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Explanation and Constructions

Adele E. Goldberg

Abstract

Adger's thoughtful comments in this volume on usage-based constructionist approaches do not make much contact with the topic of my chapter, which argues for a particular interpretation of argument structure constructions (Goldberg 1992; 1995; 2006), as against several alternatives including lexical rules and lexical templates. Instead, the focus of Adger's article is the Universal Grammar (UG) Hypothesis, which he defends, and which a growing number of researchers including myself reject in favor of adopting as the null hypothesis the idea that human languages are learnable on the basis of domain-general abilities that are independently needed. This response outlines how and why we aim to explain our impressive ability to learn language without recourse to innate or unlearned syntactic knowledge.

1. It is preferable to appeal to independently motivated systems

Adger wonders aloud why it is preferable to appeal to processes or biases of categorization, social cognition, and statistical learning in order to account for our remarkable ability to learn and use language rather than positing innate stipulations that are specifically about syntax. The answer is four fold. First, these other processes are independently needed and it is self-evident that explanations that account for a broader range of phenomena are to be preferred over those that account for a more narrow swath of data.

Secondly, the ability to categorize exemplars, share information, cooperate, and anticipate upcoming events by making various types of predictions are all clearly directly advantageous to the individual or group and so may plausibly have evolved, as Adger assumes.[1] On the other hand, while our linguistic ability taken as whole is clearly evolutionarily advantageous, the type of syntactic stipulations that have traditionally been claimed to comprise UG are not; in fact, by hypothesis, the type of modular, autonomous syntactic generalizations that have been posited over the past several decades serve no functions. For example, Adger assumes that constraints on long-distance dependencies are part of UG, but surely it is not life-threatening nor sexually unattractive to produce an ill-formed dependency. An alternative might be to suggest that the properties of UG comprise a set of *spandrels*; that is, UG may contain the byproducts of other features that do have evolutionary advantages, but such an account has not been made explicit.

Constructionists often look for explanations in terms of *functions* of the relevant constructions involved. The discovery of functional motivations obviates the need to stipulate that the constraints must be given *a priori* (Beckner et al. 2009;

[1] Constructionists generally do not make any claims about whether these other biases are "innate" since the term woefully underestimates the typically complex interactions between genes and the environment before and after birth (see Blumberg 2006; Deák 2000; Karmiloff-Smith 1994 for relevant discussion).

Bybee 2010; Bybee, Haiman & Thompson 1997; Christiansen & Chater 2008; Elman et al. 1996; Goldberg 2004; 2006; Haspelmath 2008; Levine and Postal 2012; Simone & Vallauri 2010; Tomasello 2003; 2009). That is, unless the function is so important that violations of it lead to reduced likelihood of procreation, we can understand the function itself—its usefulness—to provide a reason for the bias to arise during the course of development. For example, paraphrasing Liz Bates, the fact that all unimpaired humans eat with their hands and not their feet does not mean that we have an innate bias against eating with our feet. Eating with our hands is simply a more efficient (and cleaner) way to get food into our mouths than using our feet.

Thirdly, no one assumes that the *outcomes* of categorization, transitional probabilities, associative or Bayesian reasoning, or social cognition are innate; rather concepts of "apple" and "computer," knowledge that night follows day, and knowledge of greetings are clearly learned. But traditionally, UG has been assumed to be distinct in that *knowledge* about language has been claimed to be unlearned. That is, children have been viewed as bringing with them knowledge of noun, verb and adjective categories, binary branching trees, a multitude of functional categories, invisible placeholders (such as pro), and constraints on possible word orders. This is likely what Pearl and Sprouse (2012) have in mind when they note that positing Universal Grammar to account for our ability to learn language is "theoretically unappealing" in that it requires that we posit learning biases that "appear to be an order (or orders) of magnitude more complex than learning biases in any other domain of cognition."

Finally, human languages are unique among animal communication systems in their impressive diversity (Tomasello 2003:1; Croft 2001; Dryer 1997; Evans & Levinson 2009; Haspelmath 2008). If we suppose that all languages are underlying the same due to a tightly constrained UG, except perhaps for some simple parameter settings, it appears to be an unexplained and cruel twist of fate that language learners must face such rampant superficial variation.

