Peter Petré

How constructions are born. The role of patterns in the constructionalization of *be going to* INF

Abstract: This paper addresses the question if and why constructions, conventionalized form–meaning pairings, should have a privileged status among patterns in modelling our knowledge of a language. Constructionist approaches regard constructions as the basic unit of our language knowledge. They range from words to schematic patterns such as the ditransitive (*he gave Mary a book*). Construction grammar also recognizes the existence of connections based on similarity or repeated cooccurrence between forms alone or meanings alone. The emphasis on constructions, however, runs the risk of relegating them to second place. The strict division between constructions and connections between constructions also potentially obliterates the importance of an in-between category such as compositional combinations of constructions, which I refer to as assemblies. While these connectivity patterns have also been captured under the category of constructions broadly defined, I will argue for a separation of non-compositional form–meaning pairings from the dynamics of compositional connectivity patterns, particularly focusing on the role frequency shifts in assemblies play in a constructionalization process.

1 Introduction

In construction grammar, semantic or formal similarities are treated as (horizontal or vertical) links between constructions rather than constructions in their own right.[1] This is why Traugott and Trousdale (2013) restrict the definition of

1 The research reported on in this paper was funded by the Special Research Fund (BOF) from the Flemish Government, and is part of the project *Mind-Bending Grammars*, funded by the ERC Horizon 2020 programme (Project ID 639008; https://www.uantwerpen.be/mind-bending-grammars/). Both institutions are hereby gratefully acknowledged. I also would like to thank Elizabeth Traugott, Laura Michaelis, and an anonymous reviewer for their generous comments, from which I have much benefited when preparing the final text.

Peter Petré, University of Antwerp, Department of Linguistics, 2000 Antwerp, Belgium, peter.petre@uantwerpen.be

https://doi.org/10.1515/9783110596656-007

constructionalization to the emergence of a new form–meaning pairing. Since such a process logically implies an abrupt leap from an old symbolic interpretation to a new one, they see neoanalysis (using the term coined by Andersen 2001) as the primary mechanism of change. Other scholars, such as Fischer (2007) have argued that analogy, i.e. similarity with existing material, is the primary force in the emergence of (grammatical) constructions. In this vein, De Smet (2012) argues that the actualization of a new construction proceeds gradually, and emphasizes that an item's use can be subject to multiple, potentially conflicting generalizations. These generalizations take as their input any kind of similarity between instances, not just form–meaning pairings. De Smet's argumentation suggests that there is no hard distinction between constructional change and constructionalization. Constructionalization is the cumulative result of unobtrusive shifts. There is no point at which the original form–meaning node is replaced by a new one wholesale, because each time there is an extensive period in which either the old form or the old meaning is shared between the conventionalized and the innovative uses.

This paper fleshes out the theoretical ramifications of these different viewpoints. To this end I will carry out a high-resolution form-function analysis of the constructionalization of the string "BE *going to* INF" into [BE *going to* INF]. This constructionalization comprises the early development from a motion verb plus purposive adjunct towards a future auxiliary with infinitival complement. As such it can be said to constitute the first 'episode' of a longer grammaticalization process (cf. Petré and Van de Velde 2018 for this term). I distinguish constructionalization from grammaticalization here. We might still, with Traugott and Trousdale (2013: 25), call this first constructionalization "grammatical constructionalization", in that a more grammatical function emerges. Grammaticalization however, particularly in its later stages, also includes other types of change such as increase in schematicity and productivity, or phonetic reduction, which are not or only weakly in evidence at this earliest stage. According to Traugott (2015: 6) the actualization of the hypothetical new construction [BE *going to* INF] culminates in the early 18th century with raising structures like *there is going to be such a calm among us* (1725), whose lack of an independent subject for *be going* clearly reveal its auxiliary status. This is more than half a century after instances that do no longer refer to motion had become common, and metalinguistic comments appeared that indicate that *be going to* was established as an auxiliary of the imminent future. Assuming that the later appearance of raising is not simply an accidental gap in the data, this raises the question whether the new construction had already emerged at this earlier point, but did not yet entail any formal changes. And if this is indeed the case, is it possible to detect when exactly the

new construction came into being, in the absence of clear formal clues? And what is the status of utterances that are similar to the new construction before this point in time?

The main goal of this paper is to identify the timing and nature of the different stages of the constructionalization of [BE *going to* INF]. Specifically, I will tackle the gradualness problem by zooming in onto the nature of the changes that occur in the run-up to constructionalization. The locus of these early changes cannot be the construction itself, as this did not yet exist. However, they are also not random. Rather, the run-up phase reveals certain patterns that systematically background (or DEPROFILE) certain lexical aspects of the string "BE *going to* INF", such as motion or control. These patterns pave the way for the constructional status of [BE *going to* INF]. I will refer to them as ASSEMBLIES, recurrent configurations of existing constructions and their co-text/context, which do not (yet) have constructional status themselves. Evidence is also provided that a complex constructionalization process may feed on more than one such assembly simultaneously.

The nature of assemblies, their development, and their interaction with constructions, will be examined in four sections. Section 2 discusses the status of constructions in two major constructionist approaches, that by Goldberg (2006), and that by Traugott and Trousdale (2013), followed by the formulation of an alternative with an independent status for assemblies. Section 3 zooms in on the nature of these assemblies, and how frequency shifts in them may lead to change. This section also outlines the corpus used and the data retrieval procedure. In a fourth section, three assemblies that are particularly salient in the usage of [BE *going to* INF] are analysed in detail. Finally, section 5 discusses to what extent the notions of assembly and similarity between assemblies may help to understand how the emergence of a new construction is prepared by means of gradual strengthening of similarity clusters.

2 The status of patterns and constructions in construction grammar

2.1 Frequency and the status of constructions

Despite the confessed usage-basedness of construction grammar, the potential roles that frequency can play are arguably still not properly understood. In this section I discuss the view on frequency in one major synchronic theory of construction grammar, that of Goldberg (2006), and one major diachronic one, that of Traugott and Trousdale (2013). I will argue that each of them underplays the

distinctively dynamic nature of entrenched compositional patterns in language, which is at play in the run-up to the process of constructionalization, and important in a proper understanding of language change.

In the synchronic theory of Goldberg (2006) frequency is used as a secondary criterion for identifying constructions. Any conventional form–meaning pairing (stored in memory) is considered a construction (cf. Langacker 1987). This includes the narrower definition (Goldberg 1995: 5) in which either the form and/or the meaning/function is not predictable from its component parts. Take for instance the expression *I am going to reply to her email*. In isolation, *I am going* means 'I am in motion (towards X)'. *To reply to her email* can be interpreted as a fragment expressing purpose (as in *I will turn on my computer to reply to her email*). However, when combined, the meaning of the first component part changes. The idea of motion is no longer inherently present. Constructionist theory assumes that language users have stored the complex string as a separate, non-compositional construction of the type [[X_{SUBJ} BE *going to* Y_{INF}][X intends to do Y]]. In addition, compositional strings are also considered to be "stored as constructions even if they are fully predictable, as long as they occur with sufficient frequency" (Goldberg 2006: 5). Goldberg's inclusion of compositional strings into the constructicon is motivated by her assumption that "it's constructions all the way down". Constructions, in her view, are *the* basic unit of linguistic knowledge. Usage-based linguistics and psycholinguistics have provided ample evidence that linguistic patterns are also stored if they are sufficiently frequent. Because they are stored units, and because all stored form–meaning units are considered constructions, frequent compositional patterns are also constructions.

The diachronic theory advocated by Traugott and Trousdale (2013) is a diachronic extension of this synchronic view. In addition, they draw attention to the intrinsic difficulty of the concept of frequency to work with in actual analyses of change. They argue that the notion of "sufficient" frequency cannot be operationalized (Traugott and Trousdale 2013: 11). In their words, "establishing what level of frequency is sufficient for pattern storage and entrenchment is problematic" (Traugott and Trousdale 2013: 5), because the necessary frequency for entrenchment is "gradual and relative, not categorical or universal" (Clark and Trousdale 2009: 38).

While both synchronic and diachronic theories share the qualitative delineation of constructions as "conventionalized form–meaning pairings" (in essence an extension of the symbol beyond the word unit), they are both struggling with the role of frequency in the constructicon. Both views acknowledge the importance of frequency, but neither tries to operationalize it. Traugott and Trousdale (2013) support their assumption that the role of frequency in constructionalization cannot be

operationalized by referring to research on the gradual propagation of phonetic variants (Clark and Trousdale 2009). However, this research takes a variationist perspective where frequency is considered as a relative proportion in an onomasiological space. It also takes an aggregate perspective, whereas the effect of frequency is arguably primarily located in how individuals process frequency data. If we want to come closer to the operationalization of entrenchment thresholds in the process of constructionalization, we should operationalize frequency not (only) from a variationist perspective. The variationist perspective assumes that there already is a construction, and measures its entrenchment in terms of its share in the onomasiological space. The emergence of a construction is better measured by a more fine-grained quantitative analysis of the contexts in which the pre-construction material occurs. This paper provides a way of operationalizing such a quantitative analysis.

The inclusive definition of Goldberg (2006) arguably does not give enough weight to the difference between non-compositional constructions and entrenched patterns. One obvious cognitive difference lies on the perception side. A language learner has to learn a non-compositional construction *as is* in order to use it properly. However, it may suffice to store only the component parts in the second case. Separate storage may still facilitate production, and is expected to occur spontaneously with higher entrenchment (Schmid 2016: 9), but it is neither logically required nor necessarily expected from the start.

