

The road ahead for Construction Grammar

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1 Introduction

Speculating about the future of a research program such as Construction Grammar is a risky business. Given that scientific progress is characterized by unexpected insights that disrupt the status quo and that call fundamental assumptions into question, a prediction that sounds very reasonable today might, just a few years later, reveal itself to be completely off the mark. As any healthy research field evolves, so do its guiding questions, its theoretical tenets, and its methodological standards. It would therefore be my hope that future generations of Construction Grammarians will see the work that is being done today as a worthy effort that was carried out in good faith, but that was in retrospect naïve in some respects, and not just lacking in further refinement, but rather in need of a conceptual re-orientation. A prediction that I am happy to make is that some of the questions we are asking today will ultimately not receive answers. Instead, we will discover that we simply need to ask a different set of questions. Paraphrasing Samuel Beckett, we will try and fail, try again, and fail again, but better.

In the light of this outlook, what can be said about the future of our field? In order to establish a certain coherence between the papers of this special issue, the editors have asked us, the contributors, to begin our respective papers by responding to three questions that concern the theoretical foundations of Construction Grammar. The initial sections should thus comment on the status of Construction Grammar as a theoretical framework, the information that a constructional description should provide, and the way in which a concrete example of language use could be analyzed from a constructional perspective. At the risk of annoying the editors, my co-contributors, and of course the readers, I am afraid that I will not honor this request, at least not in the way it was originally planned. Let me explain.

My plan for this paper is to address the development of Construction Grammar through the perspective of researchers who, quite literally, represent the future of the field. I am talking about a new generation of young colleagues who have recently completed their PhD dissertations, in which they present the results of a critical engagement with Construction Grammar. I strongly feel that the voices of these colleagues deserve to be heard, and that their ideas will give shape to the discussions that will matter to the field in the years to come. I hasten to add that this is of course a highly subjective position. I'm fully aware that my perspective is narrow and subject to various biases. I have not undertaken a systematic review of recent dissertations with a link to Construction Grammar, which means that there are many hidden gems in the existing literature that I am simply not aware of. The dissertations that I discuss in this paper have found their way onto my desk in different ways, sometimes by sheer serendipity, and they have won me over with their insights and originality. On the following pages, I will summarize some of their respective observations and conclusions, and I will try to establish connections between them. The discussion will be structured around three main issues that are of general relevance to Construction Grammar, namely constructional meaning, the architecture of the constructional network, and the role of language change in a constructional theory of language. The global picture that emerges will hopefully provide an outline that helps us to see where the field might go next, with all the caveats that were mentioned above.

At the end of this paper, in an effort to be conciliatory and to regain the good graces of the editors, my co-contributors, and naturally also the readers, I will eventually address the three questions that tie this special issue together. Drawing on what I have learned from the six dissertations, I will try to show how the work discussed throughout this paper invites us to see them in a new light. I cannot promise to channel the views of the younger generation with great accuracy, but I will certainly do what I can.

The remainder of this paper is organized as follows. Section 2 starts out by addressing new perspectives on constructional meaning and its links to syntactic form. The relation of constructions and frames figures prominently in the work of Alexander Willich (2022a, 2022b). Constructional meaning is also at the center of Lucia Busso's (2018) research on coercion and valency. Section 3 turns to the architecture of the constructional network.

Tobias Ungerer (2022a) shows how results from syntactic priming studies can be used to gain insights into that architecture. Nicholas Lester (2018) studies how the syntactic distribution of English nouns affects how they are processed, even in experimental tasks where no explicit context is present. Section 4 moves on to the issue of language change. Lorenzo Moretti (2021) discusses how new nodes emerge in the network of constructions, and how different existing constructions can contribute to that process. The research of Lynn Anthonissen (2020) views change over time through the lens of individual speakers and the cognitive and social mechanisms that influence their linguistic behavior. Once all these ideas have been laid out, Section 5 has the aim of highlighting a few common threads of the different lines of work that inform this paper. The three questions mentioned above will serve as guideposts in that discussion, which will lead to a final conclusion. Without giving too much away at this point, my final assessment will be that the future of Construction Grammar is in very capable hands indeed.

2 Constructional meaning

Meaning has always occupied a central role in constructional research, both at the theoretical level and in empirical work on the meaning of specific linguistic forms. The idea that syntactic patterns are to be seen as symbolic units that are endowed with meaning (Fillmore et al. 1988, Goldberg 1995) is a key characteristic of Construction Grammar as a linguistic theory. Within the Construction Grammar community, there is a broad consensus that Frame Semantics (Fillmore 1985, Fillmore and Baker 2010) is a theory of meaning that lends itself particularly well to the analysis of constructional meaning. The website of the Berkeley FrameNet project offers a rich implementation of the theory on the basis of authentic data. The implications of frame semantics for constructional analyses are manifold. For example, Goldberg (1995: 39) presents an argument, known as the scene-encoding hypothesis, which states that the basic argument structure constructions found in a given language should map onto event types that are foundational to human experience, that is, frames that for example describe moving from one place to another, acting on an object, or giving something to someone else. The interaction of constructional meaning and frames is further evident in genre-specific constructions that allow speakers to omit

arguments (Ruppenhofer and Michaelis 2010). Alexander Willich's research comes in at this point, specifically with the observation that despite the general openness towards Frame Semantics, several fundamental questions with regard to its integration into constructional analyses remain to be worked out (Willich 2022a: 2). How exactly are we to understand the respective semantic contributions of constructions and the lexical elements they combine with? What is the precise place of frames in constructional analyses, and what leading principles should guide a frame-based semantic analysis of constructions? The ideas presented in Willich (2022a) aim for the development of a comprehensive theory of constructional meaning, using a set of reflexive argument structure constructions from German as examples. Willich (2022b) offers a concise and accessible primer for the ideas that are presented in full depth in Willich (2022a). The following paragraphs highlight some of the main points of his account.

