

REVIEW

Adele E. Goldberg, *Explain me This: Creativity, Competition, and the Partial Productivity of Constructions*. Princeton, NJ: Princeton University Press, 2019. Pp. xi + 195.
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Adele E. Goldberg's recent book provides a new constructionist perspective on answering arguably the most fundamental question in linguistics: how do humans come to learn and use language? Goldberg – a prominent advocate of Construction Grammar – posits that the basic building blocks of human language are CONSTRUCTIONS, or learned pairings of forms and functions, which can range from single morphemes to complex grammatical patterns. Constructions are partially productive, allowing speakers to use them in creative but constrained ways. Native speakers appear to be intuitively aware of the numerous, intricate rules and constraints that govern constructions, knowing when to accept certain expressions as valid while avoiding others. How do speakers acquire and navigate the complicated rules/constraints of constructions while remaining creatively expressive? This paradoxical question, which has puzzled linguists for decades, is the focus of Goldberg's book.

The book is divided into eight chapters. Chapter 1 provides an introductory outline of the book. Goldberg begins with an intriguing phenomenon: native speakers tend to favor certain expressions over their slightly odd-sounding but otherwise perfectly understandable alternatives (e.g. our preference for the expression *explain this to me* over *explain me this*). These expressions are part of humans' vast repertoire of grammatical constructions. While constructions allow us to be productive with our language use, they are also limiting its full productivity without imposing obvious constraints (e.g. no obvious rule appears to exist that prevents us from saying 'explain me this').

Goldberg proposes that the usage-based, constructionist perspective proposed in this book can capture the intricacies of the constrained creativity of language. She summarizes the principles underlying the proposed perspective using the abbreviation CENCE ME (a pronounceable anagram of the original abbreviation of EEMCNCE):

- (i) Speakers balance between Expressiveness and Efficiency while conforming to conventions.

- (ii) Our Memory is vast but lossy/imperfect.
- (iii) Lossy memories are aligned to form Constructions.
- (iv) New information is aligned with old information to form networks of constructions.
- (v) Multiple constructions Compete with each other to be expressed.
- (vi) Our network of learned constructions is fine-tuned through Error-driven learning.

The first principle, introduced in Chapter 1, is that language users, when expressing a given message, seek balance in expressiveness (longer/additional forms) and efficiency (shorter/fewer forms) while obeying the conventions of the speech community. While language users generally strive for efficiency, in cases where convention and efficiency are at odds, conformance to convention almost always trumps efficiency (as in the *explain me this* example). The remaining chapters of the book unpack the rest of the CENCE ME principles in detail.

Chapter 2 discusses the mechanism underlying the acquisition of individual words. Goldberg postulates that words are represented in the human brain as structured representations (linguistic factors relevant to the use of the word, including form, meaning and context, etc.) in our hyper-dimensional conceptual space. Meanings of words are rich and structured, stored not in isolation, but in associative contexts. The brain appears to possess vast amounts of lossy/partially abstracted memory for implicit contextual knowledge of words. Such lossy memories allow us to grasp essential/relevant/distinctive features of words, which over time become strengthened through repeated exposure in context. If a word (e.g. the verb *fire*) has multiple senses, the senses tend to cluster around a prototypical semantic frame (e.g. ‘fire’ meaning shooting from a weapon), forming a ‘radial category’ of senses.

In the acquisition of novel words, children, deducing the meanings in limited contexts, may make mistakes of undergeneralization (e.g. using *cereal* to refer to breakfast) or overgeneralization (e.g. using *ball* to refer to the moon). Such faulty form–meaning associations can be resolved through a mechanism called STATISTICAL PREEMPTION. Through their vast, lossy memory, children keep track of contextual information related to word usage, analogous to setting up an implicit statistical tracker in memory. Children may continue using an inappropriate word until a more appropriate one is observed in the same context and statistically preempts its inappropriate counterpart to become the preferred choice. The two words are in competition with each other and are thus mutually exclusive: for a particular meaning in a given context, only one word will win out and dominate, removing the possibility of exact synonyms. A more in-depth discussion on statistical preemption in general is presented in Chapter 5.

Chapter 3 extends the previously proposed principles governing words to grammatical constructions, unifying words and grammatical constructions as abstract and structured representations in our conceptual space. Argument Structure Constructions (ASCs) are chosen as the primary construction of investigation. Ample experimental evidence on ASCs shows that construction meanings exist independently of word meanings. For instance, *A baked a cake for B* is semantically richer than *A baked B a cake*, despite the (almost) identical wording. In fact, the

actual nouns and verbs in ASCs can be replaced with nonsensical words without impacting understanding of the construction (p. 32). This suggests that the difference in construction meaning must have come from the construction itself rather than the words.

Goldberg then summarizes the various constraints that ASCs may impose on expressing 'who did what to whom'. Each construction comes with certain constraints including semantic compatibility (e.g. whether a verb can cause an effect), syntax (word categories/parts of speech), sound (e.g. Germanic/short vs. Latinate/long sounds), discourse (e.g. use of anaphora), social context (e.g. in parent-to-child communication) and dialectal variations, etc. While constructions may be free to combine in a recursive manner, the combinations must abide by these constraints, lest it be regarded as unacceptable by the speech community.

