAT.SG]
'Often, she accepts something in a very short time.'

(41) a. M_C: generic
Egon akzeptiert oft / sagt oft ja /
Egon(M)[NOM.SG] accept:PRS.3SG often / say:PRS.3SG often yes /
stimmt oft zu, ohne nachgedacht zu haben.
agree:PRS.3SG often VERB.PARTICLE without reflect:PTCP to have:INF
'Egon often accepts something/says yes to something/agrees to something without even thinking.'

b. M_C: episodic
Egon ??akzeptierte vorhin / sagte vorhin ja /
Egon(M)[NOM.SG] accept:PST.3SG earlier / say:PST.3SG earlier yes /
stimmte vorhin zu, ohne nachgedacht zu haben.
agree:PST.3SG earlier VERB.PARTICLE without reflect:PTCP to have:INF
'Earlier on, Egon has accepted something/said yes to something/agreed to something without even thinking.'

In (40a), the negotiation frame to which the DNI is bound is evoked by the frame element *Verhandlungspartner* 'negotiator'. However, this is not sufficient for such a variant, as shown by (40b); contrast certainly makes these readings better. At least it shows that for *akzeptieren* 'to accept', omission is possible without a concrete (definite and quantified) predecessor of the 'DNI'. Example (41) is more interesting in my opinion. According to my intuition, the episodic reduced variants in (41b) are all less acceptable than those in the generic contexts in (41a).[43] The high compatibility of reduced variants with generic and contrastive contexts has often been observed (cf. e.g. Blume 1993; Goldberg 2001 and Härtl 2013 on generic; Welke 1988; Jacobs 1994a and Cote 1996 on different contrastive readings).

The essential hypotheses from this subsection are as follows: DNI are completely marginal and limited to small, homogeneous groups of verbs, which means that they are bound lexically. For the (variable-behaviour) verbs in (39) and possibly also for (38), I would additionally postulate a partly filled form-meaning template in which the objectless variant is directly assigned to the respective frames.[44] The reduced variants thought of as INI in many approaches, in contrast, are not lexical at all but should be licensed by the activity context, i.e. also by the direct assignment via template rules. These as well as the rules bound by frames are examples of constructions in the Construction Grammar sense. The only verbs not flexible enough to participate are those verbs and contexts which fail to fulfill

43. That *akzeptieren* 'to accept' in these contexts is less acceptable than *ja sagen* 'to say "yes"' and *zustimmen* 'to agree' may be because it is the only verb of those in which the proposal is subcategorised as a direct object.

44. E.g. the `Reaktion_auf_Vorschlag` frame; cf. https://gsw.phil.hhu.de; BFN-1. 7: `Respond_to_proposal`.

the semantic conditions of the template and those which incorporate a STATE or culmination point, e.g. in the verb particle.

3.2.4 *Non-lexical DNI: PED (developing towards CD,) lexical rules vs sentence type rules (directly assigned)*

Though DNI may be marginal as parts of lexically bound variants, they are frequent in directive and commissive contexts:

(42) a. Directive infinitive
(Die Tabletten) unbedingt heute noch kaufen!
the.ACC.PL pill(F):ACC.PL by.all.means today still buy:INF
'By all means, buy the pills today!'

b. Directive declarative
*Du sollst unbedingt heute noch *(die Tabletten)*
2SG[NOM] shall:2SG by.all.means today still the.ACC.PL pill(F):ACC.PL
kaufen.
buy:INF
'You shall buy the pills today by all means.'

(43) a. Directive imperative
Nimm (das) mal bitte!
Take\IMP.SG that[ACC.SG] DISCOURSE.PARTICLE please
'Please take that!'

b. Directive declarative
*Du sollst *(das) bitte nehmen.*
2SG[NOM] shall:PRS.2SG that[ACC.SG] please take:INF
'You shall take that, please.'

The effects above suggest that some reduced variants may be bound by sentence type constructions – essentially, illocution types which are directedly assigned to morphosyntactic templates with restrictions on word forms, syntactic sequencing and correlated elements like certain discourse particles. The influence of sentence type on objectless variants has been suggested by Jacobs (1994a, 2016): directive infinitives as in (42a) should allow variants verb-independently, and directive imperatives should at least tolerate reduced variants to some degree. Consequently, the objectless variants are bound by direct assignment in such a sentence type construction.

There is also another crucial difference between directive infinitives and directive imperatives.[45] Consider the following differences combined with a verb allowing activity as well as accomplishment readings:

(44) (Instruction concerning a book which is present.)
a. Directive infinitive
(Das Buch) innerhalb von einer Stunde
the.N[ACC.SG] book(N)[ACC.SG] within of a:F.DAT.SG hour(F)[DAT.SG]
lesen!
read:INF!
'Read the book within an hour!'
b. Directive imperative
Lies (das Buch) innerhalb von einer
read\IMP.SG the.N[ACC.SG] book(N)[ACC.SG] within of a:F.DAT.SG
Stunde!
hour(F)[DAT.SG]
'Read the book within an hour!'

(45) (Instruction concerning a beverage that is present.)
a. Directive infinitive
(Das Getränk) gut gekühlt trinken.
the.N[ACC.SG] beverage(N)[ACC.SG] well chill:PTCP drink:INF
'Drink the beverage well chilled.'
b. Directive imperative
*Trink *(das Getränk) gut gekühlt.*
drink.IMP.SG the.N[ACC.SG] beverage(N)[ACC.SG] well chill:PTCP
'Drink the beverage well chilled.'

Both (44) and (45) suggest that only directive infinitives have real DNI, i.e. elements that are syntactically present: directive imperatives do not.

4. Empirical study: Acceptability rating experiments

In Section 3, I have suggested that the possibility of variants with vs without an overt direct object are quite heterogenous: some, like *geben* 'to give' in card games, are variants of individual polysemous lexemes and M_C-bound to certain

45. Further differences between directive imperatives and directive infinitives – which may also be interpreted as polymorphous variants – do concern genre and style: roughly, one could say that the imperative is typically preferred in informal contexts with symmetrical or non-distant relationships between speaker and hearer, while the directive infinitive is more appropriate in more formal (also written) genres.

scripts and frames with restricted sets of elements and possible actions. Others are bound to larger form-meaning templates (generalisations about F_C-M_C occurrences, directly assigned as F-M)[46] with different degrees of abstractness, like sentence type and argument structure constructions. Even combinations are possible (variants bound to certain lexemes and then (sub-)bound to certain sentence types (e.g. *Nimm mal!* 'Take (this)!'; *Zeig mal* 'Show (it to me)!' in the imperative). This explosion of types of variants is probably an effect of the multiple re-entries of form-meaning pairs as direct assignments of abstract or partially abstract templates, which are often manifested as weak, overgeneralising rules.

For argumentation on syntactic variants, this means that, to make a valid generalisation concerning certain types of variants, all these factors must be considered throughout the study. In the case of 'optional' direct objects, it is not enough to show that a variant is acceptable in a certain context – the variant might be bound by the form of a verb, bound by a special limited use of the verb, bound by the argument structure configuration, bound by sentence type, bound and subbound by sentence-type/verb (reading), etc. etc. The consequence is that all these factors must be controlled. This means that, for all but the very clear cases[47] or research questions with a very limited scope (e.g. the variants bound to a certain, very frequent verb), corpus studies have an extremely low cost-benefits ratio: every token has to be parametrised for all of these factors, many of them dependent on context. Another and more serious problem is that many of the constructions which might be of interest for the study – e.g. directive or commissive sentence types, in my case – are underrepresented in most larger corpora, though being frequent in spoken language. The case that an unexpressed argument is present in the situation should be less common as well.

4.1 Methods

As a result, my eventual method of choice is acceptability rating studies in which the test persons shall decide whether a variant is acceptable in a certain context. The design – determining category or variant status via minimal pairs – is standard procedure from phonology: the variants that are tested are pairs of sentences which differ from each other in the feature [+/−do], namely, the presence vs absence of a direct object in the respective structure. The variants are inserted in identical M_C-F_C contexts to control that the meaning contribution of the item does not change (which would mean that [+/−do] would distinguish categories

46. A re-entry in the terminology of general system theory.

47. E.g. verbs which never allow a direct object (*zubeißen* 'bite') or strong templates in which reduced variants are directly assigned (e.g. subjects in imperative sentences).

and, consequently, would not be variants but would belong to different categories).[48] The design was developed in a project run by Joachim Jacobs and founded by the DFG with the aim to investigate the influence of sentence type on "argument omissions" (Jacobs et al. 2016). 49 verbs (always the same polysemous variant or 'verb reading') were tested in several sentence types (among them assertive declarative, directive infinitive, directive imperative, and several conjunctions of imperatives and declaratives).

The studies could show that directive infinitives (as sentence type constructions) allow DNI independently from lexemes, while directive imperatives have a higher tolerance towards the reduced variants but are also influenced by the verb (cf. Jacobs et al. 2016; Külpmann & Symanczyk Joppe 2015, 2016, 2018 and Külpmann 2019). The test items, distributed on several different questionnaires, were rated by students at the University of Wuppertal (meaning that social and regional factors kept relatively constant, only the data of native speakers included).[49] Participants received the questionnaires in paper form and were instructed and supervised by one of the researchers employed in the study. The test sentences were given in contexts and underlined. The participants were instructed to judge the test sentences based on the criterion of whether they were linguistically possible in the respective context or not, relying on their linguistic intuition. The setting was two-alternative forced-choice, meaning that participants only had a binary choice (*yes* or *no*) and were instructed to always choose one of the alternatives – a slight tendency towards one of the options should be treated just like a clear 'yes' or 'no'.

Each questionnaire contained only a choice of test items. To prevent the participants from forming own hypotheses during the study, distractor sentences were included; in addition to this, each questionnaire was heterogeneous in the sense that the test items belonged to many different verbs and templates. The distractors were identical for all questionnaires and did not give statistically significant different results for the different questionnaires, suggesting that the results from different questionnaires were comparable. Several distractors were relatively clearly acceptable or unacceptable and, accordingly, gave average results of 0% or 100% acceptability. This strongly suggests that the participants understood the

48. A completely different example to clarify this principle: *Flinte* vs *Gewehr* 'shotgun' in idiomatic vs non-idiomatic contexts like [*die Flinte*] / [**das Gewehr*] *ins Korn werfen* 'to give up' vs *die Flinte / das Gewehr ins Korn werfen* 'throw the shotgun into the grain'. *Flinte* and *Gewehr* both lexical, *Flinte* also M_C-F_C bound by a directly assigned F-M pair; F being complex, but not abstract.

49. Questionnaires with items from the study, tested in different dialectal areas by Robert Külpmann and producing results that were not significantly different, suggest that the results of this study are not bound to a dialect (cf. Külpmann 2019).

task and tried to fulfil it conscientiously (instead of making random choices). The questionnaires consisted of two sections of approximately 30 test items in each (including distractors). Between the two sections with test items was a middle part with maths exercises for the participants to avoid 'tunnel vision'. For each section, including the middle part, the participants had a time limit controlled by the supervisor; when the maximum time was over, they were instructed to stop and move to the next section. To deal with differences in reading speed between participants, several distractors made up the end of the test sections.[50]

The study I present here (S2) is a successor of the first study (S1); it was conducted at the universities of Wuppertal and Bonn, 2017–2020, under the same conditions as S1. In S2, 1,636 test items were tested in 37 questionnaires (distractors not included); in addition to that, the results of 221 test items (several directive imperative and directive infinitive items for 20 verbs)[51] were taken over from S1. The study was expanded to several new templates (among them commissives, generic sentences, habitual sentences and contrastive sentences). Twenty new verbs were included in S2, many of them suggested in the literature in the context of different factors for objectless variants.

4.2 Do activity templates license valency reductions?

In the following, I will present a cutout from the 1,857 test items and 22 test templates[52] included in S2 to evaluate the suggestions made in Subection 3.2.3 of this paper.

In Subsection 3.2.3, I developed the hypothesis – strongly influenced by former proposals by Brisson (1994); Rapp (1997), Rappaport-Hovav & Levin (1998), among others – that the possibility to produce well-formed sentences without direct objects, with verbs that otherwise allow or require direct objects, may depend on (i) the interpretation of the respective sentence as an activity event

---

50. For the commented and translated cover sheet of the questionnaire, cf. Appendix A.

51. Only half of the verbs from S1 were taken over to S2; the S1 verbs were picked for several reasons not deemed interesting for S2, e.g. to test semantic fields like *anschalten, ausschalten, ausmachen, abschalten*, etc. To reduce the danger of biases, I only took one member of the syntactic field and replaced them with additional verbs.

52. The term *test template* is often, but not in all cases, identical with *template* as used in this paper (i.e. a multi-word unit with an open slot that is directly assigned to a meaning): sometimes a test template is more specific than the respective template, e.g. the template in (30b) ($V_{+active}$ $X_{nom]]}$, as a means to describe atelic activities) is tested in the form of two test templates. In one of them (ACT_{def}), the atelic reading is evoked by the temporal-durative subordinating conjunction *während* 'during'; in the other one ($KontACT_{def}$), it is evoked by a contrastive setting.

(contrary to an accomplishment event in which the direct object must be realised or be syntactically active) and (ii) the contextual or situational activation of the entity the omitted direct object would refer to if realised. If (i) is not the case (and, in the absence of other factors, suspected to favour objectless construal), the objectless variant should not be possible for syntactic-semantic reasons: the linking, bound to templates (or argument structure constructions), fails. If (ii) is not fulfilled, the objectless variant should not be possible for pragmatic reasons – too little information is given.

> H For the objectless realisation of a transitive verb in a sentence S, the following conditions must be fulfilled:
>
> i. The referent of the argument otherwise expressed by the direct object must be present in the situation in which S is uttered (or evoked by the linguistic context), and
> ii. S must be interpreted as an activity.

If H is true, there will be polymorphous variants with ([+do]) and without a direct object ([–do]) due to different licensing mechanisms: the [+do] variant is licensed by the respective verb, the [–do] variant by the template.

4.2.1 *Setting: Verbs and test templates*

I will provide data for 40 verbs and five test templates, each pairing tested with and without direct object. One of the test templates, the directive infinitive, is only included for illustrative reasons.[53]

In the following, I will give a short, informal description of each of the five test templates, illustrate each one with two test items – always one with differences between both variants, one with high acceptability scores for both – and relate them to the templates distinguished in the theoretical discussion. Percentages indicate average acceptability.

Test template 1: ACCOMP$_{def\text{-}top}$. Test template 1 is the context Fillmore (1986) suggests for the identification of DNI (cf. also 26):

(46) A: *Where is my sandwich?*
B: *Fido has eaten* *(*it*).

Essential ingredient of M_C is a direct inquiry after an object X, e.g. in the form *Where is X?* or *What about X*? Consequently, an answer as in (46) – with X as the direct object, if realised – will be interpreted as X having gone through a change of state (or of location, or of possession – depending on the verb). To sum up,

53. For more details, cf. Subsection 3.2.4 and the studies cited there.

the corresponding template[54] is the transitive one denoting an accomplishment in (30a), with the object in question either mentioned or present in M_C (in the form that it can be reconstructed by the test subject as well as by the imaginary addressee of the utterance). If F (i.e. the test sentence) has the feature [–do] (i.e. it has no direct object), this means that there would be a DNI, because only with an empty yet syntactically active element should it be compatible with the accomplishment interpretation.

(47)

TEST TEMPLATE: $ACCOMP_{def\text{-}top}$, VERB: *stehlen* ('to steal')
Stefan, ein Antiquitätensammler, erhält einen Anruf von seiner Frau, dass bei ihnen eingebrochen wurde. Er eilt nach Hause und sieht als Erstes in dem Raum nach, in dem er die wertvollsten Objekte aufbewahrt. „Wo ist die antike japanische Teeschale hin?", fragt er besorgt. Seine Frau antwortet betrübt:
'Stefan, a collector of antiques, is called by his wife and told that they have been burgled. He hurries home and heads straight to the room where he keeps the most valuable objects. 'Where is the antique Japanese teacup?' he inquires worriedly. His wife answers sadly:

„Der	Einbrecher	hat	gestohlen."		0%
the.M[NOM.SG]	burglar(M)[NOM.SG]	have.PRS.3SG	stolen:PTCP		
„Der	Einbrecher	hat	sie	gestohlen."	100%
the.M[NOM.SG]	burglar(M)[NOM.SG]	have.PRS.3SG	3SG.F[ACC]	stolen:PTCP	

'The burglar has stolen (it).'

There are very few verbs for which the [–do] variant gives medium results in this context, and I think that even these cases are problematic: in some cases, $ACCOMP_{def\text{-}top}$ is ambiguous between a direct answer to the question and an indirect answer with an implicature which gives a (partial) answer to the question (48) (cf. also the discussion of Example (26b) in Subsection 3.2.2):

(48) [*Wo ist mein Sandwich?*
'Where is my sandwich?']

a.	*Fido*	*hat*	**(es)*	*gegessen.*	DNI reading (not available)
	Fido(M)[NOM.SG]	have.PRS.3SG	3SG.N[ACC]	eat:PTCP	
	'Fido has eaten it.'				
b.	*Fido*	*HAT*	*gegessen*		Lexically bound reading; cf. (25e)
	Fido(M)[NOM.SG]	have.PRS.3SG	eat:PTCP		
	'Fido has already eaten lunch.'				

54. Template (30a) and test template are not identical in this case, because the test template $ACC_{def\text{-}top}$ has the additional feature that it is the answer to a direct inquiry after the argument which is linked to the direct object in this template.

+ -> 'I don't know, but Fido has already eaten lunch, so he shouldn't have eaten your sandwich.'

(49) [*Wer gibt mir gleich meine Tabletten?*
Who will give me my pills?]

a. *ICH gebe *(sie dir).* — DNI reading (not available)
1SG[NOM] give:PRS.1SG 3PL[ACC] 2SG.DAT
'I will give them to you.'

b. *Ich GEBE gerade (den* — Lex. bound reading, cf. (23)
1SG[NOM] give:PRS.1SG now the.M.DAT.PL
Mitspielern die Karten).
co-player(M):DAT.PL the.F[ACC.PL] card(F):ACC.PL
'Right now, I am dealing cards.'
+ -> 'I am dealing the playing cards, so I'm not available.'

Consider the following test item, which is the one with the lowest differences between the variants for $\text{ACCOMP}_{\text{def-top}}$:

(50)

TEST TEMPLATE: $\text{ACCOMP}_{\text{def-top}}$, VERB: *zählen* ('to count')
Im Park fällt Rosi eine Gruppe kleiner Kinder auf, die unnatürlich ruhig in Zweierreihen dastehen. „Was ist denn mit diesen Kindern los?", fragt sie einen Mann, der auf einer Bank sitzt. Der Mann antwortet: „Was soll sein?
In the park, Rosi notes a group of small children who are standing unnaturally calm in double rows. 'What's wrong with these children?' she asks a man sitting on a bank. The man answers: 'What should be wrong?

Ihre	Erzieherin	zählt	gerade."		69.8%
POSS.3PL:F.NOM.SG	teacher:F[NOM.SG]	count:PRS.3SG	just		
Ihre	Erzieherin	zählt	sie	gerade."	89.8%
POSS.3PL:F.NOM.SG	teacher:F[NOM.SG]	count:PRS.3SG	3PL[ACC]	just	

'Their kindergarten teacher is just counting (them).'

In my intuition, participants may have interpreted the sentence as 'Their teacher is just counting numbers (and the children are listening intently).'[55] Unfortunately, it is sometimes nearly impossible to exclude this 'implicature reading' iff a verb

55. An anonymous reviewer suggests that this may be the case because the event denoted by *zählen* 'to count' lacks an implicit culmination point (cf. also Leiss 1992: 48; Pustejofsky 1995). However, Kratzer (2000) argues that, by the appropriate context, even those verbs can be interpreted as having a designated result state, resulting in a respective grammatical behaviour (in this case, the possibility to built adjectival passives). Cf. also Maienborn (2009).

has a lexically bound INI reading in which the INI strongly evokes a certain kind of object; however, it only happens in very few cases.[56]

Test template 2: $ACT_{ind.}$ This is a test template in which the objectless variant alternates with a variant with indefinite pronouns or bare plurals in object position (corresponding to template 30b). F-M is the direct answer of a person B to a question from a person A as to what B has been doing, evoking an activity reading. There is no antecedent for a DNI in the M_C-F_C context, but the type of object can be inferred from the frame evoked in M_C or the test sentence.

(51)

TEST TEMPLATE: ACT_{ind}, VERB: *abholen* ('to fetch')
Herr und Frau Kühn sind selbständig. Als Frau Kühn in einer wichtigen Sache eine Information von ihrem Mann braucht, ist er nirgendwo aufzufinden. Später fragt sie ihn: „Was hast du gerade gemacht?" Er antwortet:
Mr and Mrs Kühn are self-employed. When Mrs Kühn needs some information from her husband in an important matter, she can't find him. Later, she asks him: 'What have you been doing?' He answers:

„ Ich	habe	bei	der	Post	abgeholt."	2.1%
1SG[NOM]	have:PRS.1SG	at	the.F.DAT.SG	post(F)[DAT.SG]	fetch:PTCP	
„ Ich	habe	bei	der	Post	etwas	
1SG[NOM]	have:PRS.1SG	at	the.F.DAT.SG	post(F)[DAT.SG]	something[ACC.SG]	
abgeholt."						90.4%
fetch:PTCP						
„ Ich	habe	bei	der	Post	ein	
1SG[NOM]	have:PRS.1SG	at	the.F.DAT.SG	post(F)[DAT.SG]	a[N.ACC.SG]	
Paket	abgeholt."					97.7%
parcel(N)[ACC.SG]	fetch:PTCP					

'I was fetching (something/a parcel) at the post office.'

56. The other verbs with over 50% for $ACCOMP_{def\text{-}top}$[−do] are *mähen* 'to mow' (69.1), *nachfüllen* 'to fill up' (62.3), *dekorieren* 'to decorate' (59.6) and *schrubben* 'to scrub' (55.7).

(52)

TEST TEMPLATE: ACT_{ind}, VERB: *korrigieren* ('to correct')
Sabine ist Lehrerin. An einem sonnigen Sonntagabend ruft ihr Bruder an und fragt: „Was hast du heute bei dem herrlichen Wetter gemacht?" Sabine antwortet resigniert:
Sabine is a school teacher. On a sunny Sunday afternoon, her brother calls and asks her: 'What have you done today, the weather being so splendid?' Sabine answers with resignation:

„ Ich	habe	korrigiert."		83.6%
1SG[NOM]	have:PRS.1SG	correct:PTCP		
„ Ich	habe	etwas	korrigiert."	92.3%
1SG[NOM]	have:PRS.1SG	something[ACC]	correct:PTCP	
„ Ich	habe	Klassenarbeiten	korrigiert."	97.6%
1SG[NOM]	have:PRS.1SG	test(F):ACC.PL	correct:PTCP	

'I have been correcting (something/tests).'

Test template 3: $ACT_{def.}$ The variant in this test template is a temporal adverbial clause with the subordinating conjunction *während* 'while'; it is clearly marked as atelic and thereby evokes an activity reading (for the corresponding template, cf. (30b)). The (sortal type of) argument that is coindexed with the accusative valency can be reconstructed from the context.

(53)

TEST TEMPLATE: ACT_{def}, VERB: *kaputtmachen* ('to destroy')
Sarah und Tobias wollen eine größere Menge Altpapier zum Container bringen. Sarah hat schon eine Kiste mit Zeitungen bepackt, Tobias hingegen reißt erst noch ein paar Kartons auseinander. Er sagt zu Sarah:
Sarah and Tobias are going to bring a large amount of wastepaper to the recycling container. Sarah has already packed a box with newspapers, while Tobias is still tearing some cartons. He tells Sarah:

„ Du	kannst	ja		schon mal	
2SG[NOM]	can:PRS.2SG	DISCOURSE PARTICLE		already DISCOURSE PARTICLE	
vorgehen,	während	ich	kaputtmache."		4.2%
go.ahead:INF, while		1SG[NOM]	torn.make:PRS.1SG		
„ Du	kannst	ja		schon mal	
2SG[NOM]	can:PRS.2SG	DISCOURSE PARTICLE		already DISCOURSE PARTICLE	
vorgehen,	während	ich	die	Kartons	
go.ahead:INF	while	1SG[NOM]	the[ACC.PL]	carton(M).ACC.PL	
kaputtmache."					97.9%
torn.make:PRS.1SG					

'You can already go ahead while I am destroying the cartons.'

(54)

TEST TEMPLATE: ACT_{def}, VERB: *bestellen* ('to order')
Jan und Kim studieren Mathe und engagieren sich ehrenamtlich für die Fachschaft. Sie wollen eine größere Bestellung Taschenrechner aufgeben, um diese dann günstig an die Kommilitonen weiterzuverkaufen. Bevor Jan bei dem Händler anruft, sagt er zu Kim:
Jan and Kim are math students who are involved in the students' council. They want to order a larger number of calculators to be able to sell them for a good price to their fellow students. When Jan is going to call the shop, he says to Kim:
„ Aber rede bitte nicht ständig dazwischen, während ich
but talk:IMP.SG please not constantly between while 1SG[NOM]
bestelle." 100%
order:PRS.1SG
„ Aber rede bitte nicht ständig dazwischen, während ich
but talk:IMP.SG please not constantly between while 1SG[NOM]
die Rechner bestelle." 94%
the[ACC.PL] calculator(M)[ACC.PL] order:PRS.1SG
'Please don't interrupt me while I am ordering (the calculators).'

Test template 4: KontAct$_{def}$. $KontAct_{def}$ is a test template in which established tasks are distributed between the speaker and the addressee in the form 'I do X, you do Y'. It was suggested by Brisson (1994) and Cote (1996) to facilitate null instantiations. The strong contrast by the parallel structure and the M_C-F_C context evoke an activity reading; the null instantiation is interpreted as DNI, because the referent of the direct object has usually been introduced or is present in the M_C-F_C-context (this means that this test template, like test template 3, corresponds with the template in 30b).

(55)

TEST TEMPLATE: KontAct$_{def}$, VERB: *herausziehen* ('to pull out')
Ulf und Werner waren zusammen angeln. Nach einem recht erfolgreichen Nachmittag wollen sie ihren Fang auch gleich grillen. Ulf zeigt auf das Ruderboot und schlägt Werner vor:
Ulf and Werner are on a fishing trip. After a successful afternoon, they want to grill their catch immediately. Ulf points to the boat and suggests to Werner:
„ Du ziehst heraus, ich mache
2SG[NOM] pull.out:PRS.2SG VERB.PARTICLE 1SG[NOM] switch.on:PRS.1SG
unterdessen schon mal den Grill
meanwhile already DISCOURSE PARTICLE the.M.ACC.SG grill(M)[ACC.SG]
an." 25%
VERB.PARTICLE
„ Du ziehst das Boot heraus,
2SG[NOM] pull.out:PRS.2SG the.N[ACC.SG] boat(N)[ACC.SG] VERB.PARTICLE
ich mache unterdessen schon mal
1SG[NOM] switch.on:PRS.1SG meanwhile already DISCOURSE PARTICLE
den Grill an." 93.5
the.M.ACC.SG Grill(M)[ACC.SG] VERB.PARTICLE
'You pull (the boat) out, I'll fire up the grill.'

(56)

TEST TEMPLATE: KontAct, VERB: *korrigieren* ('to correct')[57]
Natalie ist im Referendariat. Sie hilft ihrem Betreuungslehrer dabei, Klassenarbeiten zu bewerten. Er schlägt ihr vor:
During her training as a teacher, Natalie helps her supervising teacher with a written exam. He suggests:
„ Ich korrigiere,
1SG[NOM] correct:PRS.1SG
du zählst die Punkte zusammen
2SG[NOM] add.up:PRS.2SG the.ACC.PL point(M):ACC.PL VERB.PARTICLE
und berechnest die Note." 97.8%
and calculate:PRS.2SG the.F[ACC.SG] score(F)[ACC.SG]
„ Ich korrigiere die Arbeiten,
1SG[NOM] correct:PRS.1SG the.ACC.PL test(F):ACC.PL
du zählst die Punkte zusammen
2SG[NOM] add.up:PRS.2SG the.ACC.PL point(M):ACC.PL VERB.PARTICLE
und berechnest die Note." 97.8%
and calculate:PRS.2SG the.F[ACC.SG] score(F)[ACC.SG]
'I'll correct (the tests), you add up the points and calculate the score.'

57. A reviewer suggests that *korrigieren* 'to correct' in the [–do] variant works well in this context, while the other verbs (*zusammenzählen* 'add up' and *berechnen* 'calculate' would not because of the verb particle/prefix. In my intuition, however, the [–do] variant of *zusammen-*

Test template 5: DIR-INF$_{def}$. Test template 5 is a sentence type construction proposed by Jacobs (2016), the directive infinitive: it pairs a directive illocution with an infinitive verb form, sentence-final position of the verb and often certain discourse particles like *bitte* 'please'; the addressee (addr) of the respective sentence is usually null instantiated. It is a template that works with DNI; the referents are present or introduced in the context, and it can be shown that they are syntactically active. It is established in spoken language but has some close relations in several written genres (e.g. labels, instructions or recipes; cf. Massam & Roberge 1989; Culy 1996; Freywald 2020). A detailed description of this type is given by Külpmann (2019).

(57)

TEST TEMPLATE: DIR-INF$_{def}$, VERB: *buchen* ('to book')
Nina und Tim suchen im Internet nach günstigen Last-Minute-Reisen. „Ich hab was!", sagt Tim. „Zwei Wochen Zypern für nur zweihundert Euro pro Person!" – „Klasse!", ruft Nina.
Nina and Tim are searching the internet for cheap last-minute trips. "I found something!" Tim says. "Two weeks in Cyprus for just two hundred euro per person!" – "Great!" Nina shouts.
„ Sofort buchen!" 87.3%
immediately book:INF
„ Die Reise sofort buchen!" 36.5%
the.F[ACC.SG] trip(F)[ACC.SG] immediately book:INF
'Book (the trip) immediately!'

(58)

TEST TEMPLATE: DIR-INF$_{def}$, VERB: *polieren* ('to polish')
Ali betreibt eine Kneipe. Er gibt einem seiner Kellner eine Kiste mit neuen Gläsern und sagt:
Ali runs a pub. He hands a box with new glasses to one of his waiters and says:
„ Bitte ganz vorsichtig polieren!" 100%
please really carefully polish:INF
„ Die neuen Gläser bitte ganz
the.ACC.PL new:ACC.PL glass(N)\PL:ACC.PL please really
vorsichtig polieren!" 100%
carefully polish:INF
'Please polish (the new glasses) really carefully!'

zählen is quite acceptable in this context. Besides, the data from the study show that verb particles and prefixes might lead to less acceptable results but are often not complete blockers like verbs with a resultative part (*kaputtmachen*). Table 4 shows that *bestellen* 'to order' and *abschließen* 'to lock', for instance, are quite acceptable in many contexts.

Table 3 gives an overview on the test templates, their features and the rules that should license the polymorphous variants with and without objects:

Table 3. Test templates, features and licensing mechanisms (productive rules)

	$ACCOMP_{def\text{-}top}$	**ACTind**	**ACTdef**	**KontActdef**	**$DIR\text{-}INF_{def}$**
Event type	**accomplishment**	**activity**	**activity**	**activity**	unspecified
[+/−def]	+	−	+	+	+
[+/−kont]	−	−	−	+	−
Sentence type	assertive declarative	assertive declarative	assertive declarative	assertive declarative	directive infinitive
[−do]	Template rule: M: CAUSE (x) (BECOME(y) (STATE (z))) ∧ M_C: __Y___ -> F: $V_{+active}$ X_{nom}	Template rule: M: ACT (X) ∧ NOT M_C: __Y___ -> F: $V_{+active}$ X_{nom}	Template rule: M: ACT (X) ∧ M_C: __Y__ -> F: $V_{+active}$ X_{nom}	Template rule: M: ACT (X) ∧ M_C: __Y__ -> F: $V_{+active}$ X_{nom}	Template rule: M: (ACT (addr)) v CAUSE (addr) (BECOME(y) (STATE (z))))$_{dir}$ ∧ M_C: __Y__ -> F:$V_{+infinitive}$
[+do]	Lexical rule: F: V ∧ M_C: (x) $PRED_V$ (y) -> F_C: X_{nom} $V_{+active}$ Y_{acc}				

The participants of the study, of course, are not applying the production rules from Table 3 but what we see in Table 4:

In words: first, the participants read the context; then, they read the underlined item and interpret it (hopefully in a specific way which is directed by M_C); and then, finally, they judge whether or not the item is acceptable in the context. Obviously, this procedure is quite complex, and there are also several weak spots – most critically, it is not completely realistic to exclude non-intended readings[58] which might manifest as outliers in the data. Everything else (unfocused participants, wrong self-declarations about native speaker status, etc.) should disappear in the mass of data.

58. Cf. the discussion of the test template $ACCOMP_{def\text{-}top}$ and activity readings as indirect answers.

Table 4. Input and tasks for the participants of the study (generalised over lexical fillers)

Test template	**M_C**	**F**	-> **M (enforced by M_C and parts of F)**
$ACCOMP_{def\text{-}top}$ [–do]	__ Y___	$X_{nom}\ V_{+active}$	CAUSE (x) (BECOME(y) (STATE (z)))
$ACCOMP_{def\text{-}top}$ [+do]	__ Y___	$X_{nom}\ V_{+active}\ Y_{acc}$	CAUSE (x) (BECOME(y) (STATE (z)))
ACT_{ind}[–do]	NOT __ Y___	$X_{nom}\ V_{+active}$	ACT (X)
ACT_{ind}[+do]	NOT __ Y___	$X_{nom}\ V_{+active}\ Y_{acc}$	ACT (X)
ACT_{def}[–do]	__ Y___	$X_{nom}\ V_{+active}$	ACT (X)
ACT_{def}[+do]	__ Y___	$X_{nom}\ V_{+active}\ Y_{acc}$	ACT (X)
$KontAct_{def}$[–do]	__ Y___	$X_{nom}\ V_{+active}$	ACT (X)
$KontAct_{def}$[+do]	__ Y___	$X_{nom}\ V_{+active}\ Y_{acc}$	ACT (X)
$DIR\text{-}INF_{def}$[–do]	__ Y___	$X_{nom}\ V_{+active}$	(ACT (addr)) v CAUSE (addr) (BECOME(y) (STATE (z))))$_{dir}$
$DIR\text{-}INF_{def}$[+do]	__ Y___	$X_{nom}\ V_{+\ active}\ Y_{acc}$	(ACT (addr)) v CAUSE (addr) (BECOME(y) (STATE (z))))$_{dir}$
Task for participants (chronologically):	1st step: read context	2nd step, part 1: read test item 3rd step: judge acceptability of test item in context	2nd step, part 2: interpret test item

4.2.2 *Results*

According to my central hypothesis H, the possibility of realising objectless variants instead of otherwise identical variants F_1, F_2 with a direct object depends on two factors:

a. the referent of the argument (lexically) linked to the direct object is mentioned in the preceding textual or present in the situational context (if not fulfilled: lacking contribution of the object to M), and
b. the referent must not be an argument of the template, which would be the case for accomplishments but not for activities (if not fulfilled, e.g. in the case of accomplishments: lacking contribution of the object to F-M).

Translating this into an empirically applicable hypothesis, we receive H1:

H1. ACT_{def}[–do] and $KontACT_{def}$[–do] should receive more positive judgements than $ACC_{def\text{-}top}$ [–do] and ACT_{ind}[–do].[59]

The data allow to investigate some minor hypotheses as well:

H2. ACT_{ind}[–do] should receive more positive judgements than $ACC_{def\text{-}top}$ [–do].

H3. $KontACT_{def}$[–do] should receive more positive judgements than ACT_{def}[–do].

H2 could be the case because ACT_{ind}[–do] is only lacking a meaning contribution, contrary to $ACC_{def\text{-}top}$ [–do], which is not compatible with the template. H3 goes back to suggestions by Blume (1993), Jacobs (1993, 1994a) and Cote (1996) that contrast favours objectless realisations.

The results can be found in Appendix B at the end of the paper.

Figure 1 illustrates the range and distribution of the results for each template:[60]

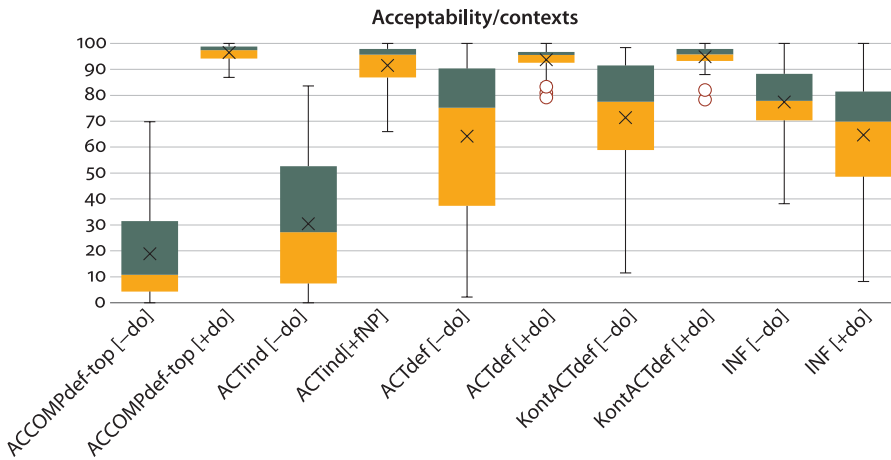

Figure 1. Positive judgements, ordered by context (box plot with outliers)

59. As an anonymous reviewer remarks, this is compatible with the transitivity scale and parameters proposed by Hopper & Thompson (1980).

60. As common in descriptive statistics, the boxes range from the first quartile (25th percentile) to the median and from the median (50th percentile) to the third quartile (75th percentile); whiskers indicate minimum and maximum (excepting outliers). Outliers are plotted as points; the mean as x.

Obviously, the [+def] activity readings (ACT_{def} and $KontACT_{def)}$ have a much higher tolerance for objectless variants than the non-activity reading $ACC_{def\text{-}top}$ and the activity reading $ACT_{ind,}$ in which the lacking meaning contribution of the unexpressed argument is not compensated by M_C. The [–do] variant of ACT_{ind} is better than $ACC_{def\text{-}top}$ [–do], but not very much. $KontAct_{def}$[–do] has a higher mean than ACT_{def}[–do], but the median is nearly identical.

A one-factored ANOVA showed that there are highly significant differences between the [–do] contexts (Kruskal-Wallis[61] with subsequent Bonferroni, $p < 0.01$ (0.000)). The results of pair-wise Mann-Whitney tests (for independent samples) are given in Table 5:

Table 5. Pair wise Mann-Whitney-U tests for differences between the 5 [–do] test templates. Pairings with highly significant differences ($p < 0.01$) are coloured dark grey; pairings with $p < 0.05$ are light grey

Group 1	Group 2	P-value	U-stat	Mean
$ACCOMP_{def\text{-}top}$ [–do]	ACTind [–do]	0.04418265	590.5	11.55
$ACCOMP_{def\text{-}top}$ [–do]	ACTdef [–do]	1.0539E-08	205	45.3725
$ACCOMP_{def\text{-}top}$ [–do]	KontACTdef [–do]	1.4125E-11	97.5	52.535
$ACCOMP_{def\text{-}top}$ [–do]	INF [–do]	1.0858E-13	27.5	58.545
ACTind [–do]	ACTdef [–do]	4.8562E-06	324.5	33.8225
ACTind [–do]	KontACTdef [–do]	7.9697E-09	200	40.985
ACTind [–do]	INF [–do]	9.8828E-12	92	46.995
ACTdef [–do]	KontACTdef [–do]	0.47044741	724.5	7.1625
ACTdef [–do]	INF [–do]	0.34564985	701.5	13.1725
KontACTdef [–do]	INF [–do]	0.71820506	762	6.01

The statistics can be interpreted as follows: results are consistent with H1; indeed, activity readings show a high tolerance for objectless variants, if the referent of the unexpressed argument is present in the context. If the latter is not the case, the acceptability of the objectless variant is still better than in a non-activity template (as proposed by H2). Contrast (as suggested by H3) is not a statistically valid factor for objectless variants; there is no statistically significant difference between ACT_{def} and $KontACT_{def}$. This suggests that contrast is just a strategy to disambiguate activity readings (probably especially for contextless test items).

61. Kruskal-Wallis because a preceding test on normal distribution (Shapiro-Wilk) showed that only the $DIR\text{-}INF_{def}$ [+/–do] gave normally distributed results.

Some additional observations can be made based on the results in the appendix (and Figure 1).

The first is about the directive infinitive: the statistics on the [–do] data show no difference between DIR-INF[–do] and (Kont)ACT_{def}[–do]. However, a look at the [+do] counterparts of the three contexts suggests that the status of the variants is different: while the [+do] variants for the definite activity contexts are stable and overall better than the [–do] variants, this is not the case for the directive infinitive, where the [+do] variant seems to be declining. This suggests that the sentence type rule licensing objectless construals in the directive infinitive has become stronger than individual lexical rules licensing the objects. This also suggests that we might already be in the middle of a process at the end of which the distinctive feature [+/–do] is neutralised in this sentence type (similar to subjects in imperatives or voiced/voiceless oppositions in the coda of German syllables). A less speculative prognosis, though, is not possible without data on DIR-INF_{ind}.[62]

A second observation concerns verb groups. Some verbs give poor results in the activity readings, and some of these effects can easily be explained with respect to this template, e.g. the low scores for objectless *kaputtmachen* 'to destroy' or *vom Herd nehmen* 'take from the stove' can be reduced to the fact that *kaputt* 'broken' and *vom Herd* 'from the stove' introduce STATE or LOC arguments which are not compatible with the activity template. *Überraschen* 'to surprise', on the other hand, is often associated with stimulus (instead of agentive) subjects. The incompatibility of other verbs with the objectless variant, however, cannot so easily be explained (the explanations becoming very circular). For statistical analyses, the few contexts from the cutout do not suffice.

A third observation concerns some individual verbs (e.g. *abschließen* 'to lock', *korrigieren* 'to correct', *zählen* 'to count', *schrubben* 'to scrub', *polieren* 'to polish') which receive high scores for the [–do] variant even in templates like ACT_{ind} that receive low average scores, suggesting that the [–do] variant might be lexicalised in certain contexts like the 'lexical ellipses' in (25) are.

62. That the mean results are suboptimal for both INF variants may be due not to grammatical reasons but to stylistic ones; in many contexts, a directive imperative sounds more polite and natural.

5. Conclusion

In my paper, I have tried to show that variation in phonology, morphology or syntax can be treated with the same toolbox, if it is systematically applied. To do this, I have made proposals for how words and other traditional linguistic units can be decomposed as directed rules for production and interpretation and modelled this along well-known standard examples.

I then addressed the initial question: is there FV (in syntax)? My answer (for syntax and in general) is yes and no. Yes, there are options in some cases that may look like variants; but no, they do not have the status of systematically provided alternatives on the same level. Those, in the normal course of events, would either be functionalised by assignment to different categories or reduced (at least if one of the variants has lower articulatory costs; purely syntactic word order phenomena might be an exception). The variants, on the other hand, arise by virtue of the coexistence of rules on different degrees of abstraction (and strength) that lead to partially equivalent distribution: alternatives that are interchangeable in one area but not in the other. The activity readings of transitive verbs, I have argued, constitute one such case: the variation emerges because a pair of template rules allows objectless variants in a context that provides the unexpressed argument.

In the view presented here, it is this constellation (re-entry leading to partially equivalent distribution) that gives rise to language change and differentiation of the system because only here may rules get into a conflict that is not rapidly solved by the reduction of the redundant variant.

In the long run, the constellation with the 'free variants' in one restricted area will prove to be unstable, too – but the changes and the direction of the changes are not as easily predictable than those of two free variants because the latter is bound to and gives rise to new differentiation, often by successive steps of overgeneralising, overgenerating, adjusting and overgeneralising again, by which cumulative patterns may be upcycled into larger and more grammatical patterns.

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Appendix A. Cover sheet of questionnaire no. 35, incl. translations and comments

1

Z	Z	Z	B	B

2b

2a

Bergische Universität Wuppertal
Fachbereich A Geistes- und Kulturwissenschaften
Institut für Linguistik

3

Sehr geehrte Teilnehmerinnen und Teilnehmer!

Mit diesem Fragebogen versuchen wir, mehr über den Satzbau des Deutschen herauszufinden. Wir sind dabei auf Ihre Mithilfe angewiesen, für die wir Ihnen herzlich danken möchten.

In diesem Fragebogen werden Ihnen verschiedene Sätze präsentiert, die Sie Ihrem Sprachgefühl entsprechend bewerten sollen. Diese Testsätze sind der Alltagskommunikation nachempfunden. Jedem unterstrichenen Testsatz geht ein kurzer Kontext voran, der die Situation beschreibt, in der der Testsatz geäußert werden könnte. **Bitte bewerten Sie die Testsätze danach, ob sie in dem jeweiligen Kontext sprachlich möglich sind oder nicht.** Den Kontext selbst sollen Sie nicht bewerten.

Beispiele:

	ja	**nein**
Maria fragt ihren Sohn Moritz, was denn sein Vater gerade mache. Moritz antwortet daraufhin: „Der liest gerade.“	☒	☐
Gerda und Hilde unterhalten sich darüber, wo ihr alter Frisör Andi mittlerweile arbeitet. Gerda meint zu Hilde: „Weißt du das nicht? Der betreibt am Marktplatz.“	☐	☒

4

3b

Sollten Sie sich einmal schwer entscheiden können, so geben Sie bitte an, welche Antwort Ihnen eher zusagt. Kreuzen Sie die dafür vorgesehenen Kästchen für „ja“ oder „nein“ an. **Bewertungen, die einer Antwortalternative nicht eindeutig zugeordnet werden können, werden als ungültig betrachtet**.

Der Fragebogen besteht aus zwei Teilen. Wenn Sie am Ende des ersten Teils angelangt sind, warten Sie bitte auf die Anweisung umzublättern. Danach sollen Sie zur Auflockerung einige kleinere Mathematikaufgaben lösen, die aber nicht in die Auswertung eingehen. Warten Sie danach erneut auf die Anweisung zum Umblättern, bevor Sie den zweiten Teil des Fragebogens beginnen.

Zuvor bitten wir Sie noch um zwei zusätzliche Angaben:

	ja	**nein**
Ist Deutsch Ihre Muttersprache?	☐	☐
Haben Sie schon einmal an einem Fragebogen des Projektes teilgenommen?	☐	☐

5

Ihre Antworten werden selbstverständlich **anonym** behandelt!

Herzlichen Dank für Ihre Mithilfe! **FB 35**

Comments and translations:

1: To ensure the participants' anonymity on one hand and to exclude double questionnaires (filled in by the same participant) from the statistics on the other hand, participants were pseudo-anonymised: before starting a questionnaire, they had to generate their individual code consisting of the last three numbers of their matriculation number (Z) and the first two letters of their mother's first name (B).

2a: University of Wuppertal, Faculty A Humanities and Cultural Studies, Institute for Linguistics

2b: Logo of the University of Wuppertal

3a: Instructions, pt. 1; English translation:
Dear participants,
With this questionnaire, we will try to further investigate the syntax of German. To do this, we rely on your help, for which we want to thank you sincerely.
In the questionnaire, we will present you with different sentences, which you shall judge based on your linguistic intuition. The test sentences are modelled after normal everyday conversations. Every underlined test sentence is preceded by a short context which describes the situation in which the test sentence might be uttered. **Please judge the test sentences based on the criterion whether they are linguistically possible in the respective context or not.** The context itself shall not be judged.

Examples:

3b: Instructions, pt. 2; English translation:
In case you should have difficulties in making a clear decision, please follow your tendency. To do so, fill in the boxes for 'yes' and 'no'. Judgements that cannot be clearly associated with one of the answer alternatives are considered invalid.
The questionnaire consists of two parts. When you have reached the end of Pt. 1, please wait for the instruction to turn the page. After that, you will be asked to solve some small maths equations for relaxation; these, however, will not be included in the evaluation. Afterwards, please wait again for the instruction to turn the page before you start Pt. 2 of the questionnaire.
Before you begin, we ask you for two additional details:

	yes	**no**
Is German your native language?	☐	☐
Have you already participated in a questionnaire for our project?	☐	☐

Of course, your judgements will be kept anonymous.
Many thanks for your help!

4: Examples; English translation incl. glosses for the test sentences:

	ja	**nein**
	yes	**no**

Maria fragt ihren Sohn Moritz, was denn sein Vater gerade mache. Moritz antwortet daraufhin:
Maria asks her son Moritz what his father is just doing. To this, Moritz answers:

„Der liest gerade.“ ☒ ☐
DEM.M.3SG read.prs.3SG just
‘He is reading right now.’
Gerda und Hilde unterhalten sich darüber, wo ihr alter Frisör Andi mittlerweile arbeitet. Gerda meint zu Hilde: „Weißt du das nicht?
Gerda and Hilde discuss where their former hairdresser Andi is working now. Gerda says to Hilde, “Didn’t you know?
Der betreibt am Marktplatz.“ ☐ ☒
DEM.3SG.MASK run.3SG at.the.M.DAT.SG marketplace(M)[DAT.SG]
He is running (a hair salon) at the marketplace.”

