

The Constructicon: language as a cognitive network of constructions

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Abstract

This article is a summary introduction to the conception of language as a mental network of constructions: a constructicon. We outline the way this notion has evolved over the history of construction grammar, from inheritance networks to association networks and deconstructionist networks. We also give an overview of the kinds of network relations that have been proposed in the literature, and address construction networks in relation to linguistic change.

Keywords

association network, constructicon, construction, deconstructionist network, inheritance, language change, network, network relations,

Key points

- Constructicon vs. grammar-dictionary model
- Cognitive constructicon vs. reference constructicon
- Three stages of development: inheritance networks > association networks > deconstructionist networks
- Typology of network relations
- Changes in the network

1. Introduction

This article is a summary introduction to the conception of language as a mental network of constructions: a constructicon. We outline the way this notion has evolved over the history of construction grammar, from inheritance networks to association networks and deconstructionist networks. We also give an overview of the kinds of network relations that have been proposed in the literature, and address construction networks in relation to linguistic change.

2. What is a constructicon?

A simple definition of the term constructicon could be formulated as follows: a constructicon is the set of constructions in a language. This definition is embedded in several assumptions about the organization of language.

First and foremost, the definition relies on an approach to grammar which, while rejecting the dictionary versus grammar distinction, postulates constructions as the basic units of language. In constructionist approaches to language, morphemes, lexical items, phrase types, argument structures, clause combination patterns and even genres can be described in terms of constructions. As a functional, non-transformationalist theory of language, Construction Grammar describes grammatical patterns with reference to "the semantic and pragmatic purposes to which they are dedicated" (Fillmore, 1988:16).

Second, the above definition does not specify the nature of the set in which constructions are included. Because constructionists view constructions as *learned* pairings of form and function (Goldberg, 2006), the notion of a constructicon is usually associated with a mental **repository** of constructions (cf. Fillmore, 1988:37).¹ However, if, on the one hand, the semantics of the term *repository* speaks to the idea that constructions are stored in the memory of language users, on the other hand it provides no clue on how such a set is organized and/or internally structured. In the constructionist tradition, such an internal structure is usually conceived of in terms of a network, where constructions are nodes linked to one another via relations of various types. These relations would capture the extent to which any given construction shares properties with other constructions.

Last but not least, the definition we provided in the beginning of this section does not make an upfront differentiation between the two possible framings of a constructicon. While constructionist

¹ The term *constructicon* was coined by Jurafsky (1991).

theory is mostly concerned with cognitive aspects of constructions, there is also another dimension to which this term applies: that of language description. Therefore, the idea of a set of constructions can also take the more concrete form of a product of linguistic description, a reference construction. On that matter, see #REF this volume. In this paper, we will focus on the organizational principles proposed for cognitive constructions.

3. Three stages of development

The idea of language as a network of constructions grew out of the early development of CxG and cognitive linguistics (e.g., Fillmore 1988; Langacker 2000). While it has been a core feature of CxG ever since, the notion has evolved substantially over the years. One may distinguish three stages of development: *inheritance* networks, *association* networks, and *deconstructionist* networks.

3.1. Inheritance networks and association networks

In the original Berkeley CxG model (e.g., Fillmore & Kay 1995), taxonomic relations are treated in terms of *inheritance*. This conception of inheritance is a top-down hierarchy where properties of more general constructions are inherited by the more specific constructions that instantiate them. The model allows for multiple inheritance, i.e., that the same construction may inherit properties from several different supertypes.

There is a long-standing debate in CxG on the nature of inheritance, particularly regarding two related issues. One concerns strict vs. default inheritance. On a strict view of inheritance (Fillmore & Kay 1995; Sag 2012), a construction inherits all the properties of its supertype(s), which means the inheriting construction must be a proper subtype. On the default view, a construction inherits all the properties “that do not conflict with its own specifications” (Goldberg 1995: 70). This allows for particular constructions to have idiosyncratic properties that deviate from the general category. The second issue concerns whether constructional properties are stored on all levels where they apply (full inheritance) or only at the highest applicable level. This relates to the so-called “fat node problem” (Hilpert 2021), see section 3.2 below.