The shift of perspective from positing syntactic, innate stipulations to trying to account for generalizations by appealing to independently needed systems has been echoed to some extent within mainstream generative grammar. Chomsky, for example, has noted recently that he would like to eliminate the stipulations that comprise Universal Grammar, noting that it is just "normal scientific methodology" to aim to eliminate stipulations in favor of deriving them from independently needed abilities or biases (lecture, Princeton University 2010). In fact, as Adger acknowledges, Chomsky has gone so far as to suggest that the only language-specific innate ability that is absolutely required is recursion, and the point is raised that even recursion might turn out not to be specific to language (Hauser et al. 2002).[2]

There is no longer any consensus of what UG means among generative syntacticians (see Tomasello 2004 for review). Adger himself suggests that evidence for a "faculty of language" could come from the existence of a single *domain-general*

[2] In fact, the claim that recursion is domain-specific has been hotly contested (Jackendoff & Pinker 2005). Moreover, there exists a serious question about whether recursion in the form of embedded clauses, stacked adjectives, or conjunction exists in all languages (Everett 2009; Piantadosi et al. 2012).

capacity which "logically could be used to analyze the linguistic environment, but which is not used." This is his proposal that the faculty of language could consist simply of our making use of only a subset ("L") of the set of domain-general cognitive processes that could in principle be used to learn language ("C"). I will say that I am skeptical of the suggestion that "units of colour categorization" *could* logically lead to grammatical categories, or that social cognition could logically be used to learn word order effects. In any case, even if there existed a circumscribed subset of logically relevant domain-general processes that are used to learn language, it would be a long way from traditional Universal Grammar which has stipulated unlearned and syntactic principles, grammatical categories, invisible functional categories, constraints on tree structures, constraints on long-distance dependences, etc.

And if we abandon the traditional version of UG, we no longer need to assume that all languages must be underlyingly the same, despite their vast apparent differences (Boas 2010; Croft 2001; Culicover 1999; Dryer 1997; Evans & Levinson 2009; Haspelmath 2008). Instead, we can recognize the 6000-7000 languages that exist as solutions to the problem of communication: variable solutions that have emerged on the basis of domain-general skills and pro-social motivations (Bates and MacWhinney 1987; Herrmann et al. 2007; Tomasello 2003; 2008). At the same time, constructionists recognize that languages are constrained and that variation among languages is not unlimited.

2. Cross-linguistic diversity

Constructionists' views about universal constraints and generalizations are empirical. Our formalisms are not intended to constrain language; instead, they allow us to capture the facts that are discovered (Michaelis 2012; Müller 2012). If language is learned on the basis of the input together with domain-general abilities and constraints, constructions are expected to vary in their specifics cross-linguistically, and this does seem to be the case (Boas 2010; Croft 2001; Culicover 1999; Dryer 1997; Evans & Levinson 2009; Haspelmath 2008). For example, Croft (2001) notes that words that translate into English as nouns, adjectives and adverbs, as well as verbs, are inflected for person, aspect and mood in Makah, an American Indian language, and that no words are inflected for these categories in Vietnamese. He points out that therefore tense-aspect-mood inflection cannot be taken as critical for determining the category of verb cross-linguistically (unless of course one is willing to say that all words are verbs in Makah, and no words are verbs in Vietnamese). Croft goes on to point out that no syntactic test will pick out all and only entities that one might wish to call nouns, adjectives, subjects, or objects either, across all languages; finding two constructions in two different languages that are absolutely identical in form, function, and distribution is a rare occurrence outside of cases of shared diachronic history or language contact. For this reason, the vast majority of typologists are not proponents of Universal Grammar (e.g., Croft 2001; Dryer 1997; Evans & Levinson 2009; Haspelmath 2008).

Oftentimes quite quirky constraints arise due to diachronic change (Bybee et al. 1997; Traugott 2008). For example, contrary to Adger's assumption that phonology *never* constrains syntax, the English ditransitive construction is sensitive to whether

verbs have stress on the first syllable (sounding Germanic) or not (Gropen et al. 1989; Ambridge et al. 2012). A subclass of English adjectives that begin with an unstressed shwa systematically resist prenominal attributive use; even nonse adjectives show this tendency to some extent (Boyd and Goldberg 2011). Explanation comes from understanding how the constraints arose diachronically and how they are learned synchronically. This is where our efforts lie.