5: Number of the questionnaire with respect to S2.

Appendix B. Results

Results for 40 verbs and 5 templates; percentages indicate share of positive judgements; [+do] variants coloured grey; *sth: etwas* ‘something’ as a direct object; *fNP:* full NP as a direct object

Verb	$ACCOMP_{def\text{-}top}$		ACT_{ind}			ACT_{def}		$KontACT_{def}$		DIR-INF	
	[–do]	[+do]	[–do]	[+sth]	[fNP]	[–do]	[+do]	[–do]	[+do]	[–do]	[+do]
abgeben ‘to give away’	0	100	1.9	90.9	88.1	38.1	100	54	100	66.7	50
abholen ‘to fetch’	5.3	98.4	2.1	90.4	97.7	8.3	95.2	71.1	94	78.2	49
abschließen ‘to lock’	44.4	98.1	53.2	88.1	95.5	88	91.5	98.4	95.1	91.3	76.9
aufmachen ‘to open’	2	89.1	28.3	78.3	97.9	72	100	76	96.7	82.7	71.4
ausstellen ‘to switch off’	4.8	98.4	5.6	47.1	78.6	35.1	96	42.6	92	65.4	57.7
auswechseln ‘to change’	4.8	96.8	6.6	96.7	90	43.5	96.7	80.2	100	90.2	47.4
bauen ‘to build’	33.3	100	68.8	95.2	97.5	88.9	96	75.6	78.3	70.5	8.2
benutzen ‘to use’	10	96.7	0	35.9	83	2.2	93.5	25.6	95.7	73.5	23.8
besorgen ‘to get’	5.5	94.2	1.6	95.2	100	12	84.8	56	89.1	52.9	32.7
bestellen ‘to order (goods)’	28	96.4	60.7	100	100	100	94	87.1	96.9	64.7	39.2
braten ‘to fry’	11.5	91.8	44.7	85.7	100	78	100	96	100	85.5	98.4
buchen ‘to book’	55	98.4	42	94.1	97.9	95.6	98	95.7	98	87.3	36.5
dekorieren ‘to decorate’	31	100	78.3	91.7	100	97.8	95.6	97.9	97.9	59	72.1
einrühren ‘to stir in’	4.9	93.4	14.5	60.9	70	54.3	80.9	70.8	89.4	93.3	93
einschalten ‘to switch on’	45.2	100	9.5	85	89.4	71.4	98.9	81.4	93.3	88.5	47.6
färben ‘to colour’	14.3	98.1	29	78.1	91.5	84.4	95.7	65.6	100	75.5	43
herausziehen ‘to pull out’	0	86.9	2	79.6	81	21.3	96.7	25	93.5	92.2	89.5
kaputtmachen ‘to destroy’	0	98.4	3.3	93.4	90	4.2	97.9	59.5	93.2	74	60.8
kaufen ‘to buy’	0	100	18.8	100	97.9	46.2	95.7	11.5	82	88.2	11.8
korrigieren ‘to correct’	25	100	83.6	92.3	97.6	93.5	97.8	97.8	97.8	91.9	95.3
mähen ‘to maw’	69.1	94.2	52.5	31.9	100	90	87	91.5	97.9	78.7	78.3

Appendix B. *(continued)*

Verb	$ACCOMP_{def\text{-}top}$		ACT_{ind}			ACT_{def}		$KontACT_{def}$		DIR-INF	
	[−do]	[+do]	[−do]	[+sth]	[fNP]	[−do]	[+do]	[−do]	[+do]	[−do]	[+do]
nachfüllen 'to fill up'	45.2	95	23.1	70.9	82.5	91.3	79.1	82	93.8	89.2	81.8
nähen 'to sew'	9.6	92.3	53.2	57.5	79.5	87.2	94	95.7	100	96.9	64.5
vom Herd nehmen 'to take from the stove'	1.6	96.9	0	84.6	95.7	6.8	91.3	16.7	88	95.1	93
operieren 'to operate on'	46.2	98.1	62.3	90.2	97.6	89.1	87.2	97.8	97.9	87.5	91.9
organisieren 'to organise'	18.3	97.9	9.6	87	97.5	70	95.2	91.5	97.7	75.4	75
polieren 'to polish'	15	98.4	26.2	70	100	93.3	95.7	93.8	100	100	100
prüfen 'to hold an exam'	19.1	95	13.3	66.7	66	85.4	95.7	79.1	91.7	80.8	71.7
schrubben 'to scrub'	41.5	92.5	62.5	54.8	97.8	93.5	88.1	95.5	97.8	80	95.6
stehlen 'to steal'	0	100	47.6	90	93.6	93.8	95.7	57.1	93.2	54.8	69.8
stoppen 'to stop'	16.4	93.4	7.7	59.3	76.2	52.4	95.5	60	97.9	82.7	94.6
töten 'to kill'	4.8	96.9	50	89.4	95.2	79.1	87.5	89.6	95.2	67.2	62.9
überraschen 'to surprise'	4.8	98.4	8.2	96.7	90	28.9	93	70	95.8	38.2	70
überzeugen 'to convince'	32.8	100	29.8	54.8	70	27.3	93.3	85.4	96	77.4	81.3
untersuchen 'to examine'	23.5	100	40.3	95.2	95.7	97.6	100	82	97.9	72.1	67.2
verfassen 'to write'	1.6	91.7	10.9	61.3	100	70.2	92.9	33.3	92	53.8	61.9
verkaufen 'to sell'	2	100	43.5	96.9	100	75.5	100	67.4	100	77.5	23.1
verletzen 'to injure'	3.3	96.7	0	90.7	79.5	75	94.3	75.6	94	77	50
warnen 'to warn'	4.7	96.8	61.1	96.2	97.9	28	83.3	43.5	93.3	69.8	74.2
zählen 'to count'	69.8	89.8	60	90.2	100	100	96	80.4	91.3	70.5	75
Mean	**18.9**	**96.5**	**30.4**	**80.3**	**91.5**	**64.2**	**93.7**	**71.39**	**94.86**	**77.4**	**64.65**
Median	10.8	97.4	27.3	88.75	95.7	75.3	95.6	77.6	95.8	77.9	69.9

SECTION 2

Free variation and language change

CHAPTER 6

Variation and change in the Aanaar Saami conditional perfect

Merit Niinemägi
University of Tartu

The present study captures a case of language variation in the verbal system of Aanaar (Inari) Saami, namely that of the conditional perfect, which can be expressed by two periphrastic constructions. The aim of this paper is twofold: (1) to give a diachronic description of the Aanaar Saami conditional perfect and (2) to investigate whether its variation can be considered to be 'free' or whether it is explainable by intra- and extralinguistic determinants. The data consists of language samples gathered in 1887 and 1952, the Aanaar Saami text corpus and a survey carried out in 2020. The diachronic comparison indicates changes in the variation which are, among others, discussed in the light of linguistic interference and Aanaar Saami's recent revitalisation.

Keywords: Aanaar Saami, conditional perfect, conditional mood, morphosyntactic variation, free variation, language change, Saami

1. Introduction

A phenomenon widely spread among the languages of Europe is the periphrastic perfect, a verbal construction consisting of an auxiliary and a participial main verb (e.g. English *I have written*; see, for example, Dahl 1985; Drinka 2017). When the periphrastic perfect is combined with the conditional mood, we speak of the conditional perfect, a grammatical structure referring to counterfactual or hypothetical events placed in the past (e.g. English *I would have written*).

Aanaar (Inari) Saami, a Uralic minority language traditionally spoken in the northernmost part of Finland, does not usually fall within the scope of general typological studies; yet, at first glance, the structure of its periphrastic perfect and its conditional perfect seems to resemble that of more-thoroughly described languages of Europe. The Aanaar Saami perfect, as shown by the Example (1a) below, consists of the auxiliary *leđe* 'to be' and the past participle of the main verb. In the

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conditional perfect (1b), the participial main verb is preceded by the auxiliary *leđe* 'to be' in the conditional mood.

(1) Aanaar Saami
a. *Mun lam vájáldittám.*
1SG be.1SG forget.PST.PTCP
'I have forgotten.'
b. *Mun liččim vájáldittám.*
1SG be.COND.1SG forget.PST.PTCP
'I would have forgotten.'

However, in Aanaar Saami as well as in various other Saami languages, the conditional perfect can also be expressed by another periphrastic construction: the auxiliary *leđe* 'to be' in the indicative past tense and the infinitive of the main verb (2). According to Saami grammars (see, for example, Olthuis 2000: 89–90), the two constructions are identical in meaning.

(2) Aanaar Saami
Mun lijjim vájáldittiđ.
1SG be.PST.1SG forget.INF
'I would have forgotten.'

In previous research, the Saami conditional perfect has been relatively neglected, particularly within the last four decades. More specifically, the last comprehensive study on the conditional mood in the Saami languages dates back to the 1980s (Bartens 1980). Whilst grammars of various Saami languages depict the two competing constructions as interchangeable, no recent studies have addressed their variation and prevalence.

Thus, the question arises of whether the two constructions truly are subject to 'free variation', i.e. speakers choose freely between two variants in any given context (cf. Cappelle 2009), or whether decisive predictors of the variation have simply yet to be determined – a possibility that often functions as a counter-argument to the notion of free variation (see, e.g. Labov 1969). The fact that the variation of the conditional perfect is not solely found in Aanaar Saami but also in other Saami languages suggests that the two competing constructions have been coexisting for an extended time. This being the case, the Aanaar Saami conditional perfect could serve as a relevant example of how (un)stable free variation can be over time.

This article therefore has two central research questions: (1) to what extent the two Aanaar Saami conditional perfect constructions have been and are still used and (2) whether the selection of one construction over the other can be explained

by intra- and extralinguistic determinants or whether they are, indeed, in free variation.

With an estimated number of 450 speakers, Aanaar Saami is classified as a severely endangered language (Valtonen, Ylikoski & Aikio 2022: 178–179). It has long been in contact with Finnish, especially so from the 19th century on, and all speakers have been bilingual in Finnish for generations (ibid.). Moreover, the recent revitalisation of Aanaar Saami has caused a significant growth in the number of L2 speakers whose native language is Finnish (Pasanen 2015: 78). By comparing contemporary data to languages samples collected in the 1880s and 1950s, this paper addresses, among others, the question of whether the revitalisation process has (and has had) an impact on the morphosyntactic features of Aanaar Saami, i.e. the form and usage of the conditional perfect.

For the discussion presented in this paper, it is noteworthy that in Finnish, we find two periphrastic constructions which structurally resemble the aforementioned two Saami conditional perfects. Just like in Aanaar Saami, the Finnish conditional perfect is expressed by the auxiliary *olla* 'to be' in the conditional mood, followed by the past participle of the main verb (Example (3a), cf. Example (1b) above). When the auxiliary *olla* 'to be' in the indicative past tense is followed by the infinitive of the main verb, however, it does not express the conditional perfect. Instead, it carries a so-called propinquative (or propinquitive, as in Johanson 2008; see also Johanson 2017 for a discussion of the terminology) meaning, in other words, it implicates an action that was almost or about to be carried out (3b).[1]

(3) Finnish
  a. *Olisin unohtanut.*
  be.COND.1SG forget.PST.PTCP
  'I would have forgotten.'
  b. *Ah, olin unohtaa!*
  INTERJ be.PST.1SG forget.INF
  'Oh, I would have almost forgotten!'

In what follows, I will first give an overview of the Saami conditional and its perfect as described in previous studies (Section 1.1). Then, the data and methods of the current study will be presented (Section 1.2). This is followed by the main part of this paper, which investigates the variation of the conditional perfect in Aanaar Saami. First, I will describe the conditional perfect and its variants as they occur in the data of this study (Section 2). Subsequently, I will address vari-

1. See Saukkonen (1965: 170–171) and Jomppanen (2009: 111–132) for comparisons of the Finnish propinquative with the structurally similar North Saami conditional perfect.

ous variables (person and number, main verb, type of clause, polarity, dialect and speaker generation) and their possible influence on the variation (Section 3). In the discussion and conclusion (Section 4), I will summarise the aforementioned variables and point out the changes attested in the Aanaar Saami conditional perfect. In doing so, I will demonstrate how the underlying reasons for the attested changes can be found in language-internal analogy, formal transparency and linguistic interference. Moreover, I will address the interconnection of free variation and language change.

1.1 The Saami conditional and its perfect: An overview

The Saami languages form a dialect continuum reaching from Norway in the west through Sweden and Finland to the Kola peninsula in the east. Their mood systems consist of up to four moods: indicative, imperative, conditional and potential.[2] In describing the conjugation of verbs, Mikko Korhonen (1967) was the first to compile an overview of how these moods are formed in the Saami languages. The first thorough study of their function was Hans-Hermann Bartens' dissertation (1980) on the use of the conditional and potential. While the Saami potential mood has also caught the interest of other researchers (see Helander 1980; and, much more recently, Ylikoski 2016), the conditional mood has since remained in the periphery of Saami linguistics. Hence, a brief overview of the conditional and its perfect in the Saami languages will be given below.

As illustrated in the first map of Figure 1 below, the Saami dialect continuum is reflected in, among other things, the conditional present and its productivity. The conditional present is typically formed synthetically by attaching the conditional marker to the verb stem. Previous descriptions (Korhonen 1967: 123–148; Bartens 1980: 1) distinguish two such markers: *-l-* in the Saami languages to the west and *-(X)č-*, where *X* marks a plosive, in the languages to the east. In the westernmost Saami languages, however, the synthetic conditional has been largely replaced by an analytic construction consisting of the conditional present of the auxiliary 'to be' and the infinitive of the main verb (Bartens 1980: 3).

The second map of Figure 1 shows the conditional perfect constructions in the Saami languages as attested by Bartens (1980: 301–302). As mentioned earlier, the expression of the conditional perfect by two distinct periphrastic constructions is a structural property shared by various Saami languages. In these languages, the conditional perfect is either expressed by a construction consisting of the auxiliary 'to be' in the conditional mood and the participial main verb (here-

2. In Western Saami languages, e.g. Pite Saami, there are also traces of a so-called second imperative (Halász 1896: XXXI), also referred to as optative (Lagercrantz 1926: 118).

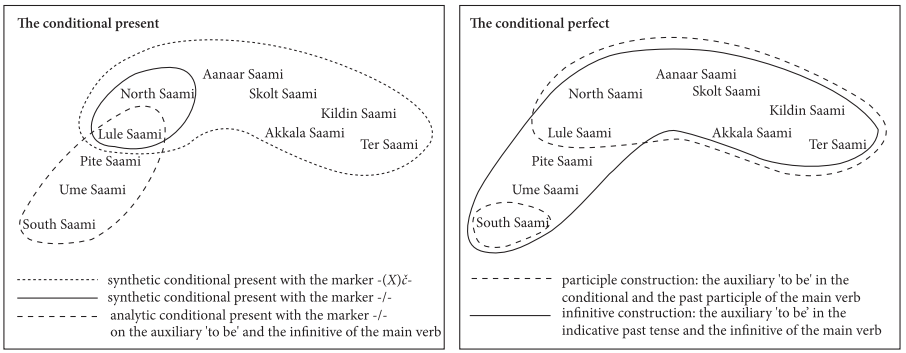

Figure 1. The conditional mood in the Saami languages based on Bartens' (1980) data

inafter, participle construction) or a construction consisting of the auxiliary 'to be' in the indicative past tense and the infinitive of the main verb (hereinafter, infinitive construction). As can be seen from the figure, the infinitive construction was once found in all Saami languages. The participle construction, on the other hand, has not been attested in Ume and Pite Saami.

In regard to Figure 1, it should be noted that Bartens' dissertation (1980) is based on a wide range of material from the last two centuries. Thus, the overview presented above does not represent the conditional mood in the Saami languages at any certain point in time but, instead, covers a relatively long timespan. Moreover, recent grammars indicate that the conditional mood has been lost entirely in the southernmost Saami languages (in South, Ume and Pite Saami; see Magga & Magga 2012; Wilbur 2014; Gertten 2015). However, the question of how productive the conditional mood is in the Saami languages spoken today goes well beyond the scope of this paper and shall be left for future research.

In the context of the present study, it is nonetheless noteworthy that, besides Aanaar Saami, the two distinct conditional perfects have at least been preserved in its closest related languages, North and Skolt Saami, both of which are also spoken in Finland (Moshnikoff, Moshnikoff & Koponen 2009; Feist 2010; Aikio & Ylikoski 2022). According to Aikio and Ylikoski (2022: 168), North Saami speakers nowadays use both the participle and the infinitive construction Examples (4a)–(4b) as well as a third periphrastic construction in which the auxiliary 'to be' in the conditional mood is combined with the infinitive of the main verb (4c). As can be seen in the sentences below, contemporary North Saami therefore has three synonymous conditional perfects.

(4) North Saami
a. *livčče* *oastán*
be.COND.1SG buy.PST.PTCP
b. *ledjen* *oastit*
be.PST.1SG buy.INF
c. *livčče* *oastit*
be.COND.1SG buy.INF
'I would have bought' (Aikio & Ylikoski 2022: 168)

As mentioned above, the infinitive construction has been attested in all Saami languages, but it is only briefly mentioned in their general descriptions. Saami grammars most commonly refer to the infinitive construction as the second conditional perfect, the first conditional perfect being the participle construction (see, e.g. Nickel 1994: 55–56; Olthuis 2000: 89–90; Moshnikoff, Moshnikoff & Koponen 2009: 103–106). On the other hand, due to its lack of a conditional suffix, Bartens (1980: 5–6) does not consider the infinitive construction to belong to the conditional mood. Like Friis (1856: 100) and Nielsen (1926: 370) before him, Bartens instead calls it the second pluperfect, despite recognising that it fulfils the same functions as what he considers to be the only conditional perfect.

Considering that the infinitive construction is only dealt with briefly in descriptions of Saami languages, it comes as no surprise that its negation is generally disregarded. However, this is where we find another aspect in the variation of the conditional perfect. While the negation of the participle construction is formed uniformly across the respective languages, there are two ways to negate the infinitive construction. Consider the following examples from North and Aanaar Saami (5–6):

(5) North Saami
a. *in* *livčče* *oastán*
NEG.1SG be.COND.CNG buy.PST.PTCP
b. *in* *lean* *oastit*
NEG.1SG be.PST.CNG buy.INF
'I wouldn't have bought'

(6) Aanaar Saami
a. *jiem* *liččii* *uástám*
NEG.1SG be.COND.CNG buy.PST.PTCP
b. *jiem* *lijjii* *uástiđ*
NEG.1SG be.COND.PST.CNG buy.INF
'I wouldn't have bought'

In both North and Aanaar Saami, the negation of the participle construction consists of the negation verb, the conditional connegative of the auxiliary 'to be' and the past participle of the main verb ((5a), (6a)). In North Saami, the negated infinitive construction is formed using the past tense connegative *lean* of the auxiliary *leat* 'to be', a form which is also found in the negated past indicative (e.g. *in lean* 'I wasn't'; cf. the connegative *lean* in Example (5b)). In Aanaar Saami, on the other hand, a distinct connegative is used: *lijjii*, which has the same form as the third-person plural indicative past of the verb 'to be' (e.g. *sij lijjii* 'they were'; cf. the connegative *lijjii* in Example (6b)).[3]

Upon closer inspection, the two ways to negate the infinitive construction align with the boundary between the Western and Eastern branches of the Saami languages. Besides North Saami, the past tense connegative of the auxiliary 'to be' was also used in other Western Saami languages (Pite and Lule Saami; see Bartens 1980: 273, 275, 280). In Eastern Saami languages (Aanaar, Skolt and Akkala Saami; see Bartens 1980: 292; Feist 2010: 277; Miestamo & Koponen 2015: 359), on the other hand, we find the connegative *lijjii ~ le'jje ~ lejjiš* instead, which, in fact, is identical to the third-person plural indicative past of the verb 'to be' in all these languages.

1.2 Data and methods of the present study

To allow for a diachronic comparison, the analysis of the present study is based on Aanaar Saami language samples from different points of time. More specifically, the data can be divided into three parts: (1) earlier language samples from 1887 and 1952, (2) the corpus of written Aanaar Saami texts (SIKOR) and (3) a survey which I conducted in spring 2020.

The earlier language samples come from two anthologies, *Inarinlappalaista kansantietoutta* 'Aanaar Saami Folklore' (IK) and *Aanaarkiela čájttuzeh* 'Aanaar Saami Language Samples' (AČ), which contain transcriptions of Aanaar Saami samples collected in 1887 and 1952, respectively. For the examples cited in this study, the earlier transcriptions found in the anthologies have been transformed to the present standard orthography.

The text corpus of Aanaar Saami provided by the SIKOR corpus constitutes the biggest data source for this study. The SIKOR corpus is a collection of texts in different Saami languages compiled by UiT The Arctic University of Norway and the Norwegian Saami Parliament. The Aanaar Saami corpus contains about 1.77 million words, the vast majority of which (over 1.3 million) are from the news-

3. In the present paper, the connegative *lijjii* is glossed as be.COND.PST.CNG based on its function in the negated conditional perfect. It does not, however, carry a conditional marker.

paper subcorpus that consists of articles published in the periodical publications *Anarâš* 'Aanaar Saami', *Kierâš* 'Woodpecker' and *Min Áigi* 'Our Time'. Further subcorpora are labelled as administrative, science, non-fiction and religious texts. The texts have been automatically processed and linguistically tagged with tools by the Giellatekno and Divvun research groups.

To gather additional data on the conditional perfect in contemporary Aanaar Saami, I carried out an online survey in spring 2020. The questionnaire contained 11 modified sentences from the sources mentioned above. These were presented as fill-in-the-gap sentences, each missing one or two predicates.

At the beginning of the online questionnaire, participants were informed that their answers would remain anonymous and only be used as part of my research. They were then asked about their background: where they are from, when they were born,[4] what gender they are, what languages they speak, how they would describe their Aanaar Saami proficiency, where they had learned Aanaar Saami and how often they use it.

Then, the informants were prompted with three to four fill-in-the-gap sentences at a time. First, they were asked to find the most fitting word(s) for the gaps presented in three sentences, so that the remaining parts of the sentence didn't contain any conditional perfect forms (as in Example (7), which lacks the predicate in the dependent as well as the main clause).

(7) *Puohâin tergâdumos anarâš informant akateemikko Itkosâžân lâi eeppidhánnáá Lesk-Ant Uulá ađai Uula Morottaja (1892–1963). Erkki Itkonen eeđâi-uv, et Lesk-Ant Uulást _____ Johan Turi viärdásâš čällee, jis _____ máhđulâšvuođah.*
'The most important Aanaar Saami informant for the academic Itkonen was without doubt Lesk-Ant Uulá alias Uula Morottaja (1892–1963). Erkki Itkonen even said that Lesk-Ant Uulá _____ a writer comparable to Johan Turi, if _____ the possibilities.'

Secondly, the informants were presented with four counterfactual conditional sentences in which the predicate was missing in either the dependent or the main clause. In the corresponding other clause, the conditional perfect was either expressed by the participle or the infinitive construction. The sentence below (8), for example, includes the participle construction *liččih uážžum* 'you would have got' in the main clause of the conditional sentence but is missing the predicate of the dependent clause.

4. To guarantee anonymity despite the small speech community, the informants were asked which decade they were born in, not their exact year of birth.

(8) *Jis tun _____ ustevlâš saanijd, te liččih uážžum ustevlâš vástádâsâid-uv.*
'If you _____ friendly words, then you would have got friendly replies, too.'

In the last four sentences of the fill-in-the-gap task, the infinitive form of the missing verb was provided for each gap. The informants were prompted to list all forms of the provided verb that they considered to be possible in the respective gap. At the end of the questionnaire, the participants had the possibility to leave comments.

In total, 17 informants took part in the survey, four of which were native speakers. The informants were recruited through social media, more specifically through the Aanaar Saami Facebook group 'Anarâškielâ orroomviste'. Out of the 17 informants, three (including two natives) were born in the 1960s, six in the 1970s and eight (including two natives) in the 1980s. All of the L2 speakers indicated that they had a good or very good command of Aanaar Saami. They had learned the language as adults, either at the one-year intensive classes provided by the Sámi Education Institute (four informants) or at the university (five informants) or both (four informants).

All informants, including the L2 speakers, are active users of the language, i.e. they speak, listen to, write or read in Aanaar Saami on a daily basis (twelve informants) or at least several times a week (five informants). For that reason, all received answers were taken into consideration in this study, including those by L2 speakers. However, in the analysis of the present paper, the answers provided by non-native speakers will be marked accordingly.

As emerges from the descriptions above, the material used in this study not only covers a time span of over 130 years but is also diverse in its nature. The various data sources include spoken and transcribed language material from two anthologies, written and published texts from a corpus as well as a questionnaire targeted to the object of this study.

In what follows, I will analyse the data both qualitatively and quantitatively. For the latter, the conditional inference tree method was used to determine the interplay and significance of various variables in the variation of the conditional perfect (Section 3.7). The method is based on binary recursive partitioning (splitting), wherein at each stage, the algorithm tests which independent variable is the most strongly associated with the given dependent variable. The dataset is then split into two subsets based on the independent variable. The splitting continues until there are no more independent variables which are statistically significant ($p \leq .05$), resulting in a tree structure with binary splits. The method was applied with the function ctree() of the party package in R (R Core Team 2018).

2. The Aanaar Saami conditional perfect and its variation across the data

The data sources of the present study differ considerably in size. Predictably, this is also reflected in the raw frequencies of the conditional perfect in each source. In total, 1,717 occurrences of the conditional perfect were attested across all data sets. There were 11 occurrences in the language samples from 1887 (IK), 52 in the language samples from 1952 (AČ) and 1479 in the corpus (SIKOR). In the fill-in-the-gap sentences of the questionnaire, the four native speakers produced 38 instances of the conditional perfect, and the 13 L2 speakers produced 137.

Despite the considerable differences in the number of occurrences of the conditional perfect, both the infinitive and the participle construction were attested in all sources. As also illustrated in Figure 2 below, the variation of the conditional perfect was, therefore, already present in the 1880s and has been preserved until today. However, there seems to be a shift in frequency; more specifically, the percentage of participle constructions has increased in more recent data sources.

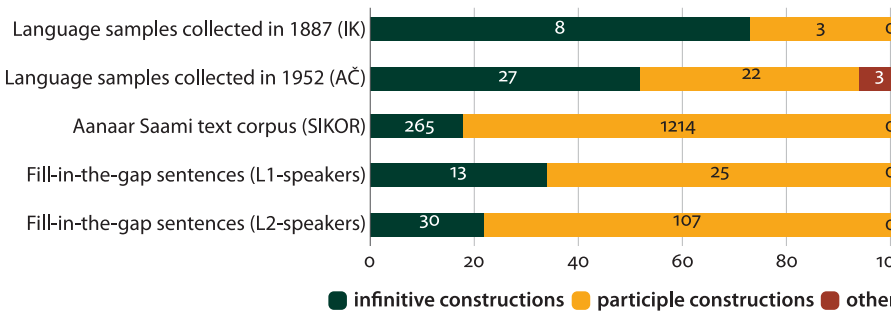

Figure 2. The conditional perfect constructions across the data

As mentioned in the previous Section (1.2), the participants of the questionnaire were primed with either a participle or an infinitive construction in four of the fill-in-the-gap sentences. Moreover, in the last sentences, they were asked to list all possible forms of a verb provided in its infinitive form. The different primers and the altered task led to considerable differences in the results. In the first part of the questionnaire, 27% of the conditional perfect constructions produced by L1 speakers and 15% of those produced by L2 speakers were infinitive constructions. This percentage decreased when the participants were primed with a participle construction (to 14% and 12%, respectively) and increased when they were primed with an infinitive construction (to 43% and 32%, respectively). When asked to list all possible forms of a verb provided in its infinitive form, the percentage of infinitive constructions was 31% for L1 speakers and 38% for L2 speakers. These results show that, while both L1 and L2 speakers seemed to

have a preference for the participle construction, their likelihood of producing an infinitive construction increased when they were primed with an infinitive construction or explicitly asked to list all possible forms of a given verb.

In addition to the infinitive and participle construction, the language samples collected in 1952 (AČ) also contained utterances in which elements from both constructions were combined (indicated as 'other' in Figure 2). One such construction can be found below (10), where 'I would have dressed' refers to a counterfactual event in the past, something which is typically expressed by the conditional perfect in Aanaar Saami. Instead of the expected participle (9a) or infinitive (9b) construction, it contains a third construction: *lijjim kárvudattam*, which consists of the auxiliary 'to be' in the indicative past tense and the past participle of the main verb. In its form, this construction equals the pluperfect (*lijjim kárvudattam* 'I had dressed'), but in the sentence below, its function is that of the conditional perfect.

(9) a. *liččim kárvudattam*
be.COND.1SG dress.PST.PTCP
b. *lijjim kárvudattiđ*
be.PST.1SG dress.INF
'I would have dressed'

(10) *Mun jiem kuittag viettim nuuvt ennuv ko lijjim*
1SG NEG.1SG still grasp.PST.CNG so much that be.PST.1SG
kárvudattam nuuvt ennuv ko lâi kolgađ.
dress.PST.PTCP so much as be.PST.3SG must.INF
'I still didn't grasp that much, that I'd have dressed as much as I should have.'
(AČ: 255)

While affirmative mixed constructions as pictured above could also be interpreted as the pluperfect, their respective negated equivalents leave no room for ambiguity. As previously described in Section 1.2, in Aanaar Saami, the negation of the participle construction is formed with the negation verb, the conditional connegative of the auxiliary 'to be' (*liččii*) and the past participle of the main verb (11a). In the negation of the infinitive construction, the negation verb is followed by the connegative *lijjii* and the infinitive of the main verb (11b). However, as illustrated in Example (12), there were also occurrences where the negation of the conditional perfect was expressed by the negation verb, the connegative *lijjii* and the participle of the main verb.

(11) a. *eä liččii iällám*
NEG.3PL be.COND.CNG live.PST.PTCP
b. *eä lijjii eelliđ*
NEG.3PL be.COND.PST.CNG live.INF
'they wouldn't have lived'

(12) *Eähan toh lijjii iällámgin, jos ucceebeh*
NEG.3PL.PTL DEM.PL be.COND.PST.CNG live.PST.PTCP.PTL if small.COMP.PL
liččii lam.
be.COND.3PL BE.PST.PTCP
'And they wouldn't have lived, if they had been smaller.' (AČ: 71)

In the language samples gathered in 1952 (AČ), there were three so-called mixed constructions uttered by three informants. In the other data sources, such constructions were not attested. This being said, the analysis of the corpus data (SIKOR) revealed yet another layer of the variation in the conditional perfect, more precisely, in the negation of the infinitive construction. Namely, the past tense connegative *lam* ~ *lamaš* of the auxiliary 'to be' was used instead of the connegative *lijjii* in some occurrences.[5] In the dependent clause of the conditional sentence below (13), for example, the negation appears as *ij lam ävttiđ* instead of *ij lijjii ävttiđ* '(s)he wouldn't have helped'.

(13) *Jos Máárjá enni ij lam ävttiđ suu toi*
If Máárjá.GEN mother NEG.3SG be.PST.CNG help.INF 3SG.ACC DEM.PL.GEN
kerdij, te sun-uv lâ jäämmiđ.
time.PL.GEN then 3SG-PTL be.PST.3SG die.INF
'If Máárjá's mother hadn't helped her those times, then she'd have died as well.'
(SIKOR)

In the corpus, there were altogether 60 constructions that matched the following structure: negation verb + connegative *lijjii* ~ *lam* ~ *lamaš* + infinitive of the main verb. Out of these constructions, 43 were formed with the connegative *lijjii*, 15 with the connegative *lam* and two with the connegative *lamaš*.

The variation described above was also attested in the fill-in-the-gap sentences of the questionnaire. These sentences, among others, included a modified version of Example (13) which was missing the connegative (*lam*) as well as the infinitive (*ävttiđ*). As shown in the answers quoted below (14), some of the informants used the verb *išedid* 'help' in their answers. In total, these informants formed three variants of the negated conditional perfect: the negated participle

5. According to Aanaar Saami grammars aimed at language learners (e.g. Olthuis 2000: 197), the past tense connegative of the verb *leđe* 'to be' is *lamaš*. In actual language use, however, the shortened variant *lam* is also widely attested (e.g. Example (12)).

construction (14a), the negated infinitive construction with the connegative *lijjii* (14b) and the negated infinitive construction with the connegative *lam* (14c).

(14) a. *ij* *liččii* *išedâm*
NEG.3SG be.COND.CNG help.PST.PTCP
b. *ij* *lijjii* *išedid*
NEG.3SG be.COND.PST.CNG help.INF
c. *ij* *lam* *išedid*
NEG.3SG be.PST.CNG help.INF
'[Máárjá's mother] wouldn't have helped' (Answers to the questionnaire)

3. Possible determinants of the variation

The second research question addressed in the present study is whether the selection of one conditional perfect construction over the other can be explained by intra- and extralinguistic variables. Based on the possibilities and limitations of the available data sources, the following variables were inspected in this study: the person and number of the verb, the main verb, the type of clause, the polarity, the dialect and the speaker generation. Each of these variables will be examined more closely in the following subsections. In the last subsection (Section 3.7), the role of the possible determinants and their relation to one another will be further discussed using a conditional inference tree analysis.

3.1 Person and number

Aanaar Saami verbs inflect for three numbers (singular, dual, plural) and three persons (first, second, third). In the data of the present study, however, no conditional perfect constructions in the second-person dual or plural could be attested. A likely reason for this is the nature of the data sources, which either consist of written texts (SIKOR) or narratives and dialogues (IK, AČ).

As can be seen from Table 1, the participle construction occurred more often than the infinitive construction, no matter the person and number. Nonetheless, the distribution of the two constructions seems to vary: while for most person and number combinations, the infinitive construction makes up 16.7–28.6% of all occurrences, this percentage was slightly higher for the first-person plural (32%) and considerably higher for the first-person dual (46.7%).

However, despite the slight differences in the distribution of the two constructions with different person and number combinations, the conditional inference tree analysis (Section 3.7) suggests that person and number are not a statistically significant variable in the variation of the conditional perfect.

Table 1. Frequencies of the two conditional perfect constructions according to person and number

Number	Person	PTCP	INF	Total
Singular	1st	156 (73.6%)	56 (26.4%)	212
	2nd	27 (81.2%)	6 (18.5%)	33
	3rd	936 (81.5%)	213 (18.5%)	1149
Dual	1st	8 (53.3%)	7 (46.7%)	15
	3rd	15 (71.4%)	6 (28.6%)	21
Plural	1st	34 (68%)	16 (32%)	50
	3rd	195 (83.3%)	39 (16.7%)	234

3.2 Main verb

In the present data, 340 distinct main verbs were used with the conditional perfect, 67 of which occurred in the participle as well as the infinitive construction. With 235 verbs, only the participle construction was attested; with 37 verbs, only the infinitive construction; and one verb only occurred once in a mixed construction (*eelliđ* 'to live'; see Example (12)).

Most of the attested verbs were scarce, making it difficult to determine their role in the variation. If we instead only consider the most prevalent verbs, i.e. verbs which were attested at least 20 times in the conditional perfect, we are left with 13 verbs which all occurred in both constructions. As illustrated in Table 2, the participle construction was more widely used with 11 of these verbs, while with two verbs, the infinitive construction was slightly more common.

It is noteworthy that the two verbs which occurred more often in the infinitive than in the participle construction (*kolgâđ* 'must' and *sättiđ* 'may') are both modal verbs. Yet, in the case of both of these verbs, the participle construction was also widely used (in 47.3% and 39.3% of all occurrences, respectively). The most frequent verb in Table 2, *leđe* 'to be', on the other hand, stands out in regard to the distribution of the two conditional perfect constructions. A total of 369 conditional perfect constructions were formed with the main verb *leđe* 'to be' in all the analysed data sources, only four of which were infinitive constructions. It seems that, in the case of this verb, the participle construction is almost always preferred over the infinitive construction.

Out of the four infinitive constructions with *leđe* 'to be' as the main verb, two occurred in the corpus (SIKOR), including sentence 15 below. The other two occurrences were counted in the questionnaire, as two non-native informants formed the infinitive construction *lâi leđe* '(it) would have been' in one of the fill-in-the-gap sentences.

Table 2. Frequencies of the two conditional perfect constructions with frequent (n ≥ 20) verbs

Main verb	PTCP	INF	Total
leđe 'to be'	365 (98.9%)	4 (1.1%)	369
čäällid 'to write'	19 (90.5%)	2 (9.5%)	21
puáttid 'to come'	36 (90%)	4 (10%)	40
šoddâđ 'to be born; to grow'	23 (79.3%)	6 (20.7%)	29
peessâđ 'to reach'	15 (75%)	5 (25%)	20
hoksâđ 'to grasp'	17 (73.9%)	6 (26.1%)	23
pyehtid 'can; to bring'	76 (73.1%)	28 (26.9%)	104
halijdid 'to want'	51 (70.8%)	21 (29.2%)	72
moonnâđ 'to go'	24 (68.6%)	11 (29.2%)	35
finnid 'to get'	22 (64.7%)	12 (35.3%)	34
oskođ 'to believe'	22 (51.2%)	21 (48.8%)	43
kolgâđ 'must'	44 (47.3%)	49 (52.7%)	93
sättid 'may'	11 (39.3%)	17 (60.7%)	28

Table 3. Frequencies of the two conditional perfect constructions with 'to be' and other verbs

Main verb	PTCP	INF	Total
leđe 'to be'	365 (98.9%)	4 (1.1%)	369
other	1006 (74.8%)	339 (25.2%)	1345

(15) *Ennuu mielâstubbooht lijjim leđe pääihist já rossâdid*
much rather be.PST.1SG be.INF home.LOC and occupy_oneself.INF
päikkipargoin.
home.work.COM
'I would have much rather been at home and occupied myself with homework.' (SIKOR)

As indicated above, the descriptive statistics suggest a strong preference for the participle construction with the main verb *leđe* 'to be', an observation that has also been made for other Saami languages (Nielsen 1926: 370; Bartens 1980: 261). This preference was confirmed by the conditional inference tree analysis (Section 3.7), according to which the main verb was the variable associated the strongest with the variation of the conditional perfect.

3.3 Type of clause

The Aanaar Saami conditional mood typically occurs in conditional sentences as well as concessive, complement and final clauses; clauses of comparison; instances of reported speech; and relative clauses which carry the notion of desirability or irreality. In the data of the present study, both conditional perfect constructions could be attested in all these clause types.

In the language samples collected in 1887 and 1952, however, only the infinitive construction was used in the protasis and apodosis of conditional sentences in which the predicates of both clauses expressed the conditional perfect. Consider example sentence 16 below: in both, the protasis (*ko lâim tiettiđ* 'if we had known') and the apodosis (*te kodđeđ lâim* 'then we'd have killed'), the predicate is in the conditional perfect. Thus, we find the infinitive construction in both clauses.

(16) *Ko lâim tiettiđ, et tun-uv lah tobbeen, te kodđeđ lâim*
if be.PST.1PL know.INF that 2SG-PTL be.2SG there then kill.INF be.PST.1PL
tuu-uv!
2SG.ACC-PTL
'If we had known that you're also there, then we'd have killed you as well.'
(AČ: 159)

The only attested exception to this finding is clauses of conditional sentences in which the verb *leđe* 'to be' occurs as the main verb (cf. Section 3.2). As illustrated in the apodosis (*liččim lam* 'I'd have been') of the following Example (17), in the older language samples, only the participle construction was used with the main verb *leđe* 'to be', even when both parts of a conditional sentence express the conditional perfect.

(17) *Jos mun puáttee čoohčân lijjim palliđ tääbbin Anarist, te*
if 1SG next autumn.ILL be.PST.1SG can_be.INF here Inari.LOC then
mun liččim lam love ihheed tääbbin.
1SG be.COND.1SG be.PST.PTCP ten year.PART here
'If I could have stayed in Inari until next autumn, then I'd have been here for 10 years.' (AČ: 185)

However, the infinitive construction was not used in conditional sentences in which the tense or mood of the protasis differed from that of the apodosis. In the language samples collected in 1952, there were two such sentences. More specifically, in these sentences the apodosis was in the conditional (18) or indicative (19) present and the protasis in the conditional perfect. As can be seen below, in these sentences, the participle construction appears in the protasis (*liččim uážžum peessâđ* 'I could have made it there' and *jieh liččii vuálgám* 'you wouldn't have left').

(18) *Ko liččim tibi uážžum peessâđ tohon te talle kalle nelgi*
if be.COND.1SG only can.PST.PTCP reach.INF there then then sure hunger
vuálgáččij!
leave.COND.3SG
'If I could have only made it there, then the hunger would certainly leave!'
(AČ: 131)

(19) *Tääl ko sun val kuálmád kerdi poođiš, te jos jieh*
now when 3SG again third time come.POT.3SG then if NEG.2SG
liččii vuálgám, te hyeneeht kiävá.
be.COND.CNG leave.PST.PTCP then badly go.3SG
'Now, should he come again a third time, if you haven't left then, then things will go badly.' (AČ: 37)

In the language samples from the corpus (SIKOR) as well as the questionnaire, the type of clause did not seem to play a role in the variation of the conditional perfect. Unlike in the older language samples, the preference of one construction over the other in one clause of the conditional sentence did not depend on the predicate of the other clause. Likewise, the type of clause was not deemed significant by the conditional inference tree analysis (Section 3.7).

3.4 Polarity

In the present data, both conditional perfect constructions occurred in affirmative as well as negated clauses. Table 4 displays the number of occurrences of each construction based on polarity. At first glance, the percentage of infinitive constructions seems to be slightly higher in negative (25.8%) as opposed to affirmative clauses (18.9%).

Table 4. Frequencies of the two conditional perfect constructions based on polarity

Polarity	PTCP	INF	Total
affirmative	1167 (81.1%)	272 (18.9%)	1439
negative	204 (74.2%)	71 (25.8%)	275

A different picture emerges if we examine each data source separately. Figure 3 below gives an overview of the affirmative and negated conditional perfect constructions attested in the five datasets of the present study.

The language samples collected in 1887 (IK) only include one occurrence of a negated conditional perfect, namely, a negated participle construction. In affirmative clauses, the infinitive construction was used more often (80%). The same

is the case for the language samples collected in 1952 (AČ), in which the infinitive construction constitutes the majority (60%) of the occurrences in affirmative clauses, whilst in their negative equivalents, the participle construction was chosen more often (66.7%). Similarly, the percentage of participle constructions produced by native speakers in the questionnaire (Q) slightly rose in negated constructions.

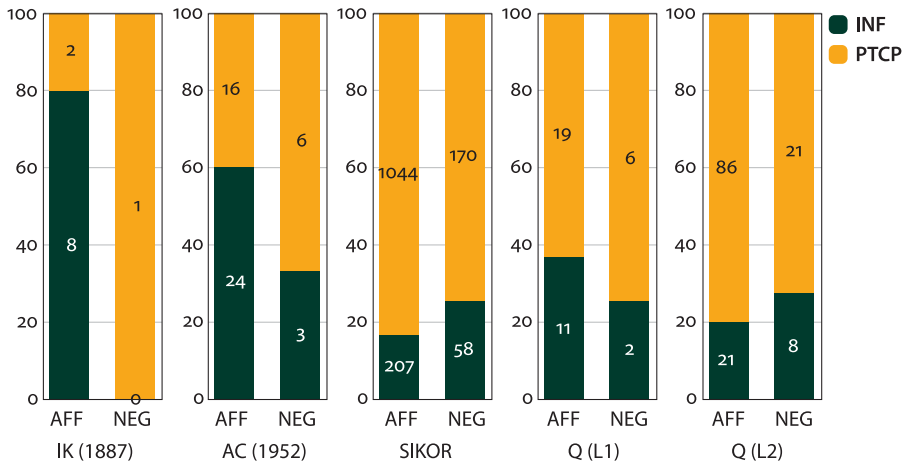

Figure 3. Affirmative and negated conditional perfect constructions across the data

In his dissertation, Bartens (1980:263) points out that in some Saami languages or, more specifically, certain dialects of some Saami languages, he observed a preference of the participle construction over the infinitive construction with negation. If we only consider the statistics of the three aforementioned sources, they seem to align with Bartens' observation.

However, the same correlation could not be attested in the rest of the analysed data. On the contrary, in the corpus (SIKOR) as well as the answers L2 speakers provided in the questionnaire, the percentage of infinitive constructions was slightly higher in negated than affirmative clauses, even though the participle construction was clearly preferred in both. Considering that these two datasets constitute over 94% of all data analysed in this study, this easily explains why the overall statistics of the present study seem to contradict Bartens' assumption. The possible role of polarity in the variation of the conditional perfect will be discussed further in Section 3.7, which also sheds a new light on negated infinitive constructions in the corpus.

3.5 Dialect

Aanaar Saami can be divided into four dialects: Northern, Southern, Eastern and Western. However, Äimä (1902: 24) already observed during his fieldwork in 1900 that the dialectal differences were quite small and their borders vague. According to Itkonen (1986: 4–5), the borders had become even more blurred later on, making it hard to point out distinctive dialectal features.

Three of the analysed data sources allow for a dialectal comparison: the language samples collected in 1887 (IK) and 1952 (AČ) and answers provided by native speakers to the questionnaire conducted in 2020. In all three data sources, both competing conditional perfect constructions were produced by speakers of the Southern, Eastern and Western dialect, an overview of which is given in Table 5 below. The present data did not include examples of the conditional perfect in the Northern dialect of Aanaar Saami.

At a first glance, the aforementioned near-absence of dialectal differences seems to be mirrored in the usage of the conditional perfect: both constructions were attested all the three dialects. Having said that, a closer look at the data reveals what might be considered a dialectal tendency. While the frequencies of the two constructions are almost equal in samples from the Southern dialect, speakers of the Eastern dialect seem to have a slight preference for the infinitive (71.4%) and speakers of the Western dialect for the participle construction (61.4%).

Table 5. Frequencies of the two conditional perfect constructions based on the speaker's dialect

Dialect	PTCP	INF	Total
Southern	19 (47.5%)	21 (52.5%)	40
Eastern	4 (28.6%)	10 (71.4%)	14
Western	27 (61.4%)	17 (38.6%)	44

Another nuance in the variation reveals itself when we consider the dialectal differences in combination with polarity. The occurrences of the conditional perfect in two data sources are illustrated in Figures 4 and 5 below. In the figures, different colours are used to mark the dialect of the informants. Yellow tones indicate speakers from the southern, green speakers from the eastern and blue speakers from the western part of Inari.

As illustrated in the figures, the dialectal difference is particularly visible in negated clauses. More specifically, as can be seen in the second graphs of Figures 4 and 5, speakers from the western part of Inari did not use the infinitive construction with negation. This aligns with Bartens' (1980: 263) observation that, in cer-

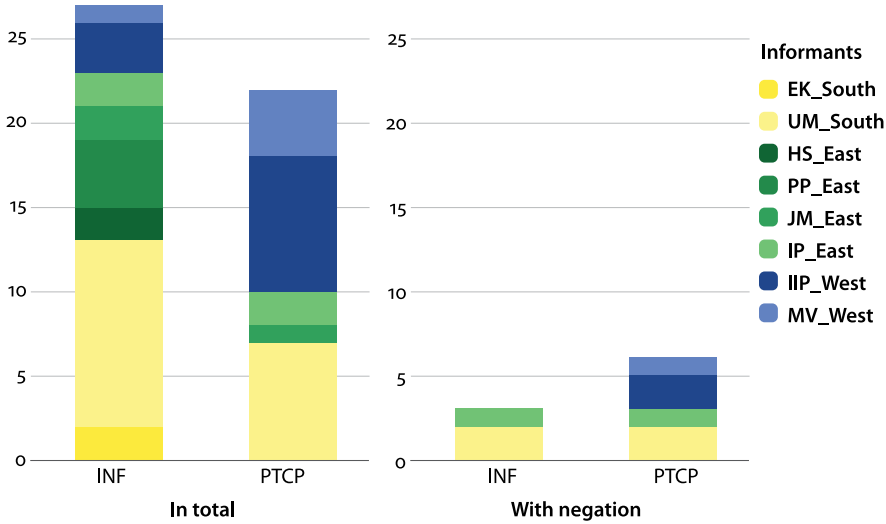

Figure 4. The conditional perfect in the anthology AČ (language samples from 1952)

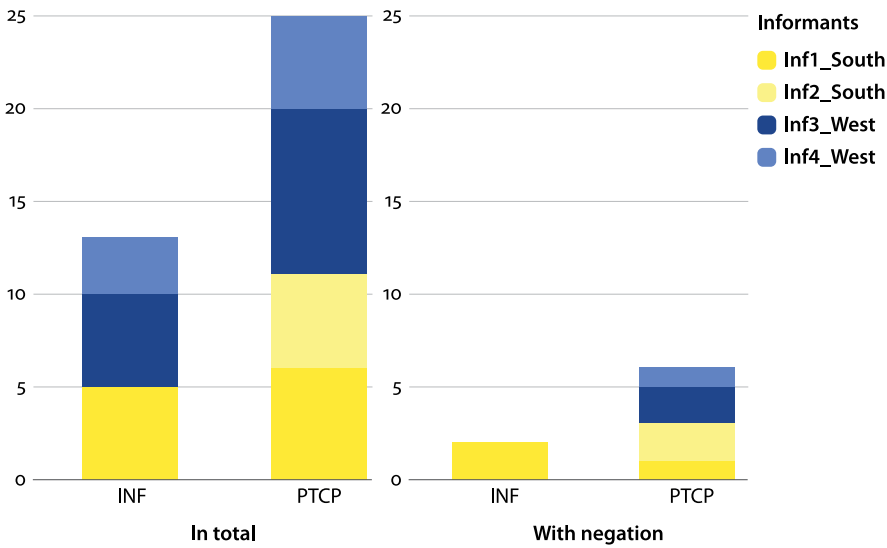

Figure 5. The conditional perfect as it was produced by native speakers in the questionnaire (conducted in 2020)

tain dialects of some Saami languages, only the participle construction is used to express the negated conditional perfect (Section 3.4); but the interplay of dialect and polarity was not deemed statistically significant in the conditional inference tree analysis (Section 3.7).