Insistence on terminological differentiation should not merely serve categorical fastidiousness. The main point I will argue for is that viewing frequent patterns as something in their own right helps understanding the nature of gradualness and neoanalysis in language change. From a diachronic point of view, it is an open question, to be investigated empirically, whether the effect of frequency shifts of compositional patterns is limited to entrenchment and separate storage. Alternatively, frequency shifts may play a decisive role in the emergence of new form–meaning pairings, that is, constructionalization in the sense of Traugott and Trousdale (2013). Traugott and Trousdale discuss frequency mainly as an effect following constructionalization, related to the idea of grammaticalization as reduction (see their footnote 24, page 35). The primary mechanism of change is neoanalysis, the new interpretation of a construction as something else. Even though ample room is left for the role of analogy and gradualness, such a view still treats constructionalization as the eventual outcome of a consecutive series of discrete changes in either form or meaning. What matters are the steps in this process. The role of frequency is not denied and is implied in the mechanism of pattern matching or analogization (the systematic copying of structure; see Traugott and Trousdale 2013: 38), but even then each instance of analogization

would be neoanalysis, and increased frequency of analogized exemplars would merely be entrenchment of the new analysis, and hence, again, an effect rather than a cause. Quantitative research into the emergence of constructions in language acquisition (e.g. Tomasello 1992, Tomasello 2000, Israel 2002) however has shown that more abstract generalizations typically emerge out of a combination of local (exemplar) clusters after these have gathered a critical mass. The role of frequency growth has been explored in more detail in recent quantitative work (e.g. De Smet 2016), but in this work it is still assumed that one step naturally leads to the next (by being semantically or formally minimally disruptive), relegating frequency to a kind of subsidiary position. This model may seem sufficient when simple lineages of consecutive changes are involved (which are the majority of cases studied). However, cases of multiple lineages arguably reveal that frequency has a more fundamental role to play (see e.g. Petré and Van de Velde 2018). In such cases it may well be the frequency balance itself that determines the way in which eventually a novel construction crystalizes.

2.2 An alternative view: Patterns all the way down

I will now turn to the difference between an assembly and a (Goldbergian) construction. Both can be seen as types of patterns, among other types, hence the idea of "patterns all the way down". I will return to the more general view on patterns and the central role of connections between them in the concluding discussion. For a detailed complementary discussion of patterns (and pre-patterns) versus constructions I refer to Traugott (this volume). Her account – even if not quantitatively conceived – shares much in spirit with my own.

The term assembly is inspired by Langacker (2009: 10–15). While Langacker refers to an assembly as a construction, from a construction grammar perspective an assembly is a meaningful compositional configuration of constructions and/or recurrent co-texts rather than a proper construction. Langacker's notion encompasses any kind of combination of constructions (his "symbolic structures"). Assemblies are not unlike the concept of idiomatic chunks, referred to for example as "reusable fragments" (Thompson 2002: 141) or "prefabs" (Erman and Warren 2000). The concept is also reminiscent of Torres-Cacoullos and Walker's "niches" (2009). They observe how functionally similar constructions typically stake out distributional "niches" that make them distinct from each other and more or less complementary. They do not, however, discuss the possibility of niche-like distributions in a context where competition is lacking. To some extent assemblies are equivalent to co-text (plus context). However, co-text is typically evoked when a construction is already there, and its context is examined. But the string

"BE *going to* INF" is not yet a construction. Co-text is also non-committal when it comes to structure. Underlyingly the recurrence of co-texts implies structure, i.e. the instantiation of other constructions. A lexicalist alternative to this idea, which approaches structure in phrasal patterns partly in terms of lexical dependencies, is provided in Michaelis's chapter in this volume. Traugott and Trousdale speak of a "constellation of constructions" specifically with regard to the case of "*be going to* INF" (Traugott and Trousdale 2013: 223). An assembly is just that – though I will argue that the relevant assemblies are even more complex than what is already combined in "*be going to* INF".

Assemblies are not unlike the exemplar clusters that occur at the pre-construction stage in first-language acquisition, but differ from these in that they are built up from already existing component parts of the grammar. If they reach a critical mass, they may be stored separately. Once they are at this stage, they do no longer involve a truly creative act on the part of the language user. Before they may be viewed as associative clusters between constructions/co-textual elements, which vary in strength. The assumption of variable associative strength arguably provides a more promising route to the operationalization of entrenchment, than simply counting occurrences. Under this assumption separate storage is the result of strengthening of associations between the component parts of the assembly beyond a certain threshold. What needs to be accounted for, then, is how associative shifts in different assemblies may conspire and lead to constructionalization. Frequency is of particular importance when multiple shifts feed into each other at various times in the development. Each frequency shift is related to a lineage underlying the resulting construction (Croft 2000: 32). The dynamics is reminiscent of what has been described as multiple source constructions (De Smet, Ghesquière and Van de Velde 2015), with two addenda: (i) The multiple sources are all instances of the sequence "BE *going to* INF" themselves, a possibility that is not discussed very often in the literature (except for Petré 2012). (ii) The multiple sources need not be constructions themselves.

Reasons for the growth in the frequency of an assembly may be pragmatic or system-related. An obvious system-related reason in the case of [*be going to* INF] is the increase of the progressive construction independently from the verb *go* (Petré 2016a). A plausible pragmatic motivation is sheer novelty. Specifically, it may be assumed that there is a reverse correlation between "noticeability" and frequency. When an assembly still has a rather low frequency, it may stand out among competing and otherwise equivalent expressions, simply because it is less entrenched. This, in turn, may lead to the assembly being used more often. The role of noticeability in grammaticalization has been discussed in detail by Detges and Waltereit (2002), who refer to it as expressivity, or Haspelmath (1999), who

refers to it as extravagance, and also specifically with regard to the data presented here (Petré 2016b, 2017). The increased frequency of assemblies may also have some specific semantic effects. In early literature on grammaticalization, one such effect was called "bleaching", i.e. the loss of semantic content. However, scholars such as Sweetser (1988: 392) and Heine, Claudi and Hünnemeyer (1991) have pointed out that what occurs in the early stages of grammaticalization is rather a redistribution or shift of meaning. Hopper and Traugott (2003: 94–95) adopt this view and illustrate it with future [BE *going to* Inf], pointing out that the loss of motion in the construction is compensated by the gain of new meaning, that of intention or future prediction. I will argue that bleaching, as a gradual process, occurs even at these early stages, but is then better understood as what Langacker calls "deprofiling", i.e. the process whereby a certain semantic aspect of an assembly receives less prominence than when all component parts conveyed their semantics to the fullest extent. Deprofiling in itself does not constitute a semantic change in the strict sense.[2] Occasionally, however, these frequency effects lead to a more qualitative change. At this point a new construction may be said to emerge.

2.3 Methodology

When frequency shifts also lead to functional shifts, strengthening of associations potentially goes beyond mere frequency increase. Various diachronic construction grammarians, such as Hilpert (e.g. 2008) have focussed on frequency shifts as indices of functional change. Bottom-up operationalizations of the effects and cognitive representation of associative strengths to language change may be achieved by the implementation of connectionist models of language (cf. pioneering work by Tabor 1994 or Bates and Elman 1993; recent advocates in McClelland 2015; Manning 2015). Very recently, connectionist or related methods are also finding their way into historical linguistics, taking into account co-text and context in a richer way than traditional collocational analysis (e.g. Perek and Hilpert 2017, which makes use of refined vector space models; Petré and Budts forthc., which implements neural network representations). Yet such methods are typically data-hungry, and tend to focus on post-constructionalization constructional change. They are generally less suitable to look into the emergence of a construction. To better assess the role of frequency in functional shifts within

2 My view here is in line with Disney (2009a), who offers a cognitive perspective on the grammaticalization of [BE *going to* INF] from the related point of view of domain-shifting.

and across assemblies in the process of constructionalization I propose a more fine-grained method combining qualitative and quantitative research. This operationalization involves a scoring system of various functions associated with various assemblies, where functions that are conducive to grammatical constructionalization are interpreted in terms of the degree to which they deprofile original semantic features. Degree of deprofiling is measured by means of a ternary system. Wherever original semantic features are not particularly backgrounded in the assembly's interpretation, a score of 0 is assigned. Wherever some deprofiling is involved a score of 1 is assigned. Cases where a certain semantic feature is lost receive a score of 2.

To test for trends in the frequency of higher deprofiling in assemblies, and their significance, I make use of two non-parametric statistical tests (using the R package, R Core Team 2013), meaning that it is not assumed that the data reflect a single global mathematical function (of change). The first is Kendall's tau-b correlation test, which is a robust and widely used test for trend analysis (see e.g. Agresti 2010: 196). The second is loess regression, a method of locally weighted regression, which calculates a polynomial function for each data point (here a second-degree polynomial), based on a local subset of all data points (Cleveland et al. 1992, Cleveland and Loader 1996). A more detailed explanation of what these tests imply is provided when they are first applied in the analysis section.

3 Assemblies as multiple sources in grammatical constructionalization

3.1 Hypothesis

The specific hypothesis that will be tested is that simultaneous frequency growth of assemblies may lead to their interconnection and eventually to the emergence of a new construction. A second hypothesis is that the appearance of raising is the result of further strengthening of associations, and as such may appear considerably later than first constructionalization. The hypothetical scenario is as follows. Assemblies combine a set of constructions. In the current case, we are dealing with recurrent combinations of [[BE V*ing*][ongoing involved activity]], [[GO]['go'] and [[*to* Vinf (NP_{OBJ})][Purpose]] + one other construction. If the set of constructions that is combined is partly shared between these assemblies – as in the current case – they share multiple links, which may, under certain conditions, result in a more global association between the assemblies. Some assemblies may catch on in the speech community and grow in frequency. It is

furthermore assumed that these increases are initially largely independent from each other. However, when their parallel development reaches a critical level, the assemblies will become interconnected. At this point, the language user may make a more abstract generalization, which captures all instances of all assemblies under a single cognitive schema. Such a generalization, then, constitutes a new form–meaning pairing, i.e. a new construction (in this case [[BE *going to* VInf][imminent future]]). Frequency in this scenario is not merely a symptom or effect of routinization, but instead functions as a dynamic catalyst enabling the emergence of a new association and, hence, construction.

3.2 Assembling [BE *going to* INF]

In the following discussion of the pre-1700 development I draw freely on the literature while specifically zooming in on the earliest stages, in which [BE *going to* INF] has arguably not yet crystallized as a construction and where the notion of assembly will turn out to be most relevant. The literature on [BE *going to* INF] is extensive, with, within the past ten years, work by Hilpert (2008), Disney (2009b), Torres-Cacoullos and Walker (2009), Nesselhauf (2010), Garrett (2012), Traugott (2012, 2015), Traugott and Trousdale (2013), Budts and Petré (2016), Petré (2016b) and Petré and Van de Velde (2018).

The source of [BE *going to* INF] was a fully compositional combination of a progressive construction, expressing ongoing activity, the lexical construction [GO] expressing physical motion, plus a purposive non-finite clause. The combination may be represented in construction grammar formalization in (1), with double arrows dividing the form and the function of the constructions involved (see e.g. Traugott and Trousdale 2013). An early attestation is (2).