3.Cross-linguistic generalizations

At the same time, relationships between form and meaning are typically *motivated* (cf. e.g., Saussure 1916; Bybee et al. 1997; Lakoff 1987; Goldberg 2006), and thus we find recurrent patterns cross-linguistically. Let us consider a few examples in order to illustrate the type of facts that exist, and the type of explanations that have been offered.

Consider the generalization that the number of semantic arguments tends to equal the number of overt complements expressed (e.g., Lidz, Gleitman and Gleitman 2003). Clearly particular constructions circumvent this general tendency; for example, short passives allow the semantic causer or agent argument to be unexpressed. The modest, accurate empirical generalizations are captured by acknowledging the pragmatics underlying successful communication as captured in the following simple statement:

Pragmatic Mapping Generalizations
A) The referents of linguistically expressed arguments are interpreted to be *relevant* to the message being conveyed.
B) Any semantic participants in the event being conveyed that are *relevant* and *non-recoverable* from context must be overtly indicated.

Notice that these generalizations make no predictions about semantic participants that are recoverable or irrelevant. This is important because languages and constructions within languages treat these arguments differently. Perhaps the majority of the world's languages including for example, Japanese and Korean, readily allow recoverable or irrelevant arguments to be omitted. Other languages, such as English, generally require such arguments to be expressed (typically by pronouns); but even in English, the "deprofiled object construction" allows certain irrelevant arguments to be omitted (e.g., *Tigers only kill at night*.) (Goldberg 2000). Thus the original syntactic claim was too strong, while the pragmatic mapping generalizations are valid cross-linguistically and across constructions within a given language.

Dowty (1991) proposed linking generalizations that are now widely cited as capturing the observable (i.e., surface) cross-linguistic universals in how arguments are linked to syntactic relations. He observed that in simple active clauses, *if* there is a subject and an object, *and if* there is an agent-like entity and an "undergoer," then the agent is expressed by the subject, and the undergoer is expressed by the direct object (cf. also Van Valin 1990). Roughly, arguments that are volitional, sentient, causal or moving are agent-like, while arguments that undergo a change of state, are causally affected or are stationary are considered undergoers. Dowty further observes that the opposite mapping appears to be possible in syntactically ergative

languages. It is well known that ergative languages themselves are quite complicated and moreover, the grammatical relation of subject is not clearly valid cross-linguistically (Dryer 1997). Therefore, clearly the relevant generalization is again quite modest. Moreover, since the generalization only holds of active clauses, it allows for the fact that the passive construction only optionally expresses an agent argument, and when the agent is expressed, it appears as a non-subject oblique (e.g., a prepositional phrase). A fair generalization, nonetheless, can be rephrased as follows: actors and undergoers are generally expressed in prominent syntactic slots.

The salient-participants-in-prominent-slots generalization has the added advantage that it accounts for the fact that an agent argument without an undergoer, and an undergoer without an agent are also expressed in prominent syntactic positions; moreover, it follows directly from well-documented aspects of our general attentional biases. Humans' attention is naturally drawn to agents, even in non-linguistic tasks. For example, visual attention tends to be centered on the agent in an event, during and after an action is performed (Robertson and Suci, 1980). Infants as young as nine months have been shown to attribute intentional behavior even to inanimate objects that have appropriate characteristics (e.g., motion, apparent goal-directedness) (Csibra et al.1999); infants habituated to a scene in which a computer-animated circle jumped over an obstacle and contacted another circle, expected the first circle to take a direct route when the obstacle was removed from the scene. Thus, pre-linguistic infants attend closely to the characteristics of agents (volition, sentience, and movement) in visual as well as linguistic tasks.

The undergoer in an event is generally the endpoint of some sort of force (Talmy, 1988; Langacker, 1987; Croft, 1991). The tendency to attend closely to one particular type of endpoint, that of change of state, begins as early as 6 months. Woodward (1998) demonstrates that 6-month-old infants attend more to changes of state than to changes of motion without corresponding state-change. It has been hypothesized that *effects* of actions are the key elements in action-representations both in motor control of action and in perception (Prinz 1990; 1997). For evidence that undergoers are salient in non-linguistic tasks, see also Csibra et al. 1999; Bekkering et al. 2000; Jovanovic et al. 2007). For evidence that endpoints or undergoers are salient in linguistic tasks, see Regier and Zheng (2003), Lakusta and Landau (2005), Lakusta et al. (2007). Thus the observation that agents and undergoers tend to be expressed in prominent syntactic positions follows from general facts about human perception and attention.