3.6 Speaker generation

The overview of the conditional perfect across the data (see Figure 2, Section 2) showed that the use of the participle construction has increased in more recent data sources. Considering the concept of apparent time, i.e. the assumption that differences among speaker generations mirror diachronic developments in the language (Bailey et al. 1991), we would expect to encounter the same change in frequency when comparing the use of the conditional perfect across different generations of Aanaar Saami speakers.

Figure 6 illustrates the percentage of infinitive constructions among all the conditional perfect constructions that a speaker produced. The informants are sorted according to their (approximate)[6] year of birth, and the different symbols indicate whether they are native or non-native speakers. The graph includes data from 1887 (IK) and 1952 (AČ) and the questionnaire conducted in 2020. As there were few occurrences of the conditional perfect in the older language samples, i.e. some speakers produced only one instance of the conditional perfect, the respective statistics should be analysed with caution. Despite these limitations, it is evident that, among the informants born before 1930, the majority either only used the infinitive construction or used it at least as often as the participle construction, while the opposite was the case for the informants born after 1960.

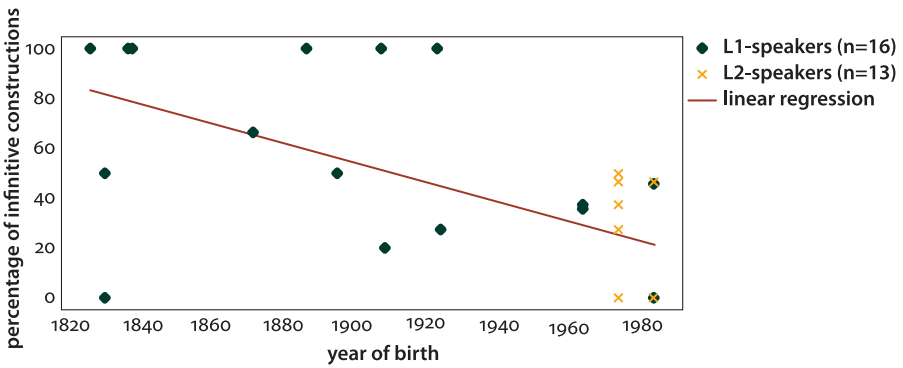

Figure 6. Percentage of infinitive constructions used by the informants based on their year of birth

6. To guarantee anonymity despite the small number of speakers, informants who participated in the questionnaire were asked which decade they were born in, not their exact year of birth. Therefore, approximate years of birth are used in Figure 6 (1965 for informants born in the 1960s, 1975 for informants born in the 1970s, etc.).

In Table 6 below, the informants are divided into four groups based on the time the data was collected and, in the case of the questionnaire, whether they are native speakers or not. The numbers in the table indicate how many of the speakers in each group either used both conditional perfect constructions or only one of the two constructions.

Again, the older language samples stand in contrast to the answers provided to the questionnaire. In the former, nearly all informants produced the infinitive construction at least once. In the latter, one out of four L1 speakers and seven out of 13 L2 speakers did not produce the infinitive construction even once, despite being asked to provide all possible verb forms and being primed with the infinitive construction in some of the sentences. The L1 speaker who did not use the infinitive construction in the questionnaire was born in the 1980s and, as such, was one of the two youngest native informants included in the present data. It seems, therefore, that the youngest generation as well as the generation of new Aanaar Saami speakers, that is, L2 speakers, shows a tendency toward the participle construction.

Table 6. Conditional perfect constructions used by speakers

Speaker generation	Only INF	Both	Only PTCP
L1 speakers in 1887 (5 speakers)	2	2	1
L1 speakers in 1952 (9 speakers)	3	6	–
L1 speakers in 2020 (4 speakers)	–	3	**1**
L2 speakers in 2020 (13 speakers)	–	6	**7**

In the conditional inference tree analysis (Section 3.7), both the informant's year of birth and the distinction between L1 and L2 speakers turned out to be significant variables in the variation of the conditional perfect.

3.7 Significance and interplay of the variables

To further analyse the statistical significance and the interplay of the variables discussed in the previous sections, I applied the conditional inference tree method (Hothorn, Hornik & Zeileis 2006) using the function ctree() of the party package in R (R Core Team 2018). The basis for this method is binary recursive partitioning (splitting). The algorithm goes through all the independent variables, at each stage finding the variable which is the most strongly associated with the dependent variable. This independent variable is then selected for the split, which divides the data into two subsets. Following this strategy, the algorithm continues

to split the subsets until there are no more variables which are statistically significant. The result of this splitting is a conditional inference tree.

For the first analysis, I applied the conditional inference tree method to the data for which information on all variables was available, including information on the informants (their dialect and year of birth). This data includes the older language samples from 1887 and 1952 as well as the answers native speakers provided to the questionnaire in 2020. For the analysis, the formula 'CP ~ data_source + person_number + main_verb + type_of_clause + polarity + dialect + year_of_birth' was used. This means that the dependent variable is the conditional perfect construction (CP), i.e. the infinitive or the participle construction, and the independent variables (the possible determinants of the variation) include the data source as well as the variables discussed in the previous sections, that is, person and number, the main verb, the type of clause, the polarity, and the speaker's dialect and generation (year of birth). The tree in Figure 7 shows the outcome of this analysis.

In Figure 7, the data is split based on the variables that are statistically significant ($p \leq .05$) in the variation of the conditional perfect. The splits are made to achieve the cleanest possible distribution of the two conditional perfect constructions. The bar plots indicate the number of occurrences (n) in which the respective values of the variables are combined and show the proportion of the infinitive (light grey) and the participle (dark grey) construction in these occurrences. Node 1, at the top of the tree, indicates that the main verb is the most relevant determinant in the variation. Here, the data is split into two groups: occurrences with the main verb *leđe* 'to be', with which we only find the participle construction (Node 5), and occurrences with other verbs, where there is variation between the two constructions. Next, at Node 2, the occurrences with other verbs are further split based on the year the informant was born. Here, we see that speakers born in or before 1924 used the infinitive construction more often (Node 3), while the opposite was the case for speakers born after 1924 (Node 4).

For the second analysis, the same method was applied to all the data of the present study. As the corpus data did not contain any information on the informants, the respective variables (dialect and year of birth) were omitted in this analysis. Instead, a new variable was added, namely, the proficiency (that is, the distinction between L1 and L2 speakers), which means that this analysis also included answers non-native speakers provided to the questionnaire. Thus, the second analysis is based on the formula 'CP ~ data_source + person_number + main_verb + type_of_clause + polarity + proficiency'. The outcome of this analysis is illustrated in Figure 8.

Just like in Figure 7, the first split in Figure 8 (Node 1) shows that the main verb is the most significant predictor in the variation of the conditional perfect.

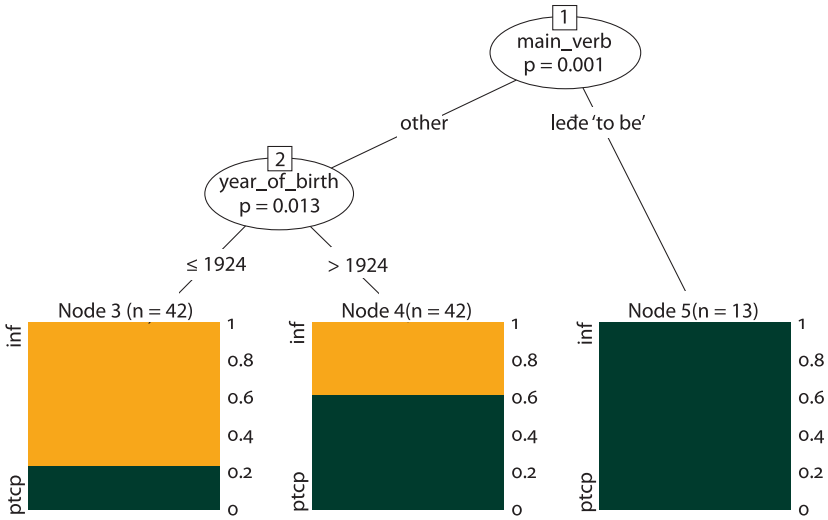

Figure 7. Conditional inference tree based on data by native speakers from 1887, 1952 and 2020

This time, however, occurrences with the main verb *leđe* 'to be' are split a second time based on the proficiency of the speaker (Node 7): while L1 speakers very rarely produce infinitive constructions with the verb *leđe* 'to be' (Node 9, cf. Section 3.2), this percentage is slightly higher with L2 speakers (Node 8). At Node 2, the occurrences with other verbs are further split based on the data source. In the older sources from 1887 (IK) and 1952 (AČ), the infinitive construction is more common (Node 6), while in the corpus (SIKOR) and the questionnaire (Q), the participle construction occurred more often. If we follow the left branch further, we get to Node 3, where the occurrences from the more recent data sources with other main verbs than *leđe* 'to be' are split based on polarity. In these occurrences, the infinitive construction is slightly more common in negated (Node 4) than in affirmative clauses (Node 5), even though the participle construction is generally preferred in both cases.

With regard to Figure 8, the question arises of what causes the increased number of infinitive constructions with negation in the corpus and questionnaire. If we take a closer look at the occurrences of the conditional perfect with negation, we find that, in the corpus data, the negated infinitive construction often appears with the main verb *oskođ* 'to believe'. In ten of these occurrences, the object is the noun *čalme* 'eye', which is marked with a possessive suffix (20). In all these occurrences, we find the past tense connegative *lam* of the verb *leđe* 'to be' (see Section 2 on the variation in the negation of the infinitive construction). The context in this sentences is always the same: somebody was surprised by what they saw.

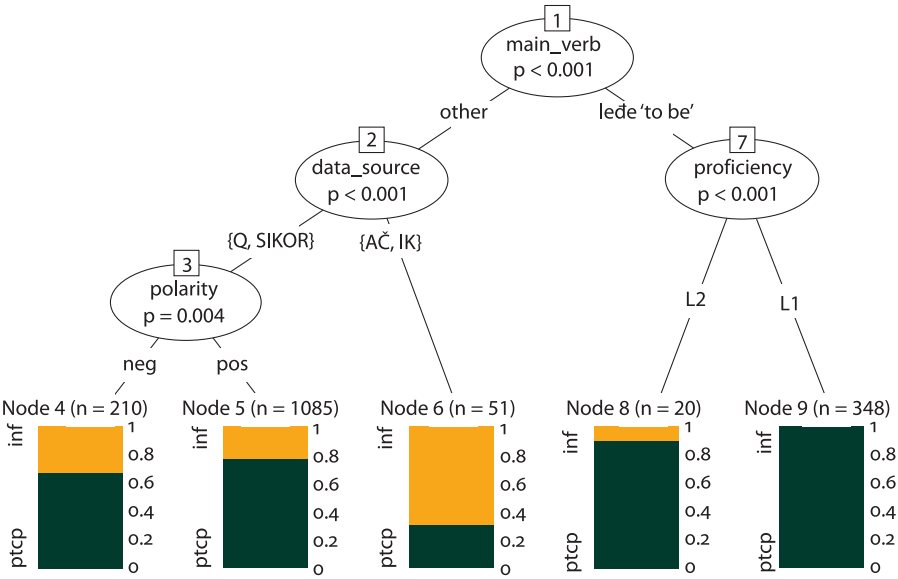

Figure 8. Conditional inference tree based on the whole data

(20) Aanaar Saami

a. *Sun ij lam oskođ čolmijdis, mut tuotâhân tot*
3SG NEG.3SG BE.PST.CNG believe.INF eye.PL.ACC.POSS.3 but true.PTL DEM
vissâ lâi
probably BE.PST.3SG
'He didn't believe (~ wouldn't have believed) his eyes, but yet, it was probably true' (SIKOR)

b. *Já ko poottim kirdemkiädán, jiem lam*
and when come.PST.1SG airport.SG.ILL NEG.1SG be.PST.CNG
čolmijdân oskođ.
eye.PL.ACC.POSS.1 believe.INF
'And when I came to the airport, I didn't believe (~ wouldn't have believed) my eyes.' (SIKOR)

As mentioned in the introduction of this paper, in Finnish, we find a construction in which the auxiliary *olla* 'to be' in the indicative past tense is followed by the infinitive of the main verb. Unlike in Aanaar Saami, this construction is not synonymous to the conditional perfect but, instead, carries a so-called propinquative meaning, i.e. it marks an action was almost or about to be carried out. A search in the Finnish web corpus fiTenTen14, which contains over 1.4 billion words, revealed that there were 1,446 sentences which matched the following structure: negation verb + past tense connegative of the verb *olla* 'to be' + *uskoa* 'to believe'.

Among these, many occurred with the nouns *silmä* 'eye' or *korva* 'ear' as a direct object, and more often than not, these were marked with a possessive suffix. When comparing some of these sentences (21) with the previous examples from Aanaar Saami, it becomes evident that they resemble each other in both structure and meaning.

(21) Finnish

a. *En ollut uskoa silmiäni, mutta*
NEG.1SG be.PST.CNG believe.INF eye.PL.PART.POSS.1SG but
tottahan se oli.
true.SG.PART.PTL DEM be.PST.3SG
'I (almost) didn't believe my eyes, but yet, it was true.' (fiTenTen14)

b. *Kun tulimme perille, en ollut uskoa*
when come.PST.1PL to_the_destination NEG.1SG be.PST.CNG believe.INF
silmiäni!
EYE.PL.PART.POSS.1SG
'When we got there, I (almost) didn't believe my eyes!' (fiTenTen14)

Based on this comparison, it seems that the Finnish propinquative meaning has been borrowed into Aanaar Saami in one reoccurring expression, namely, an idiom which also has equivalents in other languages (e.g. English: *not believe one's eyes*). If we exclude the respective sentences from the data and apply the conditional inference tree method once more, we get yet another graph in which the polarity is not a significant determinant of the variation (Figure 9).

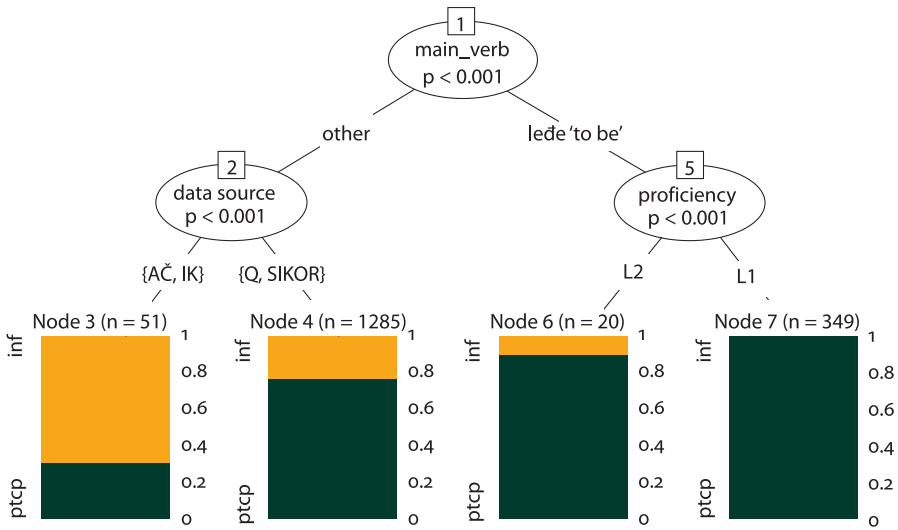

Figure 9. Conditional inference tree based on the modified data

In the preceding Sections (3.1–3.6), various possible determinants were discussed, including the person and number, the type of clause and the dialect in combination with polarity. According to the applied conditional inference tree model, however, these variables do not play a significant part in the variation. Instead, the variable which was the most associated with the variation was the main verb. Apart from that, statistically relevant variables were the year the informant was born in, the data source and the proficiency of the informant. The influence of these three variables could be considered an indicator of the ongoing language change. The infinitive construction was more widely used by speakers born before or in 1924 or in the language samples from 1887 and 1952, while the participle construction was more common in the speech of younger speakers or in the more recent data. In contrast to native speakers, the new generation of L2 speakers was more likely to produce an infinitive construction with the verb *leđe* 'to be' in an experimental setting, i.e. the questionnaire, when being primed with an infinitive construction in the same sentence.

4. Discussion: (Free) variation and change

As coined by Weinreich, Labov & Herzog (1968:188), every linguistic change involves variation. Language contact is one of the driving forces behind morphosyntactic variation and, thus, language change. It often introduces an innovative form or structure which competes with a previously existing one, resulting in either free variation or a new functional distinction between the two variants (Léglise & Chamoreau 2013:3). Gradually, the variation might lead to the abandonment of the 'old' variant (Kroch 2001:725). Yet variants may also coexist for a long time, without necessarily leading to a change at all (cf. Béniak & Mougeon 1984; Valli 2001).

The starting point for the present paper was two main research questions: (1) to what extent the two conditional perfect constructions have been and are still used in Aanaar Saami and (2) whether the selection of one construction over the other can be explained by intra- and extralinguistic determinants. Ultimately, this brings us to the question of whether the two constructions are in free variation and whether their variation is diachronically stable.

As described in Section 2, both conditional perfect constructions were found in all analysed data sources. In the language samples from 1952, there were also occurrences of constructions in which elements from both the infinitive and the participle construction were combined. Similar constructions have also been attested in North Saami (Aikio & Ylikoski 2022:168). While these mixed constructions might indicate that the infinitive and participle construction truly are interchangeable,

they were not attested in the rest of the present data. In the case of Aanaar Saami, they can therefore only be interpreted as a phenomenon of spontaneous speech which has not established itself in the contemporary written language.

There was a diachronic change in the frequencies of the two constructions. While in the older language samples collected in 1887 and 1952, the infinitive construction occurred more often, contemporary Aanaar Saami speakers prefer the participle construction. The corpus data revealed yet another layer in the variation of the conditional perfect: instead of the connegative *lijjii*, the past tense connegative *lam* or *lamaš* of the auxiliary 'to be' was also used in the negation of the infinitive construction.

Both the general shift towards the participle construction and the novel variation in the negated infinitive construction could be the result of language-internal analogy. As demonstrated in the introduction of the present paper, the Aanaar Saami indicative perfect is formed analytically with the auxiliary 'to be' and the past participle of the main verb. Thus, the preference of the participle over the infinitive construction could be explained by the structurally similar periphrastic indicative perfect. Similarly, analogy might also be the reason why, in the corpus data, the past tense connegative *lam* ~ *lamaš* was sometimes found in the negated infinitive construction: these connegatives are used in the negation of the indicative past tense (e.g. *sun lâi išedid* '(s)he would have helped' : *sun ij lam(aš) išedid* '(s)he wouldn't have helped', cf. *sun lâi* '(s)he was' : *sun ij lam(aš)* '(s)he wasn't' in the indicative past tense).

Another explanation for the attested changes could be linguistic interference. As an endangered language spoken in Finland, Aanaar Saami has long been in contact with Finnish, and speakers of Aanaar Saami have been bilingual for generations. In addition, as a result of the recent revitalisation, there are now many L2 speakers of Aanaar Saami whose first language is Finnish. Consequently, ongoing changes in the language are often attributed to language contact (Morottaja 2007; Olthuis 2009: 84; Pasanen 2015: 348). In the case of the conditional perfect, the participle construction might be preferred by Aanaar Saami speakers due to the Finnish conditional perfect being structurally similar.[7]

However, as described earlier, Finnish also has a construction which consists of the indicative past tense of the auxiliary 'to be' and the infinitive of the main verb. It implicates an action which almost happened. As shown in Section 3.7, this so-called propinquative meaning has been borrowed into Aanaar Saami in

7. A similar observation can be made for the North Saami conditional perfect: the infinitive construction is more widely used by North Saami speakers in Norway, while North Saami speakers in Finland prefer the participle construction (Jussi Ylikoski, personal communication, December 28, 2021).

one reoccurring expression, the idiom *jiem lam oskođ čolmijdis* < Finnish *en ollut uskoa silmiäni* 'I (almost) didn't believe my eyes'. In all other instances, the infinitive construction of the Aanaar Saami conditional perfect was used in the same contexts as the participle construction.

Besides language-internal analogy and linguistic interference, a third underlying reason for the shift towards the participle construction could be its formal transparency. While in the infinitive construction, the past tense is encoded in the auxiliary, it has no evident marker of the conditional mood. The participle construction, on the other hand, combines both elements: the conditional mood is encoded in the auxiliary, and the past tense is encoded in the past participle of the main verb.

To address the second research question, an overview of the possible determinants of the variation was given in Section 3. The variable which was by far the strongest associated with the variation of the conditional perfect was the main verb: with *leđe* 'to be', almost only the participle construction was used. This restriction in the use of the infinitive construction has also been mentioned with regard to other Saami languages (Nielsen 1926: 370; Bartens 1980: 261). Bartens (ibid.) states that speakers seem to be reluctant to use the infinitive of *leđe* together with an inflected form of the same verb, but elaborates no further. However, the *horror aequi* principle might provide a possible explanation. As defined by (Rohdenburg 2003: 236), it stands for the possibly universal tendency to avoid formally (near-)identical words in adjacent position – a tendency which, according to (Vosberg 2006: 41), may also surface on the lexical level.

Another relevant variable is the speaker generation. As already concluded from the diachronic comparison of the data, speakers in 1887 and 1952 were more likely to use the infinitive construction, while speakers in the more recent data sources preferred the participle construction. The same observation could be made when the birth year of the informant was considered instead: informants born in or before 1924 favoured the infinitive construction, while the opposite was the case for informants born after 1924. One out of four L1 speakers and more than half of the L2 speakers who participated in the questionnaire did not produce a single instance of the infinitive construction but, instead, only used the participle construction.

Other variables discussed in this paper were the person and number of the verb, the type of clause, the polarity and the dialect of the speaker. The person and number were not a relevant predictor in the variation. In the older language samples, only the infinitive construction was used in conditional sentences in which the predicates of both clauses were in the conditional perfect. However, the conditional inference tree analysis did not identify the type of clause as statistically relevant either. Similarly, the data indicated small dialectal differences: speakers of the Eastern dialect used the infinitive and speakers of the Western dialect the

participle construction slightly more often, while speakers from the South used both constructions with almost equal frequency. The difference was more evident in negated clauses, in which speakers from the western part of Inari only used the participle construction. Nonetheless, neither the dialect itself nor the dialect in combination with polarity was deemed statistically significant. A possible explanation for this might be the limited amount of data, especially considering the older language samples.

To conclude, the only strong determinant in the variation of the conditional perfect is the main verb. With other main verbs than 'to be', the remaining variables only function as constraints. While it is typical that predictors analysed in variationist studies cannot fully account for all of the variation (Cappelle 2009; cf. Gries 2003; Hinrichs & Szmrecsanyi 2007; Bresnan & Ford 2010), it is striking that there is only one decisive variable in the variation of the Aanaar Saami conditional perfect. In many settings, the two constructions really appear to be interchangeable and could be considered subject to free variation.

The analysis also showed a possible change in the variables of the variation: though not identified as statistically significant, only the infinitive construction was used in certain types of conditional sentences in the older language samples, while in contemporary Aanaar Saami, the clause type does not play a role in the variation. With one determinant not applying any longer, the variation could have, in a way, become even 'freer'.

If we juxtapose the general shift towards the participle construction with the changes in the variables of the variation, the close interaction of (free) variation and language change becomes apparent. On the one hand, the gradual abandonment of one variant could have been facilitated by the two variants' high level of interchangeability (cf. Kroch 2001: 725); on the other hand, the increasing frequency of the other variant might have resulted in an even higher level of interchangeability, with previously significant determinants of the variation now being disregarded. While the Aanaar Saami conditional perfect could function as an example of (nearly) free variation, the present analysis shows that this variation is far from diachronically stable. Instead, it is closely intertwined with an ongoing language change.

5. Conclusion

In a nutshell, the Aanaar Saami conditional perfect displays what could, to a great degree, be considered free variation. However, its variants are neither distributed evenly nor diachronically stable. The emergence of the periphrastic perfect and pluperfect in Finnish and other Finnic languages is often attributed to the

influence of surrounding Indo-European languages (Ariste 1956; Serebrennikov 1958; Ikola 1960; Laakso 2001), and the same might be the case for Saami languages (Ylikoski 2016: 212). It is, therefore, likely that the participle construction is an innovative variant which evolved following the structure of the newly introduced indicative perfect, while the infinitive construction is presumably older (Lehtiranta 1992: 92). As the participle construction increases in frequency, the Aanaar Saami conditional perfect serves as an example of how an older structure is slowly being replaced by a newer one. Hence, the attested free variation could be analysed as a transitional stage which eventually might result in the absence of variation.

Abbreviations

1	first person
2	second person
3	third person
ACC	accusative
CNG	connegative
COM	comitative
COMP	comparative
COND	conditional
DEM	demonstrative
GEN	genitive
ILL	illative
INF	infinitive
INTERJ	interjection
LOC	locative
NEG	negation
PART	partitive
PL	plural
POSS	possessive
POT	potential
PST	past
PTCP	participle
PTL	particle
SG	singular

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SIKOR = Saami International Korpus. UiT The Arctic University of Norway and the Norwegian Saami Parliament's Saami text collection. http://gtweb.uit.no/korp. Version 06.11.2018.

CHAPTER 7

Stability of inflectional variation

The dative of the indefinite article in Zurich German

Anja Hasse
Universität Zürich

Free morphological variation is an understudied phenomenon; however, it is implicitly included in studies on overabundance. In the inflection of the indefinite article in Zurich German, we find overabundance of the dative masculine/neuter cell over a timespan of nearly 200 years. As this study shows, instances of overabundance or (possibly) free variation have to be analysed in great detail. In Zurich German, we see a complex picture of free variation in certain linguistic contexts and conditioned variation in other contexts. This instance of morphological variation in Zurich German is quite stable, which contradicts the hypothesis that morphological variation is always a transitional stage of a changing inflectional system, and it even exists at the intra-individual level.

Keywords: Swiss German, non-standard variety, morphological variation, overabundance, shape conditioning, canonical typology, language variation and change

1. Introduction

The title of the workshop that led to this volume, *Free variation = unexplained variation?*, reflects the broad notion of free variation in linguistics. As Weber & Kopf (this volume) show, formal as well as functional linguists refuse the idea of free variation in grammar. Even sociolinguists, whose work is strongly focused on linguistic variation, are hesitant to accept free variation in language. They rather see examples of free variation as cases in which additional research is needed in order to explain the co-occurrence of varying linguistic units. Ellis (1999: 461) explains this by a strong belief that if you want to study a language as a system, you need to study its rules.

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> However, language users are variable in their choice of forms when communicating, suggesting that some linguistic elements may not be governed by either external and internal constraints. This constitutes a potential threat to the claim that languages are systems. To counter this threat, sociolinguists like Labov have endeavoured to show, with considerable success, that variability is itself systematic. (Ellis 1999: 461)

The claim that variation is systematic poses the biggest challenge for studies on (possibly) free variation. The list of factors, language-internal or -external, which might condition the variants is long, if not to say infinite. Even if an extensive list of factors is included in an analysis, not all factors can be tested quantitatively. The frequency of certain factors, or maybe only of specific values of a factor, can be so low that there are no corpora of a suitable size available. This issue is even more severe in languages for which no corpora are available, e.g. non-standard varieties or less-studied languages.

When including extra-linguistic factors in an analysis of free variation, we are confronted with yet another problem. Free variation is the variation of two forms, constructions or any other linguistic units with the same semantic and functional features in one language; but how do we define a language? How many generations speak the same language, how many villages, how many speakers at one place or how many speakers within one family share their linguistic system? If we do not want to analyse a series of idiolects but, rather, want to speak of the language of a speech community, we have to expect a certain degree of variation on every linguistic level due to interpersonal variation. These variative patterns can sometimes be explained by sociolinguistic factors, such as age, gender or origin (as expected by sociolinguists), but not always.

Morphology has, so far, gained only minor attention in variationist studies (cf. Schallert & Dammel 2019: 3). In dialectology, for instance, morphological data is captured in dialect atlases on the one hand and grammatical descriptions of single dialects on the other. Atlases usually map only single cells of an inflectional paradigm and only rarely consider variative forms found in the morphological system of a single speaker (intra-individual variation) or across the speakers of a survey site (inter-individual variation). So-called "dialect grammars" vary in their aims (descriptive grammars, such as Hotzenköcherle 1934, vs prescriptive, such as Schobinger 2008, as its title *Säit me soo oder andersch?* 'Do you say it this way or that way?' reveals), in their analytic depth and in their empirical base. Schmidt et al. (2019: 39) conclude that "questions about variation within inflectional systems […] can only be answered in corpus studies" ["Fragen nach Variation in Flexionssystemen […] lassen sich letztlich nur korpusbasiert klären", translation AH]. The lack of annotated corpora might be one factor explaining why variation is much less studied in morphology than in phonology. Another reason lies within

morphological theories. In morphology, there are a number of principles which do not allow for varying forms, among them the Law of Differentiation (cf. Bréal 1900: 27–38) and the Principle of Contrast (cf. Clark 1987: 2), which prevents synonymous forms, as well as the Elsewhere Principle or the Pāṇini Principle (cf. Anderson 1992: 132), which predicts the generation of one form only.

In the following, we are dealing with a variative phenomenon found in the inflectional system of Zurich German; more specifically, we are dealing with an instance of overabundance. Overabundance, as described in more detail in Section 2.2, is the co-occurrence of at least two inflectional forms in one cell of a paradigm, such as English *burned* and *burnt* in the past participle cell of the verbal paradigm. In Zurich German, the DAT.MASC/NEUTR cell of the indefinite article is overabundant. There are forms with single and forms with multiple exponence set in the very same cell of the inflectional paradigm. These forms do not differ in any grammatical feature. Examples are *ime Huus* 'in a house' with the enclitic indefinite article DAT.NEUTR *=me* attached to the preposition *i*, as opposed to *imene Huus* with the same structure but an additional suffix *=me-ne*. The form with the additional suffix *-ne* is an instance of multiple exponence.

In the following, we do not want to run the risk of analysing unexplained variation as free variation. Therefore, we are analysing two corpora for a number of factors that might explain the distribution of the various forms in synchrony and in diachrony. The aim is to find patterns of variation and to be able to make statements about how free this instance of presumably free variation is. By covering a time span of 200 years, we can additionally test the hypothesis that variation of two semantically and functionally equivalent forms is only found in transition stages and is not expected to be a stable situation for a linguistic system.

Section 2 discusses the theoretical notions. Section 2.1 introduces different notions of morphological variation. There are several phenomena that might be called morphological variation, but not all of them are relevant for the Zurich German case studied here. What we rather focus on is *overabundance*, as defined in Section 2.2. Overabundance is not the same as free morphological variation; therefore, we focus on free morphological variation in Section 2.3. Section 2.4 deals with another variative phenomenon, *shape conditioning*. Here, we do not expect free variation, yet we still need the notion to understand the results presented in Section 4.2. Before turning to the analysis, we describe the phenomenon we are dealing with in more detail. Section 3.1 gives a short overview of the Swiss German indefinite article, and Section 3.2 focuses more specifically on the DAT.MASC/NEUTR of the indefinite article in Zurich German. Section 3.3 deals with how Zurich German is defined in this study. As mentioned before, the aim is to capture morphological variation in one linguistic system – or, to put it differently, one variety. Section 4.1 presents the data used, followed by an analysis with one section each for

the historical data (Section 4.2.1) and the modern data (Section 4.2.2). Section 4.2.3 discusses overabundance at the level of single speakers. Since the form with multiple exponence causing variation is comparatively young and specific for Swiss German, its emergence is presented in Section 5. Section 6, finally, summarises the main findings of the analysis in Section 4.2, and Section 7 concludes with some remarks on how free this instance of variation in Zurich German is.

2. Varying forms

2.1 Morphological variation

To capture the existence of variants in phonology, Trubetzkoy (1939: 43) coined the term *allophones*, i.e. two or more variants belonging to the same phoneme. These variants can vary freely or be in complementary distribution. In the case of free variation of allophones, sociolinguists – since Labov (1972: 188–190) – aim to describe the distribution of such allophones in (presumably) free variation using language-external factors. An analogon to this terminological distinction within the realm of morphology is the well-established concept of allomorphs, e.g. two or more variants belonging to the same morpheme. Yet morphological variation in the sense that one concrete morphological unit, very broadly speaking, can appear in different variants (e.g. a lexeme with more than one plural form such as *Pizza, Pizzas, Pizzen, Pizze* 'pizzas' in German) is not what is usually understood by the notion of 'allomorph'. However, we can ask the same question that we would ask if the plural forms of *Pizza* were allophones: are all these plural forms equally frequent? Can they be used in the same linguistic context? Do they occur in one and the same variety? And are they in the repertoire of a single speaker? This is the kind of morphological variation we are dealing with in the following, and these are the kinds of question we are discussing. We are not analysing the distribution of plural forms of *pizza* but, rather, the distribution of the enclitic articles =*me* vs =*mene* in examples such as *ime Huus* vs *imene Huus* 'in a house', as already mentioned in Section 1.

Consequently, this chapter focuses on morphological variation of the kind in which a single lexeme, i.e. the indefinite article, shows more than one inflected form in a cell of its inflectional paradigm, i.e. the DAT.MASC/NEUTR cell, such as the two examples just given. This excludes allomorphy in the sense of varying exponents with the same morphosyntactic features, such as varying plural markings in German, e.g. umlaut plus suffix *-er* in *Lämmer* 'lambs', zero marking in *Tiger* 'tigers', suffix *-en* in *Papageien* 'parrots', etc. This also excludes examples such as the German plural forms *Wörter* and *Worte* of the singular *Wort* 'word', which vary in their semantics, or the plural forms *Bände* 'volumes' and *Bänder* 'ribbons' which vary in

their semantics and in their gender, as the singular forms *der Band* 'the.NOM.MASC volume' and *das Band* 'the.NOM.NEUTR ribbon' show. It also excludes variation of inflected forms between different varieties, such as varying forms of the definite article in various Swiss German dialects (cf. Hasse, Mächler & Bachmann 2020), or [German] Standard German *Parks* vs Swiss [Standard] German *Pärke* 'parks' (cf. Mörth & Dressler 2014: 250).[1] Instead, we are interested in cases with two or more inflected forms that share the same morphosyntactic features without differing in their semantics or pragmatics and are all used by speakers of one variety at one stage of a language. This kind of morphological variation has been labelled *sovrabbondanza* in Italian and *overabundance* in English, and the variants are called *cell-mates* (cf. Thornton 2010–2011, 2011).

2.2 Overabundance

"It is among the most ancient of linguistic insights that morphological paradigms do not admit doublets" (Kroch 1994: 184), and yet they exist, as studies on overabundance, and the following chapter, show. The majority of these studies is set in the framework of Canonical Typology (cf. Corbett 2005, 2007*a*). The most seminal contribution is Thornton (2011), in which Thornton defines the phenomenon and proposes a first list of parameters to evaluate the degree of canonicity of overabundance. Free variation is implicitly included in these parameters, mainly in the criterion that in a canonical case of overabundance, there are no conditions on the distribution of the varying forms (cf. Thornton 2011: 362–370).[2] The canonical case of overabundance, as the canonical case of any phenomenon, is not expected to be frequent (cf. Corbett 2007*b*: 9; Corbett & Fedden 2016: 498) or even to be attested at all in any linguistic system (cf. Corbett 2005: 26).

> Two completely interchangeable forms of equal frequency, whose use is not subject to any (speaker-related) diaphasic, diastratic, diamesic, diatopic or diachronic conditions, or to any phonological, morphological, syntactico-semantic, or pragmatic conditions, do not exist. (Thornton 2011: 362)

However, the notion of canonical overabundance is more comprehensive than that of free morphological variation. Overabundance as defined in Thornton (2011,

1. Mörth & Dressler (2014: 250) label the plural form *Pärke* as Swiss German. Swiss German, however, does not know such a plural form due to *e*-apocope. The corresponding plural form in Swiss German is *Pärk;* the singular is *Park*.

2. 'Canonical cell-mates are defined as a set of two or more forms that realise the same cell (i.e. the same set of morpho-syntactic features) in a lexeme's paradigm and can be used interchangeably, with the choice of one or the other form subject to no conditions.' (Thornton 2011: 362)

inter alia) or Hasse (in press) includes a list of other features which are independent of factors defining the degree of variation of the cell-mates. Among them are:

- the criterion that cell-mates occurring in unpredictable cells, i.e. neither in a morphomic nor in a morphosyntactic pattern, are more canonical than overabundant cells in a morphomic pattern, and these in turn are more canonical than overabundant cells in a morphosyntactic pattern (cf. Thornton 2011: 370–375),[3] or
- the criterion that overabundance attested in the grammatical system of a single speaker is more canonical than in the system of a group of speakers or even of an entire speech community (cf. Hasse in press: Section 3.3.2.5).

This article cannot discuss all the criteria for canonical overabundance but, rather, focuses on the criteria related to free variation.

2.3 Free morphological variation

As mentioned in Section 2.2, free variation is implicitly included in the notion of canonical overabundance. In Thornton (2012: 188), we find a further criterion aiming more specifically at free variation. Overabundance is more canonical if the cell-mates are equally frequent than if they differ in their frequencies. This idea of completely interchangeable forms can also be found elsewhere. Fehringer (2004, 2011) analyses the variation of the genitive suffixes *-es* ~ *-s* in German and states:

> The words containing these suffixes are considered to be doublets under this account, as the allomorphs are not systematically conditioned by phonological, morphological, or semantic factors. That is to say, each word has two variant forms, and both can be used interchangeably. (Fehringer 2004: 286–287)

A question arising from this is which relative frequency of two or more forms we define as a threshold. Do we require a fifty-fifty distribution of two varying forms in order to refer to these forms as being truly interchangeable? Fehringer (2004), in her study on genitive variation in German, finds ratios beween 1:1 (*Staub-es* ~ *Staub-s* 'dust-GEN.SG') and 131.5:1 (*Gott-es* ~ *Gott-s* 'god-GEN.SG'). Thornton

3. The example in Thornton (2011: 371–374) for overabundance in a morphomic pattern, i.e. a pattern which is not shaped by any non-morphological factors, such as morphosyntax, are Italian *aprire* 'to open', *offrire* 'to offer' and *dare* 'to give' with overabundant 1.SG.PRF.IND, 3.SG.PRF.IND and 3.PL.PRF.IND cells. This pattern is the very same we find in the Italian tense *passato remoto* of verbs with stem changes, e.g. passato remoto of *avere* 'to have' 1.SG *ebbi*, 3.SG *ebbe*, 3.PL *ebbero* vs 2.SG *avesti*, 1.PL *avemmo*, 2.PL *aveste*. Thornton's (2011: 374) example for overabundance in an unpredictable cell is the 2.SG.IMP cell of Italian *stare* 'to stay': *stai* vs *sta*.

(2012: 189) sees an instance of disappearing overabundance in the suppletive inflection of the lexeme 'eye' (disappearing *oko* vs *glaz*) in Russian, where she finds a ratio of over 70:1 based on Chumakina et al. (2004: 286). Her conclusion on the ratio of cell-mates is:

> More generally, it can be speculated that in a given synchronic corpus ratios in the range of units indicate existence of overabundance, ratios in the range of tens indicate that overabundance is on the verge of extinction or has recently ceased to exist, and higher ratios indicate complete extinction of overabundance in the synchronic stage represented by the corpus. (Thornton 2012: 189)

The question of which ratio still counts as free variation is, as far as I know, still unanswered. Yet any threshold, apart from a fifty-fifty distribution, seems to be arbitrary. A true fifty-fifty distribution, however, is to be expected very rarely – if ever – in morphological variation. The canonical approach to overabundance does not bridge this gap, but it allows for comparison of attested cases of overabundance with regard to a number of features, among them the degree of interchangeability of the forms. Once there is a reasonable number of studies of overabundance, we might get a clearer picture of which ratios are most common when two or more forms realise one and the same cell of an inflectional paradigm and correlate them with the notion of free variation.

2.4 Excursus – phonological variation: Shape conditioning

In Section 4.2, we will encounter another variative phenomenon: shape conditioning. In cases of shape conditioning, there is more than one phonological form of a word. The choice of one form over the other is fully conditioned by the linguistic context in which this word appears, e.g. the shapes of the indefinite article in English, as in *a zebra*, but *an elephant*.[4] Thus, shape conditioning and overabundance share the property that there are variants which do not differ in any grammatical or semantic feature. In the case of overabundance, these variants are called *cell-mates*; in the case of shape conditioning, *shapes;* cf. rows 2 and 3 in Table *1*.[5] Still, overabundance and shape conditioning differ fundamentally from one another (cf. Hasse in press: Section 3.5). Overabundance can only occur with

4. Shape conditioning can be much more complex with regards to the phonological processes involved and with regards to the linguistic factors triggering the use of a certain shape, as for example in the case of initial consonant mutation in Welsh (cf. Ball & Müller 1992) or Scottish Gaelic (cf. Stewart 2016: 90–150).

5. For the discussion of the position of shapes within an inflectional paradigm, cf. Green (2006); Bonami et al. (2014).

inflected forms because it is an inflectional phenomenon. Shape conditioning, on the other hand, can affect any part of speech and, consequently, inflected as well as uninflected words or word forms; cf. row 4. Cell-mates differ in their morphological structure and, thus, in their exponents or in their means of exponence. Shapes differ in their phonological structure; cf. row 5. Canonical cell-mates are in free variation. Shapes are in complementary distribution; cf. row 6. Shape conditioning is triggered by language-internal factors, i.e. the linguistic context. The distribution of non-canonical cell-mates, i.e. cell-mates which do not vary freely, can be conditioned by language-internal or external factors; cf. row 7. Language-internal are any phonological, morphological, syntactic, semantic or pragmatic factors; language-external are factors such as any sociolinguistic feature of speakers with an overabundant paradigm (cf. row 8).

Table 1. Overabundance and shape conditioning.*

	Cell-mates	**Shapes**
grammatical features	shared by the variants	
semantic features	shared by the variants	
affected	inflectional forms only	any part of speech
difference between variants	different exponents	phonological alternation
distribution of variants	free variation	complementary distribution
degree of conditioning	conditioning is lacking	fully conditioned
kind of possible conditioning*	language-internal and -external	language-internal

* The last row only affects non-canonical overabundance – in this case, conditioned variation of the cell-mates.

Since this volume deals with free variation, we will not go into any details of shape conditioning because we do not expect any examples of free variation in shape conditioning. In Hasse (2019), I analyse the interaction of shape conditioning and overabundance in the dative cell of the indefinite article in contemporary Zurich German in detail.

3. Phenomenon

3.1 The Swiss German indefinite article

Swiss German determiners inflect for case (DIRECT CASE, DATIVE), gender (MASCULINE, NEUTER, FEMININE) and – some of them – for number (SINGULAR, PLURAL).

The indefinite article only exists in the singular resulting in a paradigm with six possible cells; cf. Table 2. Swiss German dialects reveal varying syncretisms of gender in the direct case, and in some dialects, there are distinct nominative and post-prepositional accusative forms (cf. Hasse, Mächler & Bachmann 2020: 261; Hasse in press: Section 2.3.1). What all dialects share is the syncretism of DAT.MASC and DAT.NEUTR of the indefinite on the one hand and the definite article on the other (cf. Hasse, Mächler & Bachmann 2020; Hasse in press: Sections 2.1.1, 2.3.2).

Table 2. Indefinite article in Zurich German (cf. Schobinger 2008: 29)

	MASC	NEUTR	FEM
DIRECT CASE	*en*	*es*	*e*
DATIVE	*eme*		*ere*
	emene		*enere*

Dative forms of the indefinite (and definite) article appear much more often in post-prepositional than in free position (e.g. as dative objects). Nübling (1992: 221) finds a ratio of 9:1. Section 4.2, therefore, focuses on post-prepositional forms.[6]

3.2 DAT.MASC/NEUTR of the indefinite article in Zurich German

In Zurich German, there are three types of DAT.FEM (cf. (1)) and six types of DAT.MASC/NEUTR forms of the indefinite article (cf. (2)).[7]

(1) a. *i=nere Höö̈li*
in=a.DAT.FEM cave
'in a cave'

b. *mit=ere Schpänd*
with=a.DAT.FEM donation
'with a donation'

c. *enere Chaz*
a.DAT.FEM cat
'(to) a cat'

6. In the analysis of the historical data (cf. Section 4.2.1), forms in NPs and PPs are included in the statistical model; in the analysis of the modern data (cf. Section 4.2.2), only forms in PPs are included because of the low number of tokens in NPs.

7. The transcription of spoken Zurich German broadly follows the guidelines of Dieth (1938).

(2) a. *i=me* *Huus*
in=a.DAT.NEUTR house
'in a house'
b. *i=mene* *Huus*
in=a.DAT.NEUTR house
'in a house'
c. *mit=eme* *Schlüssel*
with=a.DAT.MASC key
'with a key'
d. *mit=emene* *Schlüssel*
with=a.DAT.MASC key
'with a key'
e. *eme* *Hund*
a.DAT.MASC dog
'(to) a dog'
f. *emene* *Hund*
a.DAT.MASC dog
'(to) a dog'

The distribution of the DAT.FEM forms is straightforward: clitic forms in post-prepositional position are *=nere* if the preposition has a word-final vowel such as *i* 'in' (cf. (1a)) and *=ere* if the preposition has a word-final consonant such as *mit* 'with' (cf. (1b)). This poses a clear case of shape conditioning. In free position, the form is *enere*; cf. (1c). In the DAT.MASC/NEUTR cell, we see forms varying in their morphological structure, i.e. forms with single exponence, clitic *=me* and clitic or free (=)*eme* in (2a, c, e), and forms with multiple exponence, clitic *=mene* and clitic or free (=)*emene* in (2b, d, f). The form *eme* is already fully inflected for case and gender; the form *emene* does not differ with regards to any morphological, morphosyntactic or semantic features but has an additional suffix *-ne*. This is an instance of reinforcement multiple exponence (cf. Harris 2017: 61–64).[8] The forms of the DAT.MASC/NEUTR also differ in their phonological structure, i.e. forms with word-initial vowel, *eme(ne)*, and forms with word-initial consonant, *me(ne)*. There is a tendency towards forms with a word-initial vowel after a preceding consonant (e.g. *mit=eme(ne)*; cf. (2c)–(2d)), and forms with a word-initial consonant after a preceding vowel (e.g. *i=me(ne)*; cf. (2a)–(2b)). This phonologically conditioned distribution is an instance of shape conditioning.

8. The emergence of *emene*, the form with multiple exponence, is discussed in Section 5.

3.3 Zurich German

In Section 1, we touched on the question of how to define a language. If we want to state that varying forms co-occur in one linguistic system, we need to define this system. Unlike more traditional approaches in dialectology, the current study does not analyse data that were elicited explicitly to study a specific dialect. The authors and speakers were chosen based on the linguistic system used at the time they wrote their texts (in the case of the historical corpus) or were recorded (in the case of the modern data). This linguistic system is characterised by features which can be attributed by linguists to the High Alemannic dialect spoken broadly in the Swiss canton of Zurich; but more importantly, all these texts and recordings are recognised as Zurich German by speakers of this very dialect. Any variation which is accepted by speakers of Zurich German is supposed to be a feature of it.

4. Corpus study

4.1 Data and data collection

The current study is based on two corpora which were both specifically compiled for the study of morphological variation of the indefinite article in Zurich German. One of them represents modern spoken Zurich German and the other previous stages of (written) Zurich German, so that variation of the dative of the indefinite article can be traced back in time.

The historical corpus consists of written Zurich German texts published between 1831 and 1953, thus covering 120 years. There are six authors represented with varying numbers of tokens per author, which is considered in the statistical analysis; cf. Section 4.2.1. The texts are either prose or drama; they were all scanned and searched manually for dative forms of the indefinite article. The corpus contains approximately 350,000–400,000 words and nearly 1,200 tokens of the dative of the indefinite article of any gender.

