

Modern Linguistics, Construction Grammar and our Felt Experience of Language

Hywel Evans

Modern linguistics employs language as a tool to understand the brain or mental structure, rather than because language itself is considered to be interesting in and of itself. While this approach is generally viewed as the only “scientific” possibility, there is actually no evidence to support the conviction that our experience of language is limited to the brain. In fact, there is increasing reason to believe that our experience of language extends far beyond the brain, to our bodies and, at least, to the sociocultural domain. Thus, the theoretical framework, based on the notion that we can understand the structure of the brain/mind by analyzing language, appears to be built on extremely shaky foundations. The Chomskyan account of language has long been running into severe difficulties, with no plausible candidates for principles of Universal Grammar, at least understood as unique features of a discrete language faculty, rather than simple yet mysterious forces observable in the universe in general. However, competing Cognitive accounts have failed to provide a plausible alternative because they are also unable to address the issue of an experience of language that transcends mental structure. As a result, modern linguistics has failed to provide a simple model of grammatical

structure that properly reflects our deeply felt experience of language as real, natural world objects and events. A simple model of this sort is offered with a view to developing an approach to linguistics that acknowledges the profound interest and power of language, not as an abstract, system modularized in the brain, but as a truly creative force that fully engages us in the social milieu both mentally and physically.

Introduction

Linguistics is understood to be the scientific study of language. However, this kind of definition is not unproblematic. One may state without fear of contradiction that words and expressions relate sound (or writing) to meaning. However, from a scientific perspective, this is actually already fundamentally problematic because we are immediately confronted with an apparently unbridgeable chasm opening up between the material (which may be investigated straightforwardly) and the immaterial (which may not). While sound may be plausibly characterized as something that exists in the material world, measured and recorded, meaning remains incorporeal and ultimately mysterious. It seems that we need an approach to linguistics that embraces the mystery and wonder of language as part of the natural world, rather than something that is artificially insulated from the natural world.

A further, related, difficulty is that modern linguistics has drifted very far from a concern with what language *actually is* or even what it is like, focusing instead on how language may be used as a tool to

understand putative abstract structures of the human mind. Even more startlingly, perhaps, the belief that linguistics deals with abstract, modularized mental structures is ultimately characteristic of both the Chomskyan generative tradition and the competing Lakoffian cognitive tradition. This is perhaps most easily demonstrated by looking at theories of language that explicitly attempt to construct mathematical models of language. Rather than noting similarities between language and other phenomena in the natural world, even approaches that explicitly reject a belief in a discrete genetic endowment for language remain tethered to a belief in arcane, abstract mental principles as revealing the mysteries of language. This is in spite of the fact that research suggests that language involves physical involvement that extends beyond the brain (Bergen, 2012; Lakoff & Johnson, 1999).

Here, it is humbly suggested that we might do well to recall more ancient traditions in which linguistic phenomena are understood as objects extant in the natural world, involving mysteries that go beyond purely mental computations. According to such a view, language behaves like natural world phenomena (because it is one) and is directly and profoundly experienced by us as such.

Putting two and two together: the impossibility of UG

Harris (1993: 11) discusses radical differences in approaches to linguistics, characterized by intense hostility. However, he acknowledges one area of general agreement: modern linguists are

not really much concerned with or interested in language “in and of itself.” In other words, we do not study language to find out what language is or even what it is like. Rather, we study language in order to understand how the brain (or mind, which is strongly identified with the brain) works. In other words, linguistic science regards the mind/brain as interesting, but language itself is not of any particular interest. This basic goal of linguistics as attempting to understand the brain is so deeply entrenched that it has become difficult to fully grasp what is meant when people say that linguistics is a cognitive science. It is as if we cannot really now conceive of a linguistic theory that is *not* fundamentally concerned with elucidating the structure of the brain. According to the modern, popular view of language, it goes without saying and without question that language learning takes place in the brain and that the scientific study of language will reveal something about that organ.

The Chomskyan tradition is clearly committed to discovering certain important principles ordering the Language Faculty (LF), in particular the set of abstract rules that comprise Universal Grammar (UG). To give an extreme example, in the so-called Bilingual enterprise (di Sciullo & Boeckx, 2010; di Sciullo, 2018) a dedication to proving the existence of a unique, discrete endowment for language endures even though any explicit interest in language itself seems to have been abandoned altogether.