In order to systematize the frame-semantic analysis of constructions, Willich (2022b: 2) first proposes a distinction between three different types of frame, namely lexical frames, constructional frames, and construct frames. Lexical frames are evoked by individual lexical elements, for example by the verb *fight* in the sentence *She fought her way through the thicket*, which evokes the frame of a hostile encounter.¹ As the sentence is an instance of the English *way*-construction, it also evokes a constructional frame, namely the frame of self-propelled motion. That constructional frame provides an interpretation for the prepositional phrase *through the thicket*, which is thus analyzed as the path along which motion takes place. This division of labor between lexical meaning and constructional meaning has been an important part of constructional thinking (e.g. Goldberg 1995: 51). Willich (2022b: 3) distinguishes a third component that affects the interpretation of constructional meaning, namely what he calls a construct frame. Construct frames operate at the token level of actual utterances. In the example *She fought her way through the thicket*, the construct frame represents a conceptual blend of the lexical frame of a hostile encounter and the constructional frame of self-propelled motion. Elements from both frames are selectively projected (Fauconnier and Turner 1998: 143) into the construct frame, which is thus neither a true hostile encounter nor a simple instance of self-propelled motion (cf. also Michaelis

¹ The FrameNet webpage offers a detailed description of the Hostile_encounter frame: <https://framenet.icsi.berkeley.edu/frameindex>

and Hsiao 2021, who study emergent frame-semantic structures in English denominal verbs). The two layers of meaning that are contributed by lexical frames and constructional frames come together in construct frames, which then afford the rich semantic interpretations that hearers extract from language use.

Willich (2022a: 279) further argues that the relative contribution of a constructional frame to the overall constructional meaning depends on a measure that he labels frame proximity. What is frame proximity? The greater the semantic differences between the lexical frames evoked by an utterance and the relevant constructional frame, the stronger will be the semantic impact of the latter. To illustrate, in a sentence such as *He put the plates on the table*, the verb *put* evokes the frame of placing, and the construction evokes the frame of caused motion. The two frames are highly compatible, and as a consequence, the overall interpretation of the example does not deviate from the lexical frame that is evoked. By contrast, a sentence such as *John talked himself hoarse* features a lexical frame and a constructional frame that are relatively more distant, which leaves the constructional frame with a greater semantic impact. Frame proximity can be operationalized in terms of the frame-to-frame relations that have been implemented in the FrameNet architecture (Ruppenhofer et al. 2016). Willich (2022a: 289) proposes a way to quantify frame proximity and shows empirically that language users prefer to combine lexical frames and constructional frames that are mutually close. Creative combinations, such as the famous *Pat sneezed the napkin off the table* (Goldberg 1995: 3) are of course possible, but they strike us as creative precisely because they are relatively rare.

Another central element of Willich's (2022a) account of constructional meaning is that each construction can be characterized in terms of a set of seven semantic parameters. Out of these seven, Willich (2022b) outlines the three parameters of constructional polysemy, productivity, and emergent structure. The first of these, constructional polysemy, captures the fact that constructions may be associated with more than one constructional frame. A well-known example is the polysemy of the English *way*-construction with its senses that are commonly labeled as manner (*He stumbled his way to the bar*), means (*He dug his way out of prison*), and coincidental activity (*He whistled his way down the street*). Willich (2022b: 9) notes that constructional senses tend to co-occur with specific lexical frames. For the *way*-

construction, this means that for example verbs such as *whistle* or *laugh*, which are difficult to construe as either manner or means of motion, specifically co-occur with the coincidental activity sense of the construction. The parameter of constructional productivity is understood by Willich (2022b: 9) as the variety of lexical frames that appear with a given construction in language use. This definition provides an alternative to established frequency-based measures of productivity that work with hapax legomena (Baayen 2009) or growth curves (Säily 2011). Willich draws on the notions of type frequency and semantic coherence (Barðdal 2008) in order to view the productivity of a construction as the potential to appear with a large number of lexical frames that are semantically distant from its constructional frame. Finally, the parameter of emergent structure relates to non-compositional meanings that result from the conceptual integration of a lexical frame and a constructional frame in a construct frame. Emergent structure can be observed for example in so-called grinding constructions (Hilpert 2019: 15) such as *They have alligator on the menu* or *I love to eat octopus*. In these examples, English count nouns appear in morpho-syntactic contexts that effectively turn them into mass nouns (cf. Fillmore 2013: 115-16). Importantly, the respective construct frames go semantically beyond the mere combinations of their lexical frames and constructional frames. The speaker who declares having a taste for octopus does not want to eat a homogeneous mass made out of octopus, but rather a dish that involves octopus as one of the ingredients. The construct frame thus conveys meaning that is not present in either of the input frames.

In his dissertation, Willich (2022a) applies these ideas to a careful semantic analysis of reflexive constructions in German. The result is not just a convincing account of meaning in a particular grammatical domain in German, but it rather provides a very useful template for further projects in constructicography (Lyngfelt et al. 2018). Another considerable asset of Willich's account is that it combines theoretical issues with practical methodological steps, such as the measurement of frame proximity through FrameNet annotations.

While Alexander Willich's dissertation illustrates how new research into constructional meaning tries to consolidate the theoretical foundations of Construction Grammar, there is also important work happening at the methodological level. Lucia Busso (2018) adopts methods from distributional semantics (Lenci 2008, 2018, Turney and Pantel 2010) and

experimental psycholinguistics, and she applies them to a classic topic in constructional research, namely the phenomenon of coercion.

Coercion is an effect that can be observed when a construction is used with a lexical item that is not semantically compatible with that construction (Michaelis 2004: 25). In such cases, the meaning of the lexical item changes, so that it conforms to the meaning of the construction. To illustrate, in the example *Frank played the piano to pieces*, the construction coerces the verb *play* into a meaning that conveys an idea of forceful action that is not part of the conventionalized lexical meaning of the verb. While the phenomenon of coercion has been at the center of theoretical discussions in Construction Grammar for some time (Ziegeler 2007, Boas 2011, Lauwers and Willems 2011, Audring and Booij 2016, among others), the empirical study of coercion and how it affects lexical meanings has received comparatively less attention (see however Magne et al. 2014, Piñango and Deo 2016, and references therein). The central aim of Busso's (2018) work is to assess how coercion is related to the semantic compatibility between verbs and constructions, and to analyze what role is played by the relative density of the semantic space that is covered by the verbs that appear in a given construction.

In order to analyze these issues, Busso (2018: 94) focuses on coercion in Italian argument structure constructions, including syntactic patterns such as the caused motion construction, the cognate object construction, or the passive, all of which allow uses with coerced verbs. The examples below illustrate the constructions and how they can accommodate coerced verbs.

- (1) a. *Giulia ha messo i pomodori nell'insalata* (caused motion construction)
Giulia AUX put ART tomatoes in-ART salad
Julia put tomatoes in the salad.
- b. *Giacomo ha tossito birra su tutto il tavolo* (caused motion coerced)
Giacomo AUX coughed beer on all ART table
Jack coughed beer all over the table.