There is also a strong universal tendency for languages to have some sort of construction we might refer to as a "passive." These passive constructions are identified by their related functions: they are constructions in which the topic and/or agentive argument is essentially "demoted," appearing optionally or not at all. The fact that special passive constructions exist that allow agents and/or topics to be expressed in non-prominent slots allows speakers a degree of flexibility and is therefore also motivated. At the same time, certain languages such as Choctaw do not contain subject-demoting passives at all (Heath 1977; Van Valin 1980).

3. Constructions are not functional categories

Adger is right that the notion of construction and the focus on domain-general learning are logically independent. And of course generative linguists recognize that individual constructions serve a range of functions. Adger notes that the regular correspondences between grammatical form and semantic and pragmatic functions can be captured by the ever-growing list of functional features. In fact, in order to fully account for constructional meaning, the list of universal features would need to be expanded yet further with a feature for "creation of a path and movement through it" (the English *way* construction; Goldberg 1995); formal register (for e.g., the "is to" construction; Goldberg & van der Auwera 2012), new topics as compared to moribund topics (Gregory and Michaelis 2001). In fact, insofar as every construction in a given language has a unique function (Clark 1987; Bolinger 1977), the list of functional features would become quite long indeed.

One major problem with functional categories, in my view, is that they are assumed to be part of UG and thus unlearned and universal, existing in languages and in individual sentences that show no evidence of them. Jettisoning assumptions about UG allows us to recognize the slightly different functions and varying formal trappings that are involved in the "same" constructions cross-linguistically (see also discussion of other "neo-constructionist" accounts in Goldberg 2006: chapter 10). Moreover, recognizing the functions of constructions offers a way out of the learning paradoxes that arise when one assumes that what a child needs to know are which abstract strings of categories are acceptable and which are not. A child's goal in learning a language is to understand and be understood while obeying the conventions of older people around them, whom they try to emulate. Once this simple idea is appreciated, it is natural to view our knowledge of language as an interrelated network of learned pairings of form with function; i.e., an interrelated network of *constructions*.

4. Learning

When Chomsky first argued that language was so complex and the input so impoverished that fundamental knowledge of language must be given to us *a priori*, it was not unreasonable. In 1965, we did not have access to large corpora of child-directed speech nor early child utterances, so we did not realize how massively repetitive the input was nor how closely children's initial productions reflect that input (but cf. e.g., Mintz et al. 2002; Cameron-Faulkner, Lieven and Tomasello 2003). We also did not fully appreciate at that time how statistical learning worked, or how powerful it was (e.g., Abbot-Smith et al. 2007; Fiser and Aslin 2002; Gomez and Gerken 2000; Hudson Kam and Newport 2009; Saffran 2003; Saffran, Aslin, & Newport 1996; Wonnacott, Newport and Tanenhaus 2008). Connectionist and Bayesian modeling had not yet revealed that associative learning and rational inductive inferences could unlock many mysteries involved in language learning (e.g., Bod 2009; Perfors et al. 2009; Elman et al. 1996; Alishahi & Stevenson 2008). The role of language as a communicative system was widely underappreciated (pace e.g., Bolinger 1977; Givón 1991; Lakoff 1969). Finally, the widespread recognition of emergent phenomena was years away (e.g., Elman et al. 1996; Karmiloff-Smith 2006; Lander and Schork 1994). These advances in our understanding allow us to avoid the assumption that all languages must be 'underlyingly' the same and learned

via a ready-made 'Language Acquisition Device' (Chomsky 1965). In fact, if Universal Grammar consists only of recursion, as Chomsky now proposes (Hauser et al. 2002), it is unclear how exactly it could even begin to address the purported poverty of the stimulus issue in any case.