The main limitation of inheritance is that it only accounts for taxonomic relations. Hence, other kinds of links are required to capture associations between constructions that are not taxonomically related, so-called horizontal links (e.g., Diessel 2019).² There is also a conceptual directionality problem, in particular vis-à-vis usage-based linguistics, since inheritance applies top-down while usage-based linguistics takes a bottom-up perspective, on which linguistic patterns are established by generalization over concrete usage events.

More recent conceptions of construction networks go beyond inheritance and view the construction as a multidimensional *association* network (e.g., Diessel 2019; 2023). Thus, various kinds of horizontal associations are included, and taxonomic relations are bidirectional (generalization vs. instantiation). Specific constructions are awarded primacy over more general ones, in accordance with usage-based linguistics, and the stance towards positing abstract

² Horizontal links also mitigate the risk of proliferation of weakly supported abstract constructions, posited as superordinate constructions to facilitate connection by inheritance, i.e., to connect apparent sister constructions that would otherwise lack a shared mother (cf. Audring 2019).

constructions tends to be restrictive in general. Thus, the coherence of the system depends less on central nodes (i.e. general constructions) and is rather attributed to the network relations as such.

On this view, network relations do not only hold *between* constructions, but also *within* them. This is key to the treatment of language change (section 5), as well as the conception of deconstructionist networks (section 3.2). Internal links include symbolic associations between form and function and sequential relations between construction elements. Construction elements are subject to both internal and external relations. For a typology of network relations, see section 4.

3.2. Deconstructionist networks

Even association networks have been criticized for being too rigid and not dynamic enough. On the one hand, pairings between forms and functions tend to be many-to-many (REF Schmid?). On the other hand, the various internal and external relations pertaining to a construction vary over time by different processes in a non-synchronized manner (see section 5). Taking this multidimensional variability into account, distinguishing one construction from another is anything but straightforward. Furthermore, assuming so much information of various relations to be collected in a single node, i.e., a construction, is somewhat dubious from a cognitive point of view, a dilemma labeled the “fat node problem” (e.g., Hilpert 2021).

On such grounds, Schmid (2020) and others conclude that the nodes of the network are not constructions, but that associations are all there is. In the words of Hudson (2015: 692), “it’s networks all the way down”. On this view, what we perceive as constructions are merely clusters of associations. This conception may be called **deconstructionist** networks.

If the deconstructionist view of linguistic networks is right, does this mean that the idea of construction networks is wrong? We think not. Constructions as conventional units of language, like any idea of linguistic conventions, are to some extent idealizations. They abstract away from particular socio-cognitive processes in order to be useful for purposes like reference constructions and grammars, cross-linguistic comparison, language teaching, and other linguistic activities pertaining to notions of standard language and thus dependent on such idealizations.

Deconstructionist networks, on the other hand, are more closely aligned with current knowledge about socio-cognitive processes and, therefore, better suited to handle the finer details of situated interaction and linguistic change.

Therefore, we consider construction networks and deconstructionist networks to be complementary rather than opposing approaches to linguistic structure.³ Note, however, that the complementarity of these perspectives ultimately depends on their compatibility; one must bear in mind that constructions and construction networks are to some extent idealizations and take the finer dynamics of language use and cognition into account where relevant. For a more elaborate discussion of these matters, see Blenselius & Lyngfelt (forthc.).

³ Similar views have been expressed by van Trijp (2024) on the relation between “aggregate” and “population” perspectives on language, and by Boas et al. (2024) on the relation between relatively more “system-oriented” or “usage-oriented” linguistic approaches.

4. Typology of network relations

What different kinds of relations are at work in constructional networks? What do these relations connect, and what are the cognitive processes on which they are based? These questions have gained traction in recent work (Diessel 2019; 2023; Schmid 2020; Sommerer and Smirnova 2020; Hilpert 2021; Sommerer & van de Velde 2025), but typologies of network relations have been a topic of interest in Construction Grammar already from its very beginning.