Until the advent of the Minimalist Program (Chomsky, 1993, 1995), the

principle explanatory mechanism in linguistic theory was move- α , the notion that you could basically take any linguistic constituent and move it anywhere you wanted to. Hard-wired principles of UG were pursued like the Holy Grail and candidate principles such as Subadjacency (Ross, 1967), a general syntactic constraint on movement now virtually forgotten, were taken very seriously indeed. This was in spite of the fact that apparent violations of Subadjacency seem acceptable to large numbers of native English speakers. Take 1 below, for example, which does not seem particularly bad in spite of the fact that the constituent *where* might be expected to occupy a landing site for the constituent *which books*, which might equally be expected to have moved from its original position t.

1. Which books do you know [where we filed t]?

In fact, now it is routinely assumed that movement was an illusion all along, an astonishing development given that movement was barely even questioned just over two decades ago. In the Minimalist Program (MP), movement and constraints on movement have been abandoned in favor of Merge, a maximally simple, yet ultimately entirely mysterious, operation that allows us to combine two syntactic units to form a new one. In the MP, it is assumed that there are only two fundamental principles of UG, Merge and Recursion so Merge may apply to its own input.

One attraction of UG was that, if knowledge of language is regarded as a

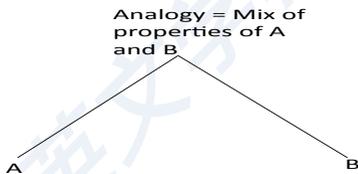
biological endowment, it offers an integrated account of language related conundrums. For example, if infants are born with knowledge of grammatical categories and principles wired into a specific module in their brains, we may explain why children acquire language, apparently without effort, from an early age. If we assume that access to these inborn capacities becomes somehow degraded after a certain age, we can also offer explanations regarding why second language acquisition is relatively more challenging, particularly for adult learners. It is true, at least, that the imposition of a narrow theoretical focus delivers order to a potentially messy and chaotic situation.

Unfortunately, we cannot really assume that children acquire L1 without effort. Certainly, our ability to learn languages seems to drop off as we get older, as do other learned abilities (such as skiing). However, children engage in as many as 10,000 hours of speaking practice by the time they are six years old (Anderson, 1995) and we are not really justified in rejecting the possibility that languages are learned in ways that are fundamentally the same as those relating to other abilities. Also, the minimalist attempt to simplify linguistic theory has brought with it a number of problems and the MP has run into severe difficulties in recent years. Tomasello (2003: 3-7), argues that UG principles are divorced from the practical reality of use in sociocultural contexts, and do not consider the parallelism of a wide range of non-linguistic cognitive abilities (to be discussed later) at the disposal of human beings. Harris (1993: 13) says that our brains are “fundamentally pattern

detectors,” working, of course, largely subconsciously and effortlessly. Hofstadter & Sander (2013) argue that analogy, an effortless and largely subconscious blending process, is the “core of cognition.”

In fact, sophisticated blending phenomena are assumed by a rather large number of scholars to be fundamental to cognition (Fauconnier & Turner, 2002; Holyoake & Thagard, 1995; Koestler, 1964; Lakoff, 1987; Lakoff & Johnson, 1980, 1999). It is difficult to see, therefore, how it is possible to determine that Merge and Recursion are entirely unconnected to and distinct from such basic yet mysterious cognitive pattern detecting endowments. This is particularly the case given that cognitive abilities such as analogy formation would appear to be necessarily of a far higher order of sophistication than syntactic Merge. One must suspect that the desire to see not just syntax but language in general as an autonomous endowment is ultimately a matter of wishful thinking.

2. Analogy



Furthermore, the explanation on offer for how this putative discrete, language-dedicated faculty could possibly have evolved in a single individual, for no particular reason (Evans 2014: 92) also sets off alarm bells. In the Prometheus account (Chomsky & Berwick 2016), a single, random genetic mutation resulted

in the miraculous creation of the cognitive ability Merge referenced above. This is presumed to have taken place at some time before human beings appeared outside Africa. Note, however, that we must assume that Merge was of more general use beyond application to language, or it would have provided no advantage to poor Prometheus, who would inevitably have found herself surrounded by non-speaking, pre-modern humanoid brutes. Therefore, the mysterious Merge operation does not seem to have been a strictly language related capacity, which suggests it is a more general cognitive endowment, which necessarily entails that the attempt to explain human language development in terms of a unique, *language-specific* endowment entirely falls apart.