(1) [[BE V*ing*] ↔ [ongoing activity]] +
[[GO] ↔ ['go']] +
[[*to* INF] ↔ [intended activity]]

(2) *You thinke I* ***am going*** *to market* ***to buy rost meat****, do ye not?*
(Robert Wilson, 1592)

At this stage the assembly is not yet a construction, and remains fully compositional. Both form and semantics of the assembly can be predicted on the basis of the component constructions. Additional evidence that the assembly is compositional is found in the simple observation that combinations with one construction less are perfectly adequate and commonly attested. This is obvious for a sentence

such as (3), which lacks the purposive adjunct, but in the 17th century, it is also possible to leave out the progressive construction while retaining the purposive, as in (4).

(3) *Well, well, I **am going** now to the Market, and thy head shall pay for it.* (J.H., 1650)
(4) *Neighbour, this cow is much like mine. It is very true (quoth he) and therefore I **go to sell** her, because our wiues contend about them euery night, not knowing which to take*. (Richard Carew?, 1607)

A proper [BE *going to* INF]-construction emerges when the assembly acquired holistic semantic and formal properties of its own. Formally, BE *going* acquired the characteristics of an auxiliary, and the purposive adjunct (*to buy some chocolate* in (5)) was neoanalysed as the complement of this auxiliary, as in (6).

(5) [*I am going*] [*to buy some chocolate*] >
(6) [*I am going to buy some chocolate*]

Semantically, futurity was semanticized and became the primary meaning of the construction, resulting, among other things, in its expansion to situations where motion is no longer at stake.

The new construction [BE *going to* INF] remained restricted to imminent or "relative" future (Traugott 2015: 67), as well as to intentional actions until somewhere in the 18th century (Budts and Petré 2016). Metalinguistic evidence suggests that it became a conventional means of expressing such futures between 1620–1640. A *terminus a quo* is provided by some comments first published in 1616 on a biblical passage that makes use of the Hebrew equivalent of *be going* combined with *to die*.[3] The presence of an elaborate comment, which tries to link the passage to motion, where a non-motion reading is the more natural one, reveals a certain uneasiness with the futurate use of [*be going to* INF]. A *terminus ad quem* is provided in 1646 by a reference in a Latin school grammar, where it is said that "*going to*, is the signe of the Participle of the future … *I am … going to read*" (cf. Petré and Van de Velde 2018 for a detailed overview of the evidence).

3 This is the passage by Ainsworth that is referred to by Traugott and Trousdale (2013: 221) as an indication of conventionalization, and dated 1639 by them. This date is not that of the first edition, however. Petré and Van de Velde (2018) also argue that the passage points to the lack of conventionalization of *be going to* INF instead.

According to Traugott (2015: 69), the new analysis is formally actualized when sentences appear of the type in (7), where *go* no longer has a subject of its own, but instead appears with dummy *there* and is notionally catered for by the subject of the infinitive. Together with the semantic loss of motion this may be taken as formal evidence that [BE *going to*] is now conceived of as an auxiliary. The earliest attestation of this type found by Traugott dates from 1725 (Traugott 2015: 69). In the corpus used for the current analysis, an instance in an English work from 1701 occurs (for another early instance from New England, 1693, see Petré and Van de Velde 2018).

(7) *... told him **there was going to be** an Inquisition made in some Accounts* (Anonymous. 1701)[4]

The main challenge, now, is to determine which steps had to occur in the two centuries stretching out between the first attestations of "BE *going to* INF" (in the late 15th century), and the structural actualization of the new analysis by the end of the 17th century.

Two cautionary remarks are in place before trying to analyse this transitional period. First, one has to be careful not to project the new construction too far back in time in a classic case of *Hineininterpretierung*. It has been argued, for instance by Garrett (2012), that the neoanalysis takes place early in the 17th century, with the occurrence of instances where motion is lacking. Garrett (2012: 69) gives (8), dating from 1611, as the earliest example.

(8) *The Gentleman tooke the dog in shagge-haire to be some Watch-man in a rugge gowne; and swore hee would hang mee vp at the next doore with my lanthorne in my hand, that passengers might see their way as they went without rubbing against Gentlemens shinnes. So, for want of a Cord, hee tooke his owne garters off; and as he **was going to make a nooze**, I watch'd my time and ranne away*. (1611)

In itself it is likely enough that the anonymous *Gentleman* tries to convert his garters into a device for hanging someone on the spot. However, the writer may well have had in mind for the gentleman to walk to this *next doore* mentioned in the

4 EEBO, whose copy is undated on the cover, gives 1680 as the date and the Earl of Rochester as the author, but these metadata are inaccurate. The text consists of an inscription in honour of the Earl by an unknown author, followed by short biographical material. The date of writing, 1701, is printed in the body of the text as a signature to this inscription.

previous sentence, to attach his garters there as a noose – many doors at the time had a sign or emblem above them that was ideally suited for hanging someone. In general, one has to be very careful in assigning a label like "no motion", in order to avoid anachronistic interpretations fed by the current situation.

Second, while there are some early instances where one would indeed have a hard time arguing that motion is still there, one has to be careful about what kind of evidence this presents. Specifically, looking at the aggregate behaviour of the speech community may be misleading in this respect, because the earliest examples may be realized by an unrepresentative minority of progressive language users. As Hilpert (2018) points out, practitioners of Construction Grammar more often than not carry out analyses on aggregate data while making use of a theory that is framed as a psychologically plausible model of how linguistic knowledge is stored in individual minds. Such a misalignment of theory and practice is far from ideal (see also Fonteyn 2017 for some thoughts on the aggregate-individual-mismatch). However, the more one returns to the period where innovation begins, the less likely one will have sufficient data to do such an individual analysis. This is why I will focus on aggregate data. Individual analyses on prolific authors is possible from roughly the 1630s onward, and yields results that are compatible with and complementary to those presented here (Petré 2016b; Petré and Van de Velde 2018).

With these two caveats in mind, let us turn again to the question: what happened in the run-up to the appearance of sentences such as (7)? First, it appears that "BE *going to* INF" as a string (so remaining agnostic about its status of assembly or construction), after a stable though marginal existence in the 16th century, exhibits an ever stronger increase in the 17th century, as is shown in figure 7.1 below (adopted from Petré 2016b).

Importantly, this increase was not random. Specific assemblies featuring "BE *going to* INF" were more successful than others. I will focus on three such assemblies: (i) combinations of "BE *going to* INF" with a topicalized object (e.g. *the death I am going to seeke* [1636]); (ii) combinations with present-tense assertions (*He's going to kill me!* [1699]); (iii) combinations with the passive construction (*He was going to be Marry'd to a Whore* [1688]). Each of these, it will be argued, has contributed significantly to the emergence of an auxiliary construction [BE *going to* INF]. Specifically, in each of them a certain semantic aspect of the original, non-grammaticalized assembly, is susceptible to being backgrounded or "deprofiled". Deprofiling here is not to be understood as a conventionalized property of a construction, as in Goldberg (1995: 57). Rather it involves the loss of a profiled aspect of a construction, and is similar to Langacker's notion of profile shift

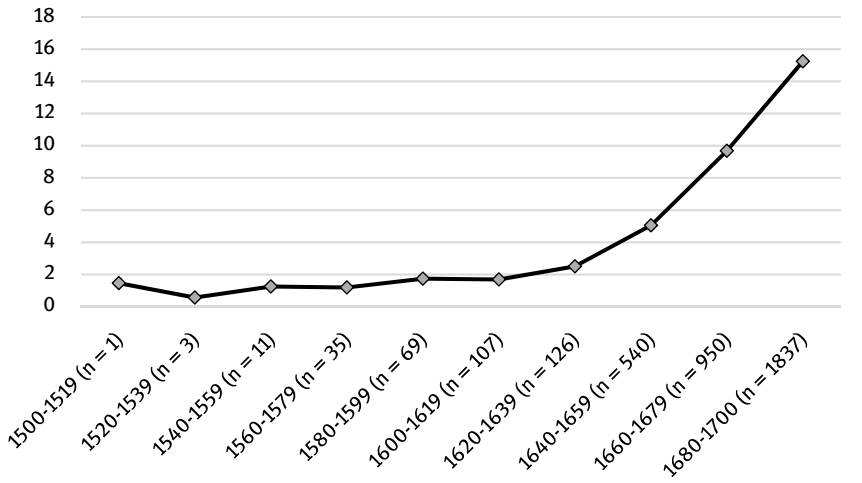

Fig. 7.1: Normalized frequency of "BE *going to* INF" per million words

(Langacker 2009: 66). Langacker gives the example of size-noun constructions such as *a lot of* X, where the original meaning of *lot* 'part, portion' recedes in the background, and the profile shifts to the meaning of size unit that was already pragmatically present. The concept of profile shift seems to imply that deprofiling one aspect automatically means profiling another, similar to Sweetser's (1988) idea of semantic enrichment accompanying bleaching. However, their simultaneity is not a logical necessity, and the respective timing of deprofiling and enrichment is an empirical question.

In the case of "BE *going to* INF", three types of deprofiling are at play. The source assembly "BE *going to* INF" conveys an instance of "ongoing controlled motion with a purpose". An agent, (i) by CONTROLLING his legs (or sometimes, metonymically, some other means of motion, such as a ship or a horse), (ii) IS MOVING to some location, (iii) WITH THE INTENTION of doing something there. It will be argued that the increased use of topicalization primarily deprofiles motion (semantic component (ii)); the increase in present-tense assertions deprofile first ongoingness and then intentionality (iii); and, finally, the development of assemblies with the passive shows an increased deprofiling of control (i).