- (2) a. Sara ha dormito un sonno di piombo (cognate object construction)²
 Sara AUX slept ART sleep of lead
Sara slept a deep sleep.
- b. Giulia ha gareggiato un'ottima partita (cognate object coerced)
 Giulia AUX competed ART great match
Julia competed a great game.
- (3) a. La malattia è stata combattuta dal paziente. (passive construction)
 ART illness AUX be.PST fight.PST by.the patient
The illness was fought by the patient.
- b. La malattia è stata lottata dal paziente. (passive coerced)
 ART illness AUX be.PST struggle.PST by.the patient
The illness was struggled by the patient.

For the selected constructions, Busso (2018: 146) identifies the verbs that occur with these constructions in corpus data and analyzes their meanings with the help of distributional semantic methods. The core idea that motivates this approach is the insight that the meaning of linguistic elements is reflected in their collocational behavior. Linguistic elements with similar or strongly related meanings, as for example the English verbs *catch* and *throw*, will occur with similar sets of collocates at similar frequencies. Busso (2018: 148) uses the collocational profiles of more than 200 verbs in order to construct a visual representation of how these verbs relate semantically to each other and to the Italian argument structure constructions in which they appear. This analysis reveals that the selected constructions differ in terms of their semantic generality and in terms of the collocational overlap they share with other constructions. For example, the Italian caused motion construction and the Italian Dative construction, which expresses a transfer, exhibit highly similar distributional profiles (Busso 2018: 151).

² Note that Busso's definition of the cognate object construction does not require the lexical items to be cognates in the strict sense, so that for example *dormire* 'to sleep' and *sonno* 'sleep' co-occur.

Central to the subsequent analysis of coercion is the notion of semantic density. In order to measure how dense the semantic space of a given construction is, Busso (2018: 152) uses the cosine to compute pairwise differences between all verbs that appear in a construction, following a suggestion by Perek (2016). If the average difference between the obtained cosine values is small, this means that the construction has a very focused and dense collocational profile. If the average difference is large, this indicates that the verbs of a construction can be semantically very different from one another, and that the semantic space covered by the construction is more sparsely populated. In Busso's data, the Italian passive construction occupies a semantic space that is not very dense, whereas the Italian cognate object construction shows much higher semantic density. The crucial question with regard to semantic density is of course whether and how it impacts coercion. All other things being equal, are coercion effects more easily achieved with semantically dense constructions or with constructions that are semantically expansive?

In order to address this question, Busso (2018: 157) checks if the measurements of semantic density can be used to predict acceptability ratings that speakers of Italian gave to examples of constructions that were either conventional, exhibited coercion effects, or were downright ungrammatical. The analyses indicate that semantic density has a significant effect, even when factors such as type and token frequency of a construction are systematically controlled for. Specifically, speakers accept coerced examples more readily when the semantic density of the coercing construction is high. In Busso's (2018: 161) own words, "mismatching formulations are more easily coerced into acceptable novel meanings if the target construction of reference is observed with similar verbs". Very interestingly, the differences in acceptability between fully conventionalized sentences and coerced examples do not show any sensitivity to the type or token frequency of the constructions in question. Semantic density appears to drown out any frequency effects that could be expected.

Complementing this result, Busso (2018: 201) further presents the results of a priming study in which example sentences of constructions with coerced verb meanings serve as primes, and a subsequent lexical decision task measures reaction times relative to stimuli that instantiate either prototypical verbs of the prime construction, verbs with semantic similarity to the verb in the prime stimulus, or unrelated verbs. It is shown that the first

condition produces the shortest latencies, which motivates the conclusion that constructional meaning is strongly activated in the processing of coerced verb meanings.

Busso's work illustrates how new methodological developments, particularly techniques that draw on distributional approaches to semantics, can shed new light on topics that have been central to Construction Grammar as a theory of language for a long time. Her dissertation also shows that the combination of corpus-based and experimental techniques continues to yield results that push the boundaries of our current understanding of language.

Reading the dissertations by Alexander Willich and Lucia Busso side by side, I found it striking that despite their differences in outlook and approach, they provide insights that are suggestive of new and original connections. The concepts of frame proximity and semantic density capture ideas that are strongly related, in the same way that conceptual integration and coercion are intimately linked to one another. Putting these issues into a mutual context and exploring the questions that result from this enlarged perspective would be a worthwhile project to pursue.

3 The architecture of the constructional network

Besides the idea that constructions are to be understood as symbolic units, a second central notion in Construction Grammar is that knowledge of language can be analyzed as a network. The links between constructions that give shape to this network have been the subject of intensive discussion. Different typologies of links have been proposed (Goldberg 1995, Diessel 2019, Schmid 2020, Sommerer and Smirnova 2020, amongst others), and in particular the relation and division of labor between inheritance links, which reflect category inclusion, and horizontal links, which relate for example to partial similarity or association due to frequent co-occurrence, has attracted attention (Audring 2019, Sommerer and Baumann 2021, Ungerer to appear). Phenomena such as statistical preemption (Goldberg 2019), constructional contamination (Pijpops and Van de Velde 2016), or constructional network reconfiguration (Torrent 2015) essentially concern effects of different patterns of linkage between constructions. Developing a coherent and exhaustive architecture for the

constructional network is a highly complex task. In this section I want to highlight research that helped me understand a few issues a bit more clearly.

Tobias Ungerer (2021, 2022a, 2022b) uses the experimental paradigm of structural priming to investigate how English argument structure constructions are interrelated in the constructional network. The constructions that are analyzed include the caused motion construction (*John rolled the ball down the hill*), the resultative construction (*Susan hammered the metal flat*), and what Ungerer calls the object-oriented depictive construction (*Bob ate the steak raw*). A first experimental study (Ungerer 2021) focuses on a contrast between the first two constructions, that is, the caused motion construction and the resultative construction. The linkage between these two can be conceived of in different ways, for example in terms of metaphor (Goldberg 1995: 81), or as members of a construction family that are connected through bidirectional horizontal links (cf. Goldberg and Jackendoff 2004). Ungerer (2022: 195) argues that these views yield different predictions with regard to structural priming. Whereas bidirectional horizontal links would predict that either of the two constructions primes the other, the metaphorical analysis predicts an asymmetric priming effect, such that the caused motion construction primes the resultative construction, but not vice versa. Ungerer uses a maze task design, which combines self-paced reading with a forced choice between two words that are presented simultaneously on a computer screen. The experiment included examples of the caused motion construction, the resultative construction, and an unrelated construction both as primes and as targets. The results show inhibition effects. The observed reaction times are generally slower when there is a difference between prime and target, for example when a caused motion construction is followed by a resultative construction. Importantly, this effect is not asymmetric. Ungerer (2021) is careful to point out that this result should not be interpreted as evidence against the metaphorical account as such, but rather as an insight into the way in which the two constructions can activate each other in language processing.