The modern corpus consists of transcriptions of two types of recordings. On the one hand, there are recordings made for the project *Archimob*.[9] The aim of this oral history project (1999–2001) was to interview 555 people in all parts of Switzerland about their life during World War II. Ten of these interviews, which are 1 h44m long on average, were conducted with speakers of Zurich German. These were transcribed by various student assistants at the University of Zurich. On the other hand, there are 27 episodes of *Schawinski*, a Swiss German talk

9. http://www.archimob.ch/ [10.12.2021].

show hosted by a speaker of Zurich German and aired on the TV channel SRF 1. All interviews with Zurich-German-speaking guests broadcast between February 2012 and November 2014 were included. They are half an hour long each, and they were transcribed by the author of this article.

Both subcorpora (*Archimob* and *Schawinski*) are neither annotated nor tagged and were searched manually for dative forms of the indefinite article. There are 252 tokens in the *Archimob* corpus (hereafter, *Archimob)* and 259 tokens in the *Schawinski* corpus (hereafter, *Schawinski)* for a total of 511 tokens.

In Archimob, there are 7 male and 3 female speakers born in the first third of the 20th century. In Schawinski, there are 18 male and 6 female speakers of varying age. The age of some speakers is unknown and can only be estimated. The oldest speaker is in his late 80s, the youngest in his late 20s. As in the historical corpus, the tokens of speakers vary in both subcorpora.

The tokens of the two corpora (historical and modern) were each included in a database, and they were all categorised according to the following variables:

I. morphological and phonological form
   a. atheoretical classification, e.g. DAT.MASC/NEUTR *emene, mene, eme*, etc.
   b. length of the form accounted for by the number of consonants, e.g. DAT.MASC/NEUTR *eme, me* vs *emene, mene*, etc.
   c. phonetic reductions of assumed full forms: e.g. DAT.MASC/NEUTR *emene* vs apheretic *mene*, or DAT.MASC/NEUTR *eme* vs apocopated *em*
II. grammatical gender: MASC vs NEUTR vs FEM
III. syntactic variables
   a. phrase: NP vs PP[10]
   b. preposition in PPs[11]
   c. syntactic function
   d. complexity of the phrase with a number of subtypes of complex phrases
IV. phonological variables
   a. preceding sound[12]
   b. following sound[13]
   c. epenthetic nasal after the indefinite article[14]

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10. For the asymmetry in number of tokens of dative forms of articles in NPs and PPs, cf. Section 3.1 and Nübling (1992: 221).

11. Hotzenköcherle & Trüb (1975: maps 137–138) map varying forms of the definite article ACC.SG.MASC in PPs with the preposition *uf* 'on' vs PPs with *i* 'in' or *a* 'to'. We assume that something similar is possible for DAT.MASC/NEUTR of the indefinite article.

12. For an extensive list of references concerning the distribution of dative forms of the indefinite article following prepositions ending on a consonant vs prepositions ending on a vowel in various Swiss German dialects, cf. Hasse (in press: Section 2.2.2).

V. animacy[15]

Not all values of all variables are attested frequently enough to include them in statistical analyses. Sections 4.2.1 and 4.2.2 list the independent variables used in the analyses of the historical and of the modern corpus. Because morphological variation only concerns the DAT.MASC/NEUTR forms, all DAT.FEM forms were excluded from the statistical model.

4.2 Data analysis and results

The data of the historical and the modern corpus were gathered in two databases and analysed separately. Both subcorpora were analysed quantitatively as well as qualitatively. In the following, I will restrict myself to the quantitative results of the corpus study to give a broader picture of the degree of variation between forms with single and multiple exponence. The response variable, i.e. single or multiple exponence, is categorical. Therefore, general linear mixed models (GLMM) were conducted in R (version 3.4.3, RStudio version 1.1.383). Non-significant variables were excluded from an initial full model based on AIC (Akaike information criterion). All the variables that proved to be statistically significant after this stepwise backwards procedure were included in an optimised model that is presented for each corpus in the following subsections.

4.2.1 *Findings in the historical corpus*

The effects of several linguistic factors on the occurrence of single or multiple exponence were tested in a generalised linear mixed model (GLMM). As fixed factors, the following were included: gender (2 levels: MASC, NEUTR), preceding sound (2 levels: C, V),[16] following sound (2 levels: C, V), the word-initial sound (2 levels: C, V), occurrence of an epenthetic nasal after the article (2 levels: yes, no), phrase (2 levels: NP, PP), phrase complexity (2 levels: simple, complex), occurrence of an adjective (2 levels: yes, no), syntactic function (4 levels: indirect

13. Dal Negro (2004) finds different forms of the definite article NOM.MASC and ACC.MASC in Highest-Alemannic linguistic islands in Italy depending on the following sound. Hotzenköcherle & Trüb (1975: maps 132–135) map varying forms of the definite article NOM/ACC.PL and NOM.SG.MASC of the definite article in various Swiss German dialects.

14. Cf. Section 5 for references of the epenthetic nasal in Swiss German.

15. Cf. dal Negro & Musso (2003) for the effect of animacy on varying NOM.MASC forms of the definite article in the dialect of Issime, or Alber & Rabanus (2011) for the interaction of animacy and syncretism in various Germanic varieties.

16. C: consonant, V: vowel.

object, adjunct, adnominal modifier, object-like PP)[17] and animacy (3 levels: animate, inanimate, abstract). Because of the differences in numbers of tokens per author, a random intercept for author was included. The minimal model contained the factors that proved to be significant after a stepwise backwards procedure based on AIC. The inclusion of the random intercept was justified as shown by likelihood ratio tests. The factors preceding sound ($\chi^2(1) = 5.9$, $p = 0.01501$), word-initial sound of the article ($\chi^2(1) = 129.0$, $p < 0.001$) and epenthetic nasal ($\chi^2(1) = 37.4$, $p < 0.001$) proved to have a significant effect of the distribution of single and multiple exponence; cf. Table 3. The various contexts in which the article forms appear are named in column 1.[18]

Table 3. Factors with a significant effect on the occurrence of multiple exponence in the historical corpus.*

Context	Preceding sound	Word-initial sound of the article	Epenthesis	Observations		Relative frequency of ME
				Total	Thereof with ME*	
CV+	consonant	vowel	yes	27	5	19%
CV–			no	256	39	15%
VC+	vowel	consonant	yes	55	12	22%
VC–			no	412	229	56%
VV+		vowel	yes	3	0	0%
VV–			no	31	12	39%

* ME: Multiple exponence

After a preceding consonant, only forms with a word-initial vowel are attested (context CV+ and CV–). These forms conform with shape conditioning as described in Section 3.2. The majority of these forms have single exponence (corresponding to *uf=eme* 'on=a.DAT.MASC/NEUTR' or *mit=eme* 'with=a.DAT.MASC/NEUTR', respectively). Forms with multiple exponence are relatively rare (19% in context CV+ with an epenthetic nasal (cf. (3)); 15% in context CV– without an epenthetic nasal (cf. (4))).

17. Corresponding to *Dativobjekt, Adverbial, Attribut, Präpositionalobjekt* in German grammar-writing.

18. The labels are to be read as CV+ 'preceding consonant, word-initial vowel, plus epenthetic nasal', CV– 'preceding consonant, word-initial vowel, no epenthetic nasal', VC+ 'preceding vowel, word-initial consonant, plus epenthetic nasal', etc.

(3) *uf=emenen einsame Berghoof*
on=a.DAT.MASC lonely.DAT.MASC.SG mountain farm
'on a lonely mountain farm' (Biedermann 1889: 20)

(4) *mit=emene ganz kuriose Lächle*
with=a.DAT.NEUTR very strange.DAT.NEUTR.SG smirk
'with a very strange smirk' (Biedermann 1889: 66)

After a vowel (context VC± and VV±), we find much higher rates of morphological variation, i.e. more canonical overabundance, but also higher rates of phonological variation, i.e. less strict shape conditioning. A preceding vowel can either be followed by an article form with a word-initial consonant (context VC±) or – much less frequently – by an article form with a word-initial vowel (context VV±). In context VV±, shape conditioning is violated. In both contexts, VC± and VV±, we find variation of single and multiple exponence to various degrees. The variation is particularly high in context VC–, which is also the most frequent context. Here, 56% of the article forms have multiple (cf. (5)) and 44% have single exponence (cf. (6)).

(5) *vo=mene ehrehafte, tugedliche*
from=a.DAT.NEUTR honourable.DAT.NEUTR.SG virtuous.DAT.NEUTR.SG
Puuremaitli
farm girl
'from a honourable, virtuous farm girl' (Biedermann 1888: 33)

(6) *vo=me arme Schriiner*
from=a.DAT.MASC poor.DAT.MASC.SG carpenter
'from a poor carpenter' (Biedermann 1932: 80)

A high rate of both forms with multiple (cf. (7)) and single exponence (cf. (8)) is further attested in context VV–, but with much lower absolute numbers.

(7) *na emene richtige Plan*
towards a.DAT.MASC real.DAT.MASC.SG plan
'towards a real plan' (Biedermann 1888: 64)

(8) *na eme Öpfel*
towards a.DAT.MASC apple
'towards an apple' (Biedermann 1889: 13)

The rate of forms with multiple exponence is generally low in article forms with an epenthetic nasal (not attested in context VV+; in context VC+, 22% of multiple exponence (cf. (9)) vs 78% of single exponence (cf. (10))).

(9) *a=menen Egge*
at=a.DAT.MASC corner
'at a corner' (Eschmann 1912: 62)

(10) *a=men andere Ort*
at=a.DAT.MASC different.DAT.MASC.SG place
'at a different place' (Biedermann 1888: 43)

If dative forms with single and with multiple exponence of the indefinite article varied freely, we would expect to find the same proportion of each form in every context. This, however, is not the case. Instead, we find conditioned variation next to free variation in conditioned contexts. Examples like (3) and (4) are rather rare: forms with multiple exponence do not even reach 20% in contexts with a preceding consonant (CV±). In contexts with a preceding vowel, the situation is much more complex. In the most frequent context, VC–, we find a distribution that is very close to random: 56% of forms with multiple and 44% of forms with single exponence. In the second most frequent context, VV–, we find comparably high ratios of both types of forms: 39% with multiple and 61% with single exponence. Only an epenthetic nasal can diminish the rate of forms with multiple exponence drastically. Otherwise, there is sound evidence that forms with single and with multiple exponence vary rather freely – but only under certain conditions.

4.2.2 *Findings in the modern corpus*

The GLMM of the modern spoken data for analysing the effect of various factors on the occurrence of single vs multiple exponence included the following as fixed factors: gender (2 levels: MASC, NEUTR), word-initial sound (2 levels: C, V), preceding sound (2 levels: C, V), following sound (2 levels: C, V), epenthetic nasal following the article (2 levels: yes, no), syntactic function (3 levels: adjunct, adnominal modifier, object-like PP), phrase complexity (2 levels: simple, complex), occurrence of an adjective (2 levels: yes, no) and animacy of the noun (3 levels: animate, inanimate, abstract). Because of the differences in numbers of tokens per speaker, a random intercept for speaker was included. The inclusion of the random intercept was justified as shown by likelihood ratio tests. After the stepwise backwards procedure based on AIC, the minimal model included preceding sound (χ^2 (1) = 97.7, $p < 0.001$) and epenthetic nasal (χ^2 (1) = 12.5, $p = 0.0004$) as fixed factors. Unlike in the analysis of the historical data, the word-initial sound

is not significant, yet there is a trend (χ^2 (1) = 3.8, p = 0.05); cf. Table 4.[19] Again, the relevant contexts are named in column 1.[20]

Table 4. Factors with a significant effect on the occurrence of multiple exponence in the modern corpus

Context	Preceding sound	Epenthesis	Observations		Relative frequency of ME
			Total	Thereof with ME	
C+	consonant	yes	7	0	0%
C–		no	84	13	15.5%
V+	vowel	yes	22	11	50%
V–		no	179	133	74.3%

The results resemble the ones of the historical data in some regards. If the article is preceded by a consonant, we find relatively few forms with multiple exponence (15.5% of multiple exponence in context C– without a subsequent epenthetic nasal (cf. (11)) and no forms with multiple exponence in context C+ (cf. (12))).

(11) *mit=emene* *andere* *Schwiizer*
with=a.DAT.MASC different.DAT.MASC.SG Swiss person
'with a different Swiss person' (A320)[21]

(12) *nach=emen* *Uuftritt*
after=a.DAT.MASC performance
'after a performance' (S67)

In context V±, the majority of the article forms have multiple exponence. In context V+, we see 50% of forms with single (cf. (13)) and 50% of forms with multiple exponence (cf. (14)).

(13) *a=men* *andere* *Ort*
at=a.DAT.MASC different.DAT.MASC.SG place
'at a different place' (S207)

19. For shape conditioning of these forms in the modern corpus, cf. Hasse (2019).

20. The labels are to be read as C+ 'preceding consonant, plus epenthetic nasal', C– 'preceding consonant, no epenthetic nasal', etc.

21. The tokens from the modern corpus are numbered: *A* is for tokens from Archimob, *S* for tokens from Schawinski.

(14) *i=menen aatrunkne Zueschtand*
in=a.DAT.MASC tipsy.DAT.MASC.SG state
'in a tipsy state' (S40)

The context V– is much more frequently attested than the others (V+ and C±). Out of these forms, three quarters have multiple exponence (cf. (15)) and only one quarter have single exponence (cf. (16)).

(15) *zu=mene ächte Desaschter*
to=a.DAT.NEUTR real.DAT.NEUTR.SG disaster
'to a real disaster' (S23)

(16) *i=me andere Schpitaal*
in=a.DAT.NEUTR different.DAT.NEUTR.SG hospital
'in a different hospital' (S273)

Similar to the historical data, we find conditioned variation next to (rather) free variation. In contexts where the article is preceded by a consonant (C±), the majority of forms has single exponence as in (12). A much higher rate of interchangeability is found in contexts with a preceding vowel (V±); yet the rate is lower than in the comparable contexts in the historical data (contexts VC± and VV±). This means that one form is more frequent than the other but, again, only in certain contexts. In context V–, we see forms with single exponence in one quarter of the article forms. In the same context but with an epenthetic nasal (V+), we find a fifty-fifty distribution. Even though the total numbers of V+ are much lower than those of V–, we find free variation in this linguistic context.

4.2.3 *Intrapersonal variation*

In Section 2.2, we encountered the parameter that overabundance is more canonical if it is attested in the inflectional system of a single speaker than if it only appears on the more abstract level of the speech community. So far, we have analysed the data across all speakers, even if speaker/author was included as a random effect in the statistical model. The question of how overabundance appears in an idiolectal inflectional system, however, is still open. In the following, we focus on the modern data only. The vast majority of the tokens were recorded in one interview situation, which means that they were realised in the very same interactional situation. If we zoom in at the individual level, we find only one speaker without an overabundant DAT.MASC/NEUTR cell of the indefinite article.

RB, a male speaker born in the 1910s, uses only forms with single exponence even in context V–, the context where we find predominantly multiple exponence in the corpus study; cf. (17).

(17) *i=me* *Tresor*
in=a.DAT.MASC safe
'in a safe' (A453)

However, there is sound evidence for intraindividual morphological variation in the DAT.MASC/NEUTR cell of the indefinite article in both contexts defined in Section 4.2.2. In context C–, only 15.5% of the article forms in the corpus have multiple exponence. That this variation is not due to interpersonal variation with one speaker using only forms with single exponence and one speaker using only forms with multiple exponence can be illustrated with PPF, a male speaker born in the 1910s. He uses forms with single exponence, as expected (cf. (18)) next to forms with multiple exponence (cf. (19)), even after the same preposition.

(18) *under=eme* *främde* *Name*
under=a.DAT.MASC foreign.DAT.MASC.SG name
'under a foreign name' (A399)

(19) *under=emne* *Vorwand*
under=a.DAT.MASC excuse
'with an excuse' (A386)

In context V±, where we expect a majority of forms with multiple exponence (50% in V+, 74.3% in V–), CM, a male speaker born in the 1960s, uses forms with single (cf. (20)) and multiple exponence (cf. (21)) in post-vocalic position in the very same interview with comparable semantics.

(20) *vo=men* *Aarzt*
from=a.DAT.MASC doctor
'from a doctor' (S230)

(21) *vo=mene* *tailäändische* *Aarzt*
from=a.DAT.MASC Thai.DAT.MASC.SG doctor
'from a Thai doctor' (S222)

In the same context, TK, a female speaker born at around the same time, shows an overabundant DAT.MASC/NEUTR cell, but with a different pattern. Even though we expect ca. 75% of forms to have multiple exponence in this context, she uses forms with multiple exponence only in two out of eleven cases; cf. (22) for a form with multiple exponence and (23) for a form with single exponence. This time, however, both forms are used in the very same utterance, and both forms are used in exactly the same PP.

(22) *i=mene* *Tanzlokaal*
in=a.DAT.NEUTR dance hall
'in a dance hall' (A376)

(23) *i=me* *Tanzlokaal*
in=a.DAT.NEUTR dance hall
'in a dance hall' (A377)

So, even if the ratios of the cell-mates at an individual level might not always mirror the ones found at the level of a speech community, we do find cell-mates in the inflectional system of single speakers. Furthermore, the cell-mates are used in one and the same interaction, and there is even evidence for morphological variation in the very same phrase.

5. Emergence of *emene* and of overabundance

One question which has remained open so far is the emergence of the overabundant DAT.MASC/NEUTR cell. The forms *eme* and *emene* are attested in various Swiss German dialects. Historically, it is the form *emene* that has caused overabundance in the Zurich German DAT.MASC/NEUTR cell of the indefinite article. So how has this form emerged?

Some of the Swiss German dative forms of the indefinite article can be traced back directly to older stages of German; others, such as *emene*, cannot. In Middle High German (1050–1350 AD), there are four forms (cf. Paul 2007: 227); in Early New High German, there are three forms (cf. Ebert et al. 1993: 220) varying with each other. Consequently, variation in the DAT.MASC/NEUTR cell of the indefinite article is nothing recent but has existed for about a thousand years. The forms are not in free variation but are subject to various diatopic and diachronic distributions. Paul (2007: 227) notes that *eineme* is found in Early Middle High German. Out of the younger forms *einem* and *eime*, the former is more frequent. The form *eim* finally appears only in unstressed position. Klein et al. (2018: 467) specify that the Middle High German forms differ not only in their age and in their frequency but also in their geographical distribution. According to Paul (2007), the oldest of the varying forms, i.e. *eineme*, has been preserved longer in Alemannic than in other Upper German varieties. The less frequent form *eime* as well as *eim*, the form in unstressed position, are Upper German variants, with *eime* being better attested in Alemannic than in Bavarian. The form *einem*, which has undergone apocope, becomes more frequent in the course of the Middle High German period. Only in Central German varieties, "the word-final schwa in *ėi(ne)me* is almost continuously preserved until the last stage of Middle High German" ["bleibt das finale Schwa von *ėi(ne)me* bis zum Ende der mhd. Zeit fast durchweg erhalten", translation AH] (Klein et al. 2018: 467). There is no evidence that

free variation of these forms is found in Middle High German. The forms differ in their geographical distribution as well as in their frequency over time.

For Early New High German (ca. 1350–1650 AD), Ebert et al. (1993) list the forms *einem, eineme, eime*, i.e. the same forms as attested in Middle High German. The first, *einem*, is the youngest form found in Middle High German; the second, *eineme*, is the oldest form; and, finally, *eime* is less frequent than *eineme*, according to Paul (2007: 227), or a form that is particularly common in Alemannic, according to Klein et al. (2018: 467). While the variative pattern in Middle High German is discussed in the literature, Ebert et al. (1993) do not provide comparable information on the distribution of the various forms in Early New High German. Still, we find variation of forms such as *einem, eineme* and *eime* over a time span of 600 years, even if, as stated above, the forms do not appear to vary freely.

The Swiss German forms of the DAT.MASC/NEUTR with the nasal sequence /n/ – /m/ (such as *enem*)[22] or – much more common – forms without /n/, such as *eme*, descend directly from Middle and Early New High German, with the only difference of a monophthongised word-initial vowel (*eime* > *eme*) being attributable to the high frequency of the article (cf. the retention of the Germanic diphthong in the numeral ONE). The tendency found in Middle High German that *eime* is particularly frequent in Alemannic (see above) is still reflected in modern Swiss German dialects. The majority of the Swiss German dialects has such a form (*eme*) at least as a variant, if not even as the only DAT.MASC/NEUTR form.

Whether *emene*, the most frequent form in Swiss German next to *eme*, could be inherited from earlier stages of German is a matter of discussion. There are two possibilities: (a) *emene* is inherited but underwent metathesis or (b) *emene* is a morphologically innovative form. Explanation (a) is much more common. Remarkably, its proponents do not assume that a form *eneme*, a form which can be directly linked to *einem* in Middle and in Early New High German, is subject to metathesis (*eineme* > *eneme* > *emene*). Rather, they assume that metathesis operated on a form *eme* in contexts with prepositional dative marking (such as *i-n-eme* or *a-n-eme*) (for Zurich German, cf. Weber 1923: 168; Weber 1948: 105; Schobinger 2008: 30),[23] or on a form *eme* preceded by an epenthetic nasal, such as *bi-n-eme* (cf. Baumgartner 1922: 137; Marti 1985: 79 for Bernese German). Prepositional dative marking exists in a number of Swiss German dialects. In these dialects, NPs with a bare dative are extended by a preposition turning them into PPs, e.g. *Ich gib s dier* 'I give it to you' > *Ich gib s a/i dier* (cf. Seiler 2003). Yet Zurich German is precisely one of the dialects lacking prepositional dative

22. Forms with the sequence /n/ – /m/ are only found in parts of the canton of Valais and the Eastern Bernese Oberland (cf. Hasse in press, Section 2.3.2.1.1).

23. The same assumption has been made for other dialects (cf. Hasse in press: footnote 89).

marking. Furthermore, metathesis is a rather rare phonological process in Swiss German, and nasal metathesis is not attested at all. The DAT.MASC/NEUTR of the possessive pronoun 1SG, with the same sequence of nasals (*minem*, next to *mim*), for instance, does not exhibit any metathetic forms (**mimen*). Therefore, explanations invoking metathesis do not seem very plausible to me, and I rather want to analyse *emene* as a morphologically innovative form. It is an extension of *eme*, a form that is already fully inflected for case and gender, by an additional suffix *-ne*. This approach is not new and was already suggested by Stalder (1819: 89); yet the following nearly 200 years of research on Swiss German have not considered it. But where does this suffix *-ne* come from?

There are two sources for *-ne* as a suffix of the DAT.MASC/NEUTR of the indefinite article. For the first source, we need to keep in mind that the majority of dative forms of the indefinite article occur post-prepositionally. A further characteristic of these forms, not only in Zurich German but in most Swiss German dialects, is an unstressed word-final vowel. This word-final vowel prevents the forms of the indefinite article (cf. (24)) becoming syncretic with the definite article (cf. (25)); for the DAT.MASC/NEUTR forms of the definite article, cf. Hasse, Mächler & Bachmann (2020).[24]

(24) *uf eme Ross* 'on a horse'

(25) *uf em Ross* 'on the horse'

This word-final vowel also poses a systematic difference between the indefinite article (cf. (26)) and the numeral ONE (cf. (27)) with which the indefinite article shares its ancestors.

(26) *mit eme Hund* 'with a dog'

(27) *mit aim Hund* 'with one dog'

A well-known phonological process of Swiss German is the insertion of a nasal /n/ in hiatus positions; for the oldest accounts, cf. e.g. Stalder (1819: 65–66), Weinhold (1863: 171); for younger accounts, cf. e.g. Nübling & Schrambke (2004: 285, 293–294), Fleischer & Schmid (2006: 249). Nübling & Schrambke (2004: 294) note explicitly that the epenthetic nasal is particularly frequent with articles. If the noun in a phrase, as in (26), has a word-initial vowel, the article is subject to the insertion

24. In most Swiss German dialects, the definite and indefinite article do not share the same stem in the DAT.FEM cell. The most widespread definite article forms are those with a word-initial plosive, i.e. *de* or *dr* (cf. Hasse, Mächler & Bachmann 2020), leading to definite *uf de/dr chue* 'on the cow' next to indefinite *uf ere chue* 'on a cow'. This might be one of the reasons why an equivalent form to indefinite DAT.MASC/NEUTR *emene* (DAT.FEM **erene*) has not emerged.

of an epenthetic nasal; cf. (28). In such a phrase, the pattern of a characteristic word-final vowel of the indefinite article is blurred. If this vowel is reinserted, in order to preserve this feature, *eme* is ultimately extended by *-ne* (*eme-n* > *eme-n-e* > *emene*).

(28) *mit eme-n aff* 'with a monkey'

The suffix *-ne*, however, is already attested in dative forms of pronouns, the second source for this suffix. On the one hand, it appears in forms such as *kene* 'no' or *öiserne* 'our', all DAT.PL forms without any gender distinctions. It also exists in the DAT forms of numerals such as *zweene* 'two', *dreine* 'three' or indefinite pronouns such as *baidne* 'both', lexemes with inherent plural semantics. The question that remains open is how this plural suffix can be transferred to a singular paradigm, like the paradigm of the indefinite article. The indefinite article shares an important feature with these numerals and indefinite pronouns: they do not inflect for number, meaning that there is only one paradigm with regard to number and, subsequently, only one dative cell for each gender as opposed to, for instance, the definite article, where there are DAT.SG and DAT.PL forms.

6. Results

Even though there are some differences between the results from the historical (cf. Section 4.2.1) and the modern corpus (cf. Section 4.2.2), both types of variation – conditioned variation and free variation in conditioned contexts – have been attested for about 200 years in Zurich German, and they are still present in contemporary spoken Zurich German, even at an individual level. Some of the forms, along with a certain degree of variation, in the DAT.MASC/NEUTR cell can even be traced back further to Middle High German times.

In the modern as well as in the historical corpus, we find predominantly single exponence after a preceding consonant (context CV± in the historic, context C± in the modern corpus), while after a preceding vowel (contexts VC± and VV± or V±, respectively), there is a much higher degree of interchangeability of forms with single and with multiple exponence. In the most common context in the historical corpus (VC–), 56% of the forms have multiple exponence; in the most common context in the modern corpus (V–), nearly 75% have multiple exponence. This increase does not necessarily mean that overabundance is dissolving. Fehringer (2004: 313–314) shows that a cell-mate which is more frequent in one stage of a language can become the less frequent variant in another stage, and *vice versa*. Anyhow, the ratios of the cell-mates in what has been labelled conditioned variation and free variation in conditioned context, respectively, both lie within

the range of units, a range defined by Thornton (2012: 189) as an indicator of overabundance. This indicates that this instance of variation is quite stable.

7. Summary: How free is free variation?

If variation is free, the variants – or in the case of overabundance, the cell-mates – are used equally often in every linguistic context in the language use of a single speaker. If variation is conditioned, there is at least one language-internal or -external factor favouring one of the variants. The DAT.MASC/NEUTR of the indefinite article of Zurich German is an instance of conditioned free variation. In certain contexts, namely, after a preceding vowel, we find comparable numbers of forms with single and multiple exponence. In the historical corpus, we encounter a distribution close to fifty-fifty. In the modern corpus, the ratio is somewhat less balanced if we leave aside the epenthetic nasal as a factor for the moment, forms with multiple exponence make up about two thirds and forms with single exponence about a third.

As mentioned in Section 2.3, linguists seem to be hesitant to define a threshold of free variation, and so am I. I rather want to concentrate on the notion of overabundance. The kind of approach taken here to define overabundance does not aim at defining something like a threshold. Rather, it defines the phenomenon in a way which allows for the comparison of instances of overabundance in the languages of the world. How free *free morphological variation* can be, i.e. if there are any instances of completely interchangeable forms, still has to be shown. The same is true for all the other criteria differentiating canonical from non-canonical overabundance which are not dealt with in this article. We need enough empirical evidence to make statements about which types of overabundance occur frequently, which ones are rare and which ones do not exist at all.

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CHAPTER 8

Resemanticising 'free' variation

The case of V1 conditionals in Dutch

Julie Nijs & Freek Van de Velde
KU Leuven

Whether or not languages display 'free' variation is a moot point. In this article, we look at a near-synonymous pair in syntax, namely, V1 vs syndetic conditionals in Dutch, and argue that due to diachronic developments, Dutch has been in a situation for quite some time in which these two variants coexist. Despite this coexistence, a state in which they alternate freely is unstable: syntactic/semantic investigation shows that V1 is retreating into a specialised niche of tentativeness and counterfactuality, though the development has not advanced as far as in English, where a similar development can be witnessed. We show the subtle differences between the two types of conditionals with traditional logistic regression as well as with semantic vectors and multidimensional scaling.

Keywords: conditionals, V1 clauses, semantic vectors, logistic regression, multidimensional scaling

1. Introduction

Languages often sport various ways of expressing similar meanings in grammar as well as in the lexicon. Expression of possession (e.g. Van de Velde & Lamiroy 2017), expression of recipient roles (Bresnan et al. 2007) and expression of argument realisation in psych verbs (Pijpops & Speelman 2017), to name just a few among many phenomena of variation, are encoded by 'allostructions' (Cappelle 2006). While many of these alternations (i.e. 'alternate ways of saying "the same" thing', Labov 1972: 188) show slight semantic differences (Pijpops 2021), complex regression analyses are often needed to lay bare the differences between the options. At first sight, the distribution of competing constructions can be qualified as free variation in such cases. This immediately raises the question of when variation qualifies as 'free'. Is it sufficient for the alternating variants to be truth-conditionally equivalent, or is the variation 'unfree' or 'constrained' if hemmed

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in by social or stylistic factors? The latter kind of factor is likely to always be at issue – as shown by almost all variationist linguistic studies – but even ignoring these, the question of how 'free' variation really is remains a vexing question. One of the reasons is that it is often a non-trivial task to detect differences between two variants. In this paper, we look at slight language-internal differences between two competing strategies that are hard to eyeball from the raw data. The strategies have to do with the expression of conditionals in Dutch. Like English, there is a long-standing competition between the V1 conditional and the syndetic conditional. We offer quantitative support for the idea that Dutch stands midway between English and German in the refunctionalisation of V1 conditionals: they slowly creep into the niche of tentative and counterfactual contexts. Looking at diachronic data from Late Modern Dutch, we give statistical support for the idea that V1 conditionals are less integrated, more associated with epistemic modal contexts, less likely to have subjects high on the animacy scale and more likely to have infrequent and abstract verbs. The variation is subtly constrained, and it appears that over time, the constraints become stronger, suggesting a scenario where free variation is diachronically unstable: a *'horror aequi'* situation.

2. Development of the V1 conditional in West Germanic

Dutch, like its neighbour German, has two syntactic strategies for building subordinate conditional clauses at its disposal. One of these strategies is the default strategy and consists of the use of a conditional conjunction (*als, indien* or the more archaic *zo*) and verb-final (Vfn) word order.[1] Examples are given in (1)–(3). The other strategy consists of verb-initial (V1) word order and lacks a conjunction. An example is given in (4). The latter strategy is sometimes referred to as 'asyndetic' and the former as 'syndetic'. Note that conditional clauses may also follow the main clause instead of preceding it, though for the asyndetic V1 variant, this is only a marginal possibility in present-day Dutch (as opposed to Middle Dutch and Early Modern Dutch; see Van der Horst 2008: 1044, 1598). Note further that there is an optional resumptive pronoun *dan* (in older stages of Dutch, also *zo*) following the preposed conditionals, as in (4) (and (8), below).

(1) *Als hij niet komt, ga ik mee* (SoNaR)[2]
if he not comes, go I with
'If he does not come, I'm coming along.'

1. We ignore the periphrastic conjunctions like *in geval dat* (lit. 'in case that'), *gesteld dat, gegeven dat* ('given that'), etc.

(2) *Indien hij staat, moet u buigen …* (SoNaR)
if he stands, must you bow
'If he stands up, you have to bow.'

(3) *Zo hij ter rechterhand snijdt, zal hij toch hongeren* (SoNaR)
if he by.the righthand cuts shall he still be_hungry
'If he cuts with his right hand, he will still be hungry.'

(4) *Had hij je geloofd, dan leefde Katrien nog* (SoNaR)
had he you believed then lived Katrien still
'Had he believed you, Katrien would still live.'

In earlier stages of Dutch, the asyndetic V1 conditional was much wider in use (see Van der Horst 2008: 543, 773, 1325). It appears, then, that the V1 conditional has waned over time but once was the default expression for conditionality.[3]

Some of the literature on V1 has looked at how much the different V1 contexts overlap. For Dutch, Daalder (1983), Van der Horst (1984: 172–175, 1995, 2008) and Van de Velde (2014: 149–150) acknowledge an underlying meaning of 'non-assertion' in all V1 contexts, and a comparable view can be found for English subject–aux inversion in Goldberg & Del Giudice (2005). Beekhuizen (2016) questions this on the basis of a multi-dimensional scaling, where he shows that the different V1 clauses occupy subtly distinct regions in the reduced dimensional space.

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2. SoNaR corpus; see Oostdijk et al. (2013).

3. There are two main theories about the origin of V1 conditionals. One is advocated by Hopper (1975: 50–51), goes back to Erdmann (1886), is supported by Harris & Campbell (1995: 282, 284, 308) and seeks the origin in the use of V1 in main clauses, where it was used in emphatic contexts; see (i). The other is advocated by Jespersen (1940: 373–374), goes back to Behaghel and Hirt, is supported by Hermkens & Van de Ketterij (1980) and Van den Nest (2010b) and explains the origin of the V1 conditional as the product of a grammaticalisation process of a short question-answer pair; see (ii). The two scenarios differ in the details, but there is a common denominator: they both assume that the V1 conditional arose from a paratactic structure. Jespersen's account is supported by the observation in Haiman (1978) that conditional clauses tend to develop from the same source in other languages as well, including Hua, Hungarian (Riese 1984), Kashmiri (Griersom 1911) and Bulgarian (Feuillet 1995), though this argument is hampered by the fact that Hungarian and Bulgarian may have been subject to areal effects and undergone replica grammaticalisation (Heine & Kuteva 2003) and that Kashmiri is an Indo-European language. Dutch shares its similarity in the use of word order for polarity questions and conditional with Portuguese (Gärtner 1998), French (Hentschel 1998), Romansh (Danielsen 1968), German and English (Van den Nest 2010a, b).

(i) *hængir klocka i kirkiu, faldær i hovod mannæ, böti sopn firi*
(Old Swedish, Hopper 1975: 50)
'If a bell hangs in a church, and it falls on someone's head, let the parish pay.'

(ii) *Art thou bound unto a wife? seeke not to be loosed. Art thou loosed from a wife? seek not a wife.* (Jespersen 1940: 374)

In this paper, we will not look into the relatedness and differences between V1 conditionals and other V1 clauses but, rather, look at the division of labour between the V1 conditionals and the conjunctional (i.e. syndetic) conditionals. We take a quantitative perspective, focus on Late Modern Dutch and will only look at the default conjunction *als*.

The starting point is the observation that V1 has lost its status as default conditional construction to the conjunctional conditional, as part of a larger trend of increased use of conjunctions. Indeed, as Van der Horst (2008: 984) pointed out, Modern Dutch has witnessed a proliferation of conjunctions over the past 500 years. This deposition of V1 as the preferred conditional strategy in favor of conjunctional clauses can be argued to have caused a functional shift, or 'exaptation' (Lass 1990; Van de Velde & Norde 2016), in the sense that V1 has carved out a special niche as a means to express a specific type of conditional, namely, counterfactual, tentative and irrealis conditionals. English and German are on the same track, but, as is often the case (see Van Haeringen 1956; O'Neill 1978; Hüning et al. 2006; Vismans et al. 2010; Ruigendijk et al. 2012; Scott 2016; Smessaert et al. 2017; De Vogelaer et al. 2020), English is ahead in this process, German is more conservative and Dutch lies in-between. In English, V1 conditionals are almost invariably introduced by *had, were* or *should* and have retreated to this specialised function. In German, more is possible, though the cognates of the English threesome are also remarkably popular in the German V1 conditionals (Leuschner & Van den Nest 2015). Note that this process of exaptation is not reducible to what Haspelmath (2004) has called 'retraction', a sort of back-tracking situation in which a construction falls back on an earlier use. There is no clear prior stage in which English conditionals could only express tentativeness, irrealis or counterfactuality.

For Dutch, no in-depth study is available, but specific studies on modals in V1 conditionals suggest that they have a penchant for tentativeness and counterfactuality (Boogaart 2007; Breitbarth et al. 2016). There are, of course, other functional differences between conditional clauses, and various typologies have been suggested (see e.g. Dancygier & Sweetser 2005 or Renmans & Van Belle 2003 for Dutch). In (5), for instance, the conditional clause gives an epistemic evaluation, not an objective condition. In (6), the conditional clause stands on its own and forms a case of what has been called 'insubordination' (Evans 2007).

(5) If the lights are on, he must be home.

(6) If you say so.

In principle, it could very well be that the division of labour between V1 conditionals and syndetic conditionals is motivated by this typology, but we will stick to the divi-

sion between tentative/counterfactual vs objective, as this has taken centre stage in the earlier literature on V1 conditionals in English, German and Dutch. As will be shown in the remainder of this paper, the semantic difference between V1 conditionals and syndetic conditionals is indeed borne out by corpus results. We will not only look at the syntactic–semantic features of the clause but also use semantic vectors to shed more light on the nature of the two competing constructions.

3. Methods

3.1 Coding and behaviour properties of conditional clauses

There are hardly any categorical distinctions between V1 conditionals and conjunctional conditionals in Dutch. V1 conditionals are not fully restricted to a limited set of tentative or counterfactual modals. To investigate the differences, we need a quantitative corpus-based investigation. Rather than assessing directly what kind of meaning the conditional expressed, we will be interested in investigating the effects on the different behaviour and coding properties (see Haspelmath 2010 for this terminological pair). These measurable, more 'tangible' features have the advantage of being more objective and can reveal potentially subtle differences and shifts (see also De Troij & Van de Velde 2020). Directly measuring tentativeness or counterfactuality is delicate and is more likely to be prone to subjective bias of the researcher.

Our analysis comprises two parts. In the first part, we look at a number of syntactic and semantic features associated with the conditional clause: the presence of a resumptive adverb in the main clause, the occurrence of epistemic modals in the conditional clause and in the matrix clause, the tense of the conditional clause and the animacy of the subject. In the second, methodologically more innovative part, we focus on lexical effects by carrying out a distributional semantic analysis of the most important verbs of the conditional clauses.

The presence of a resumptive adverb is a signal of the level of integration of the subordinate clause. For clause integration, there are three patterns in Dutch. The first is full integration, as illustrated in (7). Here, the subordinate clause is in sentence-initial position and, as such, triggers subject–verb inversion in Dutch, which is a V2 language. The second construction, illustrated in (8), is partial integration. Here, the subordinate clause is resumed by a correlative adverb (*dan*, or in older stages of Dutch, *zo*). In the third construction, illustrated in (9), the conditional clause is in left-detached position, as shown by the absence of subject–verb inversion. The latter construction is often used with speech-act conditionals. In (9), the conditional does not specify the condition for the presence of

beer in the fridge but offers a motivation for uttering the speech act in the main clause (see Davison 1981; Van der Auwera 1986; Sweetser 1990; Renmans & Van Belle 2003).

(7) *Als het regent, blijven we thuis* (integration)
if it rains stay we home
'If it rains, we stay at home.'

(8) *Als het regent, dan blijven we thuis* (resumption)
if it rains then stay we home
'If it rains, then we stay at home.'

(9) *Als je dorst hebt, er is bier in de ijskast* (non-integration)
if you thirst have there is beer in the fridge
'If you are thirsty, there is beer in the fridge.'

The three constructions form a continuum from integrated to detached, which iconically reflects the semantic attachment (see also Cristofaro 2003, and for Dutch, Renmans & Van Belle 2003 and Smessaert et al. 2005): more readily accessible, objective semantic connections are iconically expressed by a more integrated structure. For conditionals, the less-integrated construction tends to be associated with (among other things, such as speech-act conditionals (supra)), subjective or counterfactual meaning; see (10), from König & Van der Auwera (1988: 114).

(10) *Als ik in jouw plaats was, ik zou hem aanklagen*
if I in your place was I would him sue
'If I were in your position, I would sue him.'

If the V1 conditional is indeed increasingly associated with tentative and counterfactual meaning, we should expect to see more occurrences of a resumptive adverb and/or non-integration with the V1 conditional compared to the syndetic conditional.

The second feature in our analysis is the presence of an epistemic modal in the conditional clause. We expect to see a higher proportion of modals in the V1 conditionals vis-à-vis the syndetic conditionals, as epistemic modals are more likely to occur when the propositional truth is at issue, which is *a fortiori* the case in tentative or counterfactual clauses. The potential epistemic verbs are *zullen, moeten, mogen* and *kunnen*. Only those instances that were clearly epistemic were marked as such.

The third feature in our analysis is the presence of an epistemic modal in the matrix clause, where we expect an analogous effect as in the conditional clause.

The fourth feature is the tense of the conditional clause. Past tense can be expressed in two ways in Dutch: either with a synthetic preterite or with the per-

fect tense. As in French and German, Modern Dutch has witnessed a shift from the preterite to the perfect over time, though currently, both are in use, and there are subtle regularities in when one is preferred over the other. We will not be concerned with teasing apart the semantically intricate contextual constraints but will, rather, look at the distribution of the present vs past, irrespective of how the past is expressed exactly. We expect a higher incidence of past tense in V1 conditionals as opposed to syndetic conditionals, as counterfactuality is closely connected to past tense. Indeed, counterfactuals are often expressed by mere past tense; compare the following pairs:

(11) *Had hij het geweten*, *dan had hij het niet gedaan*
had he it known, then had he it not done
'Had he known, he wouldn't have done it.' (Counterfactual: he didn't know)

(12) *Weet hij het*, *dan doet hij het niet*
knows he it, then do he it not
'If he knows, he won't do it.' (Not counterfactual: it is possible that he knows)

(13) *Als ze niet was gekomen*, *dan was er nu geen probleem*
if she not was come, then was there now no problem
'If she hadn't come, there would be no problem.' (Counterfactual: she did come)

(14) *Als ze niet komt*, *dan is er geen probleem*
if she not come, then is there no problem
'If she doesn't come, there is no problem.' (Not counterfactual: it is possible that she doesn't come)

(15) *Dat had ik wel eens willen zien*
that had I sure once want to_see
'I would have liked to see that.' (Counterfactual: I didn't get to see it)

(16) *Dat heb ik eens willen zien*
that have I once want to_see
'I once wanted to see that.' (Not counterfactual: I did see it)

These four features (integration, epistemic modals in the conditional clause, epistemic modals in the matrix clause and tense of the conditional clause) are proxies for a potential penchant of the V1 conditionals for tentative/counterfactual meanings. We expect this to be a diachronic shift whereby the V1s retreat to this realm (see Section 5 below), as the syndetic conditionals gain territory by colonising the more readily available meanings. To test this scenario, we additionally coded the data for the animacy of the subject. In a prototypical grammaticalisation process, a construction undergoes context expansion (Haspelmath 2004). At first,

the construction appears in more prototypical and unmarked contexts, in sentences with more animate subjects. Gradually, the construction expands to less prototypical contexts – sentences with non-animate subjects – until the construction is able to appear in all contexts. The idea is that the syndetic conditionals are the newer variant and have, historically, first encroached on the more straightforward constructions. With regard to animacy, they will likely have usurped the more unmarked contexts with animate subject first. The more marked contexts are the last to leave the V1 conditional. Support for this idea comes from Coussé (2013), who noticed that the expansion of the *have*-perfect in Dutch first affected the animate subjects and only later contextually seized the more abstract subjects, and from Petré & Van de Velde (2018), who show that increased grammaticalisation of *be going to* can be measured by its later occurrence with inanimate subjects.[4]

In the second part of the analysis, we look at the lexical effects of frequency and concreteness of the main collexemes of the two conditional constructions. If the syndetic conditionals are indeed the default construction, we expect the syndetic conditionals to occur more with frequent and concrete verbs. These are cognitively more easily accessed verbs and can be hypothesised to be the first verbs on which the syndetic conditionals have encroached (see Sweetser 1990 and Hernández Díaz 2019). We will make use of semantic vectors, thus contributing to the use of distributional semantic approaches to syntax and constructionalisation (see Levshina & Heylen 2014; Dubossarsky et al. 2015, 2016, 2017; Hamilton et al. 2016; Garg et al. 2018; Perek and Hilpert 2017; Pijpops 2019; Saavedra 2019; Budts & Petré 2020; Fonteyn 2020; Speelman et al. 2020, among others).

3.2 Corpus

For our study, we made use of the newly compiled CCLAMP corpus (Piersoul et al. 2021), a 200 million token corpus of Dutch written language from the period 1837 to 1999, balanced for region (Belgium and the Netherlands), holding the genre constant by only excerpting cultural magazines. The corpus is lemmatised and PoS-tagged.

We selected the texts from 1840 to 1999 and looked for sentence-initial verbs and sentence-initial *als* conjunctions. This procedure prioritised recall over precision. The initial corpus query yielded 335,701 potential hits: 280,698 V1 hits and 55,003 *als* hits. We omitted all V1 hits for which the punctuation mark first in the

4. Admittedly, the idea that many diachronic innovations start off with animate subjects and only later extend to cognitively more inaccessible inanimate subjects is a hard claim which remains to be tested against more case studies.

context following the verb was a question mark or an exclamation mark, on the assumption that these hits would very likely be polarity questions and imperative clauses, respectively, thereby reducing the total to 177,107 hits. We then took samples of 1,000 attestations per decade for the V1s and 300 attestations per decade for the *als* conditionals. The difference in sampling was motivated on the grounds that the *als* search was expected to have much higher precision and V1 conditionals are hard to extract automatically due to their abstract pattern. After manual filtering of the attestations, we were left with 3,867 V1 conditionals and 3,443 *als* conditionals, so 7,310 hits in total.

This selection procedure made it impossible to investigate the rise of *als* and concomitant drop of V1 directly, but by entering the year of attestation as an interaction term in the multiple regression on the different features introduced above, we can potentially glean the diachrony.

3.3 Operationalisation

We coded the 7,310 observations for the following variables:

- TYPE OF CONDITIONAL (binary factor): V1 vs *als*
- INTEGRATION (quaternary factor): integrated, resumptive, non-integrated, rest
- EPISTEMIC MODAL IN CONDITIONAL CLAUSE (binary factor): absent vs present
- EPISTEMIC MODAL IN MATRIX CLAUSE (binary factor): absent vs present
- TENSE (binary factor): non-past vs past
- SUBJECT ANIMACY (quaternary factor): human, concrete, abstract, rest
- YEAR (numeric, centred):[5] the year of attestation

For the lexical analysis, we carried out a collexeme analysis (Stefanowitsch & Gries 2003) and extracted the top 100 collexemes for each of the constructions. For each of these collexemes, we extracted the semantic vectors available on the *snaut* repository (if the lexeme was available at the repository). These vectors were constructed on the 500-million SoNaR corpus and a corpus of subtitles (see Mandera et al. 2017). We also looked up frequency (available in the SUBTLEX-NL database; see Keuleers et al. 2010) and concreteness ratings (Brysbaert et al. 2014).

5. By centering the variable, we avoid problems with the interpretation of the interaction effects: the effect of an interaction with the century can now be understood against the mean rather than at some meaningless 0 value. The procedure also reduces collinearity in complex models with interactions, as the regression lines of the main effect go through the origin (see Gelman & Hill 2007, Ch. 4).

The statistical analyses were carried out with the open-source software R (R Core Team 2019) and the packages dplyr (Wickham et al. 2020), MASS (Venables & Ripley 2002) and ggplot2 (Wickham 2016). For the collexeme analysis, we made use of Gries (2007).

3.4 Model building

The first (syntactic) analysis of our data consists of a generalised linear model with a logit link function.[6] The dependent variable is the TYPE OF CONDITIONAL, which is regressed on INTEGRATION, EPISTEMIC MODAL IN CONDITIONAL CLAUSE, EPISTEMIC MODAL IN MATRIX CLAUSE, TENSE OF CONDITIONAL CLAUSE and SUBJECT ANIMACY. Each of these variables is brought into interaction with the year of attestation. We expect to see an increase of the effect of the language-internal predictors through the years, so a positive estimate for the interaction effect if the main effect of the language-internal factor was positive, and vice versa.

For the second (lexical) analysis, we first carried out two collexeme analyses on the two types of conditionals to see what kind of verbs were attracted, using the log-likelihood metric for ranking the collexemes. We ran two separate collexeme analyses, rather than one distinctive collexeme analysis. The latter approach, while intuitively sensible in a case where we have two competing constructions, would not allow us to see the extent of overlap in the two constructions. This is useful information, as we want to see to what extent the two conditionals differ. Our decision to run two separate collexeme analyses can then be understood as a conservative approach. Next, we made a two-dimensional multidimensional scaling of the semantic vectors of the top 100 collexemes for the two conditional constructions and then visually looked for clustering of THE TYPE OF CONDITIONAL, the FREQUENCY OF THE VERB and the CONCRETENESS OF THE VERB.