3.3 The corpus

The focus of the present contribution is on the constructionalization of [BE *going to* INF], which can be seen as constituting the first episode of a longer grammaticalization process. Most of the literature on this stage has been qualitative in nature, for two obvious reasons. First, a novel construction is expected to be rare on its first appearance. Second, until recently historical corpora of English have generally been too limited in size. Combined, the number of data available to historical linguists was simply too small to do any useful quantitative analysis of this earliest stage. To realize a somewhat robust quantitative analysis it was therefore necessary to mine large parts from the database *Early-Modern English Books Online* (http://eebo.chadwyck.com/). This database contains scans of all available published texts between 1473–1700. The *Text Creation Partnership* (TCP; http://www.textcreationpartnership.org/) has provided accurate transcriptions for the majority of the texts in this database. All instances of *going* were retrieved from this corpus, and filtered. Given their infrequency at this early stage, inclusivity was essential. Attention was paid to spelling variants such as *a-going*, *agoing*, *goeing*, *goeinge*, *going*, *goinge*, *gooing*, *goyng*, *goynge*, as well as transcription errors such as *goin* or *go- ing*. The query was also deliberately not limited to a context window within which *going* and *to* had to cooccur. This way instances were found where the *to*-infinitive was separated from *going* by as many as 12 words, where the *to* was lacking or not properly transcribed, where *to* was realized as *t'* (once), and so on. I first extracted all instances of *going* from EEBOCorp 1.0, a selection from EEBO (Petré 2013). EEBOCorp 1.0 contains about 525 million words. This resulted in 3,673 occurrences. However, of these only 234 are dated between 1600 and 1640, and a mere 120 between 1477–1600. To make fine-grained qualitative-quantitative analysis feasible for these crucial early periods I complemented EEBOCorp 1.0 for the years before 1620 with texts from the entire EEBO-TCP database, and also analysed additional data from 1620–1640, mining approximately another 250 million words. This resulted in 218 additional data points.

4 Analysis

4.1 Introduction

In the following sections I turn to each of the three assemblies introduced in section 3.2. I will describe the different stages they go through and how these stages may be explained as a direct correlate of their routinization and increase in

frequency. Section 4.5, then, zooms in on the combined effect of these independent developments. What this means for the constructionalization of [BE *going to* INF] will be discussed in section 5.

4.2 Topicalization

The first assembly combines [BE V*ing*], [GO] and [*to* INF] with a topicalized element belonging to the embedded infinitival clause. This element appearing in front position potentially – though not necessarily – invites a monoclausal reading with *be going* functioning as an auxiliary. The most common syntactic construction triggering topicalization is the relative clause, followed by *wh*-questions, cleft-constructions,[5] or without any syntactic trigger. The topicalization assembly may be schematically represented as in figure 7.2:

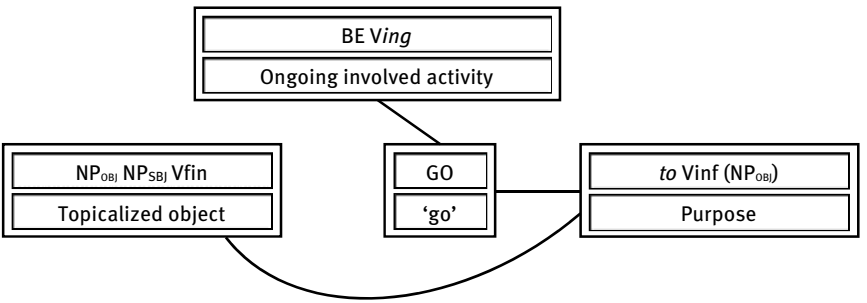

Fig. 7.2: Topicalization assembly

The lines between the different constructions in figure 7.2 represent their combination into a complex pattern, i.e. assembly.[6] The topicalized object construction (or

5 While clefts increase significantly in Early Modern English (see Patten 2012), they seem unimportant in the development of [BE *going to* INF]. Only three out of 791 instances of topicalization in my data are clefts.

6 The process of combining constructions is approximately equivalent to what has been called unification in certain types of construction grammar (for more details see, e.g. Friedman and Östman 2004: 58). It is a formalized form of combining constructions, stipulating that only compatible feature matrices can be unified. Cognitive construction grammar does not adhere to a strictly formalized notion of unification, as it acknowledges that a construction's meaning is too subtle to be captured by feature structures (e.g. Goldberg 2006: 213) – in fact, even practitioners

group of constructions) shares an element with the purpose adjunct construction, the *go*-construction shares an element (*going*) with the progressive construction.

The originally compositional nature of the assembly is suggested by instances that preserve the lexical semantics of its component parts, as in (9).

(9) *What an heavenly prayer! to give them both a taste and a pledge of that intercession* ***which*** *he* ***was going*** *to Heaven* ***to make*** *for them*. (1665)

However, preservation of a semantic component does not necessarily mean that it is fully profiled. In (9) the presence of a goal location *to Heaven* suggests that the motion-component of *going* is still profiled. This is, however, highly exceptional (there are only three clear instances in my data). An important function of a topicalization construction is precisely to profile one element more emphatically than others. In this case the topicalized element belongs to the embedded clause, which is about the agent's purpose or intended action, and not (anymore) about the motion towards a location. Motion is accordingly by default of secondary importance, and deprofiled. An early example is (10).

(10) Hort[ensio]. ... *I must pick it out of him by wit*.
Flo[rimell]. *As good say steale my Lord,* ***what mary-bone*** ['essential part'] ***of witte*** *is your iudgement* ['person capable of good judgment'] ***going to pick*** *now?*
Hort. *I must, like a wise Iustice of peace, picke treason out of this fellow*. (John Day, 1608)

In this fragment from John Day's play *Humour out of breath*, Hortensio is walking about with his assistant, searching for a "proper man without a beard". Hortensio then spots Aspero (the one they are looking for), and mentions to his assistant that he thinks this is the one, ending with "I must pick it [the truth] out of him by wit". Florimell, the woman that is accompanying Aspero, overhears Hortensio and reacts by asking what he *is going to* do. The context reveals that there is motion – the two parties meet each other while walking about in town – but at the same time it is clear that the emphasis is on the intended action of 'picking out treason'.[7]

---

of unification-based models acknowledge this (e.g. Friedman 2015: 990). However, in essence what the theories want to capture is the same, viz. how existing cognitive schemas are combined, and how such combinations are constrained by (lack of) compatibility.

7 Note that topicalization is particularly common with verbs of speech or communication, where motion is generally of little importance. About 33.5% (265/791) of all instances in the 17th century contain a speech or communication verb, as compared to only 7.5% in non-topicalized instances (233/3100). Not too much importance should be attached to the genre ("drama") of this

Pragmatically, then, most of these instances are primarily about an imminent future event (and as such are roughly equivalent to *be about to*) rather than motion with a purpose. An increased degree of entrenchment of this assembly, then, may lead to the loss of the idea of motion altogether. The earliest attestation is (11), from a guide to prayer. The speaker is on his knees and will not move, but, before praying, needs to tune in spiritually with the greatness of God's presence.

(11) *And with a hart thus deuout and recollected … thou shalt thinke* ***to what an excellent, and soueraigne maiesty*** *thou* ***art going to speak.*** (1620)

The constructionalization approach of Traugott and Trousdale (2013) poses a problem here. The shift from (10) to (11) only involves semantic change (as an extreme form of backgrounding of motion, up to its loss), but no formal change. According to their analysis, this is not constructionalization, but only constructional change. But which construction, then, has changed? For we are dealing here with an assembly of four constructions. It cannot be GO that has changed, because outside this assembly GO still means 'move'. Alternatively, one may argue that the assembly already *was* a construction to start with, based on the wider interpretation by Goldberg (2006), which includes entrenched patterns. This would imply there might have been a micro-construction "[BE *going to* INF] + topicalization" prior to a more general [BE *going to* INF], which exists side by side with instantiations of [BE *going to* INF] that are *not* constructions. The evidence at least allows for the possibility that a compositional combination of constructions can develop some functional peculiarities. This may imply that the result is non-compositional anymore, but it seems reasonable to assume that, at least initially, topicalization merely coerced GO into a construction which is indeterminate as regards its motion meaning without this deprofiling being part of a new non-compositional construction.

Whereas constructional status of the topicalization assembly cannot be established qualitatively, more conclusive evidence is arguably found in the quantitative operationalization of the different effects of topicalization. Figure 7.3 outlines how the relative weight of topicalized versus non-topicalized instances of the string "BE *going to* INF" shifts throughout the 17th century. It also shows that,

early example. Eckhardt (2006: 100) has argued that drama was particularly conducive to loss of motion, because motion on the stage was associated with the performance rather than with actual real-life motion. However, early instances of indeterminate cases occur in all sorts of genres. Neither do the earliest instances where motion is lost show a special connection with drama (example (11) for instance is from a religious text).

while fully profiled motion is extremely exceptional, early instances remain consistently compatible with motion. The first attestation of topicalization dates from 1585. The first one where motion is no longer possible only appears in 1620 (example (15)). By the 1630s non-motion uses have become predominant.

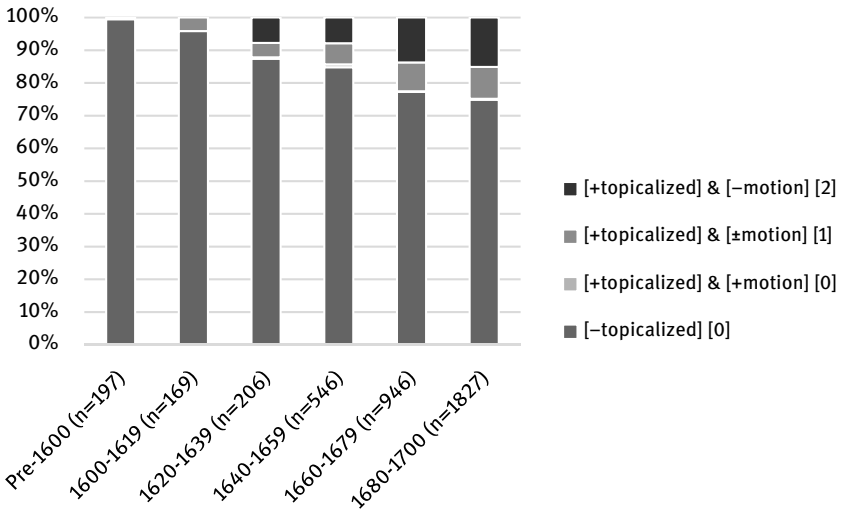

Fig. 7.3: Proportional frequency history of the topicalization assembly

Figure 7.3 provides a visualization of the development. To test for significance, I assigned scores from 0 to 2 to all instances of the string "*be going to* INF", where 0 includes all non-topicalized instances as well as the topicalized ones where motion is fully profiled (note that this last type – [+topicalized] and [+motion] [0] – only shows up as a very thin line in 1620–1639 and 1640–1659); 1 is assigned to those topicalized instances where motion is possible but deprofiled; 2 to those where motion is lost entirely. I then applied Kendall's correlation test. This test provides a p-value as well as an effect size (referred to as tau-b), which ranges between -1 and 1, where 0 means 'no trend whatsoever', and -1 and 1 represent a maximal (from 0 to 100%) upward or downward trend of a certain feature. The test tells that the increase in the relative share of topicalized instances where motion is lost constitutes a significant trend (effect size [tau-b] = 0.14, $p < 0.001$). It is remarkable that whereas up to 1620 there were no instances where motion was clearly lacking, topicalized instances without motion are already the

predominant type in 1620–1639. Comparing Kendall's tau-b values for pairs of periods further reveals that the most significant change takes place precisely between periods 1600–1619 and 1620–1639 (effect size [tau-b] = 0.15, $p < 0.01$). This leap in the data is indicative of the qualitative leap associated with the conventionalization of a pattern, or, indeed, the emergence of a new construction. A second shift that reaches significance, though with a lower effect size, occurs between 1640–1659 and 1660–1679 (effect size [tau-b] = 0.10, $p < 0.001$). Between these periods the share of non-motion instances almost doubles. I will deal with the question whether this constitutes a second qualitative leap in section 5.