Indeed, it seems likely that this has become an embarrassment for linguists and is in the process of being quietly forgotten. In the meantime we should consider the possibility that more general cognitive abilities developed to a greater level of sophistication in humans, at least in some ways, thereby facilitating the emergence of language-related abilities. At the very least, it must be acknowledged that UG-related phenomena may be replaceable with alternative, perhaps more plausible explanations (Hawkins 2004, O’Grady 2005) while it is no longer clear that even Chomsky himself believes in a strong version of UG anymore (O’Grady, 2008).

3. Merge

$$G = \{A, B\}$$

A B

The (admittedly mysterious) Merge operation merely states that two objects are taken and combined. Chomsky (2001) assumes that at most two constituents at a time are merged. Therefore, we can say that Merge takes two objects, A and B, and merges them to form a new object $G = \{A, B\}$.

Of course, this is perfectly fine, as far as it goes, and we should be happy that the fundamental principle of UG is the simplest one we can possibly imagine. However, we should be aware that it is preposterous to claim that this is a new or revolutionary idea and there seems absolutely no reason to regard it as an operation exclusive to language, or even exclusive to the cognitive domain. In fact, there is very good reason to believe that it is certainly *not* exclusive to the cognitive domain. For example, hydrogen fluoride molecules (HF) are formed from the combination of hydrogen (H) and fluorine (F) atoms. When these atoms combine, they behave in predictable ways due to the manner in which they share their electrons, in a covalent bond, a consequence of valence conditions, with both atoms preferring an extra electron in the outer shell.

Chemists, of course, do not attempt to claim that chemical elements are the only

things in the universe that have the capacity to combine to form new entities because such a claim would be laughable. Rather, it would seem that combinatorial processes are generally characteristic of ultimately mysterious creative forces in the universe. One might then question whether linguists may be justified in claiming Merge as a unique property of language.

One should note that, these days, scientists generally focus on the matter of what these molecules are and how they behave rather than speculating about the creative force that drives their behaviors. If you ask why atoms combine to form molecules, you will be offered something like the explanation above, essentially an explanation of *how* molecules are formed. The fundamental questions surrounding *why* atoms combine is wisely left to philosophy or religion. The universe *is* organized in this way but *why* the universe is organized in this way is obviously not directly the concern of scientists. Of course, scientists such as Kepler, Newton, and Einstein *were* apparently attempting to uncover the workings of God (Harris, 1993: 12). However, that is generally not how we understand the goals of science today.

Chemists are concerned with the behavior of the objects being studied rather than using these as a tool to understand the metaphysical forces driving such behavior. This is fundamentally different from linguists who are indeed not so much concerned with language as the thing that we take to be responsible for creating it: our minds or our brains. In that respect,

modern linguistics could be understood as a throwback to a much earlier scientific approach in which the mind of the creator was the true object of investigation. One of the suggestions offered here is that we might do well to restrict ourselves more narrowly to the object of study, language, while avoiding fundamental assumptions that may turn out to be entirely incorrect. This is particularly true given that there are so many things that remain a mystery.

In addition to chemical bonds, one could take an even simpler example from the natural world, that of the Fibonacci sequence, which may be observable in an array of natural developmental phenomena. The Fibonacci sequence, which itself has a long history (Devlin, 2012), is a series in which a number is found by adding up the two numbers that precede it. The Fibonacci sequence is referenced in “biolinguistics” (Jenkins, 2011) presumably because it is an example of a mathematical merging process that also stands as the classic case of recursion. Scientists are certainly entitled to study the spirals of pineapples or shells and, if one is thus predisposed, one may indeed become convinced that a great many phenomena in nature seem to follow the Fibonacci pattern. However, for a scientist to claim that this is evidence of a designer would be taken as going far beyond the bounds of scientific inquiry, and probably grounds for dismissal. By the same token, we may be going too far in assuming that evidence for combinatorial processes in language tells us anything about the structure of our brains. While it may seem very safe to assume that our brain acts as the great designer in the process of language