6. We also considered a mixed model with a random effect for the article but decided it was not a sensible approach, as the vast majority (82.56%) of the observations came from unique texts. Only 0.52% of the texts (28 out of 5,354) had more than 5 observations, and none had more than 12 observations. We assumed that the observations from the same texts are independent. While this assumption might, strictly speaking, be unwarranted, the alternative – treating the texts that contributed 5 or fewer observations as one level in the random factor, as is customarily done in other corpus-based studies – is also highly questionable (see Van de Velde & Pijpops 2021 for some reflections). Moreover, this procedure led to convergence issues and, hence, is not a practically viable solution anyway.

4. Results

4.1 Semantic and syntactic effects

Fitting a regression with interaction effects for year revealed that the interaction was significant for none of the language-internal variables. This means that there was no indication of a change over time in the effect of the predictors. We then ran a model without the effect for year and used a backward variable selection procedure on AIC to assess which factors could be dropped. Tense of the conditional clause and the presence of epistemic modals in the matrix clause did not improve the model and were not retained in the reported model. Multicollinearity was checked by the variance inflation factors and was not a problem (VIFs all smaller than 2). The final regression model, which had a C-index[7] of 0.89, is given in Table 1. The effect plots of the model are given in Figures 1–3.

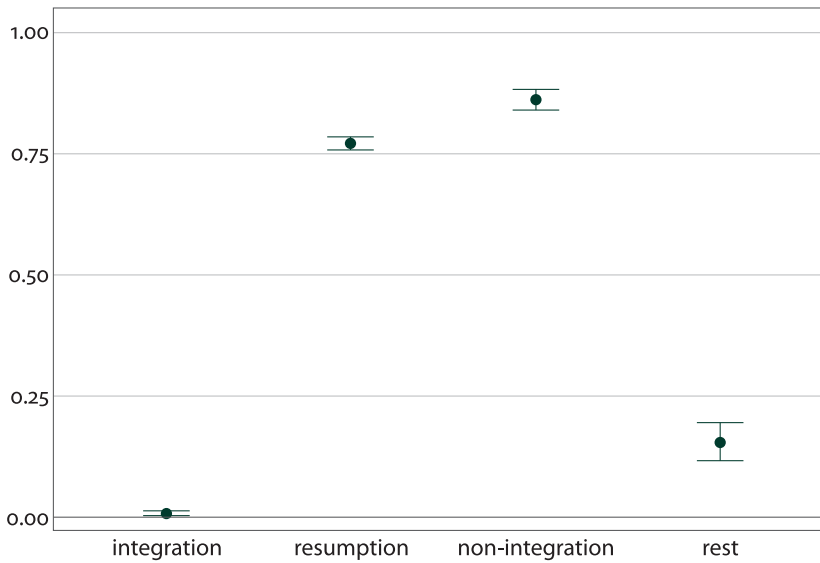

Figure 1. Effect plot for the predictor INTEGRATION. The y-axis gives the probability of V1 conditional, as estimated by the model

7. The C-index or AUC (area under the ROC-curve) is a measure of the model quality. Values range from 0.5 (not better than chance prediction) to 1 (perfect prediction). Values above 0.75 can be considered 'acceptable', above 0.8 'good', above 0.85 'very good' and above 0.9 'excellent'.

Table 1. Output generalised linear model (logit link): Success level = V1 (n=3,867), failure = *als* (n=3,443)

Variable	Level	Observations	Estimate	Confidence interval		P value
				2.5%	97.5%	
INTERCEPT	–	7291	−5.08	−5.62	−4.62	<0.001
INTEGRATION	integration (ref. level)	2178	–	–	–	–
	resumption	3593	6.06	5.60	6.60	<0.001
	non-integration	1195	6.69	6.20	7.25	<0.001
	rest*	344	3.13	2.58	3.74	<0.001
EPISTEMIC MODAL IN CONDITIONAL CLAUSE	absent (ref. level)	6846	–	–	–	–
	present	464	1.47	1.10	1.86	<0.001
SUBJECT ANIMACY	human (ref. level)	4825	–	–	–	–
	concrete	536	−0.11	−0.38	0.16	0.416
	abstract	1228	0.73	0.53	0.93	<0.001
	rest**	721	0.32	0.10	0.56	<0.01

* The level 'rest' in the variable INTEGRATION contains all instances where the subordinate clause stands on its own (i) (see above on 'insubordination') or where the main clause is an imperative (ii), in which case the verb always follows the subordinate clause.

(i) *Als het maar geen kwaad kan!*

(ii) *Mocht gij ze niet kennen, lees ze dan.*

** The level 'rest' in the variable SUBJECT ANIMACY contains all instances where the subject is empty and doesn't refer to anything concrete, for instance, in sentences such as *Het regent* 'It rains'.

The results are consonant with our assumptions: V1 conditionals are less integrated and have more epistemic modals (tense does not appear to play a huge role, but note that the connection between tense and mood is less transparent to begin with), suggesting that they do indeed associate with tentative meaning and more loosely integrated semantic connections. This is in line with the scenario in which the V1 is slowly shifting into the epistemically tentative niche. That is, if there is indeed a change, it must be a slow one, as we cannot observe it through the interaction of the variable YEAR. The diachronic scenario of 'retreat' (distinct from 'retraction' in the technical sense of Haspelmath; see above) of the V1 conditionals to terrain that has not been encroached on by syndetic conditionals is further supported by the role of animacy: V1 conditionals are more likely to refer to non-human and non-concrete entities in the subject role. In the next section, we will look at lexical effects to bolster this scenario.

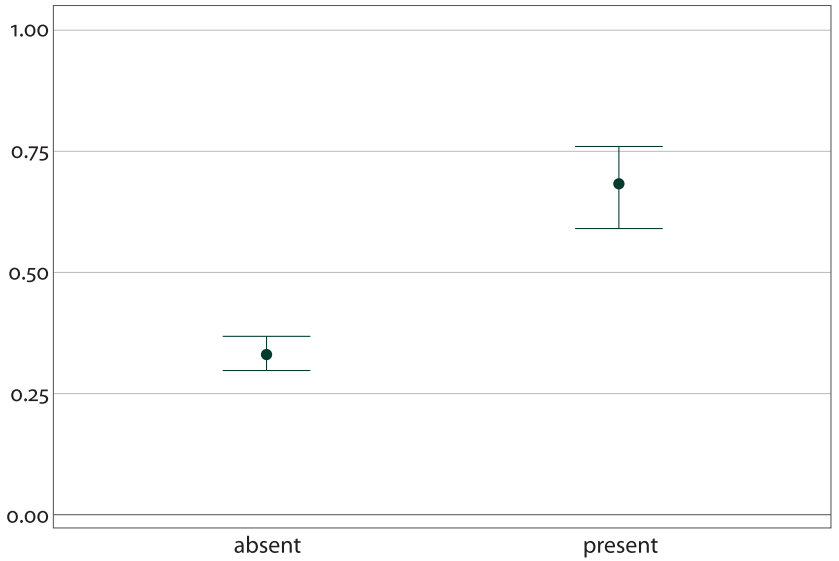

Figure 2. Effect plot for the predictor EPISTEMIC MODAL. The y-axis gives the probability of V1 conditional, as estimated by the model

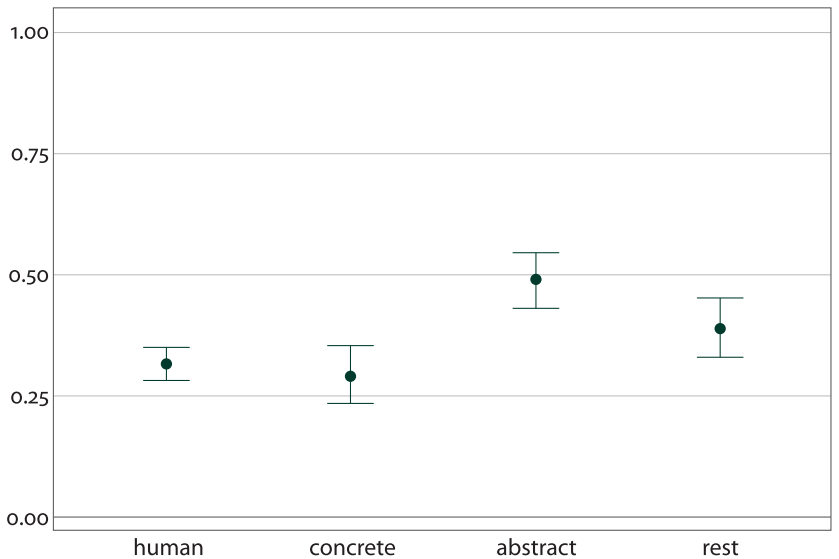

Figure 3. Effect plot for the predictor SUBJECT ANIMACY. The y-axis gives the probability of V1 conditional, as estimated by the model

4.2 Lexical effects

For the lexical effects, we built a two-dimensional metric of multi-dimensional scaling (MDS)[8] for the top 100 collexemes for each conditional construction, as given in Table A in the Appendix. For each of these collexemes, we took a semantic vector from *snaut* (if available in the *snaut* database, at least), and we calculated a dissimilarity matrix on the basis of the cosine distance. This matrix was then used to build the MDS. The resulting two-dimensional map indicates how semantically related the verbs are: the closer they are semantically, the higher the proximity on the map. For our analysis, we used colour coding for the TYPE OF CONDITIONAL, the FREQUENCY and the CONCRETENESS ratings.

Figure 4 shows that the two dimensions seem to partially capture the distinction between *als* conditionals and V1 conditionals: the unique V1 collexemes (in blue) are overrepresented on the left of the plot and on the top, whereas the *als* collexemes are not restricted to a particular space and cluster more to the centre of the plot. This suggests that the two conditional strategies are not entirely functionally equivalent and that the *als* conditionals do not have a specific profile, whereas the V1 conditionals are somewhat more clustered.

We used the same dissimilarity-matrix-based MDS for FREQUENCY and CONCRETENESS RATING,[9] though, of course, we only retained the verbs for which these metrics were available.

Figure 5 gives the MDS with colour coding for FREQUENCY. As can be appreciated, the first dimension seems to show a gradient from less frequent verbs (left) to more frequent verbs (right), with the very high frequency verbs on the top (second dimension). The left–right distribution is in line with our expectation that V1 conditionals are 'left over' with rare verbs, but at the same time, the V1 also retains domain in the extremely frequent verbs on the top (*hebben, vinden, doen* …).

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8. MDS is an exploratory technique for visual inspection of potential patterns in the data. See Levshina (2015: 336–350) for the background of this technique. The two-dimensional MDS has a high stress level (0.67). Stress, in the technical sense in which it is used here, refers to loss of information in a reduced dimensional space (here, two dimensions), and it acts as a goodness-of-fit measure in MDS. The smaller the stress, the better the fit. This is not surprising. We do not expect the semantic vectors of the verbs to results in an optimal MDS. What is of more importance is that, *despite* the high stress level, there are still patterns to be discerned that link the TYPE OF CONDITIONAL to the lexically based features.

9. We took the values for the concreteness ratio from Brysbaert et al. (2014): http://crr.ugent.be/archives/1602. The values were established by ratings by human participants. Averaging these out, we get a fairly robust value, on the basis of the 'wisdoms of crowds' principle.

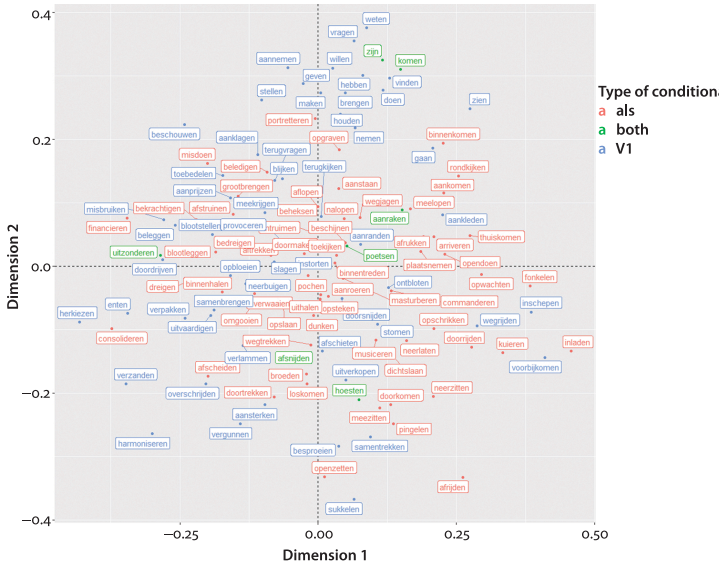

Figure 4. MDS, based on the dissimilarity matrix of the semantic vectors of the top 100 collexemes of the two types of conditional. Colour coding for preference for TYPE OF CONDITIONAL

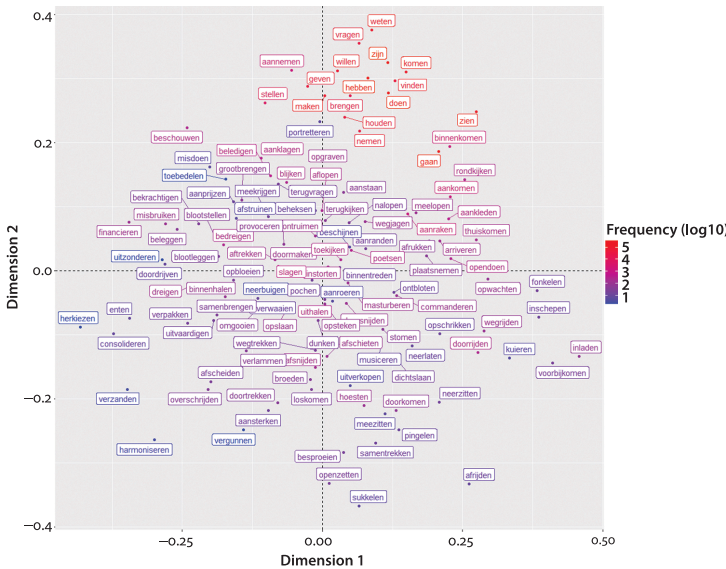

Figure 5. MDS, based on the dissimilarity matrix of the semantic vectors of the top 100 collexemes of the two types of conditional. Colour coding for preference for FREQUENCY (LOG10)

Though again hardly a categorical distinction, Figure 6 shows a left–right gradient, with less concrete (violet) verbs to the right, in the V1 realm. Again, this is in line with our hypothesis.

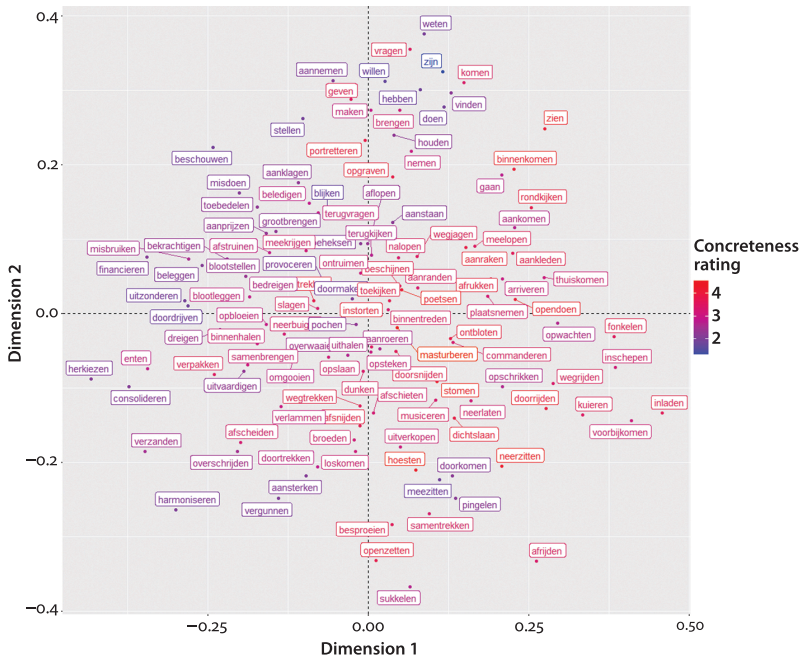

Figure 6. MDS, based on the dissimilarity matrix of the semantic vectors of the top 100 collexemes of the two types of conditional. Colour coding for preference for CONCRETENESS RATINGS

The visual inspection of the space can be buttressed by entering the x and y coordinates of the MDS in regression analyses for each of the variables.

For the TYPE OF CONDITIONAL, we set up a generalised linear model with a logit link, using only the collexemes that are unique for one of the two conditional constructions. The TYPE OF CONDITIONAL is treated as a binary dependent variable. The output in Table 2 corroborates the idea that the type of conditional is predictable from the x values and the y values. V1 conditionals are negatively correlated with higher (left) x values and positively correlated with higher (top) y values. For FREQUENCY and CONCRETENESS, we set up a linear model. Both variables increase along the x-axis. FREQUENCY also increases along the y-axis, but CONCRETENESS drops along the y-axis, as shown in Tables 3 and 4. Combining these results, we can say that V1 conditionals verbs, lower-frequency verbs and less concrete verbs are more likely to occur on the left of the MDS plots (lower x-axis coordinates).

Table 2. Output generalised linear model (logit link): Success level = V1, failure = *als*

Variable	Estimate	Confidence interval		P value
		2.5%	97.5%	
INTERCEPT	−0.16	−0.54	0.21	0.402
X VALUE	−2.59	−4.87	−0.48	0.020
Y VALUE	2.69	0.35	5.18	0.028

Table 3. Output linear model for FREQUENCY (log10)

Variable	Estimate	Confidence interval		P value
		2.5%	97.5%	
INTERCEPT	1.95	1.82	2.09	< 0.001
X VALUE	1.77	0.99	2.54	< 0.001
Y VALUE	5.08	4.23	5.92	< 0.001

Table 4. Output linear model for CONCRETENESS

Variable	Estimate	Confidence interval		P value
		2.5%	97.5%	
INTERCEPT	2.92	2.82	3.02	< 0.001
X VALUE	1.62	1.06	2.18	< 0.001
Y VALUE	−0.87	−1.48	−0.27	< 0.01

5. Discussion and conclusion

The results of the corpus study offer statistical support for the idea that V1 and syndetic conditionals in Dutch occupy subtly different niches. V1 conditionals are less integrated, are more likely to sport epistemic modals, are more likely to have subjects low in animacy and have a proclivity for more abstract and less frequent verbs. These are all 'coding and behaviour' properties that can be used as proxy for their semantics. Dutch V1 conditionals, then, seem to drift into the direction of their English counterparts: they are refunctionalised ('exapted') to express tentative or counterfactual meaning.

In our 160-year diachronic corpus of Late Modern Dutch (1840–1999), we do not have *direct* evidence of diachronic change. Interactions of the language

internal variables with the time variable were all non-significant. This might be explained by the fact that the drift is not visible in the relatively short corpus time span that we have undertaken to look at. What our study goes to show, then, is that even in the absence of a clear diachronic trend (the null result of the interaction with the temporal variable) and of a direct assessment of the semantic import (which holds the danger of being subjectively measured), a quantitative study on the coding and behaviour properties (the presence of epistemic markers, clause integration, animacy) can offer insights into a diachronic process.

How can the functional specialisation be explained? What led the V1s to slowly shift into the niche of tentative and counterfactual meanings? The most plausible scenario is one in which the syndetic conditional has steadily encroached on the V1s and has harvested the low-hanging fruit first: the concrete, relatively frequent verbs, which are cognitively more easily accessible. An exception is constituted by the super-high-frequency verbs, which are either collexemes of both constructions (*zijn* 'be', *komen* 'come') or are among the resilient verbs in the more obsolescent V1s. When we go further down the list, the very-high-frequency verbs are also found in the collexems of *als* conditionals, like *hebben* 'have' (rank 159), *doen* 'do' (rank 166), *vinden* 'find' (rank 177) and *willen* 'want' (rank 186), so increasing the bandwidth for the top collexemes from 100 to 200 includes these verbs in the promiscuous category. The V1s found themselves left with less frequent and more abstract verbs, and more marked contexts. Probably, this was just a fortuitous effect of the territorial gain of the syndetic conditionals, but it has been interpreted by the language user as part of the meaning of the construction (see also Croft 2000: 126–130 on what he calls "hypoanalysis"). This course of events has been attested elsewhere. Haspelmath (1998) argues that, in various languages, new present tense forms can oust old forms, and the old presents then 'retreat' to the niche of subjunctive mood.

What we are left with is a case where competition between an old and a new variant leads to a case of unfree variation. Language users, motivated by a form of '*horror aequi*', are likely to pick up on subtle differences that probably originate as diachronic distributional differences. As the new incoming variant occupies the easily accessible territory first, the ousted variant comes to be associated with a specialist niche. Judging by this case study, pure 'free' variation appears to be an unstable situation in language.

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Appendix

Table A. Collexemes of the syndetic and asyndetic conditionals

Lemma	Collostructional strength (log.lik.)	Collexeme	CollexemeRank
zijn	Inf	*als*	1
komen	Inf	*als*	2
aankomen	Inf	*als*	3
binnenkomen	Inf	*als*	4
binnentreden	Inf	*als*	5
dreigen	Inf	*als*	6
terugdenken	Inf	*als*	7
thuiskomen	Inf	*als*	8
aflopen	Inf	*als*	9
doortrekken	Inf	*als*	10
neerzitten	Inf	*als*	11
opendoen	Inf	*als*	12
opsteken	Inf	*als*	13
uitzonderen	Inf	*als*	14
wegtrekken	Inf	*als*	15
broeden	Inf	*als*	16
doorreizen	Inf	*als*	17
dunken	Inf	*als*	18
meelopen	Inf	*als*	19
musiceren	Inf	*als*	20
openzetten	Inf	*als*	21
opslaan	Inf	*als*	22

Table A. *(continued)*

Lemma	Collostructional strength (log.lik.)	Collexeme	CollexemeRank
rondkijken	Inf	*als*	23
toekijken	Inf	*als*	24
uithalen	Inf	*als*	25
vetrekken	Inf	*als*	26
wegjagen	Inf	*als*	27
aanhijsen	Inf	*als*	28
aanlanden	Inf	*als*	29
aanplempen	Inf	*als*	30
aanraken	Inf	*als*	31
aanroeren	Inf	*als*	32
aanstaan	Inf	*als*	33
achteruittrekken	Inf	*als*	34
afhebben	Inf	*als*	35
afrijden	Inf	*als*	36
afrukken	Inf	*als*	37
afscheiden	Inf	*als*	38
afsnijden	Inf	*als*	39
afstruinen	Inf	*als*	40
aftrekken	Inf	*als*	41
afwennen	Inf	*als*	42
afzonderen	Inf	*als*	43
arriveren	Inf	*als*	44
bedreigen	Inf	*als*	45
beheksen	Inf	*als*	46
bekrachtigen	Inf	*als*	47
beledigen	Inf	*als*	48
beschijnen	Inf	*als*	49
binnenhalen	Inf	*als*	50
binnenrukken	Inf	*als*	51
binnenstrompelen	Inf	*als*	52
blootleggen	Inf	*als*	53
bodvieren	Inf	*als*	54
commanderen	Inf	*als*	55
consolideren	Inf	*als*	56
dichtslaan	Inf	*als*	57
doorheenbreken	Inf	*als*	58
doorkomen	Inf	*als*	59
doormaken	Inf	*als*	60
doorrijden	Inf	*als*	61
doorsteken	Inf	*als*	62
financieren	Inf	*als*	63

Table A. *(continued)*

Lemma	Collostructional strength (log.lik.)	Collexeme	CollexemeRank
fonkelen	Inf	*als*	64
gedeslaan	Inf	*als*	65
graviteren	Inf	*als*	66
grootbrengen	Inf	*als*	67
handwringen	Inf	*als*	68
hoesten	Inf	*als*	69
inladen	Inf	*als*	70
kuieren	Inf	*als*	71
loskomen	Inf	*als*	72
lospingelen	Inf	*als*	73
losscheuren	Inf	*als*	74
masturberen	Inf	*als*	75
meeneuriën	Inf	*als*	76
meezitten	Inf	*als*	77
misdoen	Inf	*als*	78
nalopen	Inf	*als*	79
neerlaten	Inf	*als*	80
neerliggen	Inf	*als*	81
neerzakken	Inf	*als*	82
omgooien	Inf	*als*	83
ontruimen	Inf	*als*	84
ontrukken	Inf	*als*	85
ontweldigen	Inf	*als*	86
opeenhopen	Inf	*als*	87
openrukken	Inf	*als*	88
opgraven	Inf	*als*	89
opluisteren	Inf	*als*	90
opnenen	Inf	*als*	91
opschrikken	Inf	*als*	92
opwachten	Inf	*als*	93
overtikken	Inf	*als*	94
overwaaien	Inf	*als*	95
pingelen	Inf	*als*	96
plaatsnemen	Inf	*als*	97
pochen	Inf	*als*	98
poetsen	Inf	*als*	99
portretteren	Inf	*als*	100
uitzonderen	Inf	V1	1
vergunnen	Inf	V1	2
afsnijden	Inf	V1	3
blootstellen	Inf	V1	4

Table A. *(continued)*

Lemma	Collostructional strength (log.lik.)	Collexeme	CollexemeRank
overschreiden	Inf	V1	5
ratificeren	Inf	V1	6
terugkijken	Inf	V1	7
verwezelijken	Inf	V1	8
aanklagen	Inf	V1	9
aankleden	Inf	V1	10
aanprijzen	Inf	V1	11
aanraken	Inf	V1	12
aanranden	Inf	V1	13
aansterken	Inf	V1	14
afdelen	Inf	V1	15
afmalen	Inf	V1	16
afschieten	Inf	V1	17
afsmeken	Inf	V1	18
afsplitsen	Inf	V1	19
afstreven	Inf	V1	20
afvaardigen	Inf	V1	21
antwooden	Inf	V1	22
beleggen	Inf	V1	23
beoogen	Inf	V1	24
berechtigen	Inf	V1	25
besproeien	Inf	V1	26
bijeenzetten	Inf	V1	27
bijrijmen	Inf	V1	28
confeiten	Inf	V1	29
doordrijven	Inf	V1	30
doorsnijden	Inf	V1	31
effectueren	Inf	V1	32
enten	Inf	V1	33
harmoniseren	Inf	V1	34
herkiezen	Inf	V1	35
hoesten	Inf	V1	36
inschepen	Inf	V1	37
instorten	Inf	V1	38
losscheuren	Inf	V1	39
medebeleven	Inf	V1	40
medelen	Inf	V1	41
meekrijgen	Inf	V1	42
misbruiken	Inf	V1	43
neerbuigen	Inf	V1	44
ontbloten	Inf	V1	45

Table A. *(continued)*

Lemma	Collostructional strength (log.lik.)	Collexeme	CollexemeRank
opbloeien	Inf	V1	46
overschijden	Inf	V1	47
oxyderen	Inf	V1	48
poetsen	Inf	V1	49
provoceren	Inf	V1	50
rondspelen	Inf	V1	51
rondzien	Inf	V1	52
samenbrengen	Inf	V1	53
samentrekken	Inf	V1	54
schappen	Inf	V1	55
schreiden	Inf	V1	56
stenne	Inf	V1	57
stomen	Inf	V1	58
sukkelen	Inf	V1	59
terugvertalen	Inf	V1	60
terugvragen	Inf	V1	61
toebedelen	Inf	V1	62
toeluisteren	Inf	V1	63
uistrekken	Inf	V1	64
uitlichten	Inf	V1	65
uitspereken	Inf	V1	66
uitstamelen	Inf	V1	67
uitvaardigen	Inf	V1	68
uitverkopen	Inf	V1	69
verfransen	Inf	V1	70
vergoeilijken	Inf	V1	71
verhevigen	Inf	V1	72
verlammen	Inf	V1	73
vermeesteren	Inf	V1	74
verpakken	Inf	V1	75
verzanden	Inf	V1	76
vestaan	Inf	V1	77
voorbijkomen	Inf	V1	78
voorspiegelen	Inf	V1	79
wegrijden	Inf	V1	80
zijn	7715.435801	V1	81
hebben	1687.68404	V1	82
komen	1313.451386	V1	83
gaan	1029.629385	V1	84
nemen	935.294057	V1	85
doen	927.900434	V1	86

Table A. *(continued)*

Lemma	Collostructional strength (log.lik.)	Collexeme	CollexemeRank
zien	884.993454	V1	87
geven	736.47188	V1	88
aannemen	714.192312	V1	89
vragen	687.942519	V1	90
stellen	672.644709	V1	91
blijken	665.413057	V1	92
vinden	659.983264	V1	93
willen	615.504962	V1	94
weten	611.316224	V1	95
maken	566.254349	V1	96
houden	513.915934	V1	97
beschouwen	483.77193	V1	98
brengen	459.158773	V1	99
slagen	445.202114	V1	100

SECTION 3

Free variation? Look harder!

CHAPTER 9

Syntactic priming and individual preferences

A corpus-based analysis

Malte Rosemeyer
Freie Universität Berlin

This paper analyses the relation between syntactic priming/persistence and individual preferences in the variation between the two forms of the Spanish past subjunctive (*-ra* vs *-se*). The analysis finds that the probability of repetition of one of these variants is governed by an interaction between individual preferences and the difference between self- and other-priming. Previous use of a variant by another speaker is more likely to lead to persistence than previous use by the current speaker in the case that the current speaker does not usually prefer usage of the variant in question. However, if the current speaker prefers usage of the variant in question, this situation is inverted. These findings suggest that for speakers who prefer usage of the primed variant, self-priming in corpus data might actually be more adequately explained as an effect of individual preferences.

Keywords: variation, persistence, priming, subjunctive, Spanish, sociolinguistics

1. Introduction

Variationist linguistics argues that what is commonly perceived as noise in linguistic data is not 'free' variation in the sense that it cannot be accounted for; rather, "speakers are rarely entirely free to make a choice between the alternatives, since each grammatical option is usually subject to a variety of constraints, some of which may very subtly guide speakers to make the choices that they do" (Cappelle 2009: 183). Free variation consequently equals unexplained variation, and raising the question of free variation is tantamount to a methodological challenge: how can we refine statistical models in such a way as to explain unexplained variation? This paper focuses on one aspect of this problem, namely, the relevance of individual variation. It argues that in order to enhance our models of variation in lin-

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guistic production, it is not sufficient to control for inter-speaker variation on the one hand and syntactic priming/persistence – the repetition of a previously used variant in discourse due to activation effect – on the other hand. Rather, individual preferences are predicted to heavily influence syntactic priming effects. Selection of one variant over another is not only dependent on individual preferences and syntactic persistence *per se* but also the interaction between these two effects.

In order to demonstrate this point, the paper analyses the variation between the two forms of the Spanish past subjunctive (*cant-ara* 'sing-PST.SBJ.3SG' vs *cant-ase* 'sing-PST.SBJ.3SG') in a corpus of spoken Peninsular Spanish. Variation between the two forms is thought to be mostly free, although substantial dialectal preferences are documented. In a previous study (Rosemeyer & Schwenter 2019), it was shown that persistence heavily influences the variation between *-ra* and *-se*. This study advances previous analyses by taking into account the role of individual speaker preferences (i.e. the degree to which a speaker prefers using *-ra* or *-se*) for the variation between *-ra* and *-se*. It demonstrates the relevance of distinguishing between self- and other-priming (i.e. whether or not the prime is uttered by the speaker of the target construction or a different speaker) in such analyses. Results show that speakers who disprefer the primed variant are more likely to repeat the primed variant when that variant has been used by the previous speaker (other-priming) than when they have used it themselves (self-priming). In contrast, speakers who prefer the primed variant are shown to be less likely to repeat the primed variant when that variant has been used by the previous speaker (other-priming) than when they have used it themselves (self-priming). This finding is explained in terms of an activation-based account of persistence. Preference of a speaker for a variant over another can be described in terms of a higher baseline activation of the variant in question, which is why, for speakers who prefer the primed variant, the recent use of that variant impacts the probability of that speaker repeating it less than for speakers who disprefer the primed variant. In contrast, previous use of a variant is more likely to lead to repetition of that variant by speakers who prefer it than for speakers who disprefer it. I propose that such self-repetition processes should not be described as syntactic priming but, rather, are likely to reflect individual preferences. My results suggest that individual preferences reinforce themselves in usage, constituting the speaker's linguistic style via entrenchment processes.

This paper is structured as follows. In Section 2, I describe the relevance of modelling activation effects such as persistence in variationist analyses and develop a model of the interaction between individual preferences and persistence. Section 3 presents the case study, an analysis of the variation between the two Spanish past subjunctive forms in terms of the predictions developed in Section 2. Section 4 discusses the relevance of these findings for current variationist approaches to the description of language, as well as language change.

2. Persistence and individual variation

Drawing on the psycholinguistic notion of priming (Dell 1986; Dell et al. 1997; Bargh & Chartrand 2000), variationist studies have shown that, in a situation in which the speaker can select between two or more variants that express a similar function in discourse, she or he will display a tendency towards selecting the variant that she or he has last heard or read. This probabilistic constraint is termed persistence (Szmrecsanyi 2005, 2006), syntactic priming (Bock 1986; Mahowald et al. 2016) or perseveration (Cameron & Flores-Ferrán 2004), and has first been identified in sociolinguistic variationist studies (Poplack 1980; Weiner & Labov 1983; Cameron 1995; Pereira Scherre 2001; Cameron & Flores-Ferrán 2004; Tamminga 2016; Callaghan & Travis 2020; among many others). Persistence escapes any notion of functional or formal differences between linguistic constructions and consequently needs to be dealt as an additional predictor in variationist analyses. In the words of Szmrecsanyi (2005: 140), "persistence […] poses a problem to some varieties of quantitative linguistic research in that text frequencies of some linguistic pattern may be misleading unless, for instance, textual distances between the individual hits are factored in". Indeed, Szmrecsanyi shows that inclusion of predictor variables operationalising persistence increases the quality of statistical models of linguistic variation substantially. To give an example from Spanish, which will be studied in more detail later, Spanish has two past subjunctive forms, which express similar meanings. Thus, Example (1a), taken from the Corpus del español (Davies 2019) can easily be paraphrased using (1b). A corpus-based study by Rosemeyer & Schwenter (2019) demonstrated that use of either of these variants leads to an increased probability of use of the same variant in the subsequent context, as compared to the other variant.

(1) a. *le había-n ped-i-do que* ***cant-a-ra***
him have.PST.IPFV-3PL ask-TH-PTCP that 'sing-TH-PST.SBJ.3SG'
b. *le había-n ped-i-do que* ***cant-a-se***
him have.PST.IPFV-3PL ask-TH-PTCP that 'sing-TH-PST.SBJ.3SG'
'They had asked him to sing.'

Crucially for our purposes, persistence is moderated by additional factors, many of which have been studied in the relevant nature. First, persistence becomes less likely with increasing distance between the prime and the token of the construction under study (Gries 2005; Szmrecsanyi 2005, 2006; Gries & Kootstra 2017; Rosemeyer & Schwenter 2019). This means that the increase in the probability of use of the primed construction is exponentially higher the lower the distance between the prime and the target. Second, formal identity between the prime and the target likewise increases the odds for persistence (Gries 2005; Jaeger & Snider

2008). In other words, repetition at the token level is more likely than repetition at the more abstract type level. Third, various studies have demonstrated that persistence is governed by the individual factors such as age of the speaker (see Szmrecsanyi 2006: 196–198 and references therein). Szmrecsanyi's results suggest an interaction between age and distance in words between prime and target, in that the decay of the activation effect seems stronger for older than younger speakers. These effects are usually explained in terms of an activation-based account of persistence, which assumes that "grammatical structures vary in baseline activation, and speakers prefer structures that are more activated over structures that are less activated" (Cho et al. 2020: 477). The influence of the moderator variables described in the last paragraph can, consequently, either be explained in terms of assumptions with respect to memory constraints (distance between prime and target, age) or the degree to which a prime activates the cognitive representation of the respective construction in the listener's mind (formal identity).

A fourth important factor, which will be the focus of the present paper, is the difference between self-priming and other-priming. Self-priming refers to a situation in which the prime, i.e. preceding instance of the token, is uttered by the same speaker as the target token. In contrast, other-priming describes the situation in which the prime is uttered by a different speaker from the one uttering the target token. Corpus-based studies have found that self-priming is more likely than other-priming (Gries 2005; Fricke & Kootstra 2016). Put simply, it appears that speakers are more likely to repeat their own words than other people's. Within the activation-based account of persistence, one might assume that self-use of a linguistic element activates the cognitive representation of that element in the speaker's mind to a greater degree than other-use of the element. However, this explanation is challenged by experimental evidence that comprehension-to-production priming (referring to a situation in which production of a linguistic element is facilitated by previous exposure to that element) has similar effect sizes as production-to-production priming (see Bock et al. 2007; Pickering & Ferreira 2008: 440–441).

In this paper, I will develop and discuss the hypothesis that in some cases, the finding that speakers are more likely to repeat themselves in corpus data is an artifact of the nature of production data. When analysing corpus data, a situation in which a speaker repeats her or his selection of one variant can mean one of two things. First, the repetition could be described as persistence, in that activation of the representation of the variant in question by the previous utterance has led to easier processing and thus easier production of the same variant in later discourse. Second, it might mean that a speaker simply uses that variant frequently. In the latter case, repetition of the variant would need to be explained

as an effect of individual preferences, i.e. entrenchment of the usage of that variant in the speaker's idiolect.

As an illustration, consider the made-up examples in (2), where speakers have the choice between the prepositional dative (*give the watch to Susan*) and ditransitive dative (*give Susan the watch*) (see e.g. Szmrecsanyi et al. 2017). Whereas the use of *gave the laptop to Lisa* in (2a) would usually be described as an instance of self-priming, (2b) would be described as other-priming. However, the fact that Mary has already used a prepositional dative in (2a) might lead us to suspect that Mary generally prefers using the prepositional dative. In contrast, John's use of the prepositional dative in (2b) cannot be interpreted along the same lines.

(2) a. **Mary:** *First I gave the watch to Susan and then I gave the laptop to Lisa.*
b. **Mary:** *First I gave the watch to Susan.*
John: *And then you gave the laptop to Lisa.*

These considerations are important because they suggest an asymmetry between self-priming and other-priming in terms of the relevance of individual preferences. This might account for the fact that previous studies have found self-priming to be more likely than other-priming. In a recent study, Gradoville (2019) analyses the relation between persistence and individual variation in the reduction of *para* 'to, for, in order to' to *p(r)a* in spoken Brazilian Portuguese. He finds that failure to account for the individual speaker leads to an overestimation of persistence. In Gradoville's (2019: 120) words,

> In the case of the present study, although priming is suggested to play a role in the variation surrounding the reduction of *para*, its effect is nowhere near as strong as is suggested when individual variation is not accounted for in the statistical model.

This can be easily explained using our example in (2a). Imagine a situation in which the speaker Mary demonstrates a categorical selection rate of the prepositional dative. In this case, the selection of *gave the laptop to Lisa* over *gave Lisa the laptop* in (2a) cannot be attributed to persistence (or indeed, any other constraint). In contrast, consider a situation in which Mary's idiolect displays variation between the prepositional and the ditransitive dative. Here, the use of the prepositional dative in (2a) might well be a persistence phenomenon.

In this paper, I will argue that Gradoville's (2019) findings indicate more than just a methodological problem. In particular, I propose that the influence of individual variation on the probability for repetition to occur can be explained in terms of entrenchment processes at the speaker level. Central to this idea is the notion, expounded in Jaeger & Snider (2008, 2013), that persistence is not only contingent on activation in the hearer's mind, but also on expectedness. Put sim-

ply, linguistic stimuli that the hearer is less accustomed to will be more unexpected, i.e. surprising, to the hearer. This is due to the fact that language users "implicitly maintain and update probabilistic distributions over linguistic structures" (Jaeger & Snider 2008: 1061). Within a given context, a speaker will have expectations based on her idiolect as to which linguistic elements are likely and unlikely to be used, a fact that might be described as differences in the baseline activation levels of these elements in the given context. Persistence can thus be described as a symptom of implicit learning, i.e. "longer term adaptation within the cognitive mechanisms for creating sentences" (Bock & Griffin 2000: 177). As a result, "less probable syntactic structures, if observed, lead to a bigger change in the probability distribution, which in turn leads to an increased probability of reusing the same structure" (Jaeger & Snider 2008: 1062). In line with these assumptions, Jaeger & Snider (2008) found that the use of unusual passives such as *was ferried* leads to stronger persistence than more frequent passives such as *was made*.

Rosemeyer & Schwenter (2019) interpreted these results as proof that the notion of expectedness is intimately related to the degree of entrenchment of linguistic elements in the language user's mind. Entrenchment may be defined as "the storage of concepts and constructions as (variably) routinized items in long-term memory" (Schmid 2010: 121). Syntagms such as *I don't know, I don't think, do you want* or and *I said* are likely to receive a holistic representation in the speakers' minds due to their high usage frequency. Entrenchment can be framed in terms of predictability (see Diessel 2011: 833): in a string of words such as *I don't know*, the separate words are highly predictable from each other, a fact that corpus-based approaches typically describe using measures of collocation strength such as transitional probabilities or pointwise mutual information.

Since entrenchment is essentially a function of the usage frequency of a linguistic element, linguistic elements that have a low degree of entrenchment in the language user's mind are expected to be less predictable and therefore lead to stronger persistence than elements that have a weak degree of entrenchment. Indeed, in their corpus-based analysis, Rosemeyer & Schwenter (2019) were able to show that while Spanish speakers can select between two variants of the past subjunctive (cf. Example (1) above), the *ra*-form is much more frequent, leading to stronger entrenchment and weaker persistence compared to the *se*-form. The authors also showed that this effect is lexically specific: highly entrenched *se*-forms (especially *fuese* 'be.PST.SBJ.3SG') lead to weaker persistence than less entrenched *se*-forms (such as *ca-yese* 'fall-PST.SUBJ.3SG'). A recent study by Jacobs et al. (2019) suggests that this finding can indeed be characterised as an inverse frequency effect. In particular, Jacobs et al. (2019) present evidence from psycholinguistic experiments that find that in comprehension-to-production priming, rarer syntactic structures are more likely to persist than more frequent

structures. As a result of these findings, they propose a hybrid model that integrates both activation and error-driven/implicit learning accounts of persistence.

The fact that usage frequency moderates the probability for a linguistic element to persist has important repercussions for the analysis of persistence in corpus-based studies. This is due to the fact that speakers may exhibit difference in individual preferences with respect to the use of linguistic elements. For instance, in Gradoville's (2019) study about reduction of Portuguese *para*, the author found that more than half of the speakers in the sample displayed near-categorical reduction rates. In contrast, a significant number of speakers showed rather low regular reduction rates (Gradoville 2019: 107). As in the case of the Spanish past subjunctive, such high rates of inter-individual variation are indicative of the fact that the variation between these forms is governed less by structural constraints than by individual preferences, i.e. it can be characterised as 'free' variation. In line with the implicit learning account of persistence, however, this 'free' variation should be constrained by an interaction between persistence and inter-individual differences in terms of baseline activation levels of such constructions. If the degree of unexpectedness of a linguistic element influences the probability for persistence to occur, the implicit learning account to persistence would predict that the probability to repeat a reduced *para* token would be higher for speakers who regularly display low reduction rates (for which reduced *para* is unexpected) than for speakers who regularly display high reduction rates (for which reduced *para* is expected).

However, it is also to be expected that the influence of individual preferences on persistence is moderated by the difference between self- and other-priming. As noted by Jacobs et al. (2019: Section 6.1), implicit learning accounts to persistence are assumed to be unable to explain self-priming because trivially, speakers are generally less likely to be surprised by their own choice of words than by the choice of words of other speakers (cf. also Cho et al. 2020: 477). As a result, the prediction formulated in the previous paragraph is likely to only be relevant for other-priming, where the prime can actually be unexpected to the hearer. For self-priming, we should expect individual preferences to have the opposite effect. In terms of Gradoville's data, the probability to self-repeat a reduced *para* token would be higher for speakers who regularly display high reduction rates than for speakers who regularly display low reduction rates. Indeed, individual preferences can best be described in terms of this self-reinforcing repetition that are indicative of the speaker's language style. Consistent and selection of one variant over another is an expression of the speaker's linguistic *habitus* (see, e.g, Adli 2013). Note that this assumption is in line with historical studies to persistence effects, which have hypothesised that persistence can have a conserving effect in language change (Rosemeyer 2015; Rosemeyer & Schwenter 2019), by which linguistic elements that have become uncommon are maintained. In the same way, a conserva-

tive speaker might preserve a variant otherwise uncommon in her or his linguistic environment by self-reinforcing repetition.

In this section I have developed the hypothesis of a complex interaction between persistence and individual preferences/entrenchment at the speaker level. If strength of persistence is partially governed by the degree of expectedness of the stimulus, individual preferences should massively influence persistence. This hypothesis leads to the prediction that the difference between self- and other-priming is moderated by individual preferences, such that other-priming is expected to be stronger than self-priming when the speaker generally prefers usage of the competing variant. In the next section of this paper, I will test this prediction on the basis of an analysis of natural data from spoken Spanish.

3. The case study: Variation in the Spanish past subjunctive

I carried out a corpus-based analysis of the variation between the Spanish past subjunctive forms *-ra* and *-se* (see 3).

(3) *cant-a-ra* 'sing-TH-PST.SBJ.3SG' vs
cant-a-se 'sing-TH-PST.SBJ.3SG'

The *-ra*/*-se* alternation has received much attention in previous research (Lemon 1925; Wright 1926; Bolinger 1956; DeMello 1993; Sussman Goldberg 1995; Asratián 2007; Anderson 2017; Guzmán Naranjo 2017; Bermejo 2019; Rosemeyer & Schwenter 2019; Christ & Feldhausen 2021; Guajardo 2021). There is a consensus in the literature that the *-ra* subjunctive generally has a higher usage frequency than the *-se* subjunctive. This is due to the fact that *-ra* is an innovative variant that underwent semantic change from an original pluperfect reading towards expression of the subjunctive (Veiga Rodríguez 1996; Becker 2008; Rojo & Vázquez Rozas 2014; Rosemeyer 2021), starting to replace *-se* in Early Modern Spanish. Likewise, there is solid evidence for dialectal differences, such that Latin American Spanish dialects use *-se* less than Spanish dialects. There is much less consensus in the literature as to the contextual predictors that govern this variation. Indeed, many authors claim that there is little semantic difference between the two variants (Alarcos Llorach 1999: 158–160; Kempas 2011: 158; Guzmán Naranjo 2017; Rosemeyer & Schwenter 2019), reducing the variation to style and individual preferences (but see Bolinger 1956). Consequently, the *-ra*/*-se* alternation might represent one of the cases that can best be described as free variation, and a perfect test case for studying the interaction between persistence and individual preferences.

3.1 Data

I extracted all occurrences of the *-ra* and *-se* forms from the PRESEEA corpus of spoken Spanish (PRESEEA 2014). The PRESEEA corpus contains semi-structured sociolinguistic interviews from a variety of Spanish dialects. Given the strong impact of dialectal variation on the *-ra*/*-se* alternation, I decided to restrict the search query to interviews from Spain. I used available recordings from Alcalá de Henares ($n = 18$), Granada ($n = 17$), Madrid ($n = 18$), Málaga ($n = 18$), Palma de Mallorca ($n = 54$), Santiago de Compostela ($n = 53$) and Valencia ($n = 17$). Together, these transcripts have a length of more than 2.2 million words. Extraction procedures from these data lead to a total number of $n = 4066$ *-ra* and *-se* tokens.

3.2 Persistence as a predictor of the variation between -ra and -se

Table 1 gives the distribution of *-ra* and *-se* in the seven sub-corpora. The results from the table suggest substantial dialectal variation even within the Peninsular conversations, ranging from 6.2% *-se*-selection in the conversations from Granada to 23.7% in the conversations from Madrid. It has been a consistent finding in the literature that Southern European Spanish dialects frequently pattern with Latin American dialects, and the distribution in Table 2 seems to suggest that the same is the case here.

Table 1. Variation between *-ra* and *-se* forms, by sub-corpus

	Granada	Alcalá	Málaga	Santiago	Valencia	Palma	Madrid
n -ra	212	266	277	1077	278	994	270
n -se	14	36	41	234	61	222	84
% *-se*	6.2	11.9	12.9	17.8	18.0	18.2	23.7

It is important to note that within these sub-corpora representing different dialectal regions, individual variation abounds. Figure 1 visualises the percentage of *se*-usage (compared to *ra*-usage) for each of the $n = 361$ speakers in the corpus. In a boxplot such as the one in Figure 1, the boxes show the middle 50% of scores (i.e. the range between the 25th and 75th percentile). With the exception of the data from Granada, where almost all speakers tend towards using *-ra* over *-se*, all sub-corpora show substantial inter-speaker variation. Likewise, all sub-corpora contain speakers who only use *se*-forms in the respective interview. At the same time, the amount of inter-speaker variation displayed by the speakers in each corpus seems to correlate with the overall mean of *se*-usage described in Table 1. In other words, those dialects that display most *-se*-usage also display most variation

between *-se* and *-ra*. Consequently, while it appears that to individual preferences are to some degree predicted by dialectal variation, this correlation is not absolute.