5. Conclusion

A growing number of researchers have raised questions about whether domain-specific stipulations in the form of UG are required (e.g., Baronchelli et al. 2012; Christensen and Chater 2008; Ellefson, & Christiansen 2000; Elman et al. 1996; Goldberg 2006; Hsu & Chater 2010; Kirby 2000; Kuhl 2000; Lieven et al. 2003; Pullum & Scholz 2002; Lappin & Shieber 2007; Tomasello 2003; 2008). Many of these and other researchers have made constructions the cornerstone of their linguistic theories (e.g., Croft 2001; Culicover & Jackendoff 2005; Fillmore et al. 1988; Goldberg 1995; 2006; Michaelis and Lambrecht 1994; Sag et al. 2003), as well as theories of language acquisition (e.g., Cameron-Faulkner et al. 2003; Tomasello 2003), historical change (Traugott 2008; Bybee 2010); morphology ((Ackerman & Nikolaeva 2004; Blevins 2001; Booij 2002; Spencer 2001); processing (Gries 2003; Bergen and Chang 2005); machine learning (Bod 1998; Perfors et al. 2007); and neuroscience (Arbib and Lee 2008; Kemmerer 2000). There is a huge amount of work to do both in terms of linguistic research and in terms of building bridges between linguistics and related disciplines, but the constructionist approach offers a newer perspective, based on a range of interdisciplinary findings, on our uniquely human ability to learn and use language.

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REFERENCES

Abbot-Smith, Kirsten, Miriam Dittmar & Michael Tomasello. (2007). 'Graded representations in the acquisition of English and German transitive constructions'. Cognitive Development 23.48-66.

Ackerman, Farrell & Irina Nikolaeva. (2004). *Comparative Grammar and Grammatical Theory: A Construction-Based Study of Morphosyntax*. Stanford: Center for the Study of Language and Information.

Alishahi, Afra & Suzanne Stevenson. (2008). 'A computational model of early argument structure acquisition'. Cognitive Science 32.789-834.

Ambridge, B., Pine, J. M., Rowland, C. F., Freudenthal, D., & Chang, F. (2012). Avoiding dative overgeneralisation errors : Semantics , statistics or both ?, *00*(00).

Arbib, M., & Lee, J. (2008). Describing visual scenes: towards a neurolingistics based on construction grammar. *Brain Research*, *1226*, 146-162.

Baronchelli A, Chater N, Pastor-Satorras R, Christiansen MH (2012) The Biological Origin of Linguistic Diversity. PLoS ONE 7(10): e48029.

Bates, E., & MacWhinney, B. (1987). Competition, variation, and language learning. In B. MacWhinney (Ed.), *Mechanisms of Language Acquisition* (pp. 157–193). Hillsdale, N. J.: Lawrence Erlbaum Associates.

Beckner, C., Ellis, N. C., Blythe, R., Holland, J., Bybee, J., Christiansen, M. H., Larsen-freeman, D., et al. (2009). Language Is a Complex Adaptive System. *Language learning*, (December), 1–26.

Bekkering, F., Wohlschlager, A. and Gattis, M. 2000. Imitation of gestures in children is goal-directed. Quarterly Journal of Experimental Psychology, 53A.153-64.

Bergen, B., & Chang, N. (2005). Embodied Construction Grammar in Simulation-Based Language Understanding. In J.-O. Ostman & M. Fried (Eds.), *Construction Grammar(s): Cognitive and Cross-Language Dimensions*. Philadelphia: John Benjamins.

Blevins, J. P. (2001). 'Realisation-based lexicalism'. Journal of Linguistics 37.355-65.

Blumberg (2006) *Basic Instinct:the genesis of behavior* Avalon Publishing.

Boas, Hans C. 2010 (ed.) *Contrastive Studies in Construction Grammar*. Amsterdam/Philadelphia: John Benjamins

Bod, Rens. (1998). *Beyond grammar: an experience-based theory of language.* Stanford: Center for the Study of Language and Information.

Bod, R. (2009). From Exemplar to Grammar: Integrating Analogy and Probability Learning. *Cognitive Science*, *13*(2), 311–341.

Bolinger, D. (1977). *Meaning and form*. London: Longman.

Booij, Geert. (2010). *Construction Morphology*. Oxford: Oxford University Press.

Boyd, Jeremy K. & Adele E. Goldberg. (2011). 'Learning what not to say: categorization and statistical preemption in the production of a-adjectives'. Language.