4.3 Present-tense assertions

A second type of assembly that is hypothesized to have played a role in the constructionalization of [BE *going to* INF] is the combination of BE, *going*, *to* INF, and an assertive sentence type in the present tense. When combined, the two features of present tense and assertiveness may become conducive to deprofiling of ongoingness (inherent in the function of the progressive), and profiling of the future action expressed in the purposive *to* INF. This may lead, in turn, to deprofiling of intention (inherent in the lexical verb *go*), and the overall function may shift towards that of prediction.

The combination of the [BE *going to* INF]-assembly with this set of sentence constructions is represented schematically in figure 7.4:

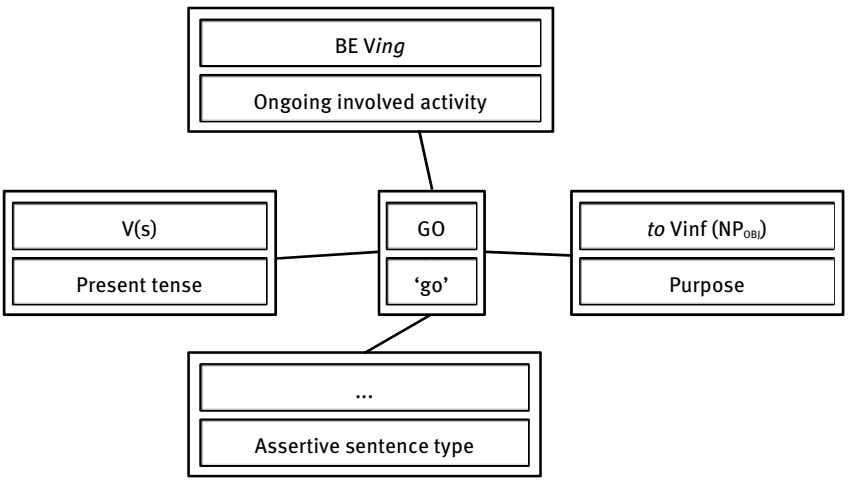

Fig. 7.4: Present-tense assertion assembly

Two distinctions, leading up to three categories, are relevant in order to understand how this shift unfolds. A first distinction is that between the egophoric and non-egophoric perspective. Egophoricity, in the sense of Dahl (2008), applies to expressions where no one is better equipped than the speaker/writer in making a particular statement about the future. Almost all early uses of "BE *going to* INF", before its grammatical constructionalization are egophoric. Within them, a further distinction needs to be made between (i) statements where the outcome is known or assumed, or where no commitment to the future is made; and (ii) those where a commitment is made to the realization of the future situation.

Category (i) contains past tense uses, generic statements, and non-assertive statements in the present tense. Predictions about the future in the past tense are generally about a future relative to the past, which is already known to the speaker/writer (see also Traugott 1989 on the development of *will* and *shall*) – past tense predictions about an absolute future do not occur at this stage. Generic statements are generalizations based on past situations with identical outcomes, and it has been generally inferred that identical future situations will yield identical outcomes. Every member of the community who subscribes to a generic statement will essentially agree on the outcome, making the statement a non-claim on the part of the current speaker. Non-assertive statements such as conditional subordinate clauses in the present tense do not imply any commitment to the realization of a future reality, and hence lack an independent testable outcome. In quantifying the effect of the present-tense assertion assembly, any instance falling within this range of uses receives a score of 0.

Category (ii) contains three types of sentence. The first is that of (mostly first-person) statements where the subject (and therefore the speaker/writer, either directly, or indirectly in the role of omniscient narrator) expresses its intended action.

(12) *I'me very sorry I can continue no longer ..., for* ***I am going to imploy my Eyes*** *in the view of some French Clothes and Garnitures*. (1674)

The subject in (12) expresses its intention. The emphasis on the intention deprofiles the ongoingness associated with the progressive construction. The speaker is not actually going right then, but rather announces that she is about to go. The unrealized nature of this intention may also activate the association with prediction. This profile shift is only a very slight one, since the progressive still preserves the function of signalling that the speaker/writer is already preparing the action. Deprofiling of ongoingness is more pronounced in the second sentence type that is included in category (ii). This type consists of statements where the speaker/writer reports the intentions of other agents, as in (13). The queen has

informed the speaker that she is going forth to meet the prince, and he simply delivers her message. The statement is not a prediction, because neither the commitment of the subject nor its realization are questioned or guessed at. For that reason, reports are also egophoric. However, the degree of certainty about the actual situation is lowered because of the distance between subject and speaker/writer, which again paves the way to the establishment of a predictive function.

(13) *My Lord, the Queen hath sent for you,* ***She is going forth to meet the Prince****, and hath Commanded none be wanting to attend With all the State that may become her, to Congratulate the triumph now brought home.* (1652)

The third type, finally, is the one where the subject demands from someone else to do something (e.g. *tell them that you are going to Interpret the Indictment*, 1682). They are egophoric insofar as the speaker/writer is the source, while also not knowing what the eventual outcome will be. Any instance belonging to any of these sentence types has received a score of 1.

This leaves us with category (iii), which consists of statements where the egophoric perspective is completely abandoned, as in (14). Here the speaker/writer predicts what someone else is going to do based on circumstantial evidence.

(14) *He charged his Gun; whereat the Child Shrieked out,* ***He's going to kill me****!* (1699)

Unlike in the previous cases, the prediction made in (14) involves guesswork, and there is no longer direct access to the intentions of the agent. Instances of such predictions have received a score of 2.

Figure 7.5 below provides an overview of the distribution of the various categories. Category (i) is split up between [-present] (other tenses of BE than the simple present) and [+egophoric] and [+certainty] (generic and non-assertive statements in the present). Category (ii) is captured by [+egophoric] and [-certainty]. Category (iii), finally, by [-egophoric] and [-certainty]. A Kendall's correlation test indicates that there is an overall trend towards a higher score (so towards categories (ii) and (iii)) which is highly significant ($p<0.001$), but overall fairly weak (effect size [tau-b] = 0.06). Between specific periods there are no shifts that are significant at a level of $p<0.01$. It is nevertheless noticeable that the highest effect size (tau-b = 0.09) is once again found for the transition from 1600–1619 to 1620–1639, but it is only significant at a level of $p<0.1$ (exact $p = 0.095$). The transition from 1640–1659 to 1660–1679 is significant at a level of $p<0.05$, but the effect size is equal to the overall trend at 0.06. Interestingly, if we disregard category (ii)

(first-person intentions and reported intentions), the transition to the last period turns out to be the most significant one (p = 0.017). This suggests that the relative importance of category (iii) increases towards the end of the 17th century. Recall that this is the category where the speaker/writer makes a guess about other people's intentions or future situations generally, implying the emergence of an epistemic layer of prediction (see also Budts and Petré 2016).

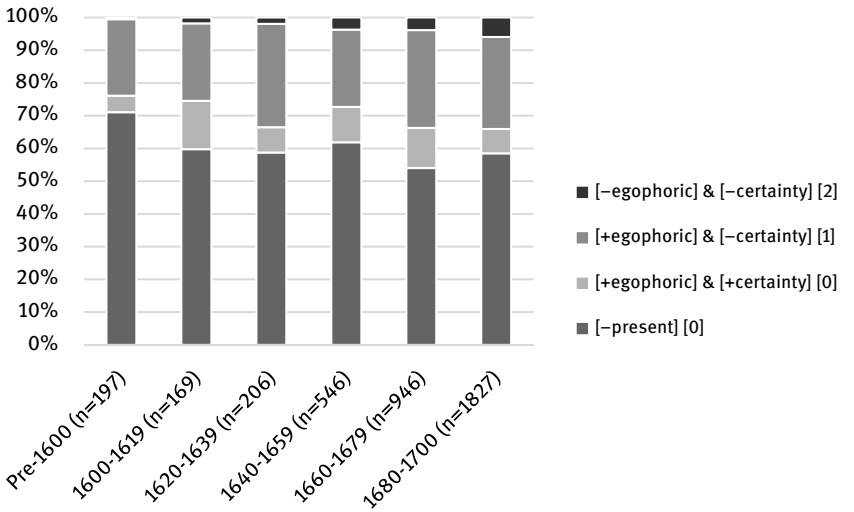

Fig. 7.5: Proportional frequency history of present-tense assertion assembly

4.4 Assembly with passive construction

The third assembly combines [BE V*ing*], [GO] and [*to* INF] with a passive construction, which can be schematically represented as in figure 7.6 below. The possible role of passive constructions in the constructionalization of [BE *going to* INF] has been pointed out early on by Hopper and Traugott (2003), who argue that "the passive demotes the inference that the subject of *go* is volitional or responsible with respect to the purposive clause" (Hopper and Traugott 2003: 89). A similar argumentation is repeated in Traugott and Trousdale (2013: 217–220). The immediate effect of a passive infinitive is limited to the demotion of agency with respect to the infinitive. Yet (some) hearers (at least) may infer that it also demotes the action of *going* more generally. Traugott and Trousdale (2013) give two very early

examples (dated 1477 and 1483) where motion is still clearly present, but at the same time may be subsidiary to the idea of something happening at a later time. Their first example (*ther passed a theef byfore alexandre that* ***was goyng to*** *be hanged* [1477]) can serve as an illustration. The focus is clearly on the hanging, not on the going to the gallows. It should be noted, though, that this effect primarily resides on the perception side. On the production side, writers/speakers, at least initially, may well have combined the passive with "BE *going to* INF" precisely to *add* the idea of (controlled) motion to their message.