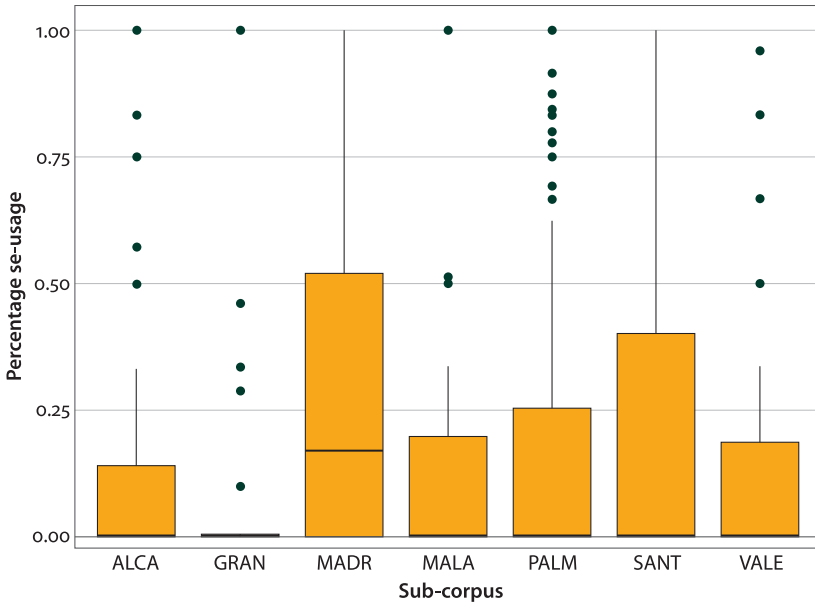

Figure 1. Individual variation in *-ra*/*-se* usage, by sub-corpus

Rosemeyer & Schwenter (2019) found that due to its status as a minority variant, previous use of *-se* is more likely to lead to persistence than the use of *-ra* in their corpus of written Spanish texts. Table 2 describes the distribution of *-ra* and *-se* in the PRESEEA corpus by previous use of a past subjunctive form. Tokens from the beginning of the conversation, in which no previous past subjunctive form is attested, were annotated as 'none', and can be used as a reference level. In comparison to contexts with unknown previous use of a past subjunctive form, previous use of *-ra* only increases the mean usage frequency of *-ra* from 87.2% to 90.4%. In contrast, previous use of *-se* increases the mean usage frequency of *-se* from 12.8% to 54.8%. The effect reaches statistical significance according to a χ^2 test ($\chi^2(2) = 790.9$, $p < .001^{***}$). The analysis thus reproduces Rosemeyer & Schwenter's (2019) findings on the basis of spoken data; previous use of *-se* is more likely to lead to persistence than previous use of *-ra*.

Table 3 again examines the distribution of *-ra* and *-se* by previous use of a past subjunctive form, distinguishing this time between self- and other-priming. For this analysis, the $n = 195$ tokens without a prime, i.e. from the beginning of the conversation, were excluded (see Table 1). The analysis replicates the results by Gries (2005) and Fricke & Kootstra (2016), where self-priming was found to

Table 2. Variation between *-ra* and *-se* forms, by previous past subjunctive form

Previous past subjunctive form	*n*	% *-ra*	% *-se*
none	195	87.2	12.8
-ra	3216	90.4	9.6
-se	655	45.2	54.8

be more likely than other-priming. Indeed, according to χ^2 tests, only the distribution for self-priming reaches statistical significance ($\chi^2(1) = 1030.6$, $p < .001^{***}$), whereas the distribution for other-priming fails to do so ($\chi^2(1) = 2.5$, $p > .05$).

Table 3. Variation between *-ra* and *-se* forms, by previous past subjunctive form and the difference between self- and other-priming

Previous past subjunctive form	*n*	Self-priming		Other-priming	
		% *-ra*	% *-se*	% *-ra*	% *-se*
-ra	3216	93.6	6.4	82.3	17.7
-se	655	34.2	65.8	77	23

3.3 Modelling the influence of individual preferences

Recall that discussion in Section 2 led to the prediction that the difference between self- and other-priming is moderated by individual preferences, such that other-priming is expected to be stronger than self-priming if the speaker generally prefers usage of the competing variant. As regards to methodology, this implies that in order to evaluate these predictions the dependent variable should not be *-ra*/*-se* selection *per se*, but rather whether or not the target is the same form as the prime. In establishing such a dependent variable – termed PERSIST – it is thus possible to predict the probability of persistence as a function of various predictor variables and their interactions by using a logistic regression model. The variable PERSIST was assigned the value 'True' in the case that a *-ra* token was preceded by a *-ra* token or a *-se* token was preceded by a *-se* token. In all other cases, the variable was assigned the value 'False'.

The nature of the dependent variable PERSIST dictates that the first *-ra*/*-se* token at the beginning of each conversation could not be taken into account. I consequently deleted these $n = 195$ tokens (one per conversation) from the dataset, leaving us with a final dataset of $n = 3871$ tokens of *-ra* or *-se* that are preceded by at least one other token of *-ra* or *-se*.

Table 4 summarises the predictor variables used in the regression model. Inclusion of the first two predictor variables was motivated in terms of the predictions established in Section 3. First, the variable PreviousSpeaker measures whether or not the speaker of the *-ra*/*-se* target is identical to the speaker of the previous *-ra*/*-se* token. Second, the variable SpeakerPreference measures the percentage with which the current speaker used the target form (*-ra* or *-se*) in the conversation (including the first tokens of *-ra* or *-se* in the conversation). Speaker preferences are operationalised the same way in Gradoville's (2019) study. I am well aware of the fact that this operationalisation procedure is inherently circular, in that the speaker's choice of one variant over the other is motivated by the overall usage frequency of that variant in the speaker's production data. Put simply, it is unsurprising that a speaker who generally prefers usage of *-ra* in a conversation should select also select *-ra* at one point in this conversation. However, recall that inclusion of SpeakerPreference in the model was not motivated by an interest about the simple correlation between SpeakerPreference and Persist, but rather the assumption that the effect of PreviousSpeaker (i.e. self- vs other-priming) on Persist is moderated by SpeakerPreference (see prediction (b) above). In other words, the fact that my results show SpeakerPreference to have a significant main effect on the choice between *-ra* and *-se* is trivial. However, the effect of the interaction effect between PreviousSpeaker and SpeakerPreference is not: it is not circular to assume that the strength of the effect of PreviousSpeaker is moderated by SpeakerPreference.[1]

The third predictor variable, Identity, was included on the basis of previous studies on persistence. As outlined in Section 2, studies such as Gries (2005) and Jaeger & Snider (2008) showed that persistence is more likely to occur in situations in which the prime and the target are formally identical. A past subjunctive form such as *fuese* 'be.pst.sbj.3sg' is more likely to prime subsequent use of *fuese* than of *cantase* 'sing-th-pst.sbj.3sg'. Gries (2005) moreover found an interaction effect between this variable and the difference between self- and other-priming, in that the identity effect was stronger for self- than other-priming. The variable Identity received the value 'True' when the prime and the target had the same verb lemma and 'False' in all other cases. Morphological information was neglected because this

1. One of the anonymous reviewers proposed to include a predictor operationalising the dialect or subcorpus in question. While this proposal seems reasonable in the light of the substantial dialectal variation (see discussion of Table 1), including such a variable in the regression model described in (4) is problematic due to collinearity between that variable and individual preferences visualised in Figure 1. In other words, individual preferences to some degree reflect dialectal variation. I tested including a Dialect variable as a random effect in the otherwise unchanged model equation in (4). As expected, inclusion of Dialect resulted in a singular model fit indicative of collinearity.

stricter operationalisation resulted in few cases coded as 'True'. In line with the results from previous studies, the probability of the value 'True' for Persist was expected to increase for cases with the value 'True' for Identity.

Table 4. Summary of predictor variables in the logistic regression model

Name	Type	Description
PreviousSpeaker	Factorial	Identity of the speaker of the previous *-ra*/*-se* token ('Other' = speaker different than current speaker, 'Self' = Same speaker as current speaker)
SpeakerPreference	Numerical	Percentage of use (0–100) of the target variant for current speaker within the conversation.
Identity	Factorial	Whether or not the target has the same verb lemma as the prime ('True') or not ('False')

At least one interaction effect was expected: an interaction between SpeakerPreference and PreviousSpeaker. The results from Gries (2005), described in the last paragraph, additionally led to the expectation of an interaction effect between PreviousSpeaker and Identity. In a first step, I consequently calculated a maximal logistic regression model in R (R Development Core Team 2021) predicting the dependent variable Persist from the three variables described in Table 4 and all possible interactions between these variables. This model is described in (4).

(4) Persist ~ SpeakerPreference + PreviousSpeaker + Identity + SpeakerPreference : PreviousSpeaker + PreviousSpeaker : Identity + SpeakerPreference : Identity + SpeakerPreference : PreviousSpeaker : Identity

In order to select the most parsimonious model, I then employed an automatic backward selection process using the function *pdredge* from the R package MuMIn (Bartón 2020). This model selection process lead to the exclusion of the interactions SpeakerPreference : Identity and SpeakerPreference : PreviousSpeaker : Identity and, thus, the final model formula in (5).

(5) Persist ~ SpeakerPreference + PreviousSpeaker + Identity + SpeakerPreference : PreviousSpeaker + PreviousSpeaker : Identity

Table 5 summarises the results from the logistic regression model. Three significant main effects were found. First, likelihood of the value 'True' for the dependent variable Persist increases with higher values for SpeakerPreference. As mentioned above, this is a result of the circularity inherent in predicting Persist

from SpeakerPreference. Second, the main effect of PreviousSpeaker indicates that Persist is more likely to receive the value 'True' when the current speaker is identical to the speaker of the previous *-ra* or *-se* token, reproducing the results from the descriptive analysis (Section 3.2). Third, the expected significant correlation between the variable Identity – measuring formal identity of the prime and the target token – and Persist was found. Thus, Persist is more likely to receive the value 'True' when the verb lemma of the prime was identical to the verb lemma of the target.

Table 5. Summary of results of the logistic regression model (dependent variable Persist). Note: COEF = coefficient, SE = standard error, Z = *z* value, P = *p* value. All *p* values below .05 were assumed to be significant

Predictor		Level	COEF	SE	Z	P
Main effects	(Intercept)		−1.28	0.3	−4.6	<.001
	Speaker-Preference (SP)		0.03	0.0	7.8	<.001
	PreviousSpeaker	Other		*Reference level*		
		Self	2.23	0.3	−6.5	<.001
	Identity	False		*Reference level*		
		True	2.0	0.4	5.4	<.001
Interaction effects	Speaker-Preference (SP) : PreviousSpeaker (PS)	SP : PS=Self	0.05	0.0	11.0	<.001
	Speaker-Preference (SP) : Identity (ID)	SP : ID=TRUE	−0.02	0.00	−4.5	<.001

The model found two significant interaction effects, which I interpret in terms of a moderator approach to interactions (see Jaccard 2001:30–41).[2] First, the effect of SpeakerPreference on Persist is moderated by PreviousSpeaker such that the positive correlation between Persist and SpeakerPreference is predicted to be even stronger if the current speaker is identical to the previous speaker. Second, the effect of SpeakerPreference on Persist is also moderated

2. In this approach, an interaction effect B : C on the dependent variable A is taken to indicate that the strength of the effect of the predictor B on the dependent variable A is moderated by the predictor C. To give a simple example, A might represent quality of taste, B the difference between cookie and broccoli, and C variation in whether or not a cup of coffee is consumed at the same time. A subject might like cookies better than broccoli (main effect of B on A) but might not generally like eating better together with a cup of coffee (main effect of C on A). However, under a moderator approach, if we find a statistically significant interaction effect of B : C on A, it might be that cookies taste even better with a cup of coffee than without one.

by Identity, such that the positive correlation between Persist and SpeakerPreference is predicted to be weaker in cases in which the prime and the target token are formally identical.

Figure 2 visualises the influence of the interaction SpeakerPreference : PreviousSpeaker on the distribution of the dependent variable Persist. In terms of the main effects of the variables, the effect of SpeakerPreference suggests that a speaker is more likely to select the same past subjunctive form (target) as the recent past subjunctive form (prime) when the data from the corpus suggest that this speaker generally prefers using this past subjunctive form. As noted above, this effect is circular, since the choice of the variants is motivated by the tendency for the speaker to select the variant in question over the entire course of the conversation. Interestingly, however, the regression analysis suggests that the effect is governed by the variable PreviousSpeaker in two ways. First, the analysis shows that the increase of Persist for each percentage of SpeakerPreference is very much linear for other-priming (black line). In contrast, for self-priming (orange line), we find a nonlinear trend: the correlation between SpeakerPreference and Persist is much stronger for speakers who either strongly disprefer (SpeakerPreference between 0 and 25) or prefer (SpeakerPreference between 75 and 100) use of the past subjunctive form than for speakers who show more variable behaviour (SpeakerPreference between 25 and 75).

Second, for speakers who do not prefer usage of the target variant (SpeakerPreference between 0 and 50), we can see that previous production of that variant by another speaker is more likely to lead to a repetition of that variant by the current speaker than previous production of that variant by the same speaker. This effect is particularly strong for speakers who strongly disprefer using the target variant (SpeakerPreference between 0 and 25). As we will see in the discussion of the findings below, this finding can be motivated in terms of an implicit learning account to persistence.

The model predicts a very different situation for speakers who prefer usage of the target variant (SpeakerPreference between 50 and 100). In this speaker group, self-priming is consistently stronger than other-priming. It appears that speakers in this group select the variant they prefer independently of the other speakers' linguistic behaviour. Put simply, speakers who show strongly entrenched usage patterns (e.g. speakers who almost always use *-ra*) are less affected by previous usage of that variant because they would have selected that variant anyways. Arguably, the variable Persist does not measure persistence in this speaker group anymore but is directly correlated to individual preferences.

Figure 3 visualises the influence of the interaction SpeakerPreference : Identity on the distribution of the dependent variable Persist. Again, the figure demonstrates the main effect of SpeakerPreference, in that speakers who prefer

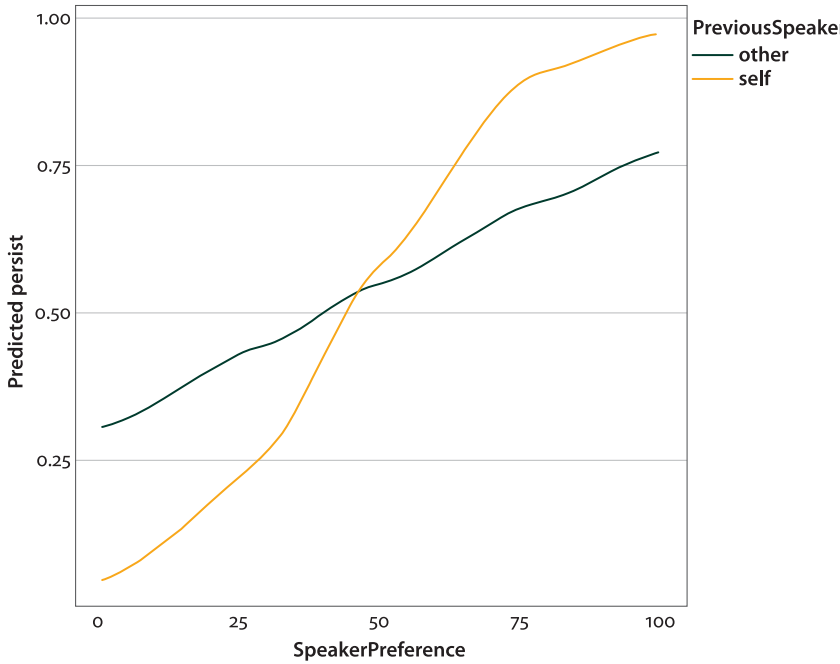

Figure 2. Predicted PERSIST (use of *-ra* or *-se* following the same variant in the previous discourse), by SPEAKERPREFERENCE and PREVIOUSSPEAKER

using the target variant will typically do so as well when that variant is used in the prime. It also illustrates the main effect of the variable IDENTITY, in formal similarity (same verb lemma) between the prime and the target generally increases the likelihood of persistence (i.e. repetition of the primed form in the target).

As to the interaction between SPEAKERPREFERENCE and IDENTITY, Figure 3 demonstrates that the correlation between IDENTITY and the dependent variable PERSIST is moderated by SPEAKERPREFERENCE. In particular, the effect of IDENTITY on PERSIST is much stronger for speakers who do not prefer usage of the target variant (SPEAKERPREFERENCE between 0 and 75) than for speakers who do (SPEAKERPREFERENCE between 75 and 100). As in the case of the interaction effect between SPEAKERPREFERENCE and PREVIOUSSPEAKER, I will argue in the discussion that this effect can be motivated in terms of entrenchment, on the basis of the assumption that the productivity of a variant that is weakly entrenched in a speaker's mind relies more on exact repetition than the productivity of a variant that is strongly entrenched in a speaker's mind. In terms of the statistical description, this leads to a ceiling effect; speakers who almost always use the primed variant are necessarily insensitive to factors such as lexical identity.

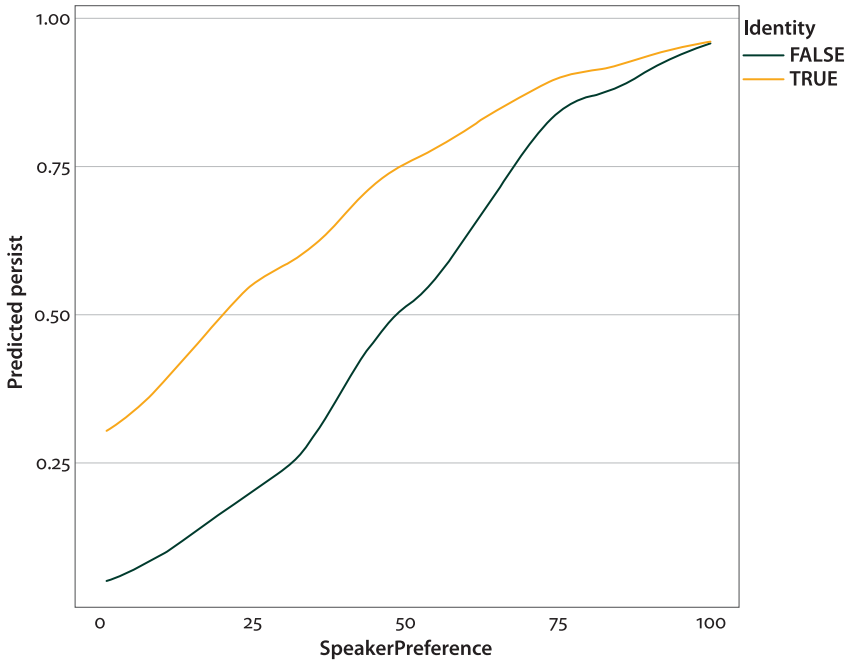

Figure 3. Predicted PERSIST (use of *-ra* or *-se* following the same variant in the previous discourse), by SPEAKERPREFERENCE and IDENTITY

3.4 Discussion of results

The analysis presented in this section of the paper tested the prediction that the influence of individual preferences on persistence is moderated by the difference between self- and other-priming, such that other-priming is expected to be stronger than self-priming when the speaker generally prefers usage of the competing variant. As predicted, the analysis has found that other-persistence is stronger than self-persistence for speakers who do not prefer usage of the primed variant (in terms of my operationalisation of SPEAKERPREFERENCE, speakers who use the primed variant in less than 50% of the cases). This finding is in line with the assumption that strength of persistence is correlated to expectedness and implicit learning: when another speaker uses a variant that is only weakly entrenched in the hearer's grammar, this usage event will lead to more surprisal and concomitantly, stronger persistence than previous use of a variant that the hearer prefers.

50% of SPEAKERPREFERENCE was found to be the tipping point after which self-priming becomes stronger than other-priming. When a hearer listens another speaker use a variant that she or he prefers using herself, this previous use of the

variant leads to weaker persistence. This means that for speakers who strongly prefer using one variant, repeated use of this variant is less likely to reflect persistence in the strict sense than these individual preferences. From the perspective developed in this paper, this result warrants the conclusion that for speakers who show a strong preference for the primed element, the phenomenon of self-priming in corpus data is more adequately explained as individual-level entrenchment or style. In line with these assumptions, studies such as Kaschak (2007) and Kaschak, Kutta & Schatschneider (2011) report that persistence operates over time spans as long as one week.

This assumption explains why, on average, self-priming (measured in terms of the probability of a variant being used after previous use of that variant by the same speaker) has a stronger effect than other-priming in corpus data. As hypothesised by Gradoville (2019), failure to distinguish persistence from individual preferences leads to an overestimation of persistence in the data. Crucially however, this problem affects self-priming to a much greater degree than other-priming, which is less easily attributed to individual preferences.

Finally, the analysis also found a significant interaction between speaker preferences and the variable IDENTITY measuring whether or not the previous past subjunctive token is formally similar (same verb lemma) to the target past subjunctive token. As expected, formal similarity was found to increase the probability of an element to persist. However, this main effect is moderated by speaker preferences: formal similarity has a stronger impact of persistence for speakers who disprefer using the primed variant. This effect can again be explained in terms of an implicit learning account to persistence. Thus, speakers who disprefer using the primed variant have a weaker representation of this variant in their mind (entrenchment), leading to comparably lower cognitive ease of accessibility and production of the entire morphological paradigm of that variant. For such speakers, previous use of a form such as *fueseis* 'be.PST.SBJ.2PL') is more likely to lead be unexpected and consequently cause persistence than for speakers who display strongly entrenched usage of *-se*.

4. Conclusions

Variationist linguistics assumes that "a lot of what appears to be free variation can be accounted for if linguists take social factors into account as well as linguistic factors" (Meyerhoff 2006: 10). Free variation is indeed unexplained variation, and it is up to the analyst to develop methods and concepts that allow identifying constraints that explain away 'free' variation. The results from this paper suggest that

one way of attaining this goal is to explore the constraints that shape individual preferences in language usage. In particular, it was proposed that individual preferences and syntactic priming, two variables that are usually modelled as separate predictors and whose effects are typically attributed to 'free' variation are, in fact, collinear. Consequently, 'free variation' is not just an effect of individual preferences but results from a complex interaction between the speaker's previous experience with language and social constraints.

Focusing on one specific case of variation, namely, the alternation between two Spanish past subjunctive forms, an analysis was developed that allowed formulating predictions about whether or not a speaker will use the same subjunctive form as a previously subjunctive form. The analysis thus effectively measured the probability for persistence to occur depending on three predictor variables: individual speaker preferences as regards selection of these variants, the difference between self- and other-priming, and formal similarity between the prime and the target. The analysis demonstrated a strong influence of these parameters on strength of persistence, which was explained in terms of the notions of persistence and cognitive entrenchment. In particular, it was found that previous use of a variant by another speaker is more likely to lead to persistence than previous use by the same speaker in the case that this speaker does not usually prefer usage of the variant in question. In contrast, previous use of a variant by the same speaker is more likely to lead to persistence if the speaker generally displays high rates of selection of this variant. Similarly, the effect of formal similarity between the prime and the target was found to be moderated by individual preferences, such that formal similarity leads to stronger persistence for speakers who disprefer usage of the primed variant than for speakers who prefer usage of the respective variant.

These findings suggest that, in order to explain more 'free' variation in such cases, it is necessary to assume more complex models of the influence of individual preferences on linguistic variation. It has been proposed in this paper that for speakers who prefer the primed variant, self-priming can be described as linguistic style, in that consistent and self-reinforcing selection of one variant over another is an expression of the speaker's linguistic *habitus* (Adli 2013). Consequently, the results from this paper call for a finer-grained perspective on operationalising individual preferences in variationist sociolinguistics. In particular, the desideratum can be formulated that individual preferences be operationalised not only of the basis of the production data of the respective speaker within one conversation (as in the analysis reported in this paper), but ideally in more production data or even pre-tests. Such a procedure would allow escaping the inherent circularity of trying to predict usage of one variant over another by a speaker in terms of her or his production of these variants in the same stretch of speech, which arguably weakens the analysis presented in this article.

Finally, the results from this paper have interesting implications for studies on language change that discuss the role of asymmetric priming (Jäger & Rosenbach 2008; Hilpert & Correia Saavedra 2016). Hilpert & Correia Saavedra (2016) tested the prediction, established in Jäger & Rosenbach (2008), that the unidirectionality of grammaticalisation is due to the fact that in grammaticalisation processes, the original lexical item (e.g. *go*) should prime the constructions that have resulted from grammaticalisation processes affecting *go* (e.g. *be going to*), but not vice versa (Hilpert & Correia Saavedra 2016: 358). As experimental paradigm, the authors employed a maze task in which participants' response times to primed and unprimed elements were measured, but failed to find evidence for the assumed asymmetric priming effect. In the lights of the results from this paper, one possibility for this null finding is that the maze task only involved other-priming (participants were given stimuli by the experimenters that they had to respond to). However, the results from this paper suggest that it is self-priming, not other-priming, that can lead to the conventionalisation of usage of variants or grammatical constructions. It thus stands to reason that, in order to test the hypothesis of asymmetric priming, it might be necessary to consider the difference between self- and other-priming.

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CHAPTER 10

Optionality, variation and categorial properties

The case of plural marking in Yucatec Maya

Yidong Yu
Georg-August-Universität Göttingen

In this paper, I propose a semantic account of the optionality of plural marking in Yucatec Maya (Mayan; Mexico) which pins the variation in plural marking on the variation in noun denotations (Chierchia 1998; Borer 2005; Deal 2017; Moroney 2021). I argue that this optionality is not a free variation. I further argue that the noun denotations vary between apportionable and generic, which is manifested in the option of a pseudopartitive operation (Selkirk 1977; Higginbotham 1994) available at the final stage of the interpretation of the nouns in the semantics. The fact that, by this account, the computation of Yucatec constructions that involve counting yields correct results provides further supporting evidence for the proposed analysis.

Keywords: semantics, number, plural marking, optionality, Mayan languages, Yucatec, pseudopartitive operator

1. Introduction

The optionality of plural marking in Yucatec Maya (Mayan, Mexico; henceforth, Yucatec) has been widely observed in the literature. In this paper, I explore the question of whether this optionality should be understood as evidence of the existence of free variation in the grammar or as an unexplained variation whose conditions have yet to be spelled out. By comparing evidence supporting these two possibilities, I argue that the optionality of plural marking in Yucatec should be treated as an unexplained variation whose conditioning factors have been unclear thus far, rather than as an unconditioned free variation. In light of this, I provide an analysis which is effective in explaining the variation in plural marking in Yucatec by proposing a covert pseudopartitive operator embodied in the Yucatec noun denotations. I argue that the variation in Yucatec plural marking results

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from the variation in noun denotations, which is conditioned by the combinative ability of the aforementioned pseudopartitive operator.

The paper is structured as follows. In Section 2, I present basic information about modern Yucatec that is relevant for the analysis, with emphasis on the morphosyntactic description of Yucatec plural marking. In Section 3, I lay out the relevant data and argue that the optionality of Yucatec plural marking is not a case of free variation but a variation whose conditioning factors await closer investigation. In Section 4, I motivate an analysis, building upon theories that predict a unified syntactic structure for counting and individuation in both marking and classifier languages (e.g. Borer 2005; Moroney 2021) and the cross-linguistic observation of pseudopartitives (e.g. Selkirk 1977; Higginbotham 1994). I further present the semantics of this analysis and demonstrate in a compositional manner the efficacy of this semantics in yielding the desired interpretations in all possible plural constructions in Yucatec. In Section 5, I briefly discuss further issues related to the Yucatec phenomenon. Finally, in Section 6, I present the conclusions.

2. Plural marking in Yucatec

Yucatec is a Mayan language spoken primarily in the Yucatán Peninsula in Mexico by approximately 824,670 people (INEGI 2010 census). Outside Mexico, Yucatec speakers are also found in the bordering districts of Belize and Guatemala. The scope of Yucatec data in this paper ranges from the 1980s to the present day, and these data are from three sources: (i) published Yucatec narratives, (ii) elicited data in published papers and monographs by their authors and (iii) data from my own field notes. The sources of data from (i) and (ii) are cited explicitly, although the transcription and the glosses are either added, if not available, or altered for the sake of uniformity; data from (iii) are not cited.

Yucatec is a head-marking language. Person and number are marked with cross-reference morphemes that are attached to the verbal component. There are two sets of such cross-reference markers, traditionally called sets A and B by Mayanists. Set A marks agreement with the ergative arguments and possessors; it precedes the verb but follows the aspect-mood auxiliary in a clause. Set B marks agreement with the absolutive arguments; it is suffixed to the verb to the slot succeeding the aspect-mood suffix. Like many other languages in the Mayan family, Yucatec is a split ergative language. (1) is an example of a simple Yucatec clause which consists solely of a verbal component; the verb in this clause is *jats'ike'ex*. See Andrade (1955); Bricker (1981); Bohnemeyer (2002); Verhoeven (2007); Briceño Chel (2006) and Gutiérrez-Bravo (2015), among others, for more morphosyntactic descriptions of modern Yucatec.

(1) *táan a jats'-ik-Ø-e'ex*
PROG A.2 whip-IND-B.3SG-B.2PL
'you (pl.) are whipping it' (Bricker 1981: xxi)

The marking of nominal plurality in Yucatec is done by means of suffixation. The Yucatec plural marker is *-o'ob*, which is homophonous with B.3PL; *-o'ob* has an allomorph *-ob* which is realised when it follows a glottalised vowel. The Yucatec plural suffix is differentiated from the Spanish plural suffix *-s*, which is also in use in modern Yucatec as a plural marker but combines exclusively with Spanish loanwords (Uth & Gutiérrez-Bravo 2018). Due to its unproductive disposition and the complications resulting from the functional borrowing discussed in Gutiérrez-Bravo & Uth (2020), however, the scope of the present paper is limited to the examination of the *Yucatec* plural suffix *-o'ob* on *Yucatec* nouns.

The plural marking in Yucatec is essentially optional. In other words, nominals that signify plural referents do not need to be marked for plural in the syntax, and this is still the case even when the plural interpretation of the nominal is implied in the syntactic structure (2).[1]

(2) *ka'a-túul nukuch tso'*
two-CLF.AN big turkey
'two big turkeys' (Monforte et al. 2010: 139)

The optionality of plural marking in Yucatec has been widely reported (Andrade 1955; Lehmann 1998; Lucy 1992; Briceño Chel 2002) and experimentally and statistically attested (Butler 2011, 2012, 2013; Butler et al. 2014; Schellenbach 2018). There are four types of nominal constructions in which nominal plural marking can occur: (i) nP+*-o'ob*, as in (3); (ii) *le*+nP+*-o'ob*+ CL, as in (4); (iii) numeral-classifier+nP+*-o'ob*, as in (5); (iv) *le*+numeral-classifier+nP+*-o'ob*+ CL, as in (6). Construction types (iii) and (iv) occur at a much lower frequency in comparison with (i) and (ii); some Yucatec speakers whom I have consulted even reject the co-occurrence of numeral-classifier and *-o'ob* categorically.[2]

1. Note that in Example (2), the presence of a numeral does not contribute to the absence of plural marking in syntax. This point will be elaborated on in 3.2.3.

2. The aversion to the use of plural morphology in numeral modification constructions is also observed in Indonesian (Dalrymple & Mofu 2012). There seems to be a degree of parallelism between the data from Yucatec and from Indonesian: both are classifier languages with optional plural marking; in both languages, all nouns, regardless of whether they are notionally mass or count nouns, can be morphologically marked for plurality; in both languages, the denotations of the plurally marked nouns do not entail definiteness; both languages have an extensive number of classifiers (Lucy 1992 for Yucatec; Dardjowidjojo 1978 for Indonesian), but only very few are in common use as numeral classifiers, the choice of which is determined by the animacity of the noun; neither language bans the co-occurrence of classifiers and the plural marking in numerical constructions, although this use is rare and disfavoured.

(3) *chen x-k'ook'-**o'ob** u k'ajóol*
only F-nightingale-PL A.3 know
'he only knows nightingales' (Skopeteas & Verhoeven 2009)

(4) *le x-ch'úupal-**o'ob**=o'*
DET F-girl-PL=CL
'the girls' (Butler 2012: 34)

(5) *óox-p'éel ja'ab-**o'ob***
three-CLF.INAN year-PL
'three years' (Blair & Vermont-Salas 1967: 454)

(6) *le in ka'a-túul w-íits'in-**o'ob**=a'*
DET A.1SG two-CLF.AN EP-younger.sibling-PL=CL
'these two younger siblings of mine' (Briceño Chel 1996: 101)

Plural marking is distinguished from plural agreement (England 2011), although both plural marking and agreement are optional in the syntax and utilise a homophonous morpheme in many Mayan languages (e.g. Tz'utujil, as discussed in Levin, Lyskawa & Ranero 2020). Yucatec plural agreement, especially agreement of 3.PL, is also optional; nevertheless, I see it as a separate research topic from the main concern of this paper, which is delimited to the optionality of plural marking with the Yucatec plural marker *-o'ob*.

Now that the basic description of the plural marking in Yucatec has been presented, I turn to the core question of this paper, namely, whether the optionality in Yucatec plural marking is a case of free variation. I start by listing two pieces of evidence that seemingly favour a free-variation account and show why this is, in fact, not the case; then, I argue against the free-variation account using statistical evidence.

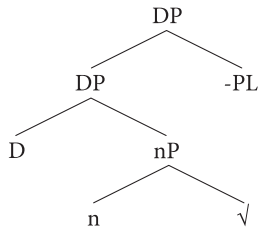
3. Variation unexplained

3.1 Morphosyntactic analysis of the Yucatec plural marker

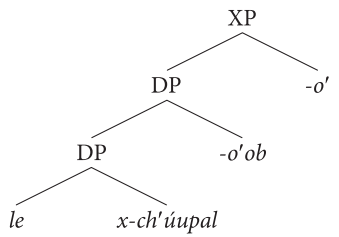
The optionality of plural marking in Yucatec can be accounted for by the morphosyntactic analysis that the Yucatec plural suffix *-o'ob* is merged as an adjunct modifier of DP (Butler 2011, 2012, 2013). This analysis follows from the universal typology proposed in Wiltschko (2008) that plural marking in the world's languages can merge in two ways at all levels: it can either merge as a head, resulting in a new projection which takes the label of the head, or it can merge as an adjunct modifier and does not change the syntactic label of the resulting projection. Butler

(2011, 2012, 2013) argues that the plural marking in Yucatec belongs to the latter case in the typology and that the plural suffix is merged at the DP level (7). For example, under this analysis, (4) has the syntactic structure in (8).[3]

(7)



(8)



Despite the fact that Butler's (2011, 2012, 2013) syntactic analysis accounts very well for the phenomenon of optional plural marking in Yucatec, it shows that the syntactic structure only plays a role in determining the optional nature of plural marking in Yucatec, rather than in determining the conditions under which the nPs are marked or unmarked for plurality. In other words, syntactic structure is not a factor that conditions the explicit grammatical expression of plurality in Yucatec, even though where and how the plural marker merges in the syntactic structure results in the optionality of plural marking in Yucatec. Without naming the conditioning factors of the adjunction, this analysis implies that the two variants of the plural-denoting Yucatec nominals are interchangeable in the syntax; hence, a free variation.

However, I argue that this is a weak piece of evidence for a free-variation account. Adjuncts are optional in the syntactic projections, but they are not stylistically irrelevant (Trubetzkoy 1939: 43). They modify other constituents with the right features and carry information about those constituents. Though adjuncts are freely introduced in the syntax, they are by no means freely introduced in the semantics: the interpretation of the sentence is different with and without a

3. Yucatec enclitics, glossed uniformly as CL, include *-a'*, *-o'*, *-e'* and *-i'*. They always appear phrase-finally. Since this paper does not concern the syntax of Yucatec enclitics, I simply assume that CL is in a projection higher than DP and leave out other syntactic details. For a KP-head (Kase Phrase, Löbel 1994) analysis of the Yucatec enclitics, see Butler (2011: 59–60).

particular adjunct. Consequently, I argue that, instead of taking the DP-adjunct analysis of the Yucatec plural marker as indicating a case of free variation in the grammar, it is more suitable to view it as a pure syntactic analysis which does not take into consideration whether the optionality is free variation or whether it is semantically motivated. The semantic motivations of this phenomenon have, therefore, yet to be scrutinised and spelled out. In other words, the availability of the syntactic adjunction of *-o'ob*, which is needed for a complete analysis of the optionality, is semantically conditioned.

3.2 Interpretation of the plural morpheme

Variation between optionality and obligatoriness of number marking has been argued to be the result of a variation in the interpretation of the number morphemes in some languages (Borer 2005; Tsoulas 2008; Alexiadou 2011; Gillon 2015; Kouneli 2019). If the variation in plural marking in Yucatec also results from a difference in the interpretation of the plural morpheme, one would expect that the occurrence of *-o'ob* is banned under certain conditions. In this respect, three parameters that have been typologically attested to correlate with number marking are examined: (i) degree of animacy (Smith-Stark 1974; Comrie 1981), (ii) argument structure (Goldberg 1995; Jackendoff 2002) and (iii) numerical quantification (Xrakovskij 1997; Yu 2003). Below, I will examine these parameters in turn.

3.2.1 *Degree of animacy*

The degree of animacy of a noun is a factor that motivates the display of plural marking cross-linguistically (Smith-Stark 1974: 663; Comrie 1981: 102–103; Corbett 2000: 55–69). This universal hypothesis is manifested in Yucatec in two ways. First, the plural marking in Yucatec Maya conforms with the animacy hierarchy in that the obligatory number marking with the singular-plural distinction affects the top segments of the animacy hierarchy (i.e. first- and second-person pronominals), whereas the facultative number marking with the general-plural distinction affects the lower segments of the animacy hierarchy (i.e. third-person pronominals and all nouns) (Yu 2020). Second, plural morphology in Yucatec tends to be displayed more frequently higher on the animacy hierarchy (Lucy 1992; Pfeiler 2009; Schellenbach 2018).

However, despite these two aspects in which animacy level has an impact on the plural marking in Yucatec, data show that the explicit grammatical expression of plurality in Yucatec is not determined by the animacy level of the nouns at all. The most evident reason for this claim is that all nouns from all animacy levels can be semantically plural with or without the grammatical plural marker *-o'ob*. Compare (2) and (5), both of which are from Yucatec narratives: (2) is a

case in which an animate noun denotes plural entities without plural marking, whereas (5) is a case in which an inanimate noun with plural marking denotes plural entities.

Therefore, the degree of animacy as an inherent property of the denotation of a noun is not a factor that conditions the explicit grammatical expression of plurality in Yucatec.

3.2.2 *Argument structure*

In a particular language, if certain syntactic positions or thematic roles are salient for the arguments in general, these positions or roles may receive a higher degree of morphological markedness (Bresnan & Kanerva 1989; Dowty 1991; Grimshaw 1990; Gleitman 1994; Jackendoff 1983; Pinker 1989). I examine in this section the markedness of Yucatec plural arguments within various argument structure.

On the syntactic level, I examine nouns that are subject (9) and direct object (10) as well as nouns that are in propositional phrases (11).[4] The fact that speakers judge both sentences in these pairs as felicitous show that all Yucatec arguments can be morphologically marked as well as unmarked for plurality, regardless of their syntactic function in the sentences.

(9) a. *j jaat in nook'*
COMPL tear A.1SG cloth
'My clothes got torn.' (Lehmann 2015)

b. *j jaat in nook'-**o'ob***
COMPL tear A.1SG cloth-PL
'My clothes got torn.'

(10) a. *Mantats' táan u t'ab-ik kib ti' kili'ch Anton.*
constantly PROG A.3 kindle-IND candle PREP saint Anton
'Regularly he lights candles for St. Anthony.' (Lehmann 2015)

b. *Mantats' táan u t'ab-ik kib-**o'ob** ti' kili'ch Anton.*
constantly PROG A.3 kindle-IND candle-PL PREP saint Anton
'Regularly he lights candles for St. Anthony.'

4. The pairs of sentences used for judgement in this section are modified from existing sentences in the published works. Only the original sentences are acknowledged with citations. The modifications I make to these sentences are minimal: I leave out or add *-o'ob* on the targeted argument noun so that the modified sentence forms a minimal pair with the original sentence. In carrying out the judgement test, I ask for speaker's judgement on both sentences in the pair with the same intended meaning; in other words, the sentence pairs in this section are judged as felicitous without interpretation alternations.

(11) a. *leti'=e' u tak-m u baj t-u paach che'=e'*
3.SG=TOP A.3 hide-PP A.3 REFL PREP-A.3 back tree=CL
'He hides himself behind the trees.' (Gutiérrez-Bravo 2015: 75)
b. *leti'=e' u tak-m u baj t-u paach che'-**o'ob**=e'*
3.SG-TOP A.3 hide-PP A.3 REFL PREP-A.3 back tree-PL=CL
'He hides himself behind the trees.'

On the semantic level, I examine nouns of various thematic roles. The fact that both sentences in the following sentence pairs are judged as felicitous without interpretation alternations shows that all Yucatec argument nouns can be morphologically marked as well as unmarked for plurality, regardless of their thematic roles in the sentences. Below are examples of agent (12a,b), patient (12a,c), theme (13), experiencer (14) and stimulus (15).

(12) a. *Je' u chi'-ik máak sina'an=e'.*
ASR A.3 bite-IND person scorpion=CL
'Scorpions (certainly) bite people.' (Hanks 1984: 162)
b. *Je' u chi'-ik máak sina'an-**o'ob**=e'.*
ASR A.3 bite-IND person scorpion-PL=CL
'Scorpions (certainly) bite people.'
c. *Je' u chi'-ik máak-**o'ob** sina'an=e'.*
ASR A.3 bite-IND person-PL scorpion=CL
'Scorpions (certainly) bite people.'

(13) a. *Ma' uts t-in t'aan káa in w-u'uy a tsolxikin*
NEG good PREP-A.1SG tongue that A.1SG EP-feel A.2 advice
sáansamal=i'.
every.day=CL.NEG
'I don't like to hear your advice every day.' (Verhoeven 2007: 132)[5]
b. *Ma' uts t-in t'aan káa in w-u'uy a tsolxikin-**o'ob***
NEG good PREP-A.1SG tougue that A.1SG EP-feel A.2 advice-PL
sáansamal=i'.
every.day=CL.NEG
'I don't like to hear your advice every day.'

(14) a. *K-u náak-al y-óol máak yaan-tal=i.*
HAB-A.3 leave.this.way-IND EP-mood person exist-INCH=CL
'People who live there get bored.' (Verhoeven 2007: 210)

5. The word *t'aan* was originally glossed as 'speech' in Verhoeven (2007: 132). I thank an anonymous reviewer for suggesting the gloss used here.

b. *K-u náak-al y-óol máak-**o'ob** yaan-tal=i.*
HAB-A.3 leave.this.way-IND EP-mood person-PL exist-INCH=CL
'People who live there get bored.'

(15) a. *Pedro=e' su'ulak yéetel u xanab.*
Pedro=TOP ashamed with A.3 shoe
'Pedro is ashamed of his shoes.' (Verhoeven 2007: 163)

b. *Pedro=e' su'ulak yéetel u xanab-**o'ob**.*
Pedro=TOP ashamed with A.3 shoe-PL
'Pedro is ashamed of his shoes.'

On the pragmatic level, I examine nouns that are in topic (16) and focus (17) positions.[6] The fact that both positions can be occupied by semantically plural arguments with and without morphological marking indicates that the information structure of the sentence does not condition morphological markedness for plurality in Yucatec.

(16) a. *Ch'íich'-**o'ob**=e' chéen x-k'ook'-o'ob u k'ajóol.*
bird-PL=TOP only F-nightingale-PL A.3 know
'As concerns birds, he only knows nightingales.'
(Skopeteas & Verhoeven 2009)[7]

b. *Ch'íich'=e' chéen x-k'ook'-o'ob u k'ajóol.*
bird=TOP only F-nightingale-PL A.3 know
'As concerns birds, he only knows nightingales.'

(17) a. *[$_{FOC}$ Bu'ul] k-u jaan-t-ik María.*
bean HAB-A.3 eat-TR-IND María
'Beans are what María eats.' (Tonhauser 2003)

b. *[$_{FOC}$ Bu'ul-**o'ob**] k-u jaan-t-ik María.*
bean-PL HAB-A.3 eat-TR-IND María
'Beans are what María eats.'

In sum, argument structure is also not a factor that conditions the explicit grammatical expression of plurality in Yucatec.

3.2.3 *Numerical quantification*

Xrakovskij (1997) observes a cross-linguistic incompatibility of plurally marked items with the explicit mentioning of the number of those items, in other words, a general tendency of languages to avoid the collocation of numerical quantifica-

6. Sentential foci appear left adjacent to the verbal component in Yucatec.

7. The word *chéen* was originally transcribed as *chen* in Skopeteas & Verhoeven (2009). I thank an anonymous reviewer for suggesting the transcription used here.

tion and morphological pluralisation. For example, if an event is frequentivised in English, then the presence of a numerical quantificational adverbial is banned (18). Another example is the nominal plural morphology in Chechen (Nakh-Daghestanian; Russia), which is absent as long as the NP is quantified by a numeral determiner (19).

(18) John used to go fishing with his father (*four times). (Yu 2003)

(19) a. *qwo twop*
three gun
'three guns'
b. **qwo tuep-ash*
three gun-PL
Intended: 'three guns' (Yu 2003)

Contrary to this observation, Yucatec data shows that the display of plural marking is independent from the occurrence of numerals. In other words, the morphological marking of plurality on the nouns remains optional irrespective of the presence of numerical quantification. Compare (2) and (6), repeated below in (20)–(21):

(20) *ka'a-túul nukuch tso'*
two-CLF.AN big turkey
'two big turkeys' (Monforte et al. 2010: 139)

(21) *le in ka'a-túul w-íits'in-**o'ob**=a'*
DET A.1SG TWO-CLF.AN EP-younger.sibling-PL=CL
'these two younger siblings of mine' (Briceño Chel 1996: 101)

(20) and (21) contrast in that the numerical quantification, formed with the numeral-classifier construction of *ka'a-túul* 'two-CLF.AN', co-occurs both with (21) and without (20) plural morphology. In other words, the above pair of examples shows that plural marking in Yucatec depends neither on the occurrence nor on the absence of numerals. As a result, the presence of numerical quantification is not a factor that restrains the explicit grammatical expression of plurality in Yucatec either.

To summarise, the above data shows that none of the examined parameters are effective in licensing the occurrence of the Yucatec plural marker *-o'ob*. In other words, the optionality of Yucatec plural marking does not result from a variation in the interpretation of the number morphology.

3.3 Not a case of free variation

There are two possible ways that one can understand the above data points: either (i) Yucatec plural marking is unpredictable or stylistically irrelevant and, hence, the optionality is a case of free variation, or (ii) the optionality is in fact a case of conditioned variation, although the conditions of the variants have not yet been spelled out. The argumentation in 3.2 favours the free-variation explanation (i), because none of the common conditioning factors of a variation in number marking can effectively license the occurrence of the Yucatec plural marker. However, as I have argued in 3.1, the morphosyntactic analysis of the Yucatec plural marker *-o'ob* implies that *-o'ob* should not be taken as stylistically irrelevant and, hence, the free-variation explanation (i) is at stake. Below, I list some statistical evidence drawn from the corpora to argue further that any account that may end up suggesting that the optionality in Yucatec plural marking is a case of free variation would be problematic.

Although the plural marker can uniformly and freely occur in all of the conditions examined in 3.2, the frequency of its occurrence does, in fact, vary. Nominal expressions higher on the animacy hierarchy show plural morphology more frequently than the ones that are lower on the hierarchy (human terms 88%/96% vs. animal terms 62%/42.6% vs. inanimate terms 63%/22%, Schellenbach 2018).[8] When in subject position, Spanish loanwords, in contrast to Yucatec nouns, display plural morphology with *-o'ob* more frequently (45% vs. 14%, Uth & Gutiérrez-Bravo 2018). In addition, my own preliminary corpus study based on the elicited data digitally published by Lehmann (2017) shows that constructions in the form of numeral-classifier+nP are noticeably infrequent (15%) and restricted (22% text range, 17% lexeme range) when the nP is marked with *-o'ob* for plurality.

The above statistical frequency difference between markedness and unmarkedness suggests that the variation in Yucatec plural marking should not be analysed as entirely unconditioned, which argues against (i) but supports (ii). As a result, in what follows, I will assume that the optionality of Yucatec plural marking is a conditioned variation yet to be explained, and I will explore the condition of this variation in the following section. Recall that I have argued at the end of 3.1 that the availability of the Yucatec plural marker *-o'ob* needs a semantic motivation. I will start from there.

