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Review: The Constructicon: Diessel (2023)

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AUTHOR: Holger Diessel

TITLE: The Constructicon

SUBTITLE: Taxonomies and Networks

SERIES TITLE: Elements in Construction Grammar

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SUMMARY

The Constructicon is a brief survey of recent developments in usage-based construction grammar, a major current approach to grammar in which the grammar and the lexicon form a unified system of form-meaning mappings (constructions) called the constructicon, and these form-meaning mappings emerge from language use. As summarized in Chapter 2, the constructicon was initially conceived of as a simple inheritance network in which constructions inherited the properties of more general constructions, with some possibility of override (a semantic network in the sense of Collins & Quillian, 1969). However, recent research has reconsidered the structure of the constructicon as a spreading activation network in which constructions can be linked by a wide variety of relations, not necessarily taxonomic, and the relations are reconceived as associations, which means that positing a relation generates predictions for language processing. The shift from a taxonomic view of memory to an associative network one generally mirrors the shift undergone in the study of semantic memory between Collins & Quillian (1969) and Collins & Loftus (1975) and brings CG into better agreement with network models in psycholinguistics. This book reviews these developments, and surveys the evidence for a wide range of relations, balancing evidence from language structure and evidence from language processing.

The bulk of the book's content is in Chapters 2-5, with Chapters 1 and 6 serving as brief bookends. Chapter 2 discusses the basic assumptions of construction grammar (the grammar and lexicon forming a continuum, and being formed of the same 'stuff' – form-meaning pairings) and the shift from a taxonomic view of the constructicon to the associative view. It

also spells out what the term association means by listing salient characteristics of associations in the psychological literature. Chapter 3 points out that constructions themselves are not unitary entities but can themselves be seen as networks. Construction-internal associations include not only associations between form and meaning but also sequential associations between forms specifying serial order within a construction and filler-slot associations specifying what elements can fill the open slots of a construction (e.g., the fact that donate can fill the verb slot of the prepositional dative construction, I donated time to the cause, but not of the double object construction, *I donated the cause time). Chapter 4 then presents a novel view of syntactic categories such as Noun, Verb, or Adjective. Syntactic categories are argued to emerge from networks of associations constituting the construction: forms of the same category are linked by filler-slot relations to the same or similar set of constructions. This view builds on the conception of syntactic categories as emergent from the network of constructions in Croft's (2001) *Radical Construction Grammar* but explicitly shows that both constructions and syntactic categories are emergent objects of the same type, forming subnetworks of the same global network. This proposal thereby brings the view of syntactic categories in construction grammar in line with the view of categories in connectionist psycholinguistics (Rogers & McClelland, 2005). Chapter 5 then turns to the global network to introduce paradigmatic associations between constructions, which link together whole constructions by similarity and contrast. These include associations between (near-)synonymous constructions as well as members of morphological or syntactic paradigms (singular vs. plural; prepositional dative vs. double object) that are exchanged for each other based on specific features of context. Among the highlights of Chapter 5 are an innovative extension of the notion of a paradigm to syntax (see also Zeldes, 2012, for related ideas), and an interesting discussion of the differences and similarities between constructional families, neighborhoods, and paradigms.

EVALUATION

This book provides a remarkably concise and insightful exposition of recent research in usage-based construction grammar. It gives much food for thought about the nature of our mental representation of linguistic structure, and should be of interest both to construction grammarians and those not as familiar with the framework. There is abundant exemplification (though mostly from English) and most representational claims are illustrated by clear diagrams. A strength of the book is that it integrates psycholinguistic evidence for its representational claims throughout the exposition. For example, Diessel draws on syntactic priming for evidence of constructional similarity, and on the visual world paradigm for evidence of predictive sequential relations between the parts of a construction.