In another experiment (Ungerer 2022: 172), participants are exposed to the resultative construction (*Nancy cut the grass short*) and the depictive construction (*Michael shaved his chin dry*). As the example sentences illustrate, the two constructions are superficially very similar in terms of their syntactic structure, but whereas the final adjective denotes a

resultant state in the first construction, it depicts a quality of the object in the second construction. The maze task is used to determine whether exposure to one construction facilitates processing of the second one. Here, the results do show an asymmetric priming effect. Exposure to the depictive construction as a prime facilitates speakers' processing of both depictive and resultative stimuli. By contrast, exposure to the resultative construction does not yield such facilitation effects. In a related study, Ungerer (2022: 182) uses the maze task to present participants with stimuli in which only the final word disambiguates between the resultative construction and the depictive construction (e.g. *John cooked the chicken tender* vs. *John cooked the chicken whole*). The results of this experiment yield a marginally significant effect for self-priming of the depictive construction. Across the two studies, it is the depictive construction that induces relatively stronger priming effects. This observation is motivated in terms of its lower frequency and acceptability, as well as its higher processing cost.

Taking a step back from the experimental results as such, Ungerer's work nicely illustrates how theoretical ideas in Construction Grammar can be made amenable to empirical testing and thus to further conceptual refinement. Research that tries to establish connections between the predictions of Construction Grammar as a theory and measurements that relate to domain-general cognitive processes such as priming is precisely what is needed in order to advance usage-based theorizing about language (Bybee 2010).

Nicholas Lester (2018) addresses the architecture of the constructional network from a perspective that highlights the connections between lexical items and the syntactic constructions in which they appear. Our knowledge of words includes knowledge of how these words are used syntactically. Lester (2018: 2) investigates how this knowledge is organized and how it impacts the processing of lexical words. In order to do this, the syntactic behavior of lexical items is captured through information-theoretic measures that are then systematically compared to behavioral data, such as response times from lexical decision tasks and picture naming experiments. Through such comparisons, it can be tested whether for example a highly diverse syntactic profile of a word either facilitates or inhibits processing or producing that word. Effects of syntactic diversity have been observed for example by del Prado Martín et al. (2004), who present evidence from Serbian. Nouns that

are evenly distributed across different case inflections show a facilitation effect. Milin et al. (2009) further observed that nouns that conform to the prototypical syntactic distribution of their respective inflectional class are processed more efficiently. Lester (2018: 11-21) surveys the existing literature on effects of this kind and argues that the empirical findings can be interpreted in at least three different ways: According to the categorical hypothesis, nouns that appear across a wide range of syntactic constructions are recognized faster. The probabilistic hypothesis suggests that distributional uniformity plays a role. Nouns that are dispersed evenly across the syntactic structures in which they occur should have a processing advantage. Finally, the prototypicality hypothesis recognizes that word classes have a typical distributional profile. In concrete terms, nouns with a syntactic distribution that is close to the distribution of the prototypical noun will be processed more quickly. The three hypotheses are not completely mutually exclusive, but with the help of different distributional measures, it is possible to gather evidence that specifically supports one hypothesis rather than the others. Lester (2018: 27-34) uses the notions of entropy, Kullback-Leibler Divergence, and Jensen-Shannon Divergence to define measures of syntactic diversity that relate to the three respective hypotheses. To illustrate this approach, the measure of entropy can be thought of as a way of quantifying how much surprise or uncertainty there is in the syntactic behavior of a given linguistic unit, such as a noun. A noun that will almost always appear in the same type of syntactic construction, then its entropy will be low. By contrast, a noun that appears in a broad range of different syntactic constructions will yield higher entropy values.

Controlling for variables such as word frequency, word length, and age of acquisition, Lester (2018: 42) tests whether the syntactic diversity that is measured for a given noun can be used to predict response times from lexical decision data. The analysis shows significant effects of syntactic diversity. Interestingly, all three hypotheses gather support of their own. Effects are documented for measures that capture distributional range, distributional uniformity, and distributional prototypicality. This indicates that any of the three hypotheses on its own is not sufficient as an explanation for the relative ease of noun processing. Specifically, adopting the categorical hypothesis on its own is not enough, frequency-related information needs to be taken into account. Lester (2018: 50) makes the point that these results can be usefully interpreted against the background of usage-based Construction

Grammar. The distributional profile of a noun can be seen as a proxy for its place in the constructional network. If a noun exhibits connections of the kind and strength that are typical of the network, that noun benefits from a processing advantage. Conversely, when the connections of a noun deviate from what characterizes other members of its category, processing that noun will be more effortful. Another important conclusion relates to the fact that even when a noun is processed in isolation, as is commonly the case in a lexical decision task, syntactic information is processed (Lester 2018: 54). This finding is suggestive of a strong and intimate connection of lexical and grammatical knowledge of language, which is one of the conceptual cornerstones of Construction Grammar.

In another study, Lester (2018: 57) tests whether nouns with similar syntactic distributional profiles prime each other. To investigate this question, a measure of syntactic similarity is devised that works on the basis of syntactic dependencies that are extracted from corpus data. The syntactic distributional profile of a noun is represented as a vector of frequencies across a range of syntactic dependencies, degrees of similarity between the vectors representing different nouns are used to operationalize syntactic similarity. In order to control for effects of semantic priming, Lester (2018: 63) uses measures based on Latent Semantic Analysis (Landauer and Dumais 1997) to annotate the nouns that enter the analysis. Further control variables, such as frequency, age of acquisition, and orthographical similarity between prime and target, enter the analysis as well. The results indicate that syntactic similarity has an effect that remains significant even when all control variables are taken into account. If a prime differs strongly from a target in terms of its syntactic distribution, processing the target takes more effort. This suggests that processing a noun, even in complete isolation, leads to activation in the constructional network. If this activation is similar from one stimulus to the next, the relative speed of processing is increased. Lester (2018: 69) sums up this finding with a slogan that merits repeating in full: "You can take a noun out of syntax, but you can't take the syntax out of a noun". In essence, the results show the constructional network in action.

The approaches taken by Tobias Ungerer and Nicholas Lester complement each other very insightfully. They both use evidence from language use and language processing to find out how exactly the architecture of the constructional network is structured. Their perspectives

however are different. Whereas Ungerer takes a fine-grained approach that focuses on selected syntactic constructions and their interrelations, Lester goes for a bird's eye view and uses aggregate data that captures generalizations across many lexical items and many different constructions that are operationalized in terms of syntactic dependencies. The respective approaches thus differ in granularity, but nothing precludes a fruitful combination of the two that targets an intermediate level of abstraction, for example in the context of analyzing larger construction families (Diessel 2019) or paradigms (Diewald 2020). Seen in a mutual context, the two studies offer a lot of inspiration for new and original research on the constructional network.