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8. The two percentages cited from Schellenbach (2018) represent the statistical results from, respectively, 'literate' speakers (i.e. people who are able to write in Yucatec) and 'nonliterate' speakers (i.e. people with "very few to no competences in writing" in Yucatec, Schellenbach 2018: 33).

4. The condition of the variation

4.1 Individuation and (pseudo-)partitivity

The semantic motivation of the availability of the Yucatec plural marker *-o'ob* must be embodied somehow in the syntactic constituents; the possible embodiments are either the plural marker itself or the nominals. In 3.2, I have argued that the variation does not lie in the interpretation of the plural morpheme; hence, the embodiment of the semantic motivation can only be the nominals. I take a stronger stance in this matter and assume that the semantic motivation to be proposed in this paper is a categorial property of the Yucatec nominals.

There are two ingredients for the analysis that I am going to pursue. The first ingredient is the line of discussions on the crosslinguistic function of counting and individuation, starting from Chierchia (1998) and continuing up until the recent discussion in Moroney's (2021) dissertation. Chierchia (1998) argues that the mass/count distinction is syntactic rather than lexical. He observes that languages differ in their noun denotations crosslinguistically: in some languages, nouns and their determinerless maximal projections are predicative; in others, they are argumental. Predicative NPs are mapped into their denotations as properties, which prevents these NPs from being arguments; they are of type <et>. In contrast, argumental NPs are mapped into their denotations as kinds, which can occur freely in argument positions; they are of type e. This typological variation is formally accounted for by what he calls the Nominal Mapping Parameter, which has further implications with respect to the nominal morphology and the syntax of a language. One prediction of this hypothesis is that a language that has both a generalised classifier system and a singular/plural contrast in nouns should not exist. Though she adopts a different theoretical framework, Borer (2005) makes a similar claim in terms of the typological dichotomy of classifiers and number contrast. She proposes that both types of languages utilise the same Classifier Phrase for individuation of stuff into countable entities and that different types of lexemes are allowed for the head position of the Classifier Phrase. Like Chierchia (1998), this model also predicts a complementary occurrence of number marking and classifiers in the typology. As mentioned in Section 2, Yucatec belongs to the group of languages that casts empirical problems for theories of this type because plural marking and classifiers can co-occur in these languages. This issue is discussed in Chung (2000); Nomoto (2013) and Kim & Melchin (2018), among others. Butler's (2011, 2012, 2013) proposal that the classifiers in these languages head Classifier Phrases (whereas the plural marking is adjoined to DP) successfully solves the morphosyntactic aspect of the problem, but the semantic motivation of the plural adjunction still awaits exploration.

Moroney (2021) proposes a unified semantics for classifiers, collectives and measure terms based upon evidence from Shan (Tai-Kadai; Myanmar). The core assumption behind her semantics is that these terms share the semantic function of providing a unit of measurement by which a noun can be individuated and that there is no significant syntactic difference among them. In other words, all of these terms function to atomise or quantise a noun, which denotes either a set of atoms or sums of atoms. This analysis is in line with Jenks (2011); Dayal (2012); Nomoto (2013) and Deal (2017), among others, and has some interesting implications, but what we are concerned here is the noun denotations and the interplay of plural morphology and classifiers. With respect to noun denotations, Moroney (2021: 33–35) argues that, since Chierchias's (1998) Nominal Mapping Parameter analysis allows for type-shifting, it is therefore unnecessary to assume that argumental bare nouns must denote kinds. As a result, she proposes that the basic interpretation of bare nouns crosslinguistically is of type <s,<et>>, *contra* Chierchias (1998), and that kind interpretation comes about through type-shifting to <se>, which occurs when a bare noun combines with a kind-verb.[9] With respect to the interplay of plural morphology and classifiers, Moroney (2021: 131–134) argues that plural morphology is distinct from classifiers in that the former has non-atomic interpretations, while the latter create atomised interpretations. Semantically, this allows derivable formalisation of the plural morphemes and the classifiers in a language, in which a plural morpheme requires a measurement of non-atomic parts of an entity and a classifier requires a measurement of atomic parts of an entity. Syntactically, this analysis allows the existence of a separate functional phrase from the Classifier Phrase to support the plural morphemes, which circumvents the abovementioned problem of Borer's (2005) analysis. In the analysis I will pursue below, I adopt the essence of Moroney's (2021) analysis but with altered formal details, mostly because of the uniqueness of the optionality in plural marking and the dis-

9. In this paper, I remain agnostic about the descriptive status of the construction of *le…*CL. However, some authors, in particular Vázquez-Rojas Maldonado et al. (2018), argue that *le…o*' is a definite article. If this analysis is on the right track, Yucatec data will pose another challenge for the typological frameworks that are in line with Chierchia (1998). This is because, assuming the definite article analysis in Vázquez-Rojas Maldonado et al. (2018), Yucatec not only has classifiers but also a definite article that co-occurs with plural marking, a phenomenon that is completely unexpected under Chierchia (1998). Nuosu Yi (Sino-Tibetan; China) is another example of a classifier language with a definite article (Jiang 2018). A unified, crosslinguistic analysis of nouns like Moroney (2021) is, hence, favoured in light of these empirical observations over Chierchia (1998) because it makes no predictions about whether or not classifier languages have definite articles. Bale & Coon (2014) and Little et al. (2022) also propose an analysis for classifiers that does not make predictions on the definiteness in the language. I thank an anonymous reviewer for pointing out the theoretical challenge with respect to the definite article and classifiers posed by the Yucatec data.

tribution of classifiers in Yucatec, which is quite distinct from the empirical evidence upon which Moroney's (2021) analysis is built.

The second ingredient is the observation of *pseudopartitives* (20) in languages, which is first introduced in Selkirk (1977) and further observed and analysed in many subsequent works, e.g. Koptjevskaja-Tamm (2001); Rutkowski (2006) and Stickney (2007). They are distinguished from *partitives* (21): ordinary partitives must involve a presupposed set of entities from which the measure is constituted (e.g. the specific wine that is referred to by 'the wine'), whereas pseudopartitives do not have such requirement: the measure simply quantifies over the entity kind (e.g. the wine-kind) (McNay 2007).

(20) Three glasses of wine.

(21) Three glasses of the wine.

Butler (2011: 42) argues that Yucatec partitives have the form of numeral-classifier+*le*+nP, as showcased in (22); hence, constructions of the form numeral-classifier+nP(+*-o'ob*) (see (5), for example) are not partitives.

(22) *le x-ch'úupal=o' t-u jat-aj* ***jun-waal le analte'=o'***
DET F-girl=CL COMPL-A.3 tear-PFV one-CLF.flat DET book=CL
'the girl tore a page from the book' (Lehmann 2015: 18)

I will not discuss the doubtful aspects of this argument but only point out that, even if Butler (2011) is right in assuming that numeral-classifier+nP(+*-o'ob*) are not ordinary partitives, it is still possible that constructions of this type involve *some sort of* pseudopartitivity. Take (5) as an example: the noun *ja'ab* 'year' without any modification is kind-referring, but the plural suffixation (*-o'ob*) and the further syntactic combination with the numeral-classifier (*óox-p'éel* 'three-CLF.INAN') renders the entire phrase a count-interpretation; this leads to a sensible conclusion that *some sort of* pseudopartitivity must take place in the course of the number modification of the bare noun. I will call this sort of pseudopartitivity *pseudopartitive operation*. I assume that the pseudopartitive operation is embodied in a *pseudopartitive operator*, which has a lexical body. I further assume that the availability of the pseudopartitive operator is the reason why a variation arises in Yucatec plural marking and that the same set of conditions regulates both phenomena. More concretely, I propose that whenever the pseudopartitive operation is available in the semantic interpretation, the nominal is marked with *-o'ob* in the morphosyntax, and whenever the nominal is marked with *-o'ob* in the morphosyntax, the pseudopartitive operation is available in the semantic interpretation. In other words, the semantic motivation of the nominal plural marking with *-o'ob* is the pseudopartitivity of the object denoted by the nominal phrase, and the overt marking with *-o'ob*

indicates exactly the aforementioned pseudopartitivity. Given the argumentation at the beginning of this section that the embodiment of the semantic motivation is the nominals rather than the plural marker, I further propose that the pseudopartitive operator is located in the Yucatec nouns. I will spell out the formal details of this account in the next subsection.

4.2 Analysis

For my account, I borrow the apparatus sketched out in Higginbotham (1994) that accounts for the grammaticality of English mass terms and their predicates, which is built upon Lønning's (1987) proposal of a general Homogeneity Constraint of the predicates that are allowed to co-occur with mass terms. For the more general setting, I follow Roeper (1983); Lønning (1987) and others in assuming that the denotations of cumulative nouns, their predicates and modifiers lie in a Boolean algebraic structure, in which the conventional Boolean operations apply. I follow Link (1983) and the subsequent works, especially Krifka (1987) and Landman (1996), in using a *-operation to define pluralisation, which is a sum operation that maps sets to their smallest cumulative superset. If a set is cumulative, it is closed under sum formation, meaning that whenever x and y are in the set, so is x+y. The semantics is truth-theoretic.

Yucatec nouns have the number opposition of general-plural, and this opposition is available throughout the entire nominal spectrum (Yu 2020; Butler 2011). This observation yields a formal representation that Yucatec nouns in their bare forms have cumulative denotations (23). Consequently, Yucatec nouns with plural marking have non-cumulative denotations that require the elements of the sets to be non-atomic (24). I adopt the analysis by Moroney (2021), as briefly sketched out in 4.1, which contends that the basic interpretation of bare nouns crosslinguistically is of type <s,<et>>, irrespective of the existence of classifiers in the language. For simplicity reasons, I ignore the situation and the world variables and assume that Yucatec nouns are of type <et> in my analysis below.

(23) $[[\text{nP}]] = \lambda x_e.{}^*P(x)$

(24) $[[\text{nP-}o'ob]] = \lambda x_e.[{}^*P(x) \wedge \neg \text{atom}(x)]$

Hence, the denotation of the Yucatec plural marker follows (25):

(25) $[[\text{-}o'ob]] = \lambda P_{<e,t>}.\lambda x_e.[{}^*P(x) \wedge \neg \text{atom}(x)]$

I have argued elsewhere (Yu forthcoming) that Yucatec nouns have mass extensions, as proposed for nouns crosslinguistically in Borer (2005) and for the so-called substance nouns (as opposed to object nouns) in Deal (2017). Since the

denotations of mass terms are themselves cumulative, the smallest cumulative superset of the set that represents the denotation of a particular mass term equals the original set (26); therefore, this yields a simplified equivalence of the denotations for the above items (27)–(29):

(26) $\lambda x_e.{}^*P(x) = \lambda x_e.P(x)$, where P is a nominal predicate of a mass term

(27) $[[nP]] = \lambda x_e.P(x)$

(28) $[[nP\text{-}o'ob]] = \lambda x_e.[P(x) \wedge \neg atom(x)]$

(29) $[[\text{-}o'ob]] = \lambda P_{<e,t>}.\lambda x_e.[P(x) \wedge \neg atom(x)]$

The proposed pseudopartitive operator from the previous subsection is defined in (30). The pseudopartitive operator α_n takes a cumulative set and returns an apportionable set. The two parameters n and g restrict the characteristics of the apportionment. n is set to define the number of apportionment; when left undefined, it simply indicates that the output set is apportionable and, hence, subject to number interpretation in further operations. g is a preset parameter which determines the contexts of variable assignment; the information of the nature of the apportionment is also defined in g. Note that I retain the *-operator in this definition, even given the Yucatec specific equivalence in (26). This is because I want to leave it open whether this operator only applies to Yucatec or is also applicable to other (Mayan) languages.

(30) $[[\alpha_n]]^g = \lambda P_{<e,t>}.\lambda x_e.[A_n[{}^*P(x)]]$

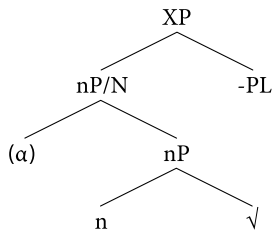
Essentially, α_n is designed as an operator that takes an input set and returns an output set which comprises n subsets of the same size defined in g. The role of α_n is to map non-quantised denotations onto quantised ones. Note that this operator, though similar in spirit to the atomisation function proposed in Deal (2017), does not go so far as to assume that the output set consists solely of atomic elements: it only requires that the elements of the output set are the same size, however this size is defined in g.[10] This view is compatible with Wilhelm's (2008) OU ('object units') operator, which accesses the minimal units, not necessarily the atoms, in the noun's denotation. My proposal is, nevertheless, semantically different from Wilhelm's (2008) OU in that α_n creates, rather than accesses, the desired apportionment.

The morphosyntactic position of the pseudopartitive operator α_n is given in (31). Since α_n needs to be within the nouns (cf. 4.1) and *-o'ob* is adjoined to the

10. Coincidentally, the atomisation function proposed in Deal (2017) is also called α, which stands for 'atomisation'. The operator α proposed in this paper, on the other hand, stands for 'apportionment'.

phrase level (cf. 3.1), it follows that it is best to postulate α_n as being the last item that can merge at the word formational level (e.g. specifier of N, for instance). Further, instead of a DP-analysis as originally proposed in Butler (2011, 2012, 2013), I adopt an NP-analysis for the reason that, so far, there are no arguments that favour a DP-analysis over an NP-analysis for Yucatec, but the latter presents more simplicity in the semantics than the former. Following this adaptation, I no longer hold the same claim as Butler (2011, 2012, 2013) in assuming that *-o'ob* is adjoined to DP, but only assume that it is adjoined to a phrase-level nominal projection higher than nP, which is represented as XP in the following syntactic structures whenever X is unclear. The proposed structure of a Yucatec NP is given below in (31):

(31)



The above postulation of α_n correctly predicts that, as soon as a pseudopartitive operation is done within the nominal projection, the plural adjunction is made available in a later projection. In other words, it is the pseudopartitive operator that enables a plural adjunction, but not the other way around. This being the case, α_n can be understood as the semantic motivation of the plural adjunction.

Under what conditions, then, is α_n available? Given that the salient semantic contribution of α_n is the apportionment of the unapportioned entity kind, as the definition of this operator indicates, one would expect that whenever a number interpretation (e.g. counting) is available for a Yucatec noun, α_n is present. This entails that all Yucatec nouns should have the ability to combine with α_n (because all Yucatec nouns can have plural interpretations) but not under all types of circumstances. In addition, given the syntactic postulation of α_n, one would also expect that the combination of α_n is non-reversible; hence, the already apportioned entity sets should be banned from combining with α_n. These conditions are summarised below in (32):

(32) Conditions of the pseudopartitive operation
   a. All bare nouns in Yucatec have the ability to combine with the pseudopartitive operator α_n.
   b. The combination with the pseudopartitive operator α_n is non-reversible.

c. The combination with the pseudopartitive operator α_n is obligatory. The only exception is when the noun is not subject to number interpretation whatsoever in later syntactic projections (e.g. under generic reading).

(32a) allows all Yucatec nouns to undergo the pseudopartitive operation. Formally, this is made possible because α_n must take a cumulative set as argument, and all Yucatec nouns have cumulative denotations. (32b) forbids any Yucatec noun with plural morphology to undergo the pseudopartitive operation. Formally, this ban is achieved through the incompatibility of the non-cumulative denotations of plural nouns with the requirement of a cumulative argument of α_n. (32c) further restricts (32a) in specifying the circumstances when the pseudopartitive operation is obligatory, namely, when the Yucatec noun is subject to number interpretation such as counting in the semantic interpretation of the higher projections. Note that (32c) says that the pseudopartitive operation is not obligatory if the Yucatec noun is not subject to number interpretation. Due to the principle of economy in languages (Martinet 1955), however, nouns under generic reading most often do not combine with α_n in real practice.

If my analysis thus far is on the right track, one would expect that plural marking is strongly disfavoured in contexts where it is apparent that a generic reading is called upon. This is exactly the case. The following example from a casual elicitation shows that there is a clear preference of (33a) over (33b) because a generic reading is called upon in the discourse context:

(33) a. *In p'óok=e' chuup yéetel ja'*.
A.1SG hat=TOP full with water
'My hat is full of water.'

b. ??*In p'óok=e' chuup yéetel ja'-**ob***.
A.1SG hat=TOP full with water-PL
Intended: 'My hat is full of water.'

With both semantic and syntactic postulations at hand, I now present the computation of the denotations of Yucatec nouns. Let us take the noun *ja'ab* 'year/years' from (5) for an example. Under a generic interpretation, the bare noun does not obligatorily combine with α_n (32c); thus this usage of *ja'ab* has the following interpretation (34):

(34) $[[ja'ab]] = \lambda x.{}^*year(x) = \lambda x.year(x)$

Under a non-generic interpretation, the bare noun has to combine with α_n before further operations (32a) so that the noun can receive an apportionable interpretation. Yucatec nouns are of type <et>, as suggested in (23) and (27). The definition of α_n in (30) shows that α_n is of type <et,et>. As a result, the combination of bare

noun with α_n requires the application of α_n to the noun denotation. (35) shows the non-generic interpretation of *ja'ab:*

(35) $[[ja'ab_{ap}]] = [[\alpha_n]]^g ([[ja'ab]])$
$= \lambda P.\lambda x.\alpha_n[^*P(x)](\lambda y.year(y))$
$= \lambda x.\alpha_n[^*\lambda y.year(y)(x)]$
$= \lambda x.\alpha_n[^*year(x)]$
$= \lambda x.\alpha_n[year(x)]$

In the next subsection, I will present further computations of Yucatec nominal constructions that involve the pseudopartitive operation.

4.3 Compositionality

There are, in total, six cases that invite a computational analysis. Recall that in Section 2, I have listed four cases of nominal constructions in which the Yucatec plural marker *-o'ob* can occur. All nouns which appear in these constructions must receive apportionable interpretation because it is the semantic pseudopartitive operation that motivates the syntactic adjunction of *-o'ob* (31). In addition, any noun that appears in its bare form but follows a numeral-classifier construction must also receive apportionable interpretation, because these nouns are subject to number interpretation (32c). Note that it follows from my analysis that nouns with apportionable interpretation are not necessarily plural: the numeral in the numeral-classifier construction may well be one, but the noun that follows it must nevertheless receive apportionable interpretation. Moreover, bare nouns that trigger plural agreement or are referred back by plural anaphora must also receive apportionable interpretation. The computation of this last case is, however, already exemplified in (35).

I will leave out the two cases which involve the construction of *le…* CL from the computational demonstration due to the disputable descriptive status of this construction; see, for example, the summary of analyses and descriptions from existing literature in Vázquez-Rojas Maldonado et al. (2018) for more details concerning this matter. In what follows, I will present the computation steps of the remaining three cases.

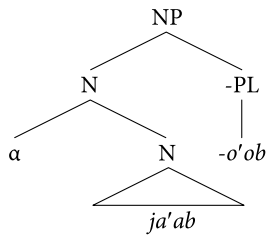
4.3.1 *Pluralised nouns*

Yucatec nouns with plural morphology have the syntactic structure as sketched out in (31): after the stem formation, the bare noun needs to combine with α_n before further operations (32a) so that the noun can receive an apportionable interpretation; subsequently, the apportionable version of the noun further com-

bines with the plural marker *-o'ob*. As mentioned above, Yucatec nouns are of type <et>, α_n is of type <et,et>, so the resulting higher N in (31) is of type <et>. Since NP is of type <et>, the plural marker *-o'ob* is of type <et,et>, which is exactly the semantic type yielded from the denotation of *-o'ob* given in (25) and (29). It follows that the computation of a plural NP as in (31) requires the application of the plural marker *-o'ob* to the higher N, which is the apportionable version of the noun that receives the non-generic interpretation.

Let us continue to take the noun *ja'ab* 'year/years' as an example. The pluralised noun is *ja'abo'ob* 'years', the structure of which is as follows:

(36)



The computation steps of the interpretation of a pluralised Yucatec noun as exemplified by *ja'abo'ob* is given below in (37):

(37) $[[ja'abo'ob]] = [[-o'ob]]([[ja'ab_{ap}]])$
$= \lambda P.\lambda x.[P(x) \wedge \neg atom(x)](\lambda y.\alpha_n[year(y)])$
$= \lambda x.[\lambda y.\alpha_n[year(y)](x) \wedge \neg atom(x)]$
$= \lambda x.[\alpha_n[year(x)] \wedge \neg atom(x)]$

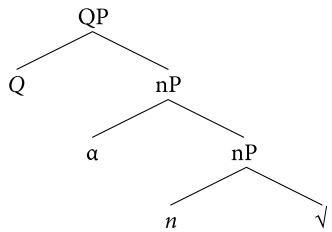
4.3.2 *Numeral-classifiers with bare nouns*

The Yucatec numeral-classifier construction can form a counting unit by combining with a nominal (Lehmann 1998: 20). Here, I assume that the numeral-classifier is the head of a QP, which c-selects an nP or an NP. It does not matter much for the current analysis, but see next subsection for the difference between these two options. Consequently, the structure of a numeral-classifier+nP construction would be either (38) or (39).[11]

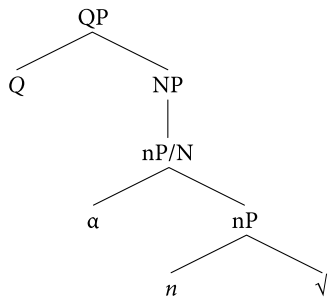
---

11. The syntax and semantics of the Yucatec numeral-classifier construction is beyond the scope of this research and so will not be discussed in further detail. For the purpose of the current analysis, it is sufficient to know that in Yucatec, the numeral and classifier together form a constituent, which then combines with a nominal constituent. In the lines of discussions on classifiers, numerals and nouns, this type of structure, referred to as a *measure structure*, contrasts with a *partition structure*, in which the classifier combines with the noun first before combining with the numeral (Bale & Coon 2014; Bale et al. 2019). Both types of structure exist in Mayan (Little et al. 2022).

(38)



(39)



As the head of QP, the numeral-classifier denotes the result of the apportionment, namely, the exact number of portions of the entity denoted by nP/NP.[12] QP denotes the resulting set of entity and is, therefore, of type <et>; since both nP and NP are of type <et>, the semantic type of Q is <et,et>. As a consequence, the denotation of the numeral-classifier is as follows (40):[13]

(40) [[numeral-classifier]] = $\lambda P_{<e,t>}.\lambda x_e.[P(x) \wedge |n|=i]$, where i corresponds to the integer denoted by the numeral, and n is the number of portions relative to α_n and g

The above denotation of the numeral-classifier also ensures that the operator α_n must be found somewhere in the formula of P(x), otherwise the variable n would be undefined. This is the formal way of saying that numeral-classifiers must combine with nouns with apportionable interpretation.

---

12. Since the semantics of the Yucatec classifiers do not contribute to the number -related interpretations of the nominals, I do not include the meaning of the particular classifier in this analysis for the sake of simplicity. Lehmann (1998: 72) notes that the choice of numeral classifier for a specific noun is essentially based on its physical properties and that the classification is exhaustive. Moreover, the slot *classifier* can also be occupied by mensuratives, which are an open class of lexical items.

13. Following Kratzer (2008), I assume that counting is only available for atomic elements. Hence, $|x| = |\{y: y \leq x \wedge atom(y)\}|$ if there is a set of atomic individuals that x is the sum of; undefined otherwise.

Let us keep using *ja'ab* 'year/years' as the building block of our examples and let (41) exemplify the construction of numeral-classifier+nP:

(41) *óox-p'éel* *ja'ab*
three-CLF.INAN year
'three years'

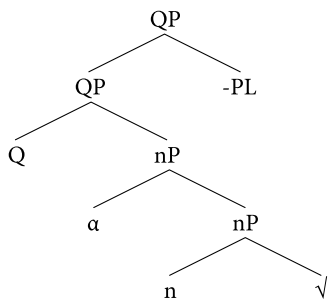
The semantic types of Q and nP/NP require that Q is applied to nP/NP. As a result, (41) receives the interpretation in (42):

(42) $[[\textit{óoxp'éel ja'ab}]] = [[\textit{óoxp'éel}]]([[\textit{ja'ab}_{ap}]])$
$= \lambda P.\lambda x.[P(x) \wedge |n|=3](\lambda y.\alpha_n[year(y)])$
$= \lambda x.[\lambda y.\alpha_n[year(y)](x) \wedge |n|=3]$
$= \lambda x.[\alpha_n[year(x)] \wedge |n|=3]$

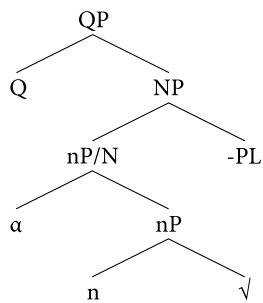
4.3.3 *Numeral classifiers with pluralised nouns*

In very rare cases, the morphologically plural nouns can appear in a counting unit, as in (5). In the previous subsection, I remained agnostic with respect to whether a QP c-selects an nP or an NP (38–39) because these two options have not made a difference in the analysis thus far. In the current subsection, however, the two options do make slightly different predictions with respect to the syntactic position of the plural marker *-o'ob*, as shown below in (43–44): *-o'ob* must adjoin above Q if QP c-selects an nP (43) but can adjoin beneath Q if QP c-selects an NP (44).

(43)



(44)



My analysis and its agnosticism stand with respect to the c-selection detail of Yucatec QP neither favouring nor ruling out either of the above two syntactic structures. Note that this lack of certainty is not at all a problem for the current analysis. Firstly, the linear output of the entire QP stays the same, irrespective of the structural choice between (43) and (44); secondly, the option between (43) and (44) provides two distinct positions to which the plural marker *-o'ob* can adjoin in the syntactic structure, which, if anything, only underlines the previous accounts that analyse the plural marker as an adjunct, as it is shown here that *-o'ob* can be attached to different projections in different cases,– an essential property of an adjunct modifier. Since there are no drawbacks to staying agnostic about the details of the constituent c-selected by the QP in Yucatec, I will keep this stance in the following analysis.

As mentioned above, QP is of type <et>, Q is of type <et,et>, the plural marker *-o'ob* is of type <et,et> and both nP and NP are of type <et>. Consequently, the higher QP in (43) is yielded from the application of the plural marker *-o'ob* to the lower QP, and the QP in (44) is yielded from the application of Q to NP.

Thus, the interpretation of the numeral-classifier constructions with plural nouns, as exemplified by (5), is as follows: under the assumption that (43) is the case, (5) receives the interpretation in (45). Under the assumption that (44) is the case, (5) receives the interpretation in (46):

(45) $[[\textit{óoxp'éel ja'abo'ob}]] = [[\textit{-o'ob}]]([[\textit{óoxp'éel ja'ab}]])$
$= \lambda P.\lambda x.[P(x) \wedge \neg atom(x)](\lambda y.\alpha_n[year(y)] \wedge |n|=3)$
$= \lambda x.[[\lambda y.\alpha_n[year(y)] \wedge |n|=3](x) \wedge \neg atom(x)]$
$= \lambda x.[\alpha_n[year(x)] \wedge |n|=3 \wedge \neg atom(x)]$
$= \lambda x.[\alpha_n[year(x)] \wedge |n|=3]$

(46) $[[\textit{óoxp'éel ja'abo'ob}]] = [[\textit{óoxp'éel}]]([[\textit{ja'abo'ob}]])$
$= \lambda P.\lambda x.[P(x) \wedge |n|=3](\lambda y.\alpha_n[year(x)] \wedge \neg atom(x)])$
$= \lambda x.[[\lambda y.\alpha_n[year(y)] \wedge \neg atom(x)](x) \wedge |n|=3]$
$= \lambda x.[\alpha_n[year(x)] \wedge \neg atom(x) \wedge |n|=3]$
$= \lambda x.[\alpha_n[year(x)] \wedge |n|=3]$

The above two methods of computation show that the resulting interpretation is identical regardless of the syntactic nuances. I therefore leave the work of determining the syntactic structure of this type of Yucatec construction to future research.

It is worth noting that the above compositions also provide an insight from a semantic perspective as to why numeral-classifier constructions with plural nouns are rare in speech. The conjunction of $|n|=3 \wedge \neg atom(x)$, which specifies the

number information of the nominal provided, respectively, by the numeral and the plural marker, contains redundant information of the entity number and so violates the Gricean maxims.

5. Further discussion

Before concluding this paper, I want to briefly address two related issues that require a more thorough discussion than can be provided here. First, since the above account is delimited to the treatment of Yucatec nouns, is it possible to extend it so that it can also include the treatment of Spanish loanwords, given the complications of Spanish loanwords in plural marking (as discussed in Gutiérrez-Bravo & Uth 2020)? I will outline a simple solution here but leave the technical details for another occasion.

The simplest solution to this extension is to treat the Spanish loanwords as doppelgängers: depending on the particular syntactic setting, a Spanish loanword can enter a syntactic projection either as a Spanish noun, with all its features borrowed from Spanish, or as a Yucatec noun. The latter case is already accounted for by the proposed analysis. For the former case, if a Spanish numeral, instead of a Yucatec numeral, heads a QP in the syntax and c-selects a NumP, then the Spanish loanword merged within the NumP must carry features of a Spanish noun and is, therefore, obligatorily pluralised by the Spanish plural marker *-s;* the semantic computation of these projections follows accordingly.

The above solution has several apparent advantages. First, it retains a unified nominal system and, furthermore, successfully accounts for the observation that the double plural marking on Spanish loanwords is allowed only in the sequence of *-s-o'ob*, but not *-o'ob-s*. Moreover, a doppelgänger analysis is compatible with the observation of language change that is happening in Yucatec due to language contact (Pfeiler 2009).

Second, the condition of the pseudopartitive operation in (32c) entails that the trigger of this semantic operation is that the noun receives number interpretation. The question is, can we exhaust the circumstances in which nouns receive number interpretation? So far, I have only considered number interpretation of nouns that is made explicit from the morphosyntax, for example, when the noun is modified by numerals or is referred back by non-singular anaphora; but is morphosyntax the only place where number interpretation can be implied?

I provide four possible factors that correlate with these circumstances but leave the examination of these factors to future work. Firstly, the individual speaker's preference of object counting can play a role in their speech in terms of whether they tend to give number interpretation to the nouns or not. Secondly,

dialectal variation may also be relevant in this regard, because it is possible that certain groups of speakers are accustomed or more inclined to give number interpretation to the nouns than other groups of speakers. Thirdly, the availability of the two choices (whether or not a noun receives number interpretation in the language) suggests an overlap of two language layers, which may be the result of either language contact or diachronic variation. Lastly, one must not forget that variation can be due to stylistic reasons, such as disambiguation of discourse referents.

6. Conclusion

In this paper, I have argued that the optionality in Yucatec plural marking was not a case of free variation but, rather, of conditioned variation whose conditions were not yet explained. I then provided a semantic account for this variation. I proposed that the condition of the variation in plural marking in Yucatec is whether the noun is subject to number interpretation, and this condition is manifested by the option of a pseudopartitive operation at the last stage of noun formation in the formal semantics. I showed how the denotations of nouns vary with and without the pseudopartitive operation and that the nouns with plural marking always have the apportionable denotations resulting from pseudopartitive operations. In addition, I strengthened the analysis by demonstrating the computation of other number constructions in Yucatec that involve not only pseudopartitive operations but also compositionality. The computation of these constructions yields correct results, which endorses my proposal of the pseudopartitive operator within the nominal category. Finally, I discussed the treatment of Spanish loanwords within this account and the non-syntactic factors that may contribute to the noun interpretations.

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Abbreviations

The orthographical system used in this paper is in accordance with the 1984 phonemic orthographic conventions of the *Academia de la Lengua Maya de Yucatán* (CDAM 1984). The abbreviations used in the examples are the following:

1	first person
2	second person
3	third person
A	set A
AN	animate
ASR	assurative
B	set B
CL	clitic
CLF	classifier
COMPL	completive
DET	determiner
EP	epenthesis
F	feminine
FOC	focus
INCH	inchoative
IND	indicative
HAB	habitual
NEG	negation
PFV	perfective
PL	plural
PP	present perfect
PREP	preposition
PROG	progressive
REFL	reflexive
SG	singular
TOP	topic
TR	transitive

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CHAPTER 11

Variation of deontic constructions in spoken Catalan

An exploratory study

Roser Giménez García;[1,2] Sheila Queralt[2] & F. Xavier Vila[1]
[1] Universitat de Barcelona | [2] Laboratorio SQ - Lingüistas Forenses

Different areas of linguistic research have given different meanings to the notion of free variation. This paper reflects on this term and variationist linguistics. We focus on the variation between prescriptive and nonstandard deontic verbal constructions in Catalan. Through a variationist lens, we use decision trees to explore 1,060 tokens of infinitive constructions with *caldre, haver de, tenir de, tenir que* and *haver-hi que*. The discussion of results is broadened to show that variationist linguistics can dismiss but not prove the existence of free variation, a notion we argue is nevertheless relevant in linguistics, whether as a fuel for more empirical studies of language use or as a label for linguistic phenomena for which no explanation is (yet) known.

Keywords: variationist linguistics, free variation, Catalan, Spanish, deontic modality, verbal periphrasis, decision trees

1. Introduction

In variationist linguistics, it has been claimed that if a linguistic variable cannot distinguish between social groups, then it must be in free variation (Ellis 1999: 463, Labov 1966). However, since the underlying assumption of this approach (i.e. that language is systematic and rule-governed; Labov 1966) would in theory preclude free variation, the general aim of this paper is to reflect on whether the variationist approach to linguistic variation is really fit to prove the (non)existence of free variation. To do so, it specifically aims to explore the variation between deontic verbal constructions in Catalan, taking into consideration linguistic and sociolinguistic variables. The sample analysed comes from a longitudinal research project. This facilitates controlling for situational and individual factors, since the speakers and the communicative situation remain stable across time.

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The rest of the paper is structured as follows. Section 2 deals with free variation in linguistics. Section 3 introduces the variation between five deontic constructions in contemporary Central Catalan. Section 4 outlines the methodological decisions of our study. Section 5 presents the main results, discussed in Section 6. Section 7 broadens the discussion to the implications of the study as to whether free variation can be empirically tested through variationist linguistics. Section 8 summarises our conclusions.

2. Free variation in language

Various areas of linguistic research have conceptualised free variation differently. For example, in Optimality Theory (OT), only grammatical principles are absent in variation phenomena described as instances of free variation, but these may be affected by sociolinguistic or performance variables, among others. This is because, in OT, "[t]he grammar is deterministic, in the sense that each input is mapped onto a single output – the most harmonic candidate for a constraint hierarchy" (Kager 2004: 404).

This understanding of free variation contrasts with those in psycholinguistics and sociolinguistics. Whereas in psycholinguistics this term refers to "non-systematic variation in an individual language user", in variationist linguistics it is defined as "non-systematic variation within a speech community", and the factors considered in these studies to explain variation may be social and situational as well as linguistic (Ellis 1999: 463). This paper uses the latter definition.

Even though (or perhaps precisely because) the starting point in variationist linguistics is that "[s]yntactic variation at the level of the individual speaker and the community is not chaotic and distributed randomly but is governed by social rules (Labov 1972, 1994 and many others)" (Cornips 2015: 153), free variation has fuelled many variationist studies. In this area of sociolinguistics, as Joos (2012: 185–186) puts it, *free variation:*

> [...] mean[s] merely 'not yet accounted for'. It is the technical label for whatever clearly does not need to be accounted for during the current operation in analysis; and to assume that it will never need to be accounted for in later operations would be a serious misunderstanding.

In this sense, it is only intended as a temporary tag attached to certain linguistic phenomena while scholars seek explanations for them. This is the meaning that Stokes (2011: 129) seems to give to free variation when summarising Espuny's (1998: 284) finding that a speaker changes from the Catalan infinitive periphrasis *haver de* to *tenir que* for no apparent contextual reason: "There seems to be no

reason for the shift from one to the other, perhaps indicating that there is free variation between the two forms."

This use of free variation has been crucial in variationist linguistics, as it signals issues that need further empirical attention. In our case, it was partly this suggestion that two deontic periphrases might display free variation in Catalan, alongside the frequent (but superficial) allusions to speakers' use of nonstandard variants (*tenir que, haver-hi que*) in the descriptive literature, that led us to employ this topic as a tool to reflect on variationist linguistics and free variation.

Free variation has been used in other areas of linguistics. Kiesling (2011: 8) graphically describes its use in structuralist and some generativist studies on phonology as a "dustbin" for phonemes whose phonetic characters could not be categorically predicted. The categorisation of phenomena for which no explanation is known constitutes a very important first step towards the construction of knowledge. This meaning of free variation has allowed structuralists and generativists to focus on areas of language which can be used to develop their programs.

Thus, in variationist linguistics, the concept of free variation is helpful in distinguishing linguistic phenomena that can and cannot be explained by (socio)linguistic constraints. Complementarily, its use in formalist approaches is relevant for the refinement of models of grammar. Nevertheless, neither perspective makes it possible to demonstrate the existence of free variation in language. Variationism might rule out free variation when a dataset correlates with independent variables, but it can hardly argue for the existence of free variation when it assumes that language is governed by rules that can be discovered by observing empirical evidence. Simultaneously, traditional models of grammar have dismissed linguistic variation and use as something other than their object of study and have focused instead on decontextualised structures (Chomsky 1965: 3).

However, the need for complementary approaches to converge, i.e. for linguistic use to inform theoretical models, has been repeatedly advocated for (e.g. Adger and Trousdale 2007: 274; Adli, García García and Kaufmann 2015: 14–15; Seiler 2015: 259–260). Several proposals on how to account for variation within Minimalism and other theoretical enterprises have emerged (e.g. Adger 2016; Baechler and Pröll 2019; Bader 2020). In what follows, variation between verbal constructions in Catalan is used to reflect on variationist linguistics and free variation, a notion shared by numerous approaches to linguistics.

3. Deontic verbal constructions in Catalan

Central Catalan varieties have various linguistic mechanisms that express deontic modality through verb forms. Some, like *haver de* + infinitive (from now on, *haver de*), are referred to as verbal periphrases in prescriptive grammars, whereas *caldre* + infinitive (here onwards, *caldre*) is termed a non-periphrastic construction (IEC 2016: 951). We therefore use the cover term *verbal constructions* for all these variants or allostructions (i.e. "(truth-)semantically equivalent but formally distinct manifestations of a more abstractly represented construction"; Cappelle 2009: 187).

The inflected verb forms in these constructions are all followed by an infinitive – *deure* + infinitive, *caldre* + infinitive, *haver de* + infinitive and *tenir de* + infinitive (from here on, *tenir de*) – and may be used interchangeably in many linguistic contexts, although some syntactic differences exist between them (see Section 3.1). Nevertheless, *deure* + infinitive is nowadays rarely used to express deontic modality in most Catalan varieties (Cabanes Fitor 1996; IEC 2016: 951): in informal use, speakers choose (in principle) among five semantically equivalent forms, the latter three constructions above and another two infinitive periphrases, which originate from the centuries-long linguistic contact between Catalan and Spanish: *tenir que* + infinitive and *haver-hi que* + infinitive (henceforth, *tenir que* and *haver-hi que*).

Although the latter are described as "unacceptable" by the prescriptive Catalan grammar (IEC 2016: 951), "[t]here is abundant anecdotal evidence" of their use, especially of *tenir que* (Stokes 2015: 461). Such evidence includes Rigau's (1998: 80) brief mention that *haver-hi que* would be gaining ground in contexts where *caldre* was previously the leading variant in Southern dialects and Sinner's (2008: 534) use of *tenir que* as an example of elements that are "quite common" in informal varieties but considered "alien to the language" in prescriptive works (cf. i.a. Hualde 1992: 325; Cabanes Fitor 1996; Martínez Díaz 2002: 87).

Due to its history and the prolonged language contact between Catalan and Spanish, currently all Catalan speakers are, at least, bilingual in these Romance languages, with the only exception being Catalan speakers in Northern Catalonia (southern France) and Alghero (Sardinia, Italy) or in diaspora (e.g. Martines 2020: 315–316, Galindo, De Rosselló and Bernat 2021). This is vital to better understand the variation between the deontic verbal constructions, since both languages have similar systems. Table 1 summarises the main possible deontic constructions in each variety.[1] Prescriptive Catalan grammar describes *tenir de*

1. Catalan and Spanish have other deontic constructions, such as the complex verbal constructions *fer falta* (Sp. *hacer falta*) or *ser necessari* (Sp. *ser necesario / ser preciso*), which mean 'to be necessary'. Practical constraints precluded the inclusion of *fer falta* in the analysis, despite

and *deure* as only found in old varieties. It claims that the former is nowadays only used in informal settings and the latter only in Valencian varieties or somewhat fixed expressions like *He fet el que devia* 'I did what I must'. In constrast, *haver de* and *caldre* are described as acceptable forms regardless of the setting (IEC 2016: 951). Variants in parentheses in Table 1 are described in prescriptive works as only used in certain varieties. The forms with an asterisk are marked in most modern vernacular varieties and settings (although *haber de* is found in formal written Spanish), as they are seen as less acceptable than their counterparts, generally perceived as genuine or not originating from the contact between Catalan and Spanish. Contrary to folk belief, however, some did not result from this sociolinguistic situation but either from the languages' own diachronic evolution or from contact with other languages (cf. Conde Noguerol 2016 on *caler* in Spanish or Sentí 2015 on *deure* in Catalan).

Table 1. Catalan and Spanish systems of deontic verbal constructions

	Standard Catalan	**Vernacular Catalan**	**Standard Spanish**	**Vernacular Spanish**
Used in all grammatical persons	*haver de* + infinitive (*tenir de* + infinitive)	*haver de* + infinitive *tenir de* + infinitive **tenir que* + infinitive **deure* + infinitive	*tener que* + infinitive *deber* + infinitive (*haber de* + infinitive)	*tener que* + infinitive *deber* + infinitive **haber de* + infinitive
Used in third person	*caldre* + infinitive	*caldre* + infinitive **haver-hi que* + infinitive	*haber que* + infinitive (*caler* + infinitive)	*haber que* + infinitive **caler que* + infinitive

Source: adapted from Stokes (2015: 447).

The use of these constructions is influenced by linguistic constraints and possibly also by sociolinguistic factors, as suggested by previous publications. The elements considered in our study of this phenomenon of variation are discussed in the remainder of this section.

its presence in the sample (54 tokens). However, we intend to incorporate it in future studies of this phenomenon, since it has become widely used in many Catalan varieties and its syntactic behaviour somewhat resembles that of *caldre* (cf. Rigau 1998: 68).

3.1 Catalan deontic constructions and linguistic factors

To understand how speakers use these deontic constructions, we must consider linguistic constraints that affect their acceptability. These and their operationalisation in our study are outlined below.

Syntactic and semantic differences exist between these modal constructions. Firstly, regarding grammatical person, *caldre* and *haver-hi que* are (almost)[2] exlusively used in third person, whereas *haver de, tenir de* and *tenir que* are used in any grammatical person. *Haver-hi que* is a (relatively recent) calque of the Spanish *haber que*, described by prescriptive grammar as a third-person verb (RAE 2010: 2148). As for *caldre*, Catalan prescriptive grammar describes it as a defective verb (IEC 2016: 272). Previous studies have considered grammatical person as a linguistic variable that may interact with their use.

According to Mier (1986: 47), there would be a syntactic restriction in the use of *tenir que* and *tenir de* in that *haver de* is used more frequently in a reflexive construction than the others ("[t]his is true whether the reflexive is the impersonal *s'ha de* or a personal reflexive such as *t'has de*", Mier 1982: 31). In Stokes (2015: 461–462), a more recent study on *haver de* and *tenir que* on Twitter, the reflexive third person pronoun *se* also favours the use of *haver de*, whereas *tenir que* in this context appears "severely limited". Stokes (2015) also finds *tenir que* mostly in first person singular and plural (60.5% of cases), whereas *haver de* appears most frequently in third person (50.8% of instances). Thus, grammatical person is one of the linguistic variables in our study.

Additionally, Rigau (1999: 194), following the traditional Catalan grammarian Anfós Par (1923), argues that *caldre* is a "relativized impersonality" construction:

> Therefore the verb *caldre* behaves as an impersonal verb. But its impersonal character may be relativized by the presence of an argument indicating the person implied or interested in the situation, that is, the argument that shows dative case.

Rigau (1999) states that this dative argument functions as the subject of the sentence, a claim we do not share. Interestingly, however, note that *caldre* may take an experiencer before the inflected form regardless of the infinitive it accompanies when it is not followed by an inflective subjunctive clause. This is not possible with the other constructions because of their syntactic structure, in which the subject is personal and specified for gender and number in the inflected verb. For example, speakers of Central Catalan may utter *{Cal / Hi ha que / S'ha de /*

2. See Rigau (2005a: 246) on the change in progress by which some speakers would also accept other uses of *caldre* + infinitive. However, no uses of *caldre* + infinitive other than third person were found in our data.

Es té de / Es té que} tenir molta paciència 'One needs to have a lot of patience' as well as *Ens*$_{[exp]}$ *cal tenir molta paciència* 'We need to have a lot of patience' but not **Ens*$_{[exp]}$ *{hi ha*$_{[3rd\ pers.\ sg.]}$ *que / hem*$_{[3rd\ pers.\ pl.]}$ *de / tenim*$_{[3rd\ pers.\ pl.]}$ *de / tenim*$_{[3rd\ pers.\ pl.]}$ *que} tenir molta paciència* (cf. Rigau 1999: 344).

Thus, while all the constructions in this study express deontic modality in the same linguistic contexts, the sentences in which they appear may need to undergo a few adjustments to meet the requirements of the verb form regarding grammatical person and argument structure. For instance, *haber que* (and *haver-hi que*) generally selects third person clitic pronouns[3] in sentences with verbs with reflexive pronouns, such as *Hay que ducharse* (Cat. *{Cal / Hi ha que} dutxar-se* 'One needs to shower'). In contrast, the deontic periphrases with *haver* and *tenir* cannot appear with such *se*-forms, since a sentence cannot have two third-person *es* pronouns nor the pronoun *es* performing two functions (e.g. *{Hem de / Tenim de / Tenim que} dutxar-nos* vs *{*S'ha de / *Es té de / *Es té que} dutxar-se*; IEC 2016: 895–896). Yet, similarly to the impersonal constructions with *caldre* and *haver-hi que*, these three periphrases can be used with no definite subject with transitive verbs (e.g. *{Cal / Hi ha que / S'ha de / Es té de / Es té que} comprar pa* 'Someone has to buy bread').

Secondly, as seen thus far, all the constructions can be followed by an infinitive clause. However, because of its semantic load (Rigau 2005b: 782), *caldre* can also be followed by a noun phrase (*Cal aigua* 'Water is necessary'), a determiner phrase (*Cal una gàbia* 'A cage is necessary') or an inflected clause, in which case the subjunctive is selected: *Cal que tingui*$_{[subjunctive]}$ *aigua* 'It needs to have water'. These are not possible with the other variants due to the conjunction (*que*) or preposition (*de*), which select an infinitive clause (e.g. **Té de {aigua / una gàbia / que tingui* $_{[subjunctive]}$ *aigua}* '*(S)he has to {water / a cage / have$_{[subjunctive]}$ water' vs *Té de tenir*$_{[infinitive]}$ *una gàbia* '(S)he has to have$_{[infinitive]}$ a cage'). Thus, we consider only instances of *caldre* followed by an infinitive.

Also because of its semantics, *caldre* allows for the infinitive form to be omitted (e.g. *No cal* '[That] is not necessary'), especially when the context facilitates retrieving the information conveyed by the infinitive. In these cases, the infinitive can be elided in some Spanish deontic constructions (*¿Puede salir ya? Sí, puede* 'May (s)he come out yet? Yes, (s)he may'; Garachana Camarero 2017: 44). With *haber de* and *tener que*, this omission is, on paper, not possible (compare *Comprarlo debería, pero no quiero* 'I should buy it, but I don't want to' and **Comprarlo tendría que, pero no quiero* 'I'd need to buy it, but I don't want to'). Nevertheless, a

3. But cf. RAE (2010: 2148–2149) for its use with first person plural pronouns due to semantic transfer from *tener que*.

specific pragmatic use of these constructions facilitates the elision of the infinitive, namely, a metalinguistic meaning, as in *No quiero comprarlo, pero {tengo que / he de}* 'I don't want to buy it, but I have to' (Krivochen 2020: 15).

According to the Catalan prescriptive grammar, this is possible with all the Catalan deontic periphrases except for *haver de*, again, because of the preposition *de* (IEC 2016: 52); yet a preliminary exploration of the sample reveals that *haver de* appears without an infinitive where it is retrievable from the context and is given the metalinguistic meaning presented above. For instance, in our data, the interviewer may ask whether the prospective owner of a cat needs to take it out for walks: *{Ha de / Cal} treure'l a passejar?* 'Does it need to be walked?' In this context, the informant may not use the infinitive (e.g. *Si vol, sí, però no {ha de / cal}* 'If (s)he wants to, sure, but (s)he doesn't need to'). Thus, since different allostructions are possible, instances where the infinitive is dropped are considered in the study.