Where the book can be faulted is in the lack of comparisons between the proposed representations and alternative theories. This makes it unclear how the representational proposals in *The Construction* can be falsified. It is evident that the proposals are intended to be in principle falsifiable by psycholinguistic experimentation. For example, on p. 15, "the multidimensional network approach (of usage-based linguistics) is solely motivated by psychological considerations. In this approach, the links of the construction are defined as specific types of associations shaped by specific domain-general processes," and on p. 59 "the main reason for positing horizontal relations is that they are psychologically real. [That is, they are] needed to describe a particular type of association that must not be ignored in a psychologically motivated theory of grammar." I share the view that the grammar is a network of learned associations, and that individual constructions are also networks of associations rather than unitary entities (Kapatsinski, 2018, 2021, 2022). However, it is often possible to account for the same behavioral data (such as priming between related

constructions) with many different associative network models. In particular, it is often the case that it is possible to explain the same data without reference to one or more of the association types proposed to underlie the behavior in the Constructicon. This raises an important question that is not addressed in the book: how, or whether, one should decide between alternative analyses or even representational frameworks.

For example, Section 3.2 proposes that constructions contain within them sequential relations that specify serial order between the elements of a construction (pp. 20-22). These relations include left-to-right associations between forms (e.g., $I \rightarrow \text{don't} \rightarrow \text{know}$) and more abstract categories (e.g., $P \rightarrow \text{NP}$), echoing the proposal of Osgood (1963). Evidence for such sequential relations is provided by studies of sentence processing in the visual world paradigm, where participants watch a visual display while hearing a spoken sentence. Participants will often look at upcoming referents that have not yet been mentioned. This is good evidence for prediction, but prediction can be implemented without storing direct left-to-right associations between forms. For example, recurrent artificial neural networks predict upcoming words from preceding context without storing direct word-to-word associations. Instead, the next word is predicted from a representation of the preceding context in which the representation of the preceding word may be impossible to isolate (Elman, 1990, et seq). In Interactive activation neural networks (which look much like the proposed conception of the constructicon), sequential prediction is accomplished instead by the first word activating larger units that contain it, which in turn activate their other parts (e.g., $I \rightarrow I \text{ don't know} \rightarrow \text{know}$; McClelland & Elman, 1986; McClelland & Rumelhart, 1981). In constructionist terms, hearing some part of a sentence would activate the constructions that are likely to be present in the signal, which would activate their upcoming parts. In production, theories of serial order often avoid the positing of item-to-item associations in favor of mechanisms that impose order via top-down mechanisms or filler-slot associations. For example, Page and Norris's (1998) model of serial order would have *I don't know* impose an activation gradient on its parts, such that *I* is easiest to activate from *I don't know*, *don't* is second easiest, and *know* is hardest, ensuring that the three words come out in the right order. Gomez et al. (2008) argue for representing serial positions of letters within a word as distributed positional codes in which nearby positions (slots) are represented by similar codes. One can easily imagine similar representational schemes for representing serial order in constructions that would dispense with word-to-word associations. This is not to say that these alternative theories of prediction and representation of serial order are superior to the proposal in the book. For example, there is evidence that preceding context biases the selection of upcoming words above and beyond the influence of top-down selection (Bannard et al., 2019; Harmon & Kapatsinski, 2021; Lindsey & Logan, 2019). However, the present book does not make a case for word-to-word associations over alternative representational devices posited in psychology and psycholinguistics.

Similarly, Chapter 5 suggests that there are paradigmatic associations linking together allostructions (e.g., Agent Action Recipient Theme ~ Agent Action Theme to Recipient, as in *I gave my cat a book* vs. *I gave a book to my cat*). It is said that "Like allomorphs, allostructions are members of the same category or schema, but since their properties are not directly predictable from the shared mother node, it seems reasonable to assume that they are horizontally related" (p. 59). It is a standard assumption in interactive activation models of comprehension that competing alternatives develop mutually inhibitory associations that make it easier to select one over the other (e.g., McClelland & Rumelhart, 1981). However, these associations are not strictly necessary, and there are models that do away with them – for example, alternatives might be competing for a limited supply of spreading activation, or dividing up probability mass given the present cues (Norris & McQueen, 2008). In

production, even though one construction might be rephrased as the other, suggesting an association between them, it is also possible to accomplish this kind of toggling between allostructions by top-down means alone (Kapatsinski, 2022). Furthermore, relations of similarity are usually no longer represented by associations between nodes (e.g., nodes representing similar constructions) but by overlap between distributed semantic representations (e.g., Rogers & McClelland, 2005). For example, syntactic priming can be accounted for by horizontal associations between similar constructions, or by semantic and structural overlap between their representations. The representational overlap account is generally preferred in modern psycholinguistics because encoding similarity as association strength conflates similarity with co-occurrence by encoding both in a single number (strength of association) and thereby creates rather complex problems for learning.