In light of the principles introduced in Chapter 3, Chapters 4–6 elaborate on the question of how children manage to acquire the numerous linguistic constraints while remaining creative with language use.

Chapter 4 introduces the concept of *COVERAGE* to explain how constructions emerge and are used creatively. Goldberg proposes that constructions, as form–function pairings, emerge from clusters of formal patterns associated with their message-in-context. A construction becomes strengthened and more accessible when new instances of the construction are observed and overlap with existing representations. The acceptability of constructions is accounted for by coverage. When a new expression is coined, it forms an ad hoc category with its closest constructions. The degree of acceptability depends on how well the category is covered/attested by instances witnessed by the hearer, correlated with the type frequency, variability and similarity of the coinage to attested instances. Goldberg presents a number of experiments with simulated and computational language models as empirical support for the theory of coverage.

Coverage explains how constructions emerge as clusters of hyper-dimensional features, with candidate constructions attested by their alignment with instances in established clusters. However, as the number of candidate constructions coverable by known clusters is potentially large, it is still difficult for speakers to determine which construction to use for particular messages-in-context. In Chapter 5, Goldberg proposes that the generalizability of candidate constructions vetted by coverage is further constrained by *STATISTICAL PREEMPTION*.

Statistical preemption refers to a mechanism where speakers choose the most appropriate construction for a given context by pitting candidates against each other in a 'competition'. The speaker's familiarity with the constructions, resulting from prior exposure, then determines which construction is statistically more likely to be chosen as the 'winner' of the competition and ultimately used by the speaker.

Statistical preemption can be used to explain why speakers consider some constructions to be more 'acceptable' than others: the acceptability of novel constructions depends on whether an alternative conventional construction exists. The more common, or entrenched the alternative construction is, the less acceptable the competing novel construction will be considered. An expression (e.g. *explain me this*) sounds odd because speakers have consistently witnessed evidence of another conventional construction (e.g. *explain this to me*) in the same context. Coverage

and statistical preemption work hand in hand in the process: coverage provides the CANDIDATES for competitive selection via statistical preemption.

Statistical preemption can be explained by Retrieval-Induced Forgetting (RIF), or more generally, Error-Driven Learning (EDL). When we hear others speak, we routinely make predictions about what they say, partially activating forms/representations relevant to the context. If a prediction is subsequently proven wrong (i.e. the speaker used another construction instead of the predicted one), we will experience RIF/EDL through which the partially activated representation becomes harder to access. In effect, a construction will be weakened and less likely to be used if it loses to a competing construction, thus improving prediction accuracy in the long run. RIF and EDL, as domain-general mechanisms, serve as evidence that language learning/use does not require any special faculty of the human brain as hypothesized by Chomskian linguists.

Chapter 6 explores the effects of age on language learning. In first-language (L1) learning, experiments show that children are both conservative (repeating input verbatim and sticking to familiar constructions) and (over)generalizing (regularizing and producing output that appears to be more general than the input). Goldberg reconciles the seemingly paradoxical evidence as two sides of the same coin: as beginning language learners striving to master the complex network of constructions, children are often unable to produce the most optimal construction for given messages-in-context, and tend to 'play safe' by opting for familiar/known ones; it is precisely for the same reason, however, that they also (over)simplify by restricting themselves to a subset of possible choices, resulting in (over)generalization. Children's ability to generalize is refined with time and experience, supported by contextual scaffolding (both explicit and implicit) in the learning process.

Goldberg also discusses why adult second-language (L2) learners are less effective in language learning than native first-language (L1) learners. Even after vast amounts of exposure to contextualized input, L2 learners can still experience difficulties in using constructions the way L1 speakers do and they have greater trouble recovering from errors. Goldberg suggests that the reason for this discrepancy may lie in the influence of the adult learners' L1. First, the L1 of adults warps the hyper-dimensional space (conceptual representations), distorting the subtle similarities and distinctions between the two languages; secondly, the need to inhibit L1 when using L2 reduces adult speakers' ability to activate error-driven learning. Compared with L1 learners, adult L2 learners appear to have a reduced ability to make predictions about grammatical forms, leading to reduced error- and competition-driven learning. Consequently, they are less able to learn from linguistic input and correct their predictions.

Chapter 7 surveys alternative accounts for the partial productivity of constructions, comparing each with the one proposed in this book. The alternative approaches outlined include, among others, the compatibility-based account (Pinker 1989), Conservatism vs. Entrenchment (Ambridge et al. 2012), Tim O'Donnell and Charles Yang's theories of linguistic productivity (O'Donnell 2015, Yang 2016), the Distributed Morphology framework (Embick & Marantz 2008). Goldberg summarizes the common drawbacks of these major alternative accounts for the partial productivity of language: they fail to provide a convincing explanation of (i) how the 'rules' of language, which these accounts claim to exist, are learned,

and (ii) how a rule-based mechanism can allow for productive/creative use of language. Goldberg argues that the current usage-based perspective based on coverage and competition provides a simple yet robust explanation more consistent with existing experimental and observational evidence.