Furthermore, *haver-hi que* is semantically different from the other constructions because it requires a participant (a noun phrase) that refers to an entity capable of displaying intentionality (RAE 2010: 2148). Therefore, for instance, it is possible to express the need for more rain in a region with the other allostructions (*Aquí cal que plogui més* or *Aquí {ha de / té de / té que} ploure més* 'It needs to rain more here') but not with the impersonal form *haver-hi que* (**Aquí hi ha que ploure més*, Sp. **Aquí hay que llover más*).

Another possible linguistic constrain is sentence polarity. Rigau (2005a: 256) claims that *caldre* is mainly used in negative sentences. A preliminary analysis of the sample seems to support this observation. Table 2 shows that 76.32% of tokens of *caldre* appear in negative sentences. Simultaneously, it seems worth considering how polarity interacts with the other constructions, since *caldre* merely accounts for 29 of the 118 instances (24.58%) in which the variants are used in negative sentences.

Lastly, there seems to be a restriction regarding the verb tenses in which these constructions are used. In a study on *haber de, tener de* and *tener que*, the variable "verb tense and mood" is statistically significant (Blas Arroyo 2015). Furthermore, these deontic constructions have an element of existentiality to their meaning. They express that *there is* a need or that the obligation *exists* for someone to do something, rather than strictly that someone needs or has the obligation to perform an action (cf. Rigau 1999: 326 on *caldre*). Therefore, the preferred verb tense for these constructions might be the present indicative (*tinc de, has de, cal*, etc.). However, this variable was not analysed due to time constraints.

Linguistic factors like, at least, the ones just outlined should be considered in studies of this phenomenon of variation. However, few steps have been taken in this direction until now. It has even been suggested that *tenir que* and *haver de* are in free variation (Stokes 2011: 129). Our study includes the linguistic vari-

Table 2. Variants in the study by sentence polarity

Variant	Sentence polarity	Total
caldre + infinitive	Affirmative	9/38 (23.68%)
	Negative	29/38 (76.32%)
haver de + infinitive	Affirmative	625/689 (90.71%)
	Negative	59/689 (8.56%)
	Neutral/question	5/689 (0.73%)
tenir de + infinitive	Affirmative	35/39 (89.74%)
	Negative	2/39 (5.13%)
	Neutral/question	2/39 (5.13%)
tenir que + infinitive	Affirmative	262/293 (89.42%)
	Negative	28/293 (9.56%)
	Neutral/question	3/293 (1.02%)
haver-hi que + infinitive	Affirmative	1/1 (100%)

ables grammatical person, sentence polarity, markedness (regarding the historical development of the constructions) and priming, i.e. uses of *haver de* by the informants may be influenced (primed) by the interviewer's preceding conversational turns.

3.2 Sociolinguistic factors and variation in Catalan

This study also considers social factors, which, as outlined, may equally interact with the phenomenon of variation we discuss to probe the suitability of variationist linguistics to attest or dismiss free variation. Variationist linguistics posits that languages interact with social variables that are relevant in their speech communities. Sociolinguistic factors that have been shown to play a role in explaining language choices in contemporary Catalan include speakers' first language(s) (Gonzàlez et al. 2014: 64; Flors 2015: 36), gender (Pujolar 2001), class (DGPL 2015), linguistic attitudes (Ubalde 2013; Bretxa 2019; Martínez Díaz 2019) or individual preferences (Flors Mas and Vila i Moreno 2014).

These and other extralinguistic factors also correlate with speakers' use of linguistic variables in other languages (e.g. Ball 2010; Chambers and Schilling 2013). Additionally, sociolinguistic factors may interact with one another, as Comajoan (1998: 87) argues regarding the effect of the social environment surrounding speakers and their attitudes towards varieties:

> In sum, intergenerational transmission depends greatly on the demo-linguistic characteristics of the languages in contact and on the representations (as evidenced by their attitudes) that the speakers ascribe to the languages. Both factors are intertwined, given that major exposure to specific social networks may affect the individual's attitudes and behavior regarding what language to use.

Scholars have thus identified extralinguistic variables that influence the choices of Catalan speakers. However, studies considering the relationship between Catalan deontic verbal constructions available to speakers and social factors (such as age, linguistic attitudes or first language(s)) are still scarce.

To the best of our knowledge, only a few studies have dealt with this issue in some detail. Mier (1982, 1986)[4] interviews 43 speakers in Barcelona and examines five phonetic and morphologic and five social variables: age, sex, occupational level, use of Spanish in childhood and declared written skills in Catalan. One of the morphologic variables is the distribution of *haver de, tenir que and tenir de*, which are found to correlate with all the social variables.

More specifically, regarding speakers' age, *tenir que* is "increasingly used over time" (Mier 1986: 47). This construction is frequently used by most younger speakers in the sample (born between 1956 and 1960) and usually not perceived as a Spanish interference. The author concludes that its use "does not seem to be stigmatized" but "could become so in the future" due to the social changes and an increased interest in Catalan that began after the reinstatement of Spanish democracy, a few years prior to the study (Mier 1986: 56–57). *Tenir de* is only used by six speakers, all but one of whom were 50 or older at the time. Results lead Mier to suggest that this construction "is an old form that is rapidly becoming obsolete" (1986: 47). Interestingly, none of the speakers who use *tenir de* also produce *tenir que* (Mier 1986: 47).

Alongside grammatical person (Section 3.1), Stokes (2015) identifies a statistically significant correlation between *haver de* and *tenir que* and diatopic factors. This author gathered a collection of 9,558 tokens of these variants over two weeks in 2013, covering eight cities across Catalonia, Valencia and the Balearic Islands.

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4. This study predates the publication of the normative Catalan grammar currently in force, so Mier relied upon a historical grammar published in 1952 by a renowned philologist, Francesc de Borja Moll, and the prescriptive grammar by Pompeu Fabra (1974). The former described *haver de* + INF as "the most normal and the only [deontic periphrasis] in modern literary language", *tenir de* + INF as "normal in Valencian but not allowed in written language for it is an interference from Castilian" (Moll 1952: 336–337; Mier 1986: 46). The latter states that using *tenir de* instead of *haver de* is not advisable, whereas using *tenir que* in its place is "absolutely inadmissible" (Fabra 1974: 88).

Tenir que amounts to 11% of the sample, and *haver de* is clearly preferred in all cities except those in Valencia.

Some of the limitations of his study, as described by Stokes (2015: 463–464), are that, first, only two constructions are analysed, which contrasts with the higher number of possibilities available to speakers; second, the methods might not suit the data; third, only present indicative forms are considered; and, lastly, more linguistic variables may influence this phenomenon of variation. These limitations were all considered in the design of our study (see Section 4).

Given these previous publications, age and sex are included as sociolinguistic variables in our study. Additionally, since our sample consists of students in secondary education, we do not consider occupational level or written skills. However, the data come from Manlleu and Mataró, two cities with different demolinguistic landscapes (see Section 6), so we include this variable in the study. Furthermore, language(s) of identification and an index measuring speakers' exposure to Catalan in the media and cultural products[5] are analysed as indicators of speakers' attitudes towards Catalan. Likewise, speakers' social environment is reflected by an index measuring their use of Catalan within their social network.[6]

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5. This index was determined from answers to four questions in a sociolingusitic questionnaire. Informants listed the three television programs, musical artists, books and webpages they had been recently most exposed to and identified the languages used in each ('only or mostly Catalan', 'only or mostly Spanish', 'Spanish and Catalan equally' or 'a different language'). To obtain a value representing their exposure to Catalan in the media and cultural products, each item (television program, music, book or webpage) was scored between 0 (no use of Catalan) and 1 (exclusive use of Catalan). Then, the percentages of Catalan, Spanish and other languages in each participant's answers were calculated. For example, informants who only consumed culture in Catalan scored 1 for their exposure to Catalan and 0 for their exposure to Spanish and other languages, while those equally exposed to Catalan and Spanish scored 0.5 for their exposure to Catalan and to Spanish but 0 for other languages. Thus, a score was obtained for each participant's exposure to different languages in cultural activities so that the sum of the three percentages (exposure to Catalan, Spanish and other languages) corresponds to an informant's overall use of languages in this sphere and, therefore, always equals 100%.

6. In the questionnaire, participants were also asked to list the twenty individuals with whom they interacted most in a week (i.e. their social network, in dyads), the relationship with them, the frequency with which they interacted and the language they used ('Catalan', 'Catalan = Spanish', 'Spanish' or 'Other (specify)'). These answers were transformed into three language use indexes (LUI), one for Catalan, one for Spanish and a third for other languages. Our study uses Catalan LUI. To obtain it, each informant was scored with 100 for dyads exclusively in Catalan, 50 for dyads using Catalan alongside another language, 33 for Catalan in combination with two other languages and 0 for answers not including Catalan. The sum of an informant's scores was divided by the number of peers in the list, which produced an index of use of Catalan between 0 (no use) and 100 (exclusive use of Catalan with all peers). For more details, see Vila, Ubalde, Bretxa & Comajoan (2020).

4. Methodology

This study explores the variation among the five deontic constructions discussed so far by analysing a sample of 1,060 tokens produced by 64 informants of the RESOL project, one of the largest longitudinal studies of Catalan to date (for details, see Bretxa and Vila 2012; Bretxa and Vila 2014; Bretxa et al. 2016). The informants in this project were recorded in the cities of Manlleu and Mataró twice in four years – aged approximately 12 years old at T1 and 16 years old at T2 – during a role-play task in which they played a pet store clerk with the aim of convincing their customer (the interviewer) to buy an animal in their store. For the purpose of this study, tokens obtained at different times are treated as belonging to different individuals, since our aim is not to compare the performance of each speaker across time but to explain variation between equivalent constructions. Table 3 summarises the distribution of the allostructions in the data. Tokens were searched for manually and included in the sample regardless of verb tense.

Table 3. Distribution of deontic verbal constructions in teenage Central Catalan speech

Variant	N (percentage)
caldre	38 (3.6%)
haver de	689 (65%)
haver que	1 (0.1%)
tenir de	39 (3.7%)
tenir que	293 (27.6%)
Total	**1,060 (100%)**

The independent linguistic and sociolinguistic variables considered are shown in Tables 4 and 5. The data for the last three sociolinguistic variables in Table 5 were obtained from the informants' responses to the comprehensive sociolinguistic questionnaire used in the RESOL research project (Bretxa 2014: 130–133). Regarding language of identification, most informants identified with Catalan (coded as '1'), Spanish ('2') or both ('3'), with one exception: an informant who answered 'Portuguese' at T1 (coded as '77') but, incidentally, answered 'Catalan and Spanish' at T2.

Table 4. Linguistic variables in the study

Dependent variable			**Linguistic variables**			
A	**B**	**C**	**D**	**E**	**F**	**G**
Token	**Informant code**	**Deontic construction**	**Grammatical person**	**Priming**	**Sentence polarity**	**Markedness**
no cal tenir-lo fora\ 'you don't need to keep him outdoors\'	M0054SCI	1	3_sg	0	0	1

C: 1 = '*caldre*, 2 = '*haver de*', 3 = '*tenir que*', 4 = '*tenir que*', 5 = '*haver-hi que*'
D: 1 = '1st.pers.sing.', 2 = '2nd.pers.sing.', 3 = '3rd.pers.sing.', 4 = '1st.pers.pl.', 5 = '2nd.pers.pl.', 6 = '3rd.pers.pl.'
E: 0 = 'no priming', 1 = 'priming'
F: 0 = 'negative', 1 = 'affirmative', 2 = 'neutral/question'
G: 1 = 'Forms perceived as genuine in Catalan (*haver de, tenir de, caldre*)', 2 = 'Forms perceived as contact-originated in Catalan (*tenir que, haver-hi que*)'

Table 5. Sociolinguistic variables in the study

Dependent variable			**Sociolinguistic variables**					
A	**B**	**C**	**H**	**I**	**J**	**K**	**L**	**M**
Token	**Informant code**	**Deontic construction**	**Age**	**Sex**	**City**	**Language of identification**	**Index of Catalan in the social network**	**Index of Catalan in culture and media**
no cal tenir-lo fora\ 'you don't need to keep him outdoors\'	M0054SCI	1	1	2	1	1	1	0.45

H: 1 = '12 y.o. (T1)', 2 = '16 y.o. (T2)'
I: 1 = 'male', 2 = 'female'
J: 1 = 'Mataró', 2 = 'Manlleu'
K: 1 = 'Catalan', 2 = 'Catalan and Spanish', 3 = 'Spanish', 77 = 'Portuguese'
L: Numeric value from 0 (no use of Catalan with the social network) to 1 (exclusive use of Catalan)
M: Numeric value from 0 (no exposure to media or cultural products in Catalan) to 1 (exposure to media and cultural products in Catalan only)

Univariate and multivariate approaches have been used to investigate linguistic variation (cf. Jacewicz et al. 2009: 245–246, Pichler 2010: 592). However, following Hinrichs and Szmrecsanyi (2007: 470), only multivariate techniques are utilised in this exploratory study, since several variables (e.g. language of identification, the index of Catalan in the social network and the index of Catalan in culture and media) reflect interrelated phenomena. These authors, following observations on the limitations of univariate analysis by Gries (2003: 185) and others, state that:

> Whenever the set of independent variables exceeds a couple of (possibly not entirely independent) factors, corpus-based research into variation in time and space should adopt multivariate methodologies, which have long been state-of-the-art in variationist linguistics and in the social sciences in general.
>
> (Hinrichs and Szmrecsanyi 2007: 470)

We employed decision trees, an exploratory multivariate statistical technique which combines descriptive and predictive analysis and projects results into a graphic that makes interpreting the results an intuitive task. Thus, a decision-tree induction algorithm was applied to the data using IBM's SPSS software (version 25) to test the hypothesis that the independent variables could, in some combination, predict most deontic constructions used by the informants.

Decision-tree induction is a predictive *ad hoc* classification technique, like discriminant analysis or neural networks (Berlanga Silvente, Rubio Hurtado and Vilà Baños 2013: 66). The technique is used in various research areas, including natural language processing in medicine (Gordon et al. 2022), research on aphasic speech (Fromm et al. 2021) and child language acquisition and development (Kim et al. 2019). Compared to other techniques, it presents several advantages.

Decision trees can be used with large sets of discrete and continuous variables (Schmid 2010: 195; Song and Yu 2015: 130). Results can be displayed in an easy-to-interpret graph (Schmid 2010: 195; Pérez 2011). They are fast, robust, accurate and unambiguous (Schmid 2010: 195; Berlanga Silvente, Rubio Hurtado and Vilà Baños 2013: 68; Song and Yu 2015: 130). Lastly, they are easy to create and need little parameter adjustment to work effectively (Schmid 2010: 195; Song and Yu 2015).

Nevertheless, they also present limitations. For example, not all relations identified between the variables are causal, even if they are selected because they improve the underlying statistical model (Song and Yu 2015: 134). Therefore, the nature of the correlations discovered in this study is not specified, i.e. Section 5 merely describes the relationships identified by the decision trees. Similarly, depending on the training data, results may not be generalisable due to over- or underfitting. This, however, is not an issue in this study, only intended as a first exploration of the sample. Lastly, changes in the training data may affect algorithm performance (Schmid 2010: 188). This was evidenced here. The first dataset

included instances of *caldre* followed by inflective subjunctive clauses. With these data, the algorithm produced slightly worse classification results (up to 91.3% of correct classifications) than it did after they were removed (up to 92.6% of correct classifications; see Section 5).

There are several growing methods for decision trees (Rokach and Maimon 2015: 81). We used chi-square automatic interaction detector (CHAID), created specifically to work with nominal variables (Rokach and Maimon 2015: 79), like most of the ones in our study. This algorithm chooses the independent variables presenting the strongest interaction with the dependent variable (Berlanga Silvente, Rubio Hurtado and Vilà Baños 2013: 68). It operates with a merge threshold, against which it compares pairs of values of the independent variables (Rokach and Maimon 2015: 79–80). Because the dependent variable in our study is nominal, the statistical test used to compare pairs of values is a Pearson chi-squared test. If two values generate a p value greater than the threshold ($p = 0.05$), CHAID merges them and searches for a new pair. This happens as many times as necessary until one of the following situations occurs: all pairs of values that are significantly different from the values in the dependent variable are found, a node contains all the cases it can or the tree reaches its maximum depth. In the first scenario, the best variable to split a node is selected "such that each child node is made of a group of homogenous values" of that variable. Splits are only performed if the p value adjusted with the Bonferroni correction method of the best variable is lower than a certain split threshold. The result of this process is a multidirectional decision tree obtained rapidly and effectively (Berlanga Silvente, Rubio Hurtado and Vilà Baños 2013: 68).

5. Results

Three models were generated using decision trees and different combinations of the ten independent variables. This section describes the results of this exploratory study.

The first model analysed the data in connection with the sociolinguistic variables – speakers' age, sex, city, language of identification, index of Catalan in culture and media and index of Catalan in the social network. Three of these were included in the resulting tree (Table 6). No validation measure was used for this exploratory analysis, and the maximum tree depth was set at ten so that the algorithm could use as many variables as relevant for the statistical model (the maximum was set at a greater value than the total of independent variables fed into the model). The default settings were used for the minimum of cases per child and parent nodes. The resulting tree has a depth of two nodes below the root and a total of 18 nodes, 13 of which are terminal.

Table 6. Model summary for the decision tree generated from the sociolinguistic variables

Specifications	Growing Method	CHAID
	Dependent Variable	Deontic_constructions
	Independent Variables	Age, Sex, City, Language_of_identification, Catalan_culture_index, Social_network_index
	Validation	None
	Maximum Tree Depth	10
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Catalan_culture_index, Age, Sex
	Number of Nodes	18
	Number of Terminal Nodes	13
	Depth	2

The model classifies 71.7% of tokens overall correctly (Table 7). Specifically, the percentage of correct classifications is higher for *haver de* (89.7%) and lower for *tenir que* (48.5%). *Caldre, tenir de* and *haver que* are never predicted correctly. The estimated risk is 0.283, with a standard error of 0.014.

Table 7. Classification results for the decision tree generated from the sociolinguistic variables

Observed	**Predicted**					
	caldre	**haver_de**	**tenir_que**	**tenir_de**	**haver_que**	**Percent correct**
caldre	0	36	2	0	0	0.0%
haver_de	0	618	71	0	0	89.7%
tenir_que	0	151	142	0	0	48.5%
tenir_de	0	25	14	0	0	0.0%
haver_que	0	0	1	0	0	0.0%
Overall percentage	0.0%	78.3%	21.7%	0.0%	0.0%	71.7%

Growing Method: CHAID
Dependent Variable: Deontic_constructions

Figure 1 shows the resulting decision tree with the sociolinguistic variables selected and the predicted category for each node highlighted in grey (note that this is never *caldre, tenir de* or *haver que*). Node 0 displays the percentages of each deontic construction. The main predictive variable in this case is the index of Catalan in culture and media. Age and sex are also selected.

The most frequent variant in most nodes is *haver de*. The factors that seem to favour *tenir que* are, firstly, a low index of Catalan in the media and culture, with values between 0 and 0.08 (node 2) or between 0.17 and 0.22 (node 5); secondly, being 12 years of age for speakers with an index between 0 and 0.08 (node 12); and, thirdly, being female for speakers with an index between 0.13 and 0.17 (node 14).

However, an overall correct prediction percentage of 71.7% means that 28.3% of instances (i.e. nearly 300) of the deontic constructions in the sample are misclassified. Thus, the information provided by the sociolinguistic variables cannot account for all the variability in the sample: restricting the analysis to these independent variables might lead to a possibly erroneous conclusion that over 25% of the sample is due to free variation. Next, therefore, the linguistic variables are used in order to compare the new results to this model.

The second model analyses the data with the linguistic variables (grammatical person, priming, sentence polarity and markedness). Table 8 shows that the specifications regarding validation, maximum tree depth and minimum of cases per child and parent nodes remained the same as in the previous model for comparability. The model generated a decision tree with a depth of four nodes and a total of nine, five of which are terminal.

The classification and risk results for this model are a considerable improvement on the previous ones, as shown in Table 9. Correct classifications amount to 92.6% overall, reaching 100% for *haver de* and *tenir que*, even though *caldre, tenir de* and *haver que* are still consistently misclassified. The estimated risk of misclassifications is, thus, set at 0.074 (with a standard error of 0.008).

Figure 2 shows the decision tree with the linguistic variables. The main predictive independent variable in this model is markedness, which differentiates between *haver de, caldre* and *tenir de* (Node 1) and *tenir que* and *haver-hi que* (Node 2). This split therefore separates the two most frequent allostructions. In Node 1, encompassing most of the sample (72.3%), most instances correspond to *haver de* (89.9%), whereas in Node 2, nearly all tokens are *tenir que* (99.7%).

Node 1 diverges into two nodes according to sentence polarity. Node 3 includes all instances of the allostructions perceived as genuinely Catalan in negative form (8.5% of the sample), and Node 4 contains the rest of tokens (63.8% of the data). The most frequent variant in both is *haver de*. In Node 3, this construction represents 65.6% of the total, whereas in Node 4, this percentage rises to

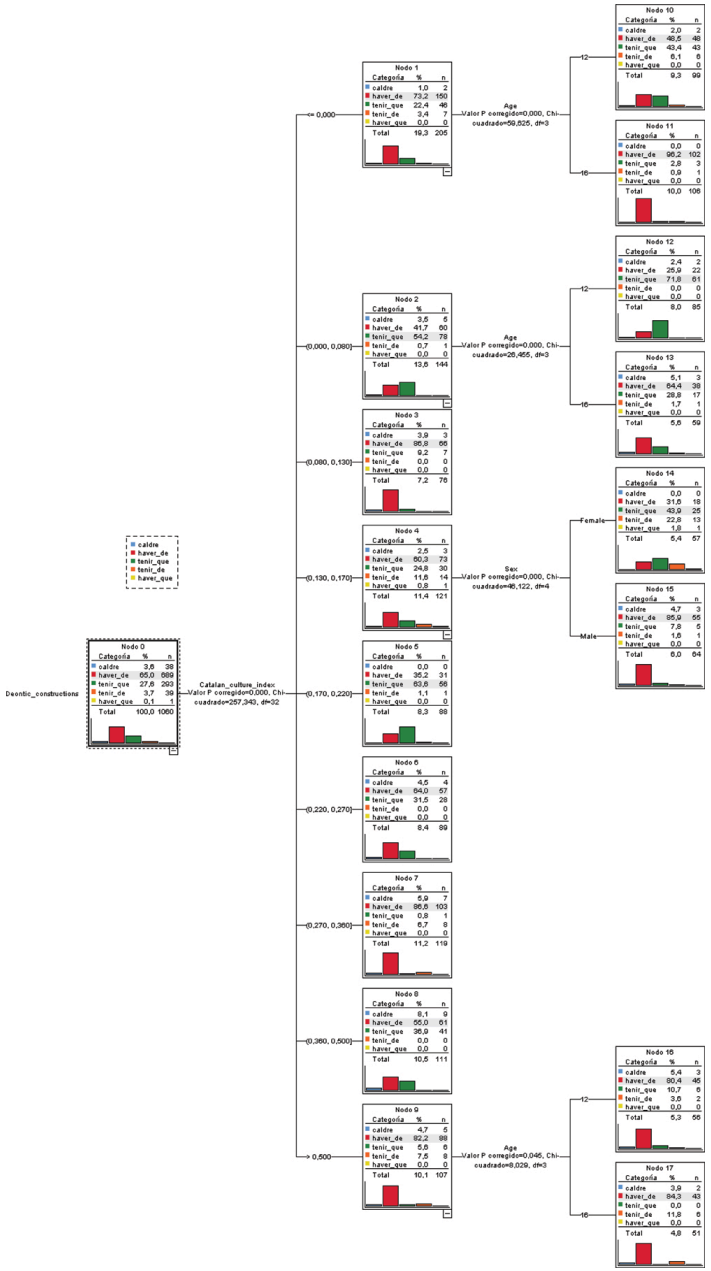

Figure 1. Decision tree of the sample of deontic constructions with sociolinguistic variables

Table 8. Model summary for the decision tree generated from the linguistic variables

Model summary		
Specifications	Growing Method	CHAID
	Dependent Variable	Deontic_constructions
	Independent Variables	Grammatical_person, Priming, Sentence_polarity, Markedness
	Validation	None
	Maximum Tree Depth	10
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Markedness, Sentence_polarity, Priming, Grammatical_person
	Number of Nodes	9
	Number of Terminal Nodes	5
	Depth	4

Table 9. Classification results for the decision tree generated from the linguistic variables

Observed	Predicted					
	caldre	haver_de	tenir_que	tenir_de	haver_que	Percent correct
caldre	0	38	0	0	0	0.0%
haver_de	0	689	0	0	0	100.0%
tenir_que	0	0	293	0	0	100.0%
tenir_de	0	39	0	0	0	0.0%
haver_que	0	0	1	0	0	0.0%
Overall percentage	0.0%	72.3%	27.7%	0.0%	0.0%	92.6%

Growing Method: CHAID
Dependent Variable: Deontic_constructions

93.2%. Furthermore, while the second most frequent variant in Node 3 is *caldre* (32.2%), in Node 4, *haver de* is followed by *tenir de* (with only 5.5% of tokens).

Node 4 splits into Nodes 5 and 6 through the variable priming. On the one hand, this classifies all instances in Node 6 as primings of *haver de* (18% of the sample); on the other, Node 5 includes 45.5% of the data, in which *haver de* is also the most frequent variant (90.5%), followed by *tenir de* (7.6%) and *caldre* (1.9%).

Lastly, Node 5 divides into two more nodes by the variable grammatical person. Node 7 includes instances of third person (singular and plural) and first person plural (in total, 22.8% of the sample). Node 8 comprises second person (singular and plural) and first person singular (22.9% of the sample). The main difference between these nodes lies, again, in the second most frequent construction, since *haver de* is the most common in both, with 93% of occurrences in Node 7 and 88.1% in Node 8. The distribution of the variants is more even in Node 7 (where *caldre* accounts for 3.7% of cases and *tenir de* for 3.3%) than in Node 8, where the only other variant is *tenir de* (11.9% of tokens).

In short, this model shows that all linguistic variables are relevant for predicting the occurrences of the constructions in the sample. More specifically, markedness influences *tenir que* in that only 0.3% of the constructions perceived as contact-originated are of *haver-hi que* instead of *tenir que*. As for *caldre*, it is most likely to occur in negative sentences. Focusing on *tenir de*, we can see that no variable in this model specifically predicts its occurrence. Most instances of this construction appear in non-negative sentences, never as primings and mostly in second- or first-person singular forms. Finally, the variant *haver de* is favoured throughout the nodes in the decision tree and can, therefore, be described as the default or unmarked construction. It is one of the forms perceived as genuine and used more in affirmative or neutral sentences (although also, to a lesser degree, in negative sentences), in contexts where the speakers are primed by the interviewer (but also otherwise) and more so in third person and first person plural than in second-person and first-person singular.

Thus, since this model does not seem to distinguish particularly well between the constructions perceived as genuine, specifically between *tenir de* and *haver de*, and since the classification and risk results show that 7.4% of cases (i.e. more than 78 instances) are still misclassified, the next step in our analysis consists in using all the independent variables as input for a new model. Ideally, this new attempt would correctly classify all the deontic constructions in the sample.

The ten independent variables were fed into the last model, which selected four (markedness, sentence polarity, index of Catalan in the social network and city) as relevant to predict instances. Table 10 displays a summary of this third decision tree with a depth of four and 12 nodes in total (eight of which are terminal).

Table 11 shows the results of the classification of tokens, which match those of the previous model. The three variants with fewer instances are again classified incorrectly. The risk estimate and the standard error values also remain stable (0.074 and 0.008, respectively).

Figure 3 shows the resulting decision tree. The first split is performed, as before, through the variable markedness. Node 1 is then divided by sentence

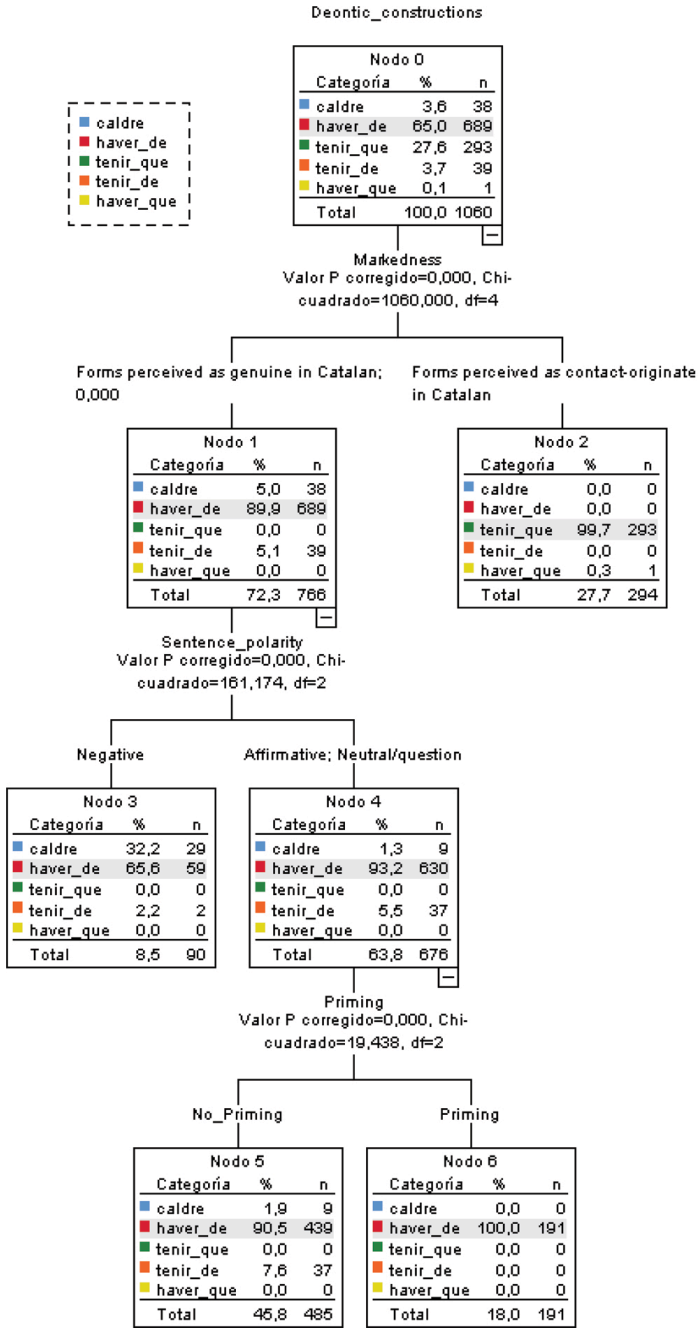

Figure 2. Decision tree of the sample of deontic constructions with linguistic variables

Table 10. Model summary for the decision tree generated from all the independent variables

Model summary		
Specifications	Growing Method	CHAID
	Dependent Variable	Deontic_constructions
	Independent Variables	Age, Sex, City, Language_of_identification, Catalan_culture_index, Social_network_index, Grammatical_person, Priming, Sentence_polarity, Markedness
	Validation	None
	Maximum Tree Depth	10
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Markedness, Sentence_polarity, Social_network_index, City
	Number of Nodes	12
	Number of Terminal Nodes	8
	Depth	4

polarity into Nodes 3 and 4 (equivalent to Nodes 3 and 4 in the previous tree). Next, Node 4 is split into five more nodes through the index of use of Catalan in the social network. Nodes 5 and 6 each group nearly 6% of the sample, Node 7 accounts for 24.2%, and Nodes 8 and 9 encompass around 14% each. *Haver de* is the most frequent variant in all these nodes, albeit with different percentages than in the previous tree. In Node 5, corresponding to constructions by speakers with an index of Catalan use in their social network of 0, *haver de* is found in 75.8% of instances and *tenir de* in the other 24.2%. Node 6 groups speakers with an index between 0 and 0.11. In this node, *haver de* accounts for 91.8% and *tenir de* for the rest of the tokens (8.2%). In Node 7, *haver de* is used in 98.4%, *caldre* in 1.2% and *tenir de* in 0.4% of cases. In Node 8, the percentage of *haver de* descends to 86.6%, followed by *tenir de* (10.7%) and *caldre* (2.7%). Finally, Node 9 groups only instances of *haver de* (98.6%) and *caldre* (1.4%).

Table 11. Classification results for the decision tree generated from all the independent variables

Observed	Predicted					
	caldre	haver_de	tenir_que	tenir_de	haver_que	Percent correct
caldre	0	38	0	0	0	0.0%
haver_de	0	689	0	0	0	100.0%
tenir_que	0	0	293	0	0	100.0%
tenir_de	0	39	0	0	0	0.0%
haver_que	0	0	1	0	0	0.0%
Overall Percentage	0.0%	72.3%	27.7%	0.0%	0.0%	92.6%

Growing Method: CHAID
Dependent Variable: Deontic_constructions

On the last level, Node 8 is split into Nodes 10 and 11 through the variable of city. Node 10 includes constructions by informants from Mataró and represents 6.9% of the sample. This node shows instances of *haver de* (93.2%), *caldre* (4.1%) and *tenir de* (2.7%). In contrast, Node 11 contains 7.2% of the sample and corresponds to speakers in Manlleu. Most (80.3%) of the tokens here are *haver de*, 18.4% *tenir de* and 1.3% *caldre*.

In short, the variables used in this combined model to classify the instances in the sample are markedness, sentence polarity, index of Catalan in the social network and city. It seems, from the order of the selected variables in the decision tree and from the results of the former models, that the linguistic variables are more relevant in explaining the variability of the data than the sociolinguistic factors. As with the previous tree, *haver de* is the predicted variant in almost all nodes except for Node 2, which gathers the forms perceived as contact originated. Regarding *tenir de*, most instances are produced in non-negative sentences by speakers with a very low (up to 0.11) or very high (between 0.75 and 0.98) index of Catalan in the social network, especially those in Manlleu. Thus, the differences between the variants perceived as genuine (*haver de, tenir de* and *caldre*) are somewhat clearer in this tree than in the previous model.

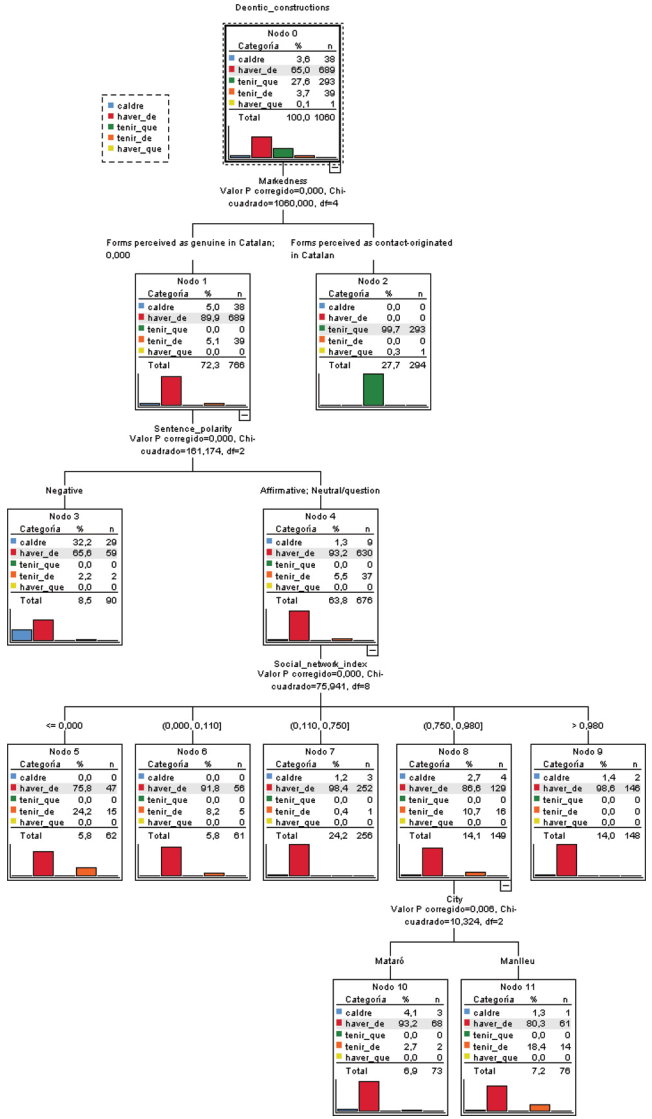

Figure 3. Decision tree of the sample of deontic constructions with all the independent variables

6. Discussion of results and possible future lines of research

The hypothesis of this study was that some combination of the variables analysed would predict most tokens in the sample. This was demonstrated for all the trees generated. However, some results, summarised below, merit more attention in future studies.

In the first decision tree, results regarding the index of Catalan in culture and media in relation to the Spanish-influenced variant *tenir que* are unexpected. Previous publications show that exposure to television, music and the Internet in a target language may positively affect speakers' proficiency levels (e.g. Peters 2018; De Wilde, Brysbaert and Eyckmans 2020; Muñoz and Cadierno 2021). Nevertheless, instead of a lower use of variants proscribed in prescriptive works, an increase in the indices of Catalan in culture and media between many nodes on the first decision tree correspond to more use of *tenir que* (cf. *tenir que* tokens between Nodes 1 and 2, 3 and 4; 4 and 5 and 7 and 8 in Figure 1). Yet Node 2 shows the highest percentage of *tenir que* and corresponds to speakers with low indexes of Catalan in the media, a finding which can be easily explained from the literature. Thus, further exploration of the role of exposure to Catalan in culture and the media in the present phenomenon of variation may shed light on these complex results.

Another interesting finding of the first tree is that male informants mainly use the standard *haver de*, whereas female speakers show a preference for *tenir que*. This agrees with changes from below identified in previous studies of Catalan varieties (see Turell 1995). However, when considering its effect on sociolinguistic variation, "[w]e clearly cannot talk about gender independently of other aspects of social identity, as no variable correlates simply with gender or social category" (Eckert 1997: 73). Therefore, future endeavours should use tools capable of exploring the relations between independent variables more deeply than decision trees.

In the second and third models, which show the best classification performances, as mentioned above, *haver de* proves to be the unmarked variant. This is also indicated by the interviewers predominantly using this construction (in front of the other two variants described as acceptable in the prescriptive grammar), as reflected by the priming results. Language use in the sample thus reflects, to a certain extent, the extended belief that 'the *correct* deontic construction in Catalan is mainly *haver de*, although *caldre* can also be used, and other forms are a product of language contact with Spanish and should therefore be avoided'. This has been repeatedly reproduced as a recommendation in numerous style manuals, language handbooks and online fora (e.g. SLUOC 2016: 48; CPNL n.d.; CNLO 2012). In this sense, Mier's (1986: 57) prediction that the genuine Catalan form *tenir de* could become stigmatised seems supported by the findings.

The results of the second model also suggest that the linguistic variables considered here cannot explain the use of the constructions originating from language contact (see Terminal Node 2 in Figure 2). Thus, the sociolinguistic situation and related factors might override grammatical constraints in this case. However, as noted above, because of the underlying assumption in variationist linguistics, our results do not allow us to dismiss the possibility that other linguistic variables not included in our study may play a role in the use of these constructions.

Results in relation to sentence polarity (Figures 2 and 3) align with Rigau's (2005a: 256) observation that *caldre* is most frequently used in negative form. Furthermore, it seems that the other constructions may also be constrained by sentence polarity. This has yet to be explored in the literature. Therefore, it will be interesting to observe if the tendencies identified here are related to the communicative task carried out by the informants or to the grammar of these constructions.

Still on the second model, the variable grammatical person seems relevant to identifying the instances of the defective form *caldre*, as expected. However, it is also worth noting that *tenir de* is most frequently used in first-person singular and second person. In light of these findings, and since there seems to be no previous literature on the use of this variant in contemporary Catalan varieties, it would be interesting to explore its uses in other samples and check whether this preference is also found or whether it may be related to the characteristics of the sample and the informants' communicative purpose in our study.

Additionally, with regard to this understudied variant, Figure 3 shows that it is mostly used by speakers with either a very low index of Catalan in their social network (of up to 0.11) or quite a high one (between 0.75 and 0.98). This finding suggests that speakers with values away from the two extremes might be avoiding its use, perhaps, in line with Mier's (1986: 57) prediction, because it is a stigmatised construction.

Figure 3 also points to possible geographical differences between the two cities in the sample. As observed, Nodes 10 and 11 comprise similar portions of the data in numerical terms (6.9% and 7.2%, respectively) but show different distributions of the tokens. Informants in Manlleu use *tenir de* seven times more frequently than those in Mataró. Diatopic differences in the use of deontic periphrases were also found in Stokes (2015), where Valencian dialects make a more frequent use of the Spanish-influenced *tenir que* than the other varieties. This is consistent with our data, since 78.84% (231) of the total occurrences of *tenir que* (293) were produced by informants in Mataró, a city in the Barcelona Metropolitan area where Spanish was the predominant first language of the population in 2008 and 2013, at 63.1% and 64.3%, respectively (SPL 2008: 174, DGPL 2015: 43). Only 21.16% (62) of tokens were produced by adolescents in Manlleu, located in central Catalonia,

where 50.4% and 49.1% of the population claimed Catalan as their first language in 2008 and 2013 (SPL 2008: 174, DGPL 2015: 43).

Lastly, although this study operationalised the speakers' perceptions of the diachronic origins of the constructions as the linguistic variable 'markedness', future endeavours might construe it as a sociolinguistic factor due to its relation with linguistic attitudes and discourses on normativity. It would be interesting, for example, to survey speakers' opinions on the 'genuineness' of each variant to empirically test the observations made in our study and previous works (e.g. Mier 1986).

This study is, thus, a successful first exploration of the phenomenon of variation at hand in our sample of contemporary Central Catalan by adolescent speakers, since it serves to identify different paths to be explored further. Additionally, future studies of this phenomenon should consider issues which were left out of the present study exclusively due to practical constraints (e.g. verb tense as a linguistic variable or the allostruction *fer falta*).

7. Can variationist linguistics prove the (non)existence of free variation?

This study takes a variationist approach to linguistics in that it attempts to correlate speakers' morphosyntactic behaviour and (socio)linguistic data. The constellation of variants analysed was designed to capture more options available to speakers than previous publications, which focused on *haver de* and *tenir que*. These constructions account indeed for most of our sample. However, not to consider other constructions with equivalent meanings may lead to partial and inaccurate descriptions of variation phenomena. Therefore, more detailed examinations of this sample will also consider the verb phrase *fer falta*. Despite this limitation, by considering five variants, this exploratory study provides an overall view of the alternatives at the speakers' disposal in vernacular Catalan varieties to express deontic meanings.

Furthermore, the statistical method used is well suited to large datasets and many independent variables. As shown, the intuitive nature of the statistical products generated is compatible with robust and statistically significant results. Since only statistically significant correlations are identified and included in the final decision tree, this method is appropriate for exploratory studies like this one and studies greatly conditioned by practical constraints. The correlations between the variables identified contribute to a better understanding of the factors which are likely to interfere in the use of the constructions. However, a relation of causality between the variables cannot be assumed. Nevertheless, two of the models reach very high correct classification percentages (92.6%), a strong indicator that the selected variables should be considered to explain the use of these constructions.

Remarkably, the second decision tree performs as well as the third one without resorting to sociolinguistic variables, which might raise the question of whether social factors are at all necessary to explain variation phenomena. This provocative question, however, deserves to be considered in much more depth than can be achieved in this paper.

The few tokens of *caldre, tenir de* and *haver que* in the sample were not correctly classified by any of the models, which highlights the shortcomings of this method with limited data. Future studies will need datasets with more instances of these variants or tools which are better equipped to deal with few realisations. Yet, within our approach, the fact that the models consistently grouped the only instance of *haver-hi que* with *tenir que* might indicate that (at least in relation to the independent variables in this study), in the sample, the occurrences of these variants – not by chance, the two originated by language contact – behave in similar ways.

As explained in Section 3.1, only instances of *caldre* followed by infinitive clauses were included in the sample to preserve equivalence between the variants as much as possible. However, future approaches might make it possible to consider other uses of this construction, although the semantic and syntactic differences between the variants should not be ignored (see Section 3).

As happens frequently in linguistic research, the independent variables may interact not only with the dependent variable but also with each other to some extent. This is why many authors advocate for multivariate methods and univariate tools were not used (see Section 4). However, the results do not provide detailed information on the potential relationships between the independent variables. Instead, they inform us of the combinations of variables relevant for classifying most of the speakers' productions.

Lastly, our approach means that the percentage of cases misclassified by the models cannot be taken to represent the amount of free variation in the sample. Rather, results indicate that the independent variables used failed to provide the information needed to correctly classify all the tokens. Thus, since the independent variables in the second and third models succeed in classifying all the instances of *haver de* and *tenir que*, it seems that free variation does not play a role in accounting for the use of these constructions in the sample (i.e. free variation can be ruled out from the results obtained for these variants). Nevertheless, the portion of the sample that does not correlate with the independent variables selected by the models (7.4% of instances) cannot be attributed to free variation solely from these results. According to the assumptions underlying variationist linguistics, a complementary set of independent variables might improve the performance of the models and ultimately rule out free variation for all the variants. Simultaneously, however, note that:

> Even if large numbers of independent variables are factored into the analysis, we can never be certain that other important but unknown variables are not responsible for the observed variation. Instead, causative links must be considered in light of the results of the study and the possible existence of confounding factors that have gone uncontrolled. This is the primary limitation of adopting an observational approach to linguistics. (Grieve 2021: 6–7)

Thus, through the lens of variationist linguistics, free variation may prove to be an unverifiable notion, but it still plays an important role in linguistics, like dark matter in cosmology. According to Robson (2018), for years, cosmologists observed rotation curves in spiral galaxies that contradicted their expectations, based on their knowledge that galaxies were formed by stars and gas. Several studies pointed to a discrepancy in the mass of spiral galaxies. To account for the flat rotation curves observed, Ostriker, Peebles and Yahil (1974) hypothesised that there was a spherical halo of unknown matter around spiral galaxies. This unknown matter is commonly known as dark matter, and it is believed to "provid[e] a large contribution to the gravitational field at large distances from the center of the galaxy", even though this hypothesis "has yet to be verified", mostly because of the unknown nature of this matter. The dark matter hypothesis boosted numerous advancements in physics, including the postulation of new hypothetical particles (Robson 2018). However, the dark matter hypothesis is not uncontroversial, and different modified gravity theories have emerged to explain the flat rotation curves of spiral galaxies independently of dark matter (e.g. Milgrom 1983).

Similarly, linguists have observed the use of different but equivalent structures for decades (e.g. deontic constructions in vernacular Catalan), apparently with no connection to (extra)linguistic factors. While some argue that empirical studies will eventually account for most variation in language, others claim that a percentage of the variability in language use corresponds to an 'invisible' (unverifiable) object, free variation, which can only be studied indirectly. Both stances contribute to the advancement of models of grammar (and linguistics more generally). Our study exemplifies that the presence of free variation can be ruled out but not demonstrated from a traditional variationist approach. Therefore, compelling proof of its eventual existence can only be obtained from other perspectives on the study of language.

8. Conclusion

This paper has dealt with the (dis)advantages of variationist linguistics in relation to free variation through the example of its application to the little-researched variation between deontic constructions in spoken Catalan. It has questioned its capacity to demonstrate that free variation does (not) exist, since a fundamental premise in variationist linguistics is that the right set of variables can account for the data.

However, as exemplified by the last two models in our exploratory study, different sets of independent variables may yield similar results, which poses some important questions: which of all the factors that yield good results should be used to explain the data? Precisely how do they influence speakers' choices? And, above all, would other independent variables produce similar (or even better) results? If so, (how) could one ever finish analysing a particular dataset, provided that the percentage of correct classifications never reached 100%?

Despite this conundrum regarding the (im)possibility of proving free variation within the variationist framework, variationist linguistics has generated a wealth of valuable knowledge over time. Indeed, the need to combine usage- and system-based approaches has been repeatedly stated in the literature. Lastly, this paper has claimed that the notion of free variation benefits scholars in different areas of linguistics regardless of whether its existence can be demonstrated, just like the dark matter hypothesis has boosted our knowledge of physics by sparking interest in the implications of its existence on the one hand and potential alternative explanations of empirical observations that initially seemed to contradict established knowledge on the other.

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Index

Recent years have seen a growing interest in grammatical variation, a core explanandum of grammatical theory. The present volume explores questions that are fundamental to this line of research: First, the question of whether variation can always and completely be explained by intra- or extra-linguistic predictors, or whether there is a certain amount of unpredictable – or 'free' – grammatical variation. Second, the question of what implications the (in-)existence of free variation would hold for our theoretical models and the empirical study of grammar. The volume provides the first dedicated book-length treatment of this long-standing topic. Following an introductory chapter by the editors, it contains ten case studies on potentially free variation in morphology and syntax drawn from Germanic, Romance, Uralic and Mayan.

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