Bybee, Joan. (2010). *Language, Usage and Cognition*. Cambridge: Cambridge University Press.

Bybee, J., Haiman, J., Thompson, S. (1997) (eds). *Essays on language function and language type* Amsterdam: Benjamins.

Cameron-Faulkner, T., Lieven, E., & Tomasello, M. (2003). A construction based analysis of child directed speech. *Cognitive Science*, *27*, 843-873.

Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Cambridge: MIT Press.

Clark, E. V. (1987). The Principle of Contrast: A Constraint on Language Acquisition. In B. MacWhinney (Ed.), *Mechanisms of Language Acquisition* (pp. 1–33). Hillsdale, NJ: Lawrence Erlbaum Associates.

Christiansen, M. H., & Chater, N. (2008). Language as shaped by the brain. *The Behavioral and brain sciences*, *31*(5), 489–508.

Croft, William. (2001). *Radical Construction Grammar.* Oxford: Oxford University Press.

Csibra, G., Gergely, G., Biró, S., Koós, O., & Brockbank, M. (1999). Goal-attribution and without agency cues: The perception of "pure reason" in infancy. *Cognition*, *72*, 237–267.

Culicover, Peter W. (1999). *Syntactic Nuts: Hard Cases, Syntactic Theory and Language Acquisition.* Oxford: Oxford University Press.

Culicover, Peter W. & Ray Jackendoff. (2005). *Simpler Syntax.* Oxford University Press.

Deák, G. (2000). Hunting the Fox of Word Learning: Why “Constraints” Fail to Capture It. *Developmental Review*, *20*(1), 29–80.
Dowty, David. (1991). 'Thematic proto-roles and argument selection'. Language 67.547-619.
Dryer, M. (1997). Are grammatical relations universal? In J. Bybee, J. Haiman, & S. Thompson (eds.), *Essays on language function and language type* (pp. 115-43). Amsterdam: Benjamins.
Ellefson, M. R., & Christiansen, M. H. (2000). Subjacency Constraints without Universal Grammar: Evidence from Artificial Language Learning and Connectionist Modeling. *The proceedings of the 22nd annual conference of the cognitive science society* (pp. 645–650).
Elman, J., Bates, E., Johnson, M., Karmiloff-Smith, A., Parisi, D., & Plunkett, K. (1996). *Rethinking Innateness: A Connectionist Perspective on Development*. Cambridge, Mass: MIT Press.
Erteschik-Shir, Nomi. (1998). 'The Syntax-Focus Structure Interface'. *Syntax and Semantics 29:The Limits of Syntax*, ed. by P. Culicover & L. McNally, 211-40.
Evans, Nick & Stephen Levinson. (2009). 'The Myth of Language Universals'. Brain and Behavioral Sciences.
Everett, D. L. (2009). Pirahã Culture and Grammar: A Response to Some Criticisms. *Language*, *85*(2), 405-442.
Fillmore, Charles J., Paul Kay & Mary Catherine O'Connor. (1988). 'Regularity and Idiomaticity in Grammatical Constructions: The Case of *Let Alone'*. Language 64.501-38.
Fiser, J., & Aslin, R. N. (2002). Statistical learning of new visual feature combinations by infants. *Proceedings of the National Academy of Sciences, USA*, *99*, 15822-15826 .
Givón, Talmy. (1991). 'Isomorphism in the Grammatical Code: Cognitive and Biological Considerations'. Studies in Language 1.85-114.
Goldberg, Adele E. (1992). 'The inherent semantics of argument structure: The case of the English ditransitive construction'. Cognitive Linguistics 3.37-74.
Goldberg, Adele E. (1995). *Constructions: A Construction Grammar Approach to Argument Structure.* Chicago: Chicago University Press.
Goldberg, Adele E. (2000). 'Patient arguments of causative verbs can be omitted: The role of information structure in argument distribution'. Language Sciences 34.503-24.
Goldberg, Adele E. 2004. 03. 00. (2004). But do we need universal grammar? Comment on Lidz et al. (2003). *Cognition*, *94*(1), 77–84.
Goldberg, Adele E. (2006). *Constructions at Work: the nature of generalization in language.* Oxford: Oxford University Press.
Goldberg, Adele E. and Johan van der Auwera (2012)
Gomez, R. L., & Gerken, L. D. A.-M. (2000). Infant artificial language learning and language acquisition. *Trends in Cognitive Sciences*, *4*(5), 178–186.
Gries, Stefan Thomas. (2003). *Multifactorial Analysis in Corpus Linguistics: A study of particle placement.* New York: Continuum.
Gregory, M. L., & Michaelis, L. A. (2001). Topicalization and Left Dislocation: A Functional Opposition Revisited. *Journal of Pragmatics*, *33*(11), 1665–1706.