The lack of argumentation in support of specific types of associations over models that omit them may be theoretically justified, given the ‘maximalist’ orientation of usage-based construction grammar. To many constructionists, the parallel nature of the brain/mind may imply that the burden of proof rests largely on those that would argue that a particular connection does not exist, rather than on those that would want to argue that it does. Indeed, Langacker (1987), in what might be considered the founding document of usage-based linguistics, correctly notes that the traditional dichotomy between words and rules is ill-founded and the fact that something is stored does not imply it is not also computed. In this view, following Householder (1966), “the brain makes little use of parsimony”, and it is therefore tempting to encode every real-world relationship that speakers seem to know about as a corresponding mental association. Thus, if A and B are in some salient relationship to each other, an $A \longleftrightarrow B$ association might be posited to account for how the speaker gets from A to B, or from B to A, even if it is possible to get from A to B through other, indirect routes.

This direct encoding approach contrasts, however, with the rest of cognitive science, where one has to argue for the pathways and associations one posits, based on them being necessary to account for a particular behavior or experimental finding. The alternative parsimony approach is also well motivated by the use-it-or-lose-it nature of synaptic pruning and the fact that neural redundancy is metabolically extremely expensive – brains are very energy-hungry organs (Sterling & Laughlin, 2015). More importantly, it is unclear how a maximalist approach can guide methodology – when are we justified in positing an association, or even an entirely new type of association? As a matter of scientific practice, there seems to be no real alternative to showing that the representational mechanisms we posit are necessary to account for the data. There are places where *The Constructionist* takes this approach, and convincingly argues against alternative representational theories. For example, I am quite convinced that filler-slot associations between individual words and constructional slots are necessary, and cannot be explained away by semantic overlap between words and constructions because there are word-construction co-occurrences unaccounted for by semantics (pp. 29-34). A particularly insightful example is the fact that *forgive* favors the ditransitive construction despite not having the semantics of transfer (p. 33). This case shows clearly that a filler-slot association can persist even as the meaning of the filler changes. However, the book does not take this approach of disconfirming alternatives consistently, which leaves the reader without methodological guidance on how one can or should argue for a particular association type as being psychologically real.

In sum, *The Constructionist* is an excellent guide to current thinking about cognitive representations in usage-based construction grammar that brings it into much stronger, though incomplete alignment with connectionist / neural network models of cognition. At the same time, it does not defend the proposed representations over plausible alternatives afforded by the broader connectionist/associationist framework and therefore falls somewhat short of the stated goal of establishing their psychological reality. By bringing construction grammar

closer to neural networks, the Constructicon does, however, succeed in begging new questions, which is in itself valuable: by articulating a concrete proposal, it makes questions about the structure of the cognitive network underlying productive language use askable within the constructionist framework, and expands the research horizons for cognitive / usage-based (psycho)linguists.

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Vsevolod Kapatsinski is Professor of Linguistics at the University of Oregon in Eugene, Oregon. He works at the intersection of usage-based linguistics and learning theory (primarily between morphology and phonetics). He is the recipient of the 2020 Bloomfield Award from the Linguistics Society of America (for Changing minds changing tools), and has written over 30 journal articles in linguistics and cognitive science. VK currently serves as area editor for computational, experimental and cognitive linguistics for *Linguistics Vanguard*, and on the editorial board of *Cognitive Linguistics*, and is excited to be directing the next Linguistics Society of America Summer Institute (Language in Use, Eugene, 2025).