4 Constructions and language change

In recent years, a significant amount of work has contributed to the constructional study of language change. The ideas presented in Traugott and Trousdale (2013) continue to inspire lively discussions, and a growing community of researchers is using the label of Diachronic Construction Grammar (Noël 2007, Barðdal et al. 2015, Sommerer and Smirnova 2020, Hilpert 2021) as an umbrella term for work that addresses how constructions and their interconnections change over time. A strong motivation for constructional work on language change is that the observable outcomes of change hold important implications for the analysis of socio-cognitive processes that are at play in language use. The goal of that work is to develop a theory in which, in the words of Joan Bybee, "facts about usage, cognitive processing and language change are united to provide an explanation for the observed properties of linguistic structures" (2010: 2).

Constructional research on language change often brings about a shift in perspective that allows us to understand an empirical observation about a historical development in a new way. An example for this that I would like to highlight in this section is Lorenzo Moretti's (2021) work on the emergence of auxiliary *do* in Middle English, which of course has been discussed in a wide-ranging literature. The analysis that Moretti offers is anchored in an understanding of the constructional network, in which newly emerging nodes entertain connections not just to one single source, but rather to multiple constructions, yielding a

scenario of multiple inheritance (Trousdale 2013). Whereas earlier accounts of auxiliary *do* have typically tried to find monocausal explanations for its emergence, Moretti (2021: 24) explicitly allows for the possibility that different hypotheses may not be mutually exclusive and that multiple different sources may have been implicated in the development.

What then are the source constructions and conspiring factors that come together in the development of auxiliary *do*? In his account, Moretti (2021: 208) assigns special relevance to both causative *(ge)don* and pro-verb *(ge)don*, which are illustrated below.

(4) and ic dyde eow witan ðurh drihtnes mihte
and I do.PST you know through God.GEN might
'And I made you know through God's might' (ÆCHom: 170.35)

(5) Ne luze þu na onnum, ac dudest god
not lie.PST you to men, but do.PST God
'You did not lie to men, but you did it to God' (CMLAMBX1: 93.798-799)

In some contexts, causative *(ge)don* appears without an overtly expressed causee and with a verb in the infinitive that is understood to have an agentive subject. This gives rise to an ambiguity, since the understood subject of the non-finite verb may or may not coincide with the subject of *(ge)don*. In the former case, *(ge)don* may be interpreted as an auxiliary verb that conveys a grammatical meaning, rather than lexical, contentful meaning. Moretti (2021: 213) argues that the switch from lexical to grammatical meaning did not come about through a gradual process of semantic bleaching. Rather, the availability of *(ge)don* as a pro-verb allowed speakers to draw an analogy and assign a grammatical meaning to instances in which *(ge)don* behaved like an auxiliary. Whereas for example Garrett (1998: 314) views the pro-verb *(ge)don* as the developmental source of auxiliary *do*, Moretti's point is a different one. The proposal is that causative *(ge)don* provided a constructional variant that, thanks to an association with pro-verb *(ge)don*, allowed a structural and semantic reanalysis.

Moretti (2021: 214) views the changes that led to the emergence of auxiliary *do* as embedded in a dynamics of factors that are both internal to the language system and

external to it. With regard to the former, analogy has a central place in the account that is proposed. The existence of other grammatical constructions consisting of a verb and an infinitive complement in the grammar of Middle English would have facilitated the processes of reanalysis that were described above. Another language-internal factor is the dynamic development that affected the family of causative constructions during the Middle English period. This includes frequency developments such as the demise of *hatan* and the rise of *lætan*, as well as the emergence of causative *maken* (Moretti 2021: 216). In a grammatical domain that is undergoing changes, innovations have an opportunity to take root. With regard to language-external factors, Moretti (2021: 218) mentions issues of language style, such as the growing importance of rhyme in Middle English poetry.

Construction Grammar has not originally been designed as a theory of language change, but it is plain to see that a network model of linguistic knowledge is a fruitful starting point for studies that try to explain how and why languages change over time. Moretti (2021) takes the idea of the network model seriously when he tries to come to terms with the different connections that would have been implicated in the development of auxiliary *do*. This is by no means an easy task, especially as the changes in connectivity are not occurring in a vacuum, but rather in real contexts of language use that are subject to the influence of language-external factors. The proposals made by Moretti (2021) are complex, which means that they are also difficult to test, but we may have to accept that a certain degree of complexity is necessary for our models to be realistic. In fact, an additional layer of complexity is added in Lynn Anthonissen's (2020) dissertation, which offers a corpus-based historical study of English passive constructions. The empirical question that is pursued in this study is how these constructions developed historically in the linguistic usage of individual writers. The purpose of focusing on individual writers is not to uncover stylistic preferences or to determine authorship. Rather, the analysis aims to engage with the cognitive and social mechanisms that influence the dynamics of language in usage-based models of linguistic knowledge. The empirical analyses are thus carried out with the express aim of developing a more adequate understanding of language as a complex adaptive system.

The source of data that is selected for the analysis is the EMMA corpus³ (Anthonissen 2020: 147). The letters of the acronym stand for *Early Modern Multiloquent Authors*. The corpus as a whole comprises 87 million words. The corpus represents 50 mostly London-based authors that spread across five generations and that have each left substantial written records between the early 17th and mid-18th century. The authors can be said to constitute a community of practice with shared goals and conventions. Links between authors in that community are established on the basis of mutual references as well as the text genres of their writings.

The analytical potential of the EMMA corpus is illustrated by a case study of the prepositional passive (Anthonissen 2020: 173), which is instantiated by examples such as *He was laughed at* or *They were never heard of again*. While the construction emerged in Middle English, a substantial increase in type and token frequency took place during Early Modern English. Anthonissen's analysis aims to determine whether these changes were the result of intra- or intergenerational change, what the respective roles of entrenchment and conventionalization are, and how language use is influenced by social network relations. A sample of prepositional passives retrieved from the EMMA corpus is used to address these issues. The analysis of the data shows an aggregate increase in token frequency, which progresses most rapidly during a phase in which interspeaker variability is particularly high (Anthonissen 2020: 184). This suggests that the prepositional passive followed the developmental profile of a typical S-curve, which exhibits strong variability in its mid-range. Anthonissen (2020: 186) retrieves the frequency developments for each writer represented in the EMMA corpus. The results are mixed in that some authors increase their usage of the prepositional passive, others show stability, and still others show decreasing frequencies. The strongest individual increases are registered during times of high interspeaker variability. The data do not just show developments in terms of text frequency. Anthonissen (2020: 194) finds that over time, the dispersion of prepositional passives becomes increasingly more even, which suggests an increase in the schematicity of the construction.