Gropen, J., Pinker, S., Hollander, M., Goldberg, R., & Wilson, R. (1989). The Learnability and Acquisition of the Dative Alternation in English. Language, 65(2), 203-257.

Haspelmath, Martin. (2008). 'Parametric versus functional explanation of syntactic universals.' T*he limits of syntactic variation*., ed. by T. Biberauer, 75-107. Amsterdam: Benjamins.

Hauser, Mark D., Noam Chomsky & W. Tecumseh Fitch. (2002). 'The Faculty of Language: What is it, who has it, and how did it evolve?' Science 298.1569-79.

Heath 1977

Herrmann, E., Call, J., Hernández-lloreda, M. V., Hare, B., Tomasello, M. (2007). Humans have evolved specialized skills of social cognition: The cultural intelligence hypothesis. *Science*, *317*(5843), 1360-1366.

Hudson Kam, C. & Newport, E. L. (2009). Getting it right by getting it wrong: When learners change languages. *Cognitive Psychology*, *59*(1), 30–66.

Hsu, A. S., & Chater, N. (2010). The logical problem of language acquisition: a probabilistic perspective. *Cognitive science*, *34*(6), 972–1016. doi:10.1111/j.1551-6709.2010.01117.x

Jackendoff, Ray & Steven Pinker. (2005). 'The Nature of the Language Faculty and its Implications for Evolution of Language (Reply to Fitch, Hauser and Chomsky)'. Cognition.

Javanovic, B., Kiraly, I. I., Elsner, Bi., Gergely, G., Prinz, W., Aschersleben, G., & Jovanovic, B. (2007). The Role of Effects for Infants' Perception of Action Goals. *Psychologia*, *50*(4), 273–290.

Karmiloff-Smith, A. (2006). The tortuous route from genes to behavior: A neuroconstructivist approach. *Cognitive, affective & behavioral neuroscience*, *6*(1), 9–17.

Kemmerer, D. (2006). Action verbs, argument structure constructions and the mirror neuron system. In M. Arbib (Ed.), *Action to Language via the Mirror Neuron System* (pp. 347–372). Cambridge: Cambridge University Press.

Kirby, S. (2000). Syntax without natural selection: How compositionality emerges from vocabulary in a population of learners. In C. Knight (Ed.), *The Evolutionary Emergence of Language: Social Function and the Origins of Linguistic Form* (pp. 1–19). Cambridge University Press.

Kuhl, P. K. (2000). A new view of language acquisition. *PNAS*, *97*(22).

Lakoff (1969) On Generative Semantics. Indiana University Linguisics Club.

Lakoff, George. (1987). *Women, fire, and dangerous things : what categories reveal about the mind*. Chicago: University of Chicago Press.

Lakusta, L., & Landau, B. (2005). Starting at the end: the importance of goals in spatial language . *Cognition*, *96*(1), 1–33.

Lander, E. S., & Schork, N. J. (1994). Genetic dissection of complex traits. *Science (New York, N.Y.)*, *265*(5181), 2037–48.

Langacker, Ronald W. (1987). *Foundations of cognitive grammar Volume I*. Stanford, Calif.: Stanford University Press.

Lakusta, L., Wagner, L., O'Hearn, K., & Landau, B. (2007). Conceptual Foundations of Spatial Language: Evidence for a Goal Bias in Infants. *Language Learning and Development*, *3*(3), 179–197

Lappin, S., & Shieber, S. M. (2007). Machine learning theory and practice as a source of insightinto universal grammar. *Journal of Linguistics*, *43*(02), 393. doi:10.1017/S0022226707004628

Levine,B. and Postal, P. (2012) A Corrupted Linguistics.Posted at ling.auf.net/lingbuzz

Lidz, Jeffrey, Henry Gleitman & Lila Gleitman. (2003). 'Understanding how input matters: verb learning and the footprint of universal grammar'. Cognition 87.151-78.