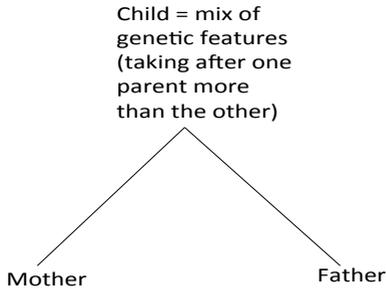
development, the purpose of this paper is to humbly raise the possibility that this fundamental assumption may be very badly mistaken. Why not, then, seek straightforward explanations for things that we do know about?

Consequences for linguistics

If the scientific study of language in and of itself reveals clear parallels with, not only other cognitive processes, but material objects in the natural world, this is likely to be a problem for “cognitive” approaches to the study of language that purport to find out about mental structure via the study of language. Indeed, we might expect researchers to do their best to distract from such parallels. We have seen how Minimalists cling to the notion that Merge evolved as a unique mental endowment via random mutation. However, competing theories that are not dedicated to this notion also tend to obfuscate the straightforward inheritance model of language.

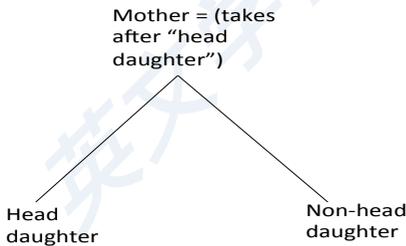
By way of illustration, let us take the simplest imaginable model of inheritance, in which a child inherits genetic features of both parents but takes after one (genetically dominant) parent more than the other.

4. Simple inheritance model



If language follows the pattern above, it might suggest that the material world offers templates for understanding language. Researchers who are committed to showing that, on the contrary, language is revealing of the structure of the mind might be expected to be uncomfortable with such a simple inheritance model. Unsurprisingly, then, phrase structure rules have evolved to mask the basic relations indicated in 4 above. Indeed, phrase structure rules employed today completely reverse the relations indicated in 4, as can be seen in 5 below.

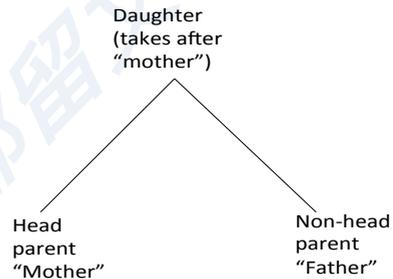
5. Example of mother-daughter nodes



Obviously, the model in 5 is intuitively wrong on a number of levels. First, we obviously do not expect mothers to *take after* their daughters exactly. That would

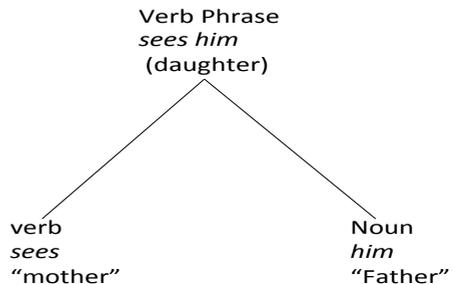
clearly be putting things the wrong way around. Also, it is obvious that the daughters in 5 are actually merging to produce a new object, the mother. Again, this is a deliberate reversal that masks parallelisms between language and objects in the natural world. The intuitively sound situation is illustrated below in 6 (I assume that the dominant parent is the mother. However, I have no particular reason for choosing the female parent to be dominant, unless you are prepared to count personal experience).

6. Intuitively sound daughter-parents nodes



This can be illustrated, as below in 7, with a specific example, the verb phrase *sees him*.

7.

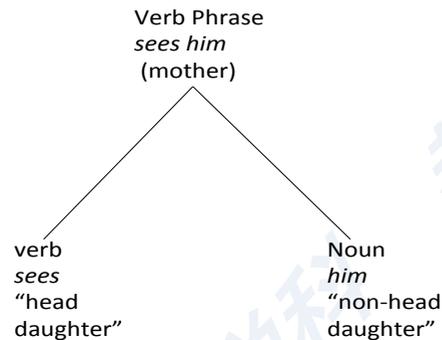


It is clear that 7 offers a better, more intuitive understanding of the proper relations involved in the noun phrase. The verb and noun may be understood as older material that has to be merged in order to produce the new creation. Yet precisely the opposite characterization is offered in modern linguistics of all stripes.