³ The EMMA corpus can be obtained at this website: <https://www.uantwerpen.be/en/projects/mind-bending-grammars/emma-corpus/>

Going beyond these observations, the real strength of the EMMA corpus shows itself in analyses that relate to social network relations. Anthonissen (2020: 210) approaches these relations in two ways. The first of these starts with purely linguistic information and checks how linguistic features map onto membership in communities of practice. The second takes the inverse perspective and investigates whether social information can be used to make reliable predictions about language use. In order to implement the first approach, the writings of each author are analyzed in terms of variables that pertain to their usage of the prepositional passive, including for example the token and type frequency of the construction, its dispersion, and the ratio of hapax legomena. The usage profiles of the 50 authors are then submitted to a cluster analysis, which reveals a fairly clean split between narrative writers and religious writers (Anthonissen 2020: 213). Rather than grouping the authors with regard to factors such as age, the analysis picks up on membership in two different communities of practice. The second approach uses a measure of social connectivity that is based on direct and indirect real-life connections as well as mutual citations in the writings of the represented authors (Anthonissen 2020: 170). For each possible pairing of two authors, the measure yields a value of mutual connection strength. This measure is then compared to the linguistic profiles of the respective authors, the prediction being that high social connectivity correlates with similar usage patterns in the prepositional passive. The results of a linear regression analysis confirm that there is a small but significant effect of social connectivity (Anthonissen 2020: 216).

The analysis illustrates how corpus studies of constructional change can take into account both frequency-related measures and operationalizations of social connectivity at the same time for the purpose of investigating the dynamic evolution of language in the individual, in communities of practice, and at the aggregate level. In doing so, the study addresses an important theoretical question, namely how processes of language change that manifest themselves at the community level are grounded in individual language use and in social and cognitive factors that apply at the level of the individual. The common theme that links the studies by Moretti (2021) and Anthonissen (2020) is not just the historical perspective, but rather the insight that we need to broaden our perspective when trying to provide explanations for diachronic changes. It is important to look beyond the construction that is in the focus of the analysis, and it is equally important to consider the extralinguistic context

in which language use is taking place. While many colleagues in Construction Grammar would probably agree with these statements, putting them into practice successfully is no small feat. Moretti (2021) and Anthonissen (2020) have taken these ideas seriously, and they have found new and original ways to advance constructional research with them.

5 Addressing the big questions

The sections leading up to this point of the paper had a dual purpose, namely to illustrate a set of ideas from recent dissertations on constructional topics, and simultaneously to prepare the ground for a discussion of three questions that the editors of this special issue wanted to see addressed. I said I would get to these questions in the end, and it is now time to make good on that promise.

The first question asks whether Construction Grammar is best considered as a coherent theoretical framework, or rather as a flexible toolbox for linguistic analysis. If the six dissertations are any indication, it appears that there is a community of researchers that is engaged in a lively, multi-layered discussion in which a number of ideas are negotiated, refined, and tested. There is a willingness to listen to others, and to present arguments that take into account what others have said. The discussion does not presuppose complete agreement on all points, but it is indicative of the fact that the participants have a sense of belonging to a community with shared conventions and shared goals, the most important of which is arguably to understand language just a little bit better. I would like to offer an example that illustrates this collaborative practice. Willich (2022a) makes use of the full conceptual apparatus of Frame Semantics, including notions such as frames, core and non-core frame elements, lexical units, and frame-to-frame relations. These are ideas that have established themselves as an important part of the view of language that characterizes Construction Grammar. Willich (2022a) integrates these notions into a model of constructional meaning that constitutes a new theoretical proposal. That model clearly builds on Frame Semantics, but it goes beyond the current status quo in several respects. It is possible, and indeed likely, that the model will encounter both approval and resistance, and that its application in actual analyses will stimulate discussions that ultimately lead to

alternative proposals. In other words, it invites us to view constructional research from a meta-perspective, which is a characteristic of a scientific theory. The question asked by the editors juxtaposes the notion of a theoretical framework with that of a toolbox. While I agree that there is a difference between the two, I also believe that the two ideas are not mutually exclusive. Willich's (2022a) construction semantics is of course meant to be used as an analytical instrument, but at the same time, several theoretical assumptions are built into it, and these assumptions are open to criticism and refinement. In fact, it might prove to be very hard to find any tool in the language sciences that can lay a claim to being completely theory-neutral. In the light of this, I am afraid that I will give the editors a rather frustrating answer: I think you cannot have one without the other: it's both.

The second question relates to the kinds of information that should be included in a description of a construction. I believe that all six dissertations that were reviewed above shed some light on this issue, in ways that usefully complement each other. Willich (2022a) makes a strong case for spelling out how constructions and the lexical items within them are linked to different frame types. Busso's (2018) results indicate that the density of semantic spaces covered by constructions have an important role to play, so that constructional descriptions need to include connections between syntactic patterns and lexical items. Ungerer (2021) highlights the importance of accounting for horizontal relations between partially similar constructions. While the connections between syntactic constructions and lexical items are often conceptualized in a way that starts with the construction and branches out to the lexical items, Lester's (2018) work reminds us not to forget the inverse type of relation, that is, the connectivity between a lexical item and all the syntactic constructions it appears in. From a constructional perspective, a noun is not just a lexical unit with conceptual and frame-semantic content, it is also a node in the constructional network that is connected to a wide array of morpho-syntactic patterns with varying degrees of abstraction. Moretti (2021) further strengthens the idea that connections of different types matter to constructional descriptions, and he makes the point that these connections may be jointly implicated in the emergence of new constructions. Finally, Anthonissen (2020) demonstrates that change in the constructional network can be linked to extra-linguistic information that is likewise organized in a network architecture. The recurring theme that is present in all of these ideas is that of connections. The findings presented in

the six dissertations strongly resonate with the recent monographs by Diessel (2019) and Schmid (2020), which aim to provide a wider backdrop against which the role of connections in Construction Grammar can be understood. Drawing on their respective proposals, I would like to answer the editors' question by saying that constructional descriptions should strive to spell out the connectivity that characterizes a given form-meaning pair. Such descriptions would include its inheritance relations, its links to semantic frames, its connections with partially similar constructions, its associations with lexical units, and its relations to extra-linguistic contexts.