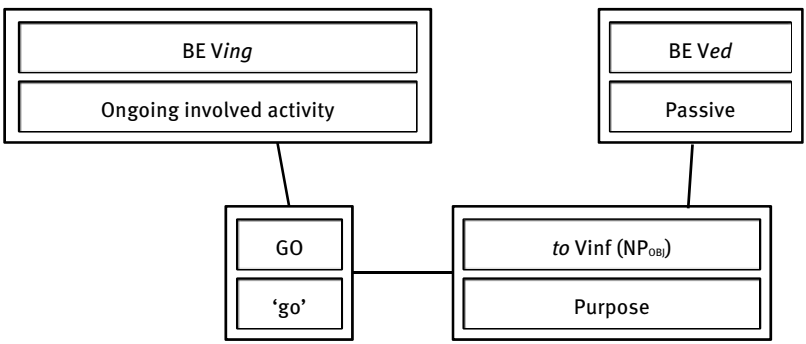

Fig. 7.6: Assembly with passive construction

Despite these two early attestations, the passive is by no means predominant at this earliest stage. Before 1600, only 10 out of a total of 197 instances is a passive (admittedly more than the single instance of topicalization predating 1600). Passives increase from 5% to 8% of all uses during the 17th century. This is only a slight rise (tau-b = 0.03), but it is significant at a level of $p<0.05$ ($p = 0.02$).

As such, a raw frequency increase does not provide much information on the question whether the passive contributed to the emergence of [BE *going to* INF], or merely followed suit. Petré and Van de Velde (2018) argue that a passive *to*-infinitive constitutes a formal feature that highly correlates with the semantic feature of lack of control over the composite action. The assumption is that the semantic extension to situations beyond the control of the subject is the more fundamental development. This semantics can be, and often is, realized by the use of a passive infinitive, but there is no one-on-one mapping between them. The more fundamental role of the semantic development is confirmed by a bi-directional stepwise variable selection procedure (see Levshina 2015: 149–151), which shows that the presence of a passive infinitive is only significant when certain semantic features are left out of the equation. When these semantic features (in

the context of passives, animacy in particular) are taken into account, it is only those that turn out to be significant predictors of the overall development of [BE *going to* INF]. I would like to refine this argumentation here. The assembly with the passive construction may have played a more dedicated role in promoting the no-control uses of [BE *going to* INF], in line with the qualitative analysis by Traugott and Trousdale (2013). However, it *only* started to play this role in the course of the 17th century, after it had gone through an internal development towards higher correlation with no-control uses. Petré and Van de Velde (2018) consistently treat formal and semantic features separately, focussing on what each feature contributed on its own. If we want to know whether the assembly with the passive changed internally, we need to look more closely at the functions associated with this form across time. For this purpose, I have distinguished three main categories of passives in the data.

The first category comprises instances where the subject is both in control of its motion and in control of the planned activity at the destination. In such instances the formal realization of a passive does not at all affect the reading of *going*. A clear example where *going* preserves its semantics of controlled motion is (15).

(15) *The duke of Normandy* ***is goynge*** *to Reynes* ***to be crowned***. (1523)

Instances belonging to this category received a deprofiling score of 0.

The second category is exemplified in (16). Instances of this category either clearly show motion (the 1477 sentence would be an example), or, as in (16), a motion reading is at least possible. In either case the subject is or would be in control of its (possible) motion. Yet in this case the subject is not in control of the composite action. The effect of this is that the semantic component of control (or agency) associated with *going* is deprofiled. Instances within this category therefore receive a deprofiling score of 1.

(16) *He is fumbling with his purse-strings, as a Schoole-boy with his points, when hee* ***is going to bee Whipt****, till the Master wearie with long Stay, forgiues him.* (1628)

It is examples such as (16) that pave the way for further extension to instances where the subject is no longer in control at all, and motion is automatically also (most likely) lacking. An instance of this third category is (17).

(17) *In all Appearance the same or worse Tragedies* ***are going to be Played over*** *again.* (1681)

In addition to these main categories, there is a small number of other cases (put between parentheses in the graph legend). These include (i) those where the subject cannot be in control of any motion (because motion is lacking entirely), but *is* in control of the composite action; (ii) cases where control over the target action is unclear. Both these minor categories receive a score of 1. (iii) cases where there is no control over the action, and control over motion is unclear – these receive a score of 2.

From figure 7.7, which shows only the passives in the data set, it appears that there is a shift towards passive assemblies where the subject lacks control entirely. These instances deprofile the lexical components of control and motion associated with GO the most.

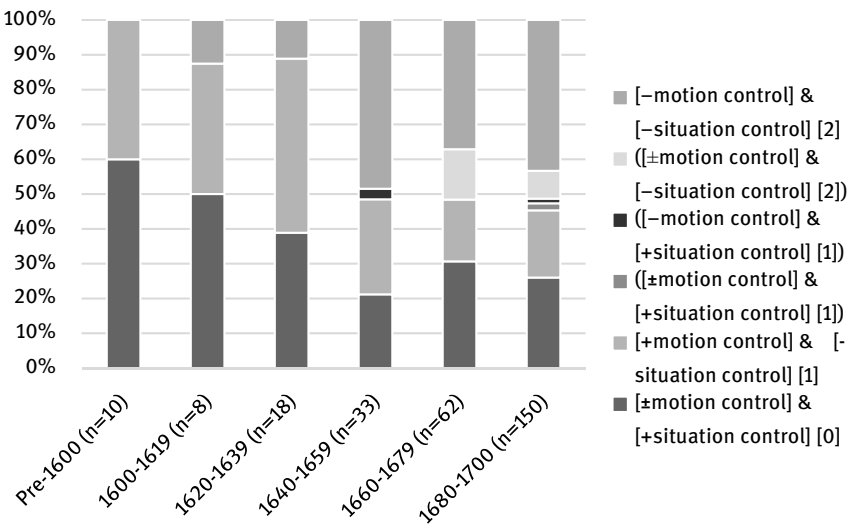

Fig. 7.7: Deprofiling of control and motion in assembly with passive construction

Kendall's correlation test reveals that the overall increase of categories other than the first (where all lexical components are preserved) constitutes a significant trend (effect size [tau-b] = 0.15, p = 0.003). Comparing Kendall's tau-b values for pairs of periods further reveals that the biggest effect occurs between 1620–1639 and 1640–1659. The effect size of the change between these periods is twice as strong as that of the overall trend (tau-b = 0.15), although only moderately significant (p = 0.016). What is most remarkable about the change between these two periods is that category 3, where motion and control are both deprofiled,

suddenly becomes the predominant one. This leap is once again indicative of the qualitative leap associated with the conventionalization of a pattern, or, indeed, the emergence of a new construction. The fact that the leap is found a decade or two later than the one we observed for topicalization, might indicate that the development in the passive was accelerated by the topicalization development. Still, passives already seem to develop internally from the start, suggesting that what happened is a combination of internal entrenchment and strengthening by other assemblies such as topicalization. It seems reasonable to assume that the assembly with the passive helped [BE *going to* INF] in establishing a function of prediction beyond that based on activities controlled by the agent.

4.5 Deprofiling of assemblies combined

The initial hypothesis was that increasing entrenchment of assemblies might lead to the crossing of a threshold, impacting on the behaviour of the construction as a whole. In order to further inform the discussion of section 5, this section briefly looks at the aggregate deprofiling scores of the various assemblies combined. For example, a data point that combines a present-tense assertion score of 1 (egophoric intention) with a topicalization score of 2 (motion lost in topicalization context) has an aggregate score of 3. To test for significance, I carried out a loess regression. Loess calculates a polynomial function for each data point, based on a local subset of all data points. This local subset is defined by smoothing parameter α, which represents the fraction of all data points that is used for the calculation of each local function. Additionally, not all of the data points in each subset are equally weighted. Instead, data points that are closer to the data point for which the local polynomial is calculated get higher weights. The method effectively allows for looking for local developments along a more longitudinal development. Its locality means that the method does not try to fit all data into a single function (such as, for instance, a single s-curve), but remains agnostic as to how many significant sub-developments there are. A lower α will stick more closely to the actual data points, and therefore will generalize less (and overfit the data), whereas a higher α will result in a graph that approximates a global parametric function. Disadvantages to loess is that it is data-intensive and tends to wag at its tails (because it lacks symmetric data to calculate the local function for those areas). To reach a maximally unbiased picture, I averaged aggregate scores per year, and only ran the loess regression from 1560 onwards, when data becomes available on a yearly basis. I also ran the regression model with different smoothing parameters, to see how robust any sub-global trends are. Overall, the graph in figure 7.8 shows that the line gets steeper around 1620–1630. While the

bumpiness of α = 0.30 (dashed line) might point to overfitting, this peak is still clearly visible when α is set at 0.50 (solid line), and weakly so with α = 0.70 (dotted line). The leap is therefore not likely to be the result of outliers, but may well signal a qualitative tipping point within a more global upward trend.

Besides the evidence of a qualitative leap around 1630, there is also evidence that the different assemblies are increasingly interconnected. As some constructs instantiate multiple assemblies simultaneously, the total score theoretically falls within the range of 0 to 6. This full range is attested in our data, but not right from the start. Scores of higher than 2 only appear from the 1620s onwards, and scores higher than 4 from the 1660s onwards. These findings are in line with those found for individual language users in Petré and Van de Velde (2018).