Why do you have to go and make things so complicated?

Following Lavigne (2002), one might ask why linguists resist the most straightforward characterization.

8. Traditional reverse-relations nodes



Let us say that Merge is applied recursively so that the verb phrase above merges with a subject to produce a new sentence. There is no way to avoid seeing this sentence as a new creation. However, the traditional phrase structure rules will again characterize this as a mother. Why would these relations be deliberately reversed in this way? Could it be because it helpfully masks the intuition that language follows a real-world inheritance model and keeps alive the arcane mental structure hypothesis?

Note that many of Chomsky's challengers also assume that language will elucidate mental structure and follow the same unintuitive pattern indicated in 8. Generic phrase structure rules employed in cognitive linguistics are predicated on the notion of constituents combining in certain predictable ways (Goldberg, 1995), directly parallel to Merge. Unification-based (e.g. HPSG and SBCG) approaches rely on highly articulated internal structure carried within lexical constituents and contributed to phrases via feature unification. In what follows, this approach is followed as it seems to offer the best format for elucidating an inheritance model of language. However, one should note at the outset that it is broadly acknowledged that such challenges to the domination of Chomskyan linguistics have failed (Goldstein, 2008) so that, even as the search for generality in the Chomskyan model becomes hopelessly untenable, "Cognitive" alternatives, focused on idiosyncrasy and complexity (Boas & Sag, 2012: 1), remain unattractive. Michaelis (2012) speculates that, in order to challenge the Chomskyan supremacy, the wider public needs to know more about this cognitive endeavor. However, if one is fundamentally not interested in language as such and offer no explanatory principles, how can one expect people to positively respond to a theory that is characterized by idiosyncratic structure explained in a maximally complex and unintuitive style?

Drawing parallels with other blending processes in the natural world, we might hypothesize that Merge may be taking place via simple inheritance conditions whereby the internal features of

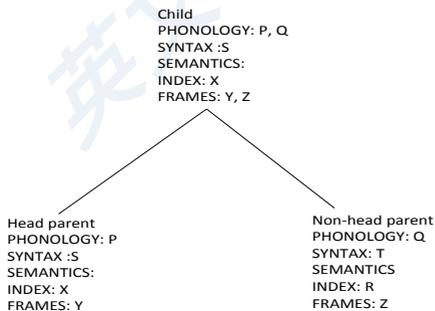
constituents are amalgamated in predictable ways into the newly created structure. In other words, the linguistic phenomenon yielding the combination of lexical items is like the combinatorial process that results in molecules in the chemical world, or new individuals in the biological domain (Waller, 2017). We might, then, treat them all as cases of inheritance. A theory of language that deals with the whole range of linguistic phenomena as a condition on feature inheritance would seem to be preferable on Minimalist grounds. However, such a simplification is likely to be opposed within the cognitive endeavor. If language is supposed to tell us something about mental structure, why is it patterning rather like material objects in the natural world?

Thus, language is no longer assumed to be *head-driven*. Features are inherited from dominant parents to children in a natural way with no need for any anomalous treatment for adjuncts. This allows a considerable degree of simplification as the above model handles adjunct structures without any need for any extra, highly problematic stipulation (Pollard & Sag, 1994: 51- 54). The matter of feature percolation and movement (Heck, 2009; Kobele, 2005), traditionally problematic for Minimalist accounts, follows straightforwardly given that features are inherited from constituents onto higher levels of structure. English, for example, manifests a syntactic condition such that a syntactic trigger feature is required in left-positioned, subject or filler, constituents.

Following Mendel, we might propose that inheritance conditions may be stated in terms of dominant and recessive features. The head constituent might be considered dominant, meaning that syntactic features and core semantic features are inherited from the head while semantic frames and phonological features are inherited from both constituents.

10. a. From which workers did you get this information?
- b. The workers [from whom] I received complaints t have all been fired.
- c. ?? [The information from *which* workers] did you hand in t to the office?
- d. ?These are [the workers [the information from whom]] we have handed t in to the office.