Finally, the editors were careful enough not to let us get away with mere abstract handwaving. Instead, they gave us the following homework question: How could a constructionist approach address the sentence *Wasn't it rather McIlroy who seemed never to be outdriven when playing in contention?* The sentence offers a nice illustration of the fact that knowledge of language is never complete. On my first reading of the sentence, several parts (*be outdriven*, *playing in contention*) remained completely elusive. Their idiomatic meaning relates to playing golf, which is a semantic frame about which I know very little. When it comes to analyzing the meaning of these expressions and their frame-semantic content in the context of the full sentence, Willich (2022a) offers a couple of useful pointers that I would use. For example, the collocation *playing in contention* evokes a construction frame that coerces the respective meanings of the lexical items *playing* and *contention* into a very specific interpretation, namely participating in the final round of a golf tournament. With regard to the syntactic structure of the example, the above-mentioned issue of constructional connectivity comes to the fore. The sentence is globally a polar interrogative that has an *it*-cleft as its basis. An *it*-cleft construction includes by definition a relative clause, which in this case contains both a passive construction and a participial clause. If all of these pieces fit together, that indicates that they are mutually connected in the constructional network. The type of connection that Diessel (2019: 113) calls filler-slot relations plays a crucial role in this regard. In his words, "(hierarchical) phrase structure involves associative relations between constructional schemas and particular phrasal fillers" (Diessel 2019: 191). To illustrate this idea with just one example, speakers know that polar interrogatives have a constituent structure that corresponds closely to that of declarative constructions, with the exception that auxiliary verbs appear utterance-initially in the former. Rather than

accounting for this correspondence in terms of a syntactic derivation, usage-based constructional approaches make the assumption that speakers recognize the structural parallels between utterances such as *Wasn't it McIlroy who won?* and *It was McIlroy who won*, which appear in authentic usage. Long-term experience of language use leads to the entrenchment of correspondences between parts of constructions, which speakers then put to use in the production of constructs that may never have been uttered before. The findings presented by Busso (2018), Ungerer (2022a) and Lester (2018) demonstrate the far-reaching effects of connections in the constructional network. It is fair to say that we are only beginning to understand how these connections are organized, and how this organization leads to the outcomes that can be observed. At the same time, it is extremely encouraging to see how the theoretical claims of Construction Grammar are put to the test, and how new insights give us the opportunity to reflect critically on our ideas.

By way of a conclusion, I would like to say the following. While I was reading the introduction by the editors, I felt a growing sense of unease. It seemed as if there were altogether more problems than opportunities, more unresolved questions than solid foundations, and more divergences than shared goals. I worried that my subjective impression of the Construction Grammar community, as a vibrant, welcoming, and dynamic group of researchers might have been completely mistaken. Had I seen things in a much too positive light? At the end of writing this paper, it seems to me that the glass is half full. While it would be dangerous to simply brush aside the problems that were pointed out by the editors, I think it is fair to conclude that the Construction Grammar community is extremely fortunate to have young members who are taking established ideas into new directions. The kids are alright. I look forward to learning more from them.

References

- Audring, Jenny. 2019. Mothers or sisters? The encoding of morphological knowledge. *Word Structure* 12/3, 274-296.
- Audring Jenny and Geert E. Booij. 2016. Cooperation and coercion. *Linguistics* 54/4, 617-637.
- Anthonissen, Lynn. 2020. *Special passives across the lifespan. Cognitive and social mechanisms*. PhD Dissertation. University of Antwerp / LMU Munich.
- Baayen, Harald R. 2009. Corpus linguistics in morphology: Morphological productivity. In A. Lüdeling, M. Kytö and T. McEnery (eds.), *Corpus Linguistics. An International Handbook*, Vol 2. Berlin: Mouton De Gruyter, 899-919.
- Barðdal, Jóhanna. 2008. *Productivity. Evidence from Case and Argument Structure in Icelandic*. Amsterdam: John Benjamins.
- Barðdal, Jóhanna, Elena Smirnova, Spike Gildea, and Lotte Sommerer (eds.). 2015. *Diachronic Construction Grammar*. Amsterdam: John Benjamins.
- Boas, Hans C. 2011. Coercion and leaking argument structures in Construction Grammar. *Linguistics* 49/6, 1271-1303.
- Busso, Lucia. 2018. *Coercing Italian: Psycholinguistic Investigations on Valency Coercion in Italian*. PhD Dissertation. Pisa University.
- Bybee, Joan L. 2010. *Language, Usage, and Cognition*. Cambridge: Cambridge University Press.
- del Prado Martín, Fermín Moscoso, Aleksandar Kostić, and R. Harald Baayen. 2004. Putting the bits together: an information theoretical perspective on morphological processing. *Cognition* 94/1, 1-18.
- Diessel, Holger. 2019. *The Grammar Network: How Linguistic Structure Is Shaped by Language Use*. Cambridge: Cambridge University Press.
- Diewald, Gabriele. 2020. Paradigms lost – paradigms regained: Paradigms as hyper-constructions. In Lotte Sommerer and Elena Smirnova (eds.), *Nodes and Networks in Diachronic Construction Grammar*. Amsterdam, New York: Benjamins, 277-315.
- Fauconnier, Gilles & Mark Turner. 1998. Conceptual integration networks. *Cognitive Science* 22(2), 133-187.
- Fillmore, Charles J. 1985. Frames and the semantics of understanding. *Quaderni di Semantica* 6(2), 222-254.

- Fillmore, Charles J. 2013. Berkeley Construction Grammar. In Hoffmann, Thomas and Graeme Trousdale (eds), *The Oxford Handbook of Construction Grammar*, Oxford: Oxford University Press, 111-132.
- Fillmore, Charles J., Paul Kay, and Mary Catherine O'Connor. 1988. Regularity and idiomaticity in grammatical constructions: The case of let alone, *Language* 64/3: 501–38.
- Fillmore, Charles J. & Collin F. Baker. 2010. A frames approach to semantic analysis. In Bernd Heine & Heiko Narrog (eds.), *The Oxford handbook of linguistic analysis*, 313-339. Oxford: Oxford University Press.
- Fillmore, Charles J., Russell R. Lee-Goldman, and Russell Rhodes. 2012. The FrameNet Constructicon. In Hans C. Boas and Ivan A. Sag (eds), *Sign-Based Construction Grammar*, Stanford: CSLI, 283–99.
- Garrett, Andrew. 1998. On the origin of auxiliary *do*. *English Language and Linguistics* 2, 283-330.
- Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.
- Goldberg, Adele E. 2019. *Explain me this: Creativity, competition, and the partial productivity of constructions*. Princeton: Princeton University Press.
- Goldberg, Adele E. and Ray Jackendoff. 2004. The English resultative as a family of constructions. *Language* 80/3, 532-568.
- Hilpert, Martin. 2019. *Construction Grammar and its Application to English*. Second edition. Edinburgh: Edinburgh University Press.
- Hilpert, Martin. 2021. *Ten Lectures on Diachronic Construction Grammar*. Leiden: Brill.
- Landauer, Thomas K. and Susan Dumais. 1997. A solution to Plato's problem: The latent semantic analysis theory of the acquisition, induction, and representation of knowledge. *Psychological Review* 104, 211-240.
- Lauwers, Peter and Willems, Dominique. 2011. Coercion: Definition and challenges, current approaches, and new trends. *Linguistics* 49/6, 1219-1235.
- Lenci, Alessandro. 2008. Distributional semantics in linguistic and cognitive research. *Italian journal of linguistics* 20/1, 1-31.
- Lenci, Alessandro. 2018. Distributional models of word meaning. *Annual review of Linguistics* 4, 151-171.