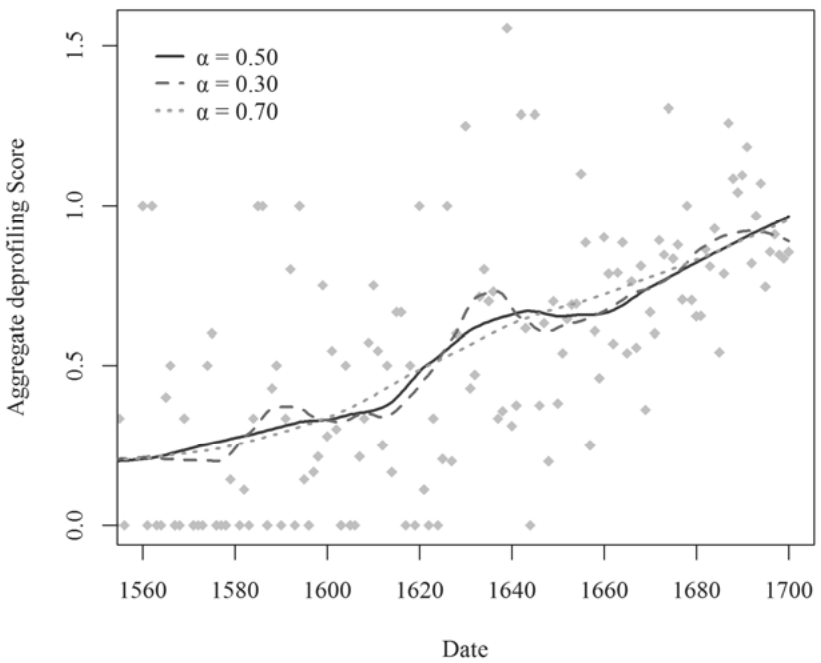

Fig. 7.8: Combined deprofiling scores

Qualitative evidence that the assemblies are shifting from local islands to realizations of a more global schema is also found in the introduction of inanimate subjects. Most inanimate subjects are not in control of what is occurring to them, have no intentions, and are incapable of motion. It is remarkable, then, that they

occur almost simultaneously in all three assemblies. The first attestation in present-tense assertions and topicalization dates from 1629, while the first in a passive dates from 1630. This is about a decade after the deprofiling of lexical features had accelerated in topicalization and present-tense assertions, and coincides with such an accelaration in the passive.

5 Discussion

What do we learn from the history of these assemblies for the constructionalization of [BE *going to* INF]? In this discussion I would like to focus on two outcomes of the analysis: (i) assemblies have certain characteristics which may differentiate them from constructions traditionally conceived; (ii) the emergence of a new form–meaning pairing, i.e. construction is preceded by frequency shifts in assemblies, which gradually bring about semantic shifts.

A first outcome concerns the *sui generis* nature of assemblies. From the analysis of the frequency and functional histories of three assemblies featuring "BE *going to* INF", it appeared that over time each assembly increasingly deprofiled a particular semantic feature of the source composition "BE *going to* INF", thereby moving towards an entrenched linguistic entity of its own. The original meaning of the source composition was that of 'controlled motion with a purpose'. Instances of the topicalization assembly increasingly deprofiled motion in this semantic complex, present-tense assertions deprofiled intentionality (purpose), and passives deprofiled control. Of course, these deprofiled features are not exclusive to a single assembly. Passives also deprofile intentionality just as present-tense assertions deprofile motion, but their prototypical semantics correlate more with the loss of certain semantic features than with others.

The increase in deprofiling each time is assumed to correlate with the strengthening of the associations between the various constructions that constitute the assembly. From a connectionist perspective (e.g. Lamb 1999: chapter 4), one might argue that the change in associative strength (strength of the connection) is all there is, without implying any unique change to the assembly as a holistic unit. Yet it seems hard to reduce what is happening here to connectivity changes alone, precisely because the process involves multiple associations that change in sync, which suggests that a more holistic process is taking place. Indeed, the non-compositional part of an assembly is arguably not primarily about its meaning or form being holistic (as is the case with constructions traditionally defined), but instead about clustered frequency changes. The various associated constructions (or, in connectionist terminology, nodes) themselves preserve their

compositionality, and may still happily occur with one construction less. The reason why they increasingly cooccur, then, is most likely related to pragmatic success rather than construction status in the narrow sense.

A second outcome relates to the timing of neoanalysis or the emergence of a new construction. The hypothesis is that the deprofiling effect of each assembly becomes so salient as to be associated across them. At some point speakers realize that the independent developments of these assemblies are underlyingly indices of a single phenomenon, which comes into being because of that realization. This point may differ between speakers – and it is still an open question whether it is possible beyond first-language acquisition – but as such signals the emergence of the new construction [BE *going to* INF]. It has been argued by Traugott and Trousdale that this is the point where [BE *going to* INF] is used to express deictic (or absolute) future (a prediction about an event in the future) rather than relative future (an imminent action that is expected to result from a controlled event that has already started). They associate the emergence of deictic future with the appearance of raised constructions and stative infinitives such as *be* (Traugott and Trousdale 2013: 118, 220–224), which first occurs towards the end of the 17th century. At the same time, instances where motion is absent, even if they are still about an imminent, hence relative future, already appear much earlier in the first few decades of the 17th century. Was [BE *going to* INF] a new construction already before the appearance of raising, then? Not if one sticks to the idea that a new construction involves a new form. Traugott and Trousdale (2013) account for the time gap between these early motionless instances and the later deictic futures by appealing to the notion of gradualness (referring to De Smet 2012). They also explicitly argue that in the early stages "BE *going to* INF" was not yet itself a construction, but rather a combination of constructions (Traugott and Trousdale 2013: 220). Their conclusion – even though this is not really made explicit – seems to be that constructionalization took place when the semantic shift towards deictic future was combined with the formal exponents of having become a full auxiliary (such as raising).

However, the precise ramifications of the notion of gradualness remain largely unaccounted for. Previous studies on gradualness such as De Smet (2012) have shown that actualization may proceed from one environment to the other on the basis of similarity relations between them. The environments discussed by De Smet (2012) are all "new" environments that are conquered in sequential fashion. An example is the extension of downtoner *all but* from predicative (*this is all but complete*) to attributive adjectives (*an all but complete story*). In the case of [BE *going to* INF] the reality seems more complex. Most of these early instances with inanimate subjects or lacking motion do not differ formally in any noticeable

way from instances of the original combination of 'controlled motion with a purpose'. I believe the evidence provided in this paper enables us to pick up the explanation where De Smet (2012) stops. The gradual approximation of [BE *going to* INF] to an auxiliary is not the result of a sequence of extensions, but instead of the development of somewhat independent assemblies. The various types of evidence I presented suggest that these local developments meet up around 1630. Around this year we see that the various assemblies take a quantitative leap in visibility (significantly higher average deprofiling score). We also see the extension to inanimate subjects in motionless contexts at this point, which implies a more definitive break with the original lexical material. Finally, the metalinguistic evidence (conventionalization between 1620–1640) also points in this direction. The quantitative-qualitative leap, then, may indicate a first "point of no return", signaling that all these independent developments have been connected and have led to a new global cognitive schema for [BE *going to* INF]. In this view, constructionalization does not require a formal change in the sense of Traugott and Trousdale (2013). Its emergence can be detected on the basis of a combination of semantic change and frequency shift. But the development does not stop at this point. The various realizations of the new schema continue to strengthen and reinforce each other. This is for instance evidenced in the occurrence of ever more combinations of what before were more independent assemblies. The occurrence of raising in this scenario would be a final step in the establishment of the new construction, which has now become so entrenched and independently established that it is no longer constrained by the formal contours of the original construction. This formal innovation constitutes a second "point of no return", as the new construction is no longer merely a matter of semantic redistribution, but is now also formally distinct.

Theoretically, the evidence suggests that cognitive schemas show different behaviour at different levels of abstraction. In this respect, complex constructions-to-be may be viewed as clusters of even smaller schemas (assemblies, or perhaps also constructions, depending on one's definition), with their own properties emerging out of this quality of being clustered. More evidence for their independence comes from the pace and timing of the shifts in the different assemblies. The topicalization assembly is the last one to occur, but is the fastest one to lead to loss of lexical material (motion). Passives occurred from the very beginning, gradually shedding the component of control, but took a real leap only in the period 1640–1659, possibly triggered by what had happened to topicalization two decades before. Present-tense assertions show a more gradual development towards predictive uses, which seems largely unaffected by the leaps in the other

assemblies. And yet together these local changes lead to what eventually will become the deictic future construction [BE *going to* INF].

The semantic shifts in the assemblies essentially imply new connectivity between the form [BE *going to* INF] and new meanings (the semantic outcome of deprofiling is also meaning extension). These shifts increase the similarity of [BE *going to* INF] to existing auxiliaries of the future such as *will* or *shall*. This growing similarity may have facilitated the emergence of deictic futures and raising structures (analogy). Non-parametric statistical tests such as loess regression are a good exploratory tool to detect the shift from local compositional assemblies (where mismatches between form and meaning are due to coercion) to more global non-compositional constructions (where the new semantics is an inherent part of the cognitive schema). An important question is how far this line of argumentation should be taken. A more radical approach to similarity may want to measure similarity in terms of frequency of occurrence in similar environments itself. The shift towards auxiliarihood of [BE *going to* INF], in such a view, would be truly gradual, with evermore auxiliary-like uses similar to those of, for instance, *will* and *shall*, appearing, and the semantics of futurity gradually becoming more and more entrenched. Even in an individual mind no abrupt neoanalysis needs to have taken place. Instead, every instance would be weighted for a number of similarity relations, and the more similar an instance is to an auxiliary use, the easier it will become to produce auxiliary-like uses in the future. At no point would there be a dichotomy between compositional and non-compositional (because forms may be associated with meanings, but not categorically linked to them), lexical and grammatical. In this type of reductionist connectionism constructions would disappear altogether, and only connections would remain. Scholars such as McClelland (2015) have argued that such a view is capable of capturing generalizations and higher-level schemas. Neurologically, however, much remains unknown. A more productive approach is perhaps to treat schemas (rules, constructions) and associations (connections, similarity strengths, analogy) as different dimensions of a single complex system (cf. Pothos 2005, who sees them as extremes on a cline). In this view, constructions would be special generalizations, that cognitively stand out, and where only a (smallish) subset of a construct's properties are involved (some meaning and some form). While they may be more flexible than exceptionless rules in that they can be argued to be radial categories around a prototype, they are still at a higher level of abstraction than similarity connections, which are pervasive and multidimensional in all the properties of a construct. Both may play an active role, but the rules may be less susceptible to frequency shifts than the similarities (though they may emerge out of such shifts). I believe the main contribution from corpus linguistic

historical studies is to get at as accurate a picture as possible of how complex developments proceed along these lines. The notion of construction, in the present study realized as a global schema pairing [BE *going to* INF] to imminent future, with certain formal consequences, is meaningful in such a view, but not exclusive. The evidence shows signs of a pre-construction-stage with its own dynamics, leading up to a new schema only after pre-construction deprofiling has reached a certain threshold. Formal actualization of the change follows still later, again, after entrenchment of the new schema has reached a certain threshold. The local patterns responsible for the run-up in this development do not show compelling evidence for constructional status, and may therefore be better captured under the heading of assemblies.