9. Basic inheritance model



Language, the body, and culture

We know that nothing can be understood in isolation. The idea that language follows a natural inheritance pattern observable in other phenomena in the natural world is supported by evidence that we experience language physically as well as mentally (Bergen, 2012; Johnson, 1987). Indeed, such an intuition is also strengthened by sociocultural theory (Lantolf, 2000; Lantolf & Poehner, 2014; van der Veer &

Valsiner, 1991; Vygotsky, 1980), which offers strong evidence that all mental development takes place in social activity, extending far beyond the mind and even the body, making it impossible to separate mind, and therefore language, from the sociocultural milieu. A similar conclusion is offered in the growing field of cross-cultural pragmatics (Remillard & Williams, 2016; Wierzbicka, 2003). This is bad news for any research agenda that hopes to achieve full autonomy and independence from other fields, of course, but it does help us to a better intuitive understanding of the extraordinary power of language in human history.

However, this all suggests that, while the brain or mind might certainly connect to the body and beyond, there seems no reason to imagine that everything is somehow still magically *contained in* the brain or mind. If this possibility (heresy?) is accepted, then the belief that we will be able to understand the brain by studying language collapses because our experience of language extends far beyond the mind. This is clearly a severe problem for modern linguistic inquiry as its whole research agenda is predicated on the conviction that mental structure can be elucidated by the analysis of language. One should hardly be surprised, then, if linguists resist evidence that language may be understood as a normal, natural world phenomenon.

Conclusion

There is no evidence for UG and future research in theoretical linguistics is likely to reveal language as sharing properties in common with not just other forms of

cognitive activity but also an array of other phenomena in the natural world. Rather than human beings merely generating abstract mathematical formulae via an isolated module in the brain, human beings experience language as actual real-world objects and events in real-world, culturally determined contexts.

This, of course, is where the incredible power of language resides. The power of enchantment, the place of language in the world's creation mythology and literary heritage, is attributable to this profound response, something that takes place both on a subconscious and physical level. An acknowledgment of the true nature of language and our experience of it, and hence its true interest, is likely to ignite a natural and long-lost connection between linguistics and literature. Recent studies (Chemero, 2011; Johnson, 1987; Lakoff, 1999; Shapiro, 2010) related to the nature of our mysterious experience of language inevitably raise the fascinating question of to precisely what extent we have an embodied experience of language that is situated in social activity and beyond. Language is not something that can be encapsulated in the brain. Its real significance resonates through our bodies and into the physical world beyond. As suggested here, our theory of grammar should reflect this reality.

The impending crisis in the modern linguistic endeavor, committed as it is to a narrow view of language as a thoroughly mental phenomenon, has consequences for language learning, as this can no longer be seen as something that takes place in some discrete abstract space but extends to our bodies and the

sociocultural domain. A dedication to “naturalistic,” all-English approaches are probably not justified as language learning is ultimately a normal form of learning, requiring us to fully engage physically in social activity with the full range of cultural artifacts at our disposal. The recent success of *translanguaging* techniques (Garcia & Wei, 2014; Lewis & Baker, 2012) underscores the opportunities for improvement in this regard.