- Lester, Nicholas. 2018. *The Syntactic Bits of Nouns: How Prior Syntactic Distributions Affect Comprehension, Production, and Acquisition*. PhD Dissertation. University of California at Santa Barbara.
- Lester, Nicholas A., Laurie B. Feldman, and Fermín Moscoso del Prado Martín. 2017. You can take a noun out of syntax...: Syntactic similarity effects in lexical priming. *Proceedings of the Thirty-ninth Annual Meeting of the Cognitive Science Society*, 2537–2542.
- Lyngfelt, Benjamin, Lars Borin, Kyoko Ohara, and Tiago T. Torrent (eds.). 2018. *Constructicography. Constructicon development across languages*. Amsterdam: John Benjamins.
- Magne, Cyrille, Mireille Besson, and Stéphane Robert. 2014. Context Influences the Processing of Verb Transitivity in French Sentences: More Evidence for Semantic–syntax Interactions. *Language and Cognition* 6/2, 181-216.
- Michaelis, Laura A. 2004. Type shifting in Construction Grammar: An integrated approach to aspectual coercion, *Cognitive Linguistics* 15/1: 1–67.
- Michaelis, Laura A. and Allen Minchun Hsiao. 2021. Verbing and Linguistic Innovation. *Frontiers in Communication* 6, <https://doi.org/10.3389/fcomm.2021.604763>
- Milin, Petar, Dušica Filipović-Đurđević, and Fermín Moscoso del Prado Martín. 2009. The simultaneous effects of inflectional paradigms and classes on lexical recognition: Evidence from Serbian. *Journal of Memory and Language* 60, 50-64.
- Moretti, Lorenzo. 2021. On Multiple Constructions and Multiple Factors in Language Change The origin of auxiliary *do*. PhD Dissertation. University of Manchester.
- Noël, Dirk. 2007. Diachronic construction grammar and grammaticalization theory. *Functions of Language* 14, 177-202.
- Perek, Florent. 2016. Using Distributional Semantics to Study Syntactic Productivity in Diachrony: A Case Study. *Linguistics* 54/1, 149-188.
- Pijpops, Dirk and Freek Van de Velde. 2016. Constructional contamination: How does it work and how do we measure it? *Folia Linguistica* 50/2, 543-582.
- Piñango, Maria Mercedes and Ashwini Deo. 2016. Reanalyzing the Complement Coercion Effect through a Generalized Lexical Semantics for Aspectual Verbs. *Journal of Semantics* 33/2, 359–408, <https://doi.org/10.1093/jos/ffv003>
- Ruppenhofer, Josef and Laura Michaelis. 2010. A constructional account of genre-based argument omissions. *Constructions and Frames* 2(2): 158-184.

- Ruppenhofer, Josef, Michael Ellsworth, Miriam R. L. Petruck, Christopher R. Johnson, Collin F. Baker & Jan Scheffczyk. 2016. *FrameNet II: Extended theory and practice*. Berkeley: International Computer Science Institute.
- Säily, Tanja. 2011. Variation in morphological productivity in the BNC: Sociolinguistic and methodological considerations. *Corpus Linguistics and Linguistic Theory* 7(1), 119-141.
- Schmid, Hans-Jörg. 2020. *The dynamics of the linguistic system. Usage, conventionalization, and entrenchment*. Oxford: Oxford University Press.
- Sommerer, Lotte and Elena Smirnova (eds.). 2020. *Nodes and Networks in Diachronic Construction Grammar*. Amsterdam: John Benjamins.
- Sommerer, Lotte and Baumann, Andreas. 2021. Of absent mothers, strong sisters and peculiar daughters: The constructional network of English NPN constructions, *Cognitive Linguistics* 32/1, 97-131.
- Torrent, Tiago. 2015. On the relation between inheritance and change: The Constructional Convergence and the Construction Network Reconfiguration Hypotheses. In Jóhanna Barðdal, Elena Smirnova, Spike Gildea, and Lotte Sommerer (eds.), *Diachronic Construction Grammar*. Amsterdam: John Benjamins, 175-214.
- Traugott, Elizabeth C. and Graeme Trousdale. 2013. *Constructionalization and Constructional Changes*. Oxford: Oxford University Press.
- Trousdale, Graeme. 2013. Multiple inheritance and constructional change. *Studies in Language* 37/3, 491-514.
- Turney, Peter and Patrick Pantel. 2010. From frequency to meaning: Vector space models of semantics. *Journal of Artificial Intelligence Research* 37, 141-188.
- Ungerer, Tobias. 2021. Using structural priming to test links between constructions: English caused-motion and resultative sentences inhibit each other. *Cognitive Linguistics* 32/3, 389-420.
- Ungerer, Tobias. 2022a. *Structural priming in the grammatical network: A study of English argument structure constructions*. PhD Dissertation. University of Edinburgh.
- Ungerer, Tobias. 2022b. Extending structural priming to test constructional relations: Some comments and suggestions. *Yearbook of the German Cognitive Linguistics Association* 10/1, 159-182.

Ungerer, Tobias. To appear. Vertical and horizontal links in constructional networks: two sides of the same coin? *Constructions and Frames*.

Willich, Alexander. 2022a. *Konstruktionssemantik: Frames in gebrauchsbasierter Konstruktionsgrammatik und Konstruktikographie*. Berlin & Boston: De Gruyter.

Willich, Alexander. 2022b. Introducing Construction Semantics (CxS): a frame-semantic extension of Construction Grammar and constructicography. *Linguistics Vanguard*.
[<https://doi.org/10.1515/lingvan-2022-0082>]

Ziegeler, Debra. 2007. A word of caution on coercion. *Journal of Pragmatics* 39, 990-1028.