References

Agresti, Alan. 2010. *Analysis of ordinal categorical data*. 2nd edn. New York: John Wiley & Sons.

Andersen, Henning. 2001. Actualization and the (uni)directionality. In Henning Andersen (ed.), *Actualization: Linguistic change in progress*, 225–248. Amsterdam: John Benjamins.

Bates, Elizabeth, & Jeffrey L. Elman. 1993. Connectionism and the study of change. In Mark H. Johnson, Yuko Munakata & Rick O. Gilmore (eds.), *Brain development and cognition: A reader*, 623–642. Oxford: John Wiley & Sons.

Heine, Bernd, Ulrike Claudi & Friederike Hünnemeyer. 1991. *Grammaticalization: A conceptual framework*. Chicago: University of Chicago Press.

Budts, Sara & Peter Petré. 2016. Reading the intentions of *be going to*. On the subjectification of future markers. *Folia Linguistica Historica* 37. 11–32.

Clark, Lynn, & Graeme Trousdale. 2009. The role of frequency in phonological change: Evidence from TH-Fronting in east central Scotland. *English Language and Linguistics* 13. 33–55.

Cleveland, William S., Eric Grosse 7 William M. Shyu. 1992. Local Regression Models in S. In John M. Chambers & Trevor J. Hastie. *Statistical models in S*, 309–376. Danvers, MA: CRC Press, Inc.

Cleveland, William S. & Clive Loader. 1996. Smoothing by local regression: Principles and methods. In Wolfgang Härdle & Michael G. Schimek (eds.), *Statistical theory and computational aspects of smoothing. Proceedings of the COMPSTAT '94 Satellite Meeting held in Semmering, Austria, 27–28 August 1994*, 10–49. Heidelberg: Physica-Verlag.

Croft, William. 2000. *Explaining language change: An evolutionary approach*. London: Longman.

Dahl, Östen. 2008. Animacy and egophoricity: Grammar, ontology and phylogeny. *Lingua* 118. 141–150.

De Smet, Hendrik, Lobke Ghesquière & Freek Van de Velde (eds.). 2015. *On multiple source constructions in language change*. Amsterdam: John Benjamins.

De Smet, Hendrik. 2012. The course of actualization. *Language* 88 (3). 601–633.

De Smet, Hendrik. 2016. How gradual change progresses: The interaction between convention and innovation. *Language Variation and Change* 28. 83–102.

Detges, Ulrich & Richard Waltereit. 2002. Grammaticalization vs. reanalysis: A semantic-pragmatic account of functional change in grammar. *Zeitschrift für Sprachwissenschaft* 21. 151–195.

Disney, Steve. 2009a. A domain matrix view of the uses and development of BE 'going to' + infinitive. *Linguistics & Language Teaching* 3. 25–44.

Disney, Steve. 2009b. The grammaticalisation of 'be going to'. *Newcastle Working Papers in Linguistics* 15. 63–82.

Eckhardt, Regine. 2006. *Meaning change in grammaticalization. An enquiry into semantic reanalysis*. Oxford: Oxford University Press.

Erman, Britt, & Beatrice Warren. 2000. The idiom principle and the open choice principle. *Text* 20. 29–62.

Fischer, Olga. 2007. *Morphosyntactic change: Functional and formal perspectives*. Oxford: Oxford University Press.

Fonteyn, Lauren. 2017. The aggregate and the individual: Thoughts on what non-alternating authors reveal about linguistic alternations – a response to Petré. *English Language and Linguistics* 21 (2). 251–262.

Fried, Mirjam & Jan-Ola Östman. 2004. Construction grammar: A thumbnail sketch. In Mirjam Fried & Jan-Ola Östman (eds.), *Construction grammar in a cross-language perspective*, 11–86. Amsterdam: John Benjamins.

Fried, Mirjam. 2015. Construction grammar. In Tibor Kiss & Artemis Alexiadou (eds.), *Syntax – theory and analysis: An international handbook*, 974–1003. Berlin: De Gruyter Mouton.

Garrett, Andrew. 2012. The historical syntax problem: Reanalysis and directionality. In Dianne Jonas, John Whitman & Andrew Garrett (eds.), *Grammatical change: Origins, nature, outcomes*, 52–72. Oxford: Oxford University Press.

Goldberg, Adele 2006. *Constructions at work: The nature of generalization in language*. Oxford: Oxford University Press.

Goldberg, Adele. 1995. *Constructions: A construction grammar approach to argument structure*. Chicago: University of Chicago Press.

Haspelmath, Martin. 1999. Why is grammaticalization irreversible? *Linguistics* 37. 1043–1068.

Hilpert, Martin. 2008. *Germanic future constructions: A usage-based approach to language change*. Amsterdam: John Benjamins.

Hilpert, Martin. 2018. Three open questions in Diachronic Construction Grammar. In Evie Coussé, Peter Andersson & Joel Olofsson (eds.), *Grammaticalization meets construction grammar*, 21–39. Amsterdam: John Benjamins.

Hopper, Paul J. & Elizabeth C. Traugott. 2003. *Grammaticalization*. 2nd edn. Cambridge: Cambridge University Press.

Israel, Michael. 2002. Consistency and creativity in first language acquisition. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 28 (1). 123–135.

Lamb, Sydney M. 1999. *Pathways of the brain: The neurocognitive basis of language*. Amsterdam: John Benjamins.

Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar*. Vol. I: *Theoretical perspectives.* Stanford: Stanford University Press.

Langacker, Ronald W. 2009. *Investigations in Cognitive Grammar*. Berlin: Walter de Gruyter.

Levshina, Natalia. 2015. *How to do linguistics with R. Data exploration and statistical analysis*. Amsterdam: John Benjamins.

Manning, Christopher D. 2015. Computational linguistics and deep learning. *Computational Linguistics* 41 (4). 701–707.

McClelland, James L. 2015. Gradience, continuous change, and quasi-regularity in sound, word, phrase, and meaning. In Brian MacWhinney & William O'Grady (eds.), *The handbook of language emergence*, 53–80. Chichester: Wiley-Balckwell.

Nesselhauf, Nadja. 2010. The development of future time expressions in Late Modern English: redistribution of forms or change in discourse? *English Language and Linguistics* 14 (2). 163–186.

Patten, Amanda. 2012. *The English* it-*cleft. A constructional account and a diachronic investigation*. Berlin: de Gruyter.

Petré, Peter. 2012. General productivity: How become waxed and wax became a copula. *Cognitive Linguistics* 23 (1). 28–65.

Petré, Peter. 2013. *EEBOCorp, Version 1.0*. Leuven: University of Leuven Linguistics Department.

Petré, Peter. 2016a. Grammaticalization by changing co-text frequencies, or why [BE Ving] became the 'progressive'. *English Language and Linguistics* 20 (1). 31–54.

Petré, Peter. 2016b. Unidirectionality as a cycle of convention and innovation. Micro-changes in the grammaticalization of [BE going to INF]. *Belgian Journal of Linguistics* 30. 115–146.

Petré, Peter. 2017. The extravagant progressive. An experimental corpus study on the history of emphatic [BE Ving]. In Alexander Bergs & Thomas Hoffmann (eds.), *Cognitive approaches to the history of English*. Special issue *English Language and Linguistics* 21 (2). 227–250.

Petré, Peter & Freek Van de Velde. 2018. The real-time dynamics of individual and community in grammaticalization. *Language* 94 (4). 867–901.

Petré, Peter & Sara Budts, 2020. Putting connections centre stage in diachronic construction grammar. In Lotte Sommerer & Elena Smirnova (eds.), *Nodes networks in diachronic construction grammar*. Amsterdam: John Benjamins.

Pothos, Emmanuel M. 2005. The rules versus similarity distinction. *Behavioral and Brain Sciences* 28 (1). 1–14.

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

Schmid, Hans-Jörg. 2016. A framework for understanding linguistic entrenchment and its psychological foundations. In Hans-Jörg Schmid, (ed.), *Entrenchment and the psychology of language learning: How we reorganize and adapt linguistic knowledge*, 9–38. Berlin: Walter de Gruyter.

Sweetser, Eve. 1988. Grammaticalization and semantic bleaching. In Shelley Axmaker, Annie Jaisser & Helen Singmaster (eds.), *Berkeley Linguistics Society 14: General session and parasession on grammaticalization*, 389–405. Berkeley: Berkeley Linguistics Society.

Tabor, Whitney. 1994. *Syntactic innovation: A connectionist model*. Stanford, CA: Stanford University Ph.D. dissertation.

Thompson, Sandra A. 2002. 'Object complements' and conversation. *Studies in Language* 26. 125–164.

Tomasello, Michael. 1992. *First verbs: A case study of early grammatical development*. Cambridge: Cambridge University Press.

Tomasello, Michael. 2000. The item-based nature of children's early syntactic development. *Trends in Cognitive Sciences* 4 (4). 156–163.

Torres Cacoullos, Rena, & James A. Walker. 2009. The present of the English future: Grammatical variation and collocations in discourse. *Language* 85 (2). 321–354.

Traugott, Elizabeth C. 1989. On the rise of epistemic meanings in English: An example of subjectification in semantic change. *Language* 65. 31–53.

Traugott, Elizabeth C. 2012. On the persistence of ambiguous linguistic context over time: Implications for corpus research on micro-changes. In Joybrato Mukherjee & Magnus Huber (eds.), *Corpus linguistics and variation in English: Theory and description*, 231–246. Amsterdam: Rodopi.

Traugott, Elizabeth Closs & Graeme Trousdale. 2013. *Constructionalization and constructional changes.* Oxford: Oxford University Press.

Traugott, Elizabeth Closs. 2015. Toward a coherent account of grammatical constructionalization. In Jóhanna Barðdal, Elena Smirnova, Lotte Sommerer & Spike Gildea (eds.), *Diachronic Construction Grammar,* 51–80. Amsterdam: John Benjamins.