Goldberg (1995: 75), who presents a model of the construction that is closely aligned with the inheritance network proposed by Fillmore & Kay (1995), distinguishes between instance links, polysemy links, metaphorical extension links, and subpart links. Instance links capture the taxonomic relations of abstract constructions and their more concrete instantiations. For example, a schematic noun phrase construction would be connected via instance links to more specific noun phrase patterns, such as a bare nominal, a definite noun phrase, or a noun phrase with a relative clause. Instance links draw on the human capacity for categorization.

Polysemy links connect a linguistic form with several related meanings, as for instance in the English *s*-genitive, which encodes possession (*John's book*), part-whole relations (*the car's interior*), and general association (*yesterday's events*), amongst other meanings. Polysemy links, like other links between form and meaning, rely on the ability of cross-modal association. Metaphorical extension links connect meanings of constructions that are derived from one another through a conceptual metaphor. Goldberg (1995: 83) offers the example of CHANGE IS MOTION, which provides a metaphorical link between the English caused motion construction and the resultative construction.

Finally, subpart links connect constructions with formal and functional overlap. For example, English intransitive clauses and transitive clauses both have a subject and a verb. Subpart links represent relations of partial identity and are thus supported by cognitive processes such as metonymy and analogy.

A typology of network relations that represents an association network has been proposed by Diessel (2019), who distinguishes between six different types. Symbolic relations connect form and meaning of constructions and thus subsume Goldberg's polysemy links as one special case amongst others. Taxonomic relations correspond to Goldberg's instance links. Sequential relations, which are not present in Goldberg's typology, are associations between linguistic units that commonly follow each other in language use. If an utterance starts with the words *once upon*, the hearer will expect it to continue with *a time*. Cognitive processes such as chunking and gestalt perception result in the associations that are at play in sequential relations.

Diessel uses the term of lexical relations for associations between linguistic units with similar or contrastive meanings and forms. This type of relation thus includes links between words that are semantically related through synonymy, antonymy, metaphor and metonymy, or phonological similarity. Constructional relations (Diessel 2019: 199), also termed horizontal relations (Diessel 2023: 16) capture associations between constructions at the same level of abstraction, and typically between constructions that compete for attention with one another, such as the English ditransitive

construction and the prepositional dative construction, or different variants of particle verb constructions such as *He turned on the radio* or *He turned the radio on*.

Filler-slot relations connect slots in schematic constructions with sets of lexical elements that typically appear in those slots. For example, a construction such as the English *way*-construction is linked to verbs such as *make*, *push*, or *fight* through filler-slot relations. Associations of this kind can be studied through collostructional analysis (Stefanowitsch and Gries 2003). Diessel (2023: 32) points out that filler-slot relations are determined by the semantic compatibility of constructions and lexical elements and by language users' experience of frequent patterns of co-occurrence.

Another typology of relations, and one that is developed in the spirit of a deconstructionist network, is presented by Schmid (2020), who discusses four different relation types, namely symbolic associations, paradigmatic associations, syntagmatic associations, and pragmatic associations. Three of these correspond to relation types that Diessel (2019) recognizes as well. Symbolic associations between form and meaning have the same status in both frameworks. Schmid's paradigmatic associations map onto Diessel's constructional relations. Syntagmatic associations are equivalent to sequential relations. Schmid's framework introduces pragmatic associations as a new type of relation, which is meant to link utterances with the situational context. Pragmatic associations thus comprise processes such as anaphora resolution, inferences, and the interpretation of speech acts (Schmid 2020: 48). In keeping with the goals of deconstructionist network modeling, Schmid's model deliberately does not include taxonomic links or filler-slot relations.

Table 1 offers an overview of the association types discussed in this section.

Type	Description	Example
Taxonomic relations	Associations between a schematic construction and its more concrete instantiations	The schematic noun phrase construction is instantiated by different noun phrase types, such as pronouns, definite nominals, and nouns modified by a relative clause.
Symbolic relations	Associations between form and meaning	In English, /kæt/ is associated with the idea of a four-legged animal that has soft fur and purrs.
Sequential relations	Associations between linguistic units that follow each other in language use	Collocations and fixed phrases such as <i>once upon a time</i> , <i>Hasta la vista baby</i> , or <i>knock knock knocking on heaven's door</i> .
Lexical relations	Associations between lexical units that are semantically or phonologically related	<i>good-bad</i> , <i>good-great</i> , <i>book-chapter</i> , <i>scratch-scrape</i>
Constructional relations	Associations between constructions that	<i>pick up the book</i> - <i>pick the book up</i> , <i>prouder</i> - <i>more proud</i> , <i>edge of the</i>