References

- Anderson, J. R. (1995). *Learning and memory: An integrated approach*. New York: Wiley.
- Bergen, B. K. (2012). *Louder than words: The new science of how the mind makes meaning*. Basic Books.
- Boas, H. C., & Sag, I. A. (2012). *Sign-based construction grammar*. CSLI Publications.
- Chemero, A. (2011). *Radical embodied cognitive science*. A Bradford Book.
- Chomsky, N. (1993). *A minimalist program for linguistic theory*. MIT occasional papers in linguistics no. 1. Cambridge, Massachusetts: Distributed by MIT Working Papers in Linguistics.
- Chomsky, N. (1995). *The minimalist program*. Cambridge, MA: MIT.
- Chomsky, N. (2001). *Beyond explanatory adequacy*. Cambridge, MA: MIT.
- Chomsky, N. (2005). Three factors in language design. *Linguistic Inquiry* 36, 1-22.
- Chomsky, N. & Berwick, R. C. (2016). *Why only us. Language and evolution*. Cambridge, MA: The MIT Press.
- Devlin, K. (2012). *The man of numbers: Fibonacci's arithmetic revolution*. Walker Books.
- Di Sciullo, A., & Boeckx, C. (Eds.). (2011). *The biolinguistic enterprise: New perspectives on the evolution and nature of the human language faculty*. Oxford University Press.
- Di Sciullo, A. (Ed.). (2018). *Biolinguistics*. Routledge.
- Evans, V. (2014). *The language myth: Why language is not an instinct*. Cambridge University Press.
- Fauconnier, G., & Turner, M. (2002). *The way we think: Conceptual blending and the mind's hidden complexities*. Basic Books.
- Garcia, O., & Wei, L. (2014). *Translanguaging: Language, Bilingualism and Education*. London, UK: Palgrave Macmillan.
- Goldberg, A. (1995). *Constructions: A construction grammar approach to argument structure*. Chicago: University of Chicago Press.
- Goldstein, E. R. (2008). Who framed George Lakoff? *The Chronicle of Higher Education*, 8/15/08.
- Harris, R. A. (1993). *The linguistics wars*. Oxford University Press.
- Heck, F. (2009). On certain properties of pied piping. *Linguistic Inquiry*, 40(1), 75-111.
- Hawkins, J. (2004). *Efficiency and complexity in grammars*. Oxford University Press.
- Hofstadter, D., & Sander, E. (2013).

- Surfaces and essences: Analogy as the fuel and fire of thinking.* Basic Books.
- Holyoak, K. J., & Thagard, P. (1995). *Mental leaps: Analogy in creative thought.* MIT Press.
- Jenkins, L. (2011). The three factors in evolution and variation. In A. M. di Sciullo & C. Boeckx (Eds.), *The Bolinguistic Enterprise* (pp.169-179). Oxford Linguistics.
- Johnson, M. (1987). *The body in the mind: The bodily basis of meaning, imagination, and reason.* Chicago: University of Chicago Press.
- Kobele, G. M. (2005). Features moving madly: A formal perspective on feature percolation in the minimalist program. *Research on Language and Computation*, 3(4), 391-410.
- Koestler, A. (1964). *The act of creation.* Macmillan.
- Lakoff, G. (1987). *Women, fire, and dangerous things: What categories reveal about the mind.* The University of Chicago Press.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by.* The University of Chicago Press.
- Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought.* Basic Books.
- Lantolf, J. P. (Ed.). (2000). *Sociocultural theory and second language learning.* Oxford: Oxford University Press.
- Lantolf, J. P. & Poehner, M. E. (2014). *Sociocultural theory and the pedagogical imperative in L2 education: Vygotskian praxis and the research/practice divide.* London, England: Routledge.
- Lavigne, A. (2001). Complicated [Recorded by A. Lavigne]. *Let Go* [CD]. New York, NY: Arista Records.
- Lewis, G., Jones, B., & Baker, C. (2012). Translanguaging: Origins and development from school to street and beyond. *Educational Research and Evaluation*, 18 (7), 641-654.
- Michaelis, L. A. (2012). Making the case for construction grammar. In H. C. Boas & I. A. Sag (Eds). *Sign-based construction grammar* (pp.31-68). CSLI Publications.
- O'Grady, W. (2005). *Syntactic carpentry: An emergent approach to syntax.* Erlbaum, Mahwah, NJ.
- O'Grady, W. (2008). Innateness, universal grammar, and emergentism. *Lingua*, 118(4), 620-631.
- Pollard, C., & Sag, I. A. (1994). *Head-driven phrase structure grammar.* The University of Chicago Press.
- Remillard, V., & Williams, K. (2016). *Human communication across cultures: A cross-cultural introduction to pragmatics and sociolinguistics.* Equinox.
- Ross, J. R. (1967). *Constraints on variables in syntax.* Published doctoral dissertation: MIT.
- Shapiro, L. (2010). *Embodied cognition.* Routledge.
- Tomasello, M. (2003). *Constructing a language: A usage-based theory of language acquisition.* Cambridge, Mass: Harvard University Press.
- van der Veer, R., & Valsiner, J. (1991). *Understanding Vygotsky.*