Chapter 8 concludes by summarizing the key points in each chapter. In addition, Goldberg notes several limitations of the research presented in the book:

- (i) The focus of the book has been limited to only one type of construction (the argument structure construction) to the exclusion of other relevant and potentially interesting constructions.
- (ii) Constructions have been studied in isolated sentences while larger units of investigation such as conversation have been neglected.
- (iii) The investigations have been limited to English constructions, which can produce language biases.

For future work, Goldberg suggests the need for improvement in computational modeling of constructions to capture the intricate relational meanings beyond the level of individual words.

In conclusion, Goldberg's new book, adopting a usage-based, constructionist perspective, presents a new and integrated theory of the general mechanisms that govern the learning and use of language. The theory gives a convincing explanation of the paradoxical partial productivity of constructions, a fundamental yet confounding question which alternative accounts have yet to address satisfactorily. Goldberg unwraps the paradox with the proposal of coverage and statistical pre-emption, two innovative models that appear to be highly explanatory and elegantly consistent with existing linguistic phenomena observed in both natural and experimental settings.

Overall, the book is well-organized and expertly written. The materials are presented in an engaging and easy-to-follow manner, fulfilling the book's intended role of 'an accessible introduction to students, teachers and researchers' (Preface). A chapter typically begins by posing an intriguing research question illustrated with real-life examples. Subsequent sections revolve around aspects essential to the question, presenting insightful theoretical analysis backed by solid empirical evidence and debunking (less plausible) alternative models, before ending with a summary of key points for review and reflection. In so doing, the author takes the reader through a puzzle-solving journey that is both enlightening and entertaining.

Alongside these strengths, however, are some potential areas for improvement. As an introductory text, the book falls short of providing proper definitions of important concepts. Several key terms referenced throughout the book, such as 'statistical preemption', 'hyper-dimensional conceptual space', and 'error-driven learning', are never formally defined. As a result, readers are left having to deduce the exact meaning from the different phrasing in context. In the few places where terms are explicitly defined, the definitions can sometimes appear obscure. For example, 'construction' is defined as 'emergent clusters of lossy memory traces that are aligned within our high- (hyper!) dimensional conceptual space on the basis of shared form, function, and contextual dimensions' (p. 7). While still conveying the

essence of the commonly accepted notion of ‘learned form-meaning pairings’, such a definition not only makes the term abstract and abstruse, but also risks relying on theoretical assertions that might be incompatible with other theories of Construction Grammar.

Another potential shortcoming is the lack of discussion on how the proposed approach relates to other strands of usage-based linguistics. Throughout the book, Goldberg refers to her proposed approach as ‘the usage-based constructionist approach’, as opposed to other non-constructionist proposals, as if it were a unified perspective shared by researchers in the field. However, as most of the theoretical innovations in the book are contributed by Goldberg herself, readers, especially those new to the field, would benefit from an explanation of how her approach departs from and adds to other usage-based strands of Construction Grammar (see Hoffmann & Trousdale 2013). Relatedly, little is discussed on how the proposed approach interfaces with other linguistic theories, especially those with practical implications (e.g. corpus-linguistic/pragmatic theories). While an in-depth discussion is unnecessary, readers may find it helpful to have a few pointers to suggested readings in the final chapter.

Notwithstanding these minor issues, the present book is evidence that Goldberg’s influential theoretical hypothesis on grammatical constructions (Goldberg 1995, 2006) has matured into a unified framework. It represents a significant milestone in the field of Construction Grammar and Cognitive Linguistics, and may serve as a welcome introductory text for scholars and students of linguistics for years to come.

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References

- Ambridge, Ben, Julian M. Pine, Caroline F. Rowland & Franklin Chang. 2012. The roles of verb semantics, entrenchment, and morphophonology in the retreat from dative argument-structure overgeneralization errors. *Language* 88(1), 45–81.
- Embick, David & Alec Marantz. 2008. Architecture and blocking. *Linguistic Inquiry* 29(1), 1–53.
- Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago, IL: University of Chicago Press.
- Goldberg, Adele E. 2006. *Constructions at Work: The Nature of Generalization in Language*. Oxford: Oxford University Press.
- Hoffmann, Thomas & Graeme Trousdale (eds.). 2013. *The Oxford Handbook of Construction Grammar*. Oxford: Oxford University Press.
- O’Donnell, Timothy J. 2015. *Productivity and Reuse in Language: A Theory of Linguistic Computation and Storage*. Cambridge, MA: MIT Press.
- Pinker, Steven. 1989. *Learnability and Cognition: The Acquisition of Argument Astructure*. Cambridge, MA: MIT Press.
- Yang, Charles D. 2016. *The Price of Linguistic Productivity: How Children Learn to Break the Rules of Language*. Cambridge, MA: MIT Press.