	compete for attention	<i>razor - the razor's edge</i>
Filler-slot relations	Associations between constructions and lexical items	<i>give</i> in the ditransitive construction, <i>elbow</i> in the <i>way</i> -construction, <i>accident</i> in the <i>waiting-to-happen</i> construction
Pragmatic relations	Associations between linguistic units and their situational context	In the sentence <i>She hit one million subs</i> , the clipping <i>subs</i> (< <i>subscribers</i>) indexes the context of social media, where viewers subscribe to a channel.

Table 1: Overview of network relation types

5. Changes in the network

A main strength of Construction Grammar as a linguistic theory is that its dynamic network architecture allows it to model variation and change as inherent aspects of language. A sizable literature on phenomena of language change, viewed from a constructional perspective, has come together under the banner of Diachronic Construction Grammar (Barðdal et al. 2015, Sommerer and Smirnova 2020, Hilpert 2021, 2024). The aim of Diachronic Construction Grammar is to account for processes of language change in terms of developments that re-organize the structure of the construction, as for example the emergence of new nodes in the network. Traugott and Trousdale (2013) discuss this process, which they term constructionalization, and distinguish between lexical constructionalization and grammatical constructionalization. The latter is a gradual process that increases the schematicity and productivity of a construction, while simultaneously decreasing its semantic compositionality. Lexical constructionalization, on the other hand, can be instantaneous and does not increase schematicity and productivity.

Besides the emergence of new nodes, the construction also exhibits a number of other types of change. Existing constructions can change in terms of their form and meaning, connections in the construction can emerge or disappear, and existing connections can become stronger or weaker (Hilpert 2021: 46). Often these processes come together in the development of constructions. Schmid (2020: 151) offers the example of English clause-initial *needless to say*, which is a conventionalized expression that presents a proposition as self-evident (*Needless to say, it was too late to do anything*). The expression evolved in a context that initially comprised further elements (*It is needless to say that*), which are no longer obligatory in present-day usage. Schmid argues that the sequential associations between the component elements have become stronger, so that *needless* strongly primes *to say*. At the same time, the symbolic associations of the component elements have given way to a holistic, non-compositional interpretation. A pragmatic association with a specific conversational situation type has emerged, and new syntagmatic associations have formed that allow parenthetical uses of *needless to say* not just at utterance-initially, but also in the middle and at the end of utterances.

Diessel (2023: 33) points out that the diachronic development of filler-slot relations is an essential element of grammatical change. At the level of the individual in first language acquisition, developing filler-slot relations can be linked to the emergence of word classes through pivot schemas and their fillers (Braine 1976). In historical language change, widening filler-slot relations, also known as host-class expansion (Himmelmann 2004), are seen as indicative of ongoing grammaticalization (Hilpert 2008, 2013).

Another topic of interest is change in paradigmatic associations. It has been observed empirically that newly grammaticalizing constructions tend to assimilate their distributional behavior to existing grammatical paradigms (Lehmann 2015). The development of paradigmatic associations has been studied in cases of attraction and differentiation of constructions (De Smet et al. 2018, Du et al. 2024).

6. Conclusion

To conclude, the concept of language as a mental network of constructions, and thus the notion of the constructicon, has evolved considerably throughout the history of construction grammar. Initially conceived as an inheritance network, representing hierarchical relationships between constructions, the need to consider horizontal links was increasingly recognized, leading to the development of association networks. These networks represent various types of relationships between constructions, including symbolic, taxonomic, sequential, lexical, horizontal, and filler-slot relationships. Deconstructionist network models even go a step further, so that associations, not constructions, are considered as the fundamental building blocks of language. On such a view, constructions emerge as clusters of associations. The dynamicity of the constructicon allows language change to be modeled as a rearrangement of network structures, including the emergence of new constructions, changes in the form and meaning of existing constructions, and the evolution of links. Understanding the diversity of network relationships and their diachronic development is crucial to grasping the complex nature of language and language change.

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