Lieven, Elena, Heike Behrens, Jennifer Speakers & Michael Tomasello. (2003). 'Early syntactic creativity: a usage-based approach'. Journal of Child Language 30.333-70.

Michaelis, Laura. 2012. Making the case for construction grammar. In Hans C Boas and Ivan A Sag, eds., Sign-Based Construction Grammar, CSLI.

Michaelis, Laura A. & Knud Lambrecht. (1996). Toward a Construction-Based Model of Language FunctionThe Case of Nominal Extraposition. Language 72.215-47.

Mintz, T. H., Newport, E. L., & Bever, T. G. (2002). The distributional structure of grammatical categories in speech to young children. *Cognitive Science*, *26*(4), 393-424.

Müller, St. 2012. Core-Gram. http://hpsg.fu-berlin.de/Projects/CoreGram.html.

Pearl, Lisa and Sprouse, Jon. 2012. Syntactic islands and learning biases: Combining exper- imental syntax and computational modeling, ms. Cognitive Science, University of Cali- fornia at Irvine.

Perfors, Amy, C. Kemp, Josh Tenenbaum & Elizabeth Wonnacott. (2007). *Learning inductive constraints: The acquisition of verb argument constructions.* University College London.

Piantadosi, S., Stearns, L., Everett, D. & Gibson, E. A corpus analysis of Pirahã grammar: An investigation of recursion. Talk presented at the LSA conference in Portland, OR on January 7, 2012.

Prinz, W. (1997). Perception and action planning. *European Journal of Cognitive Psychology*, *9*(2), 129–154.

Prinz, W. (1990). A common coding approach to perception and action. In O. Neumann & W. Prinz (Eds.), *Relationships between perception and action: Current approaches* (pp. 167–201). Berlin: Springer Verlag.

Pullum, G. K., & Scholz, B. C. (2002). Empirical assessment of stimulus poverty arguments. *The Linguistic Review*, *19*(1-2), 9–50.

Regier, T., & Zheng, M. (n.d.). An Attentional Constraint on Spatial Meaning. *Proceedings of the 25th Annual Meeting of the Cognitive Science Society.* Boston, Mass.

Robertson, S. S., & Suci, G. J. (1980). Event perception in children in early stages of language production. *Child Development*, *51*, 89–96.

Saffran, J. R. (2003). Statistical language learning: mechanisms and constraints. *Current Directions in Psychological Science*, *12*(4), 110-114.

Saffran, J. R., R. Aslin, and E. Newport (1996) *Science.*

Saussure, Ferdinand de. (1916). *Course in General Linguistics.* New York: Philosophical Library.
Simone, R., & Vallauri, E. L. (2010). Natural constraints on language. *CFS*, *63*, 205–224.
Spencer, Andrew. (2001). The Paradigm-Based Model of Morphosyntax.
Talmy., L. (1988). Force dynamics in language and cognition. *Cognitive Science*, *12*, 49–100.
Tomasello, Michael. (2003). *Constructing a language: A Usage-Based Theory of Language Acquisition*. Boston: Harvard University Press.
Tomasello, M. (2004). What kind of evidence could refute the UG hypothesis? Commentary on Wunderlich. *Studies in Language*, *28*(3), 642–645.
Tomasello, Michael. (2008). *Origins of Human Communication*. Cambridge: MIT Press.
Traugott, E. C. (2008). "All that he endeavoured to prove was..": On the emergence of grammatical constructions in dialogual and dialogic contexts. In R. Cooper & R. Kempson (Eds.), *Language in Flux: Dialogue Coordination, Language Variation, Change and Evolution* (pp. 143–177). London: Kings College Publications.
Van Valin, Robert Jr. (1990) Semantic Parameters of Split Intransitivity. *Language* 66 2: 212-260.
Woodward, A. L. (1998). Infants selectively encode the goal object of an actor's reach. *Cognition*, *69*, 1–34.
Wonnacott, E., Newport, E. L., & Tanenhaus, M. K. (2008). Acquiring and Processing Verb Argument Structure: Distributional Learning in a Miniature Language. *Cognitive Psychology*, *56*(3), 165-209