

De Busser, Rik & Randy J. LaPolla, eds. 2015.
Language Structure and Environment: Social,
cultural, and natural factors. Benjamins.

CHAPTER 2

On the logical necessity of a cultural and cognitive connection for the origin of all aspects of linguistic structure

Randy J. LaPolla
Nanyang Technological University

This chapter presents a view of communication not as coding and decoding, but as ostension and inference, that is, one person doing something to show the intention to communicate, and then another person using abductive inference to infer the reason for the person's ostensive act, creating a context of interpretation in which the communicator's ostensive act "makes sense", and thereby inferring the communicative and informative intention of the person. Language is not necessary for communication in this view, but develops as speakers use linguistic patterns over and over again to constrain the addressee's creation of the context of interpretation. Speakers choose which aspects to constrain the interpretation of, and language forms conventionalize from frequent repetition. As constraining the interpretation requires more effort than not constraining it in that way, it must be important to the speakers to constrain that particular aspect of the meaning, otherwise they would not put in the extra effort. Logically, then, the forms that do conventionalize must have been motivated by the cognition and culture of the speakers of the language when they conventionalized, even though over time the motivation is often lost and the form continues to be used only due to convention and habit.

1. Cognition: Inference in understanding our surroundings

The basis of our ability to make sense of our experiences in life is our ability to perform abductive inference. Abductive inference is hypothesis creation: when we observe some phenomenon, we try to think of a reason why that phenomenon might be the way it is. We do this based on what we know and believe, by creating a context in which the observed phenomenon makes sense to us, that is, is not surprising. So if we see the sun moving across the sky from east to west every day, we will posit a reason for it. The ancient Greeks hypothesized that it was the god

Helios driving his chariot of the sun across the sky. Modern science hypothesizes that it is the earth rotating on its axis that gives the impression of the sun moving. Both of these hypotheses derive from the same cognitive ability. In fact all of the hypotheses of philosophy, religion, and science derive from this ability. It is in fact a human instinct, on a par with other basic survival instincts, as it is necessary for survival: one needs to be able to understand or at least make sense of one's surroundings in order to effectively survive in them.¹ Above I mentioned an example of a major phenomenon, but we do this with very minor phenomena as well, such as one time, when I was given a plate and napkin after sitting down in a restaurant, I wondered why the napkin had a crease in the shape of a ring in the middle of it. I hypothesized that the plates and napkins had been stacked together (with interleafing) prior to their distribution to customers.

This sort of inference is non-deterministic, unlike deductive inference, where the truth of the premises guarantees the truth of the conclusion. In abductive inference, unless we go out and test our hypothesis or look for evidence supporting the hypothesis, we have no way of knowing whether our hypothesis is correct or not. Yet we will assume it is true until it has been proven wrong. This is in fact the nature of facts in science: they are hypotheses we haven't proven wrong yet, and so take them as truths.

One part of trying to understand the world is trying to understand what other humans are doing and why, and we do this also by applying our abductive inferential abilities to infer the nature of an action when it is performed by someone, and the intention of the person in doing that particular action. We do this automatically, and unconsciously much of the time, and this again is part of the survival instinct, as in order to survive we must be able to infer the intentions of others when they do something, because what they are doing might be with the intention of harming us. For example, if someone walks toward me with a knife in his hand, I need to be able to infer his intention in doing so, so that I can take appropriate action. We make the inferences on the basis of our own experiences, knowledge, and motivations (we project our own motivations on others).

1. The initial identification of abductive inference is due to Peirce (1940), who called it hypothesis, abduction, presumption, and retrodiction, as well as guessing. See Givón (1989, Ch. 7); Levinson (1995) on abductive inference and its role in communication, and Deutscher (2002, p. 484) on possible uses of the concept of induction in understanding language learning and historical change. In the philosophy of science abduction is sometimes talked about as "inference to the best explanation" (e.g. Harman, 1965; Lipton, 1993; Josephson & Josephson, 1996). Cf. Sperber & Wilson's 1st principle of relevance: "Human cognition tends to be geared to the maximisation of relevance" (Sperber & Wilson, 1996, p. 260/270). See also Grice (1957, p. 387) on the crucial role of relevance in determining meaning.

One part of trying to understand what other humans are doing and why is inferring their intentions when they do something with the intention of having you guess their intentions in doing the action. That is, I might wave my hand in a particular way, and you may guess that I am batting away flies around my head, but I might do it in such a way as to make it obvious I want you to notice I am doing it and want you to infer my motivations for doing it. If you then do so, that then is communication.

2. The nature of communication: Ostension and inference

[C]ommunication is not accomplished by the exchange of symbolic expressions. Communication is, rather, the successful interpretation by an addressee of a speaker's intent in performing a linguistic act. (Green, 1996, p. 1)

I would quibble with Green's statement in the quote above only in that I would say this is relevant to all communicative acts, not just linguistic communicative acts. A person wishing to communicate something does an *ostensive act*. Ostension (from Latin *ostendere* 'to show') is doing something that shows one is doing the action with the intent of having the other person notice the action and infer the intentions behind it – that is, showing one wants to communicate something. Using abductive inference, the other person must *infer* (guess) the communicative intention behind the ostensive act. Communication then involves *ostension* and *inference*.²

This inference is possible because we assume people are rational and do things with particular goals in mind (Grice, 1975, 1978). This is the core of Grice's (1975, 1978, 1989) Cooperative Principle. Since we assume the person has a reason for doing the particular action, and the person has done it in an ostensive way to show the desire to communicate, we will make an effort to find the relevance of that action, that is, try to infer the reason for the person doing the action.

2. The idea of communication being based on getting the addressee to recognize one's intention to communicate goes back to Grice (1957). The formulation of this into the idea that communication involves ostension and inference is due to Sperber & Wilson (1996), but I depart from Sperber & Wilson and Relevance Theory generally in not accepting a coding-decoding stage, or explicature/implicature stages, in the process of communication. I also do not accept their distinction between conceptual (lexical) and procedural (grammatical) information, as I have argued that all information is 'procedural', i.e. constrains the creation of the context of interpretation. This departs also from Gumperz's (1977, 1982, 1989, 1992a, 1992b) sense of contextualization cue in seeing all of language as contextualization cues. See LaPolla (2003) for detailed discussion.

The communicator also makes inferences as to what the hearer will be able to understand, and then uses the ostensive act most likely to facilitate the inferential process of the hearer.

Communication can take place with or without language. Functional MRI studies show that non-linguistic and linguistic communication are processed in the same areas of the brain, including those referred to as “Broca’s area” and “Wernicke’s area” (Xu, Gannon, Emmorey, Smith, & Braun, 2009).³ Language helps to constrain the inferential process to make it easier for the hearer to infer the speaker’s intention. The difference between non-linguistic communication and linguistic communication is simply a difference of tool or mode, with a resulting difference in precision: it is like the difference between ripping paper into two pieces with your hands and cutting it carefully with scissors. You are more likely to get the outcome you want using the specialized tool because it constrains the process.

The inferential process can be more or less constrained, but never constrained completely (in a fully deterministic way). Consider for example, the exchange in (1):⁴

- (1) Guest: (Sitting at dinner table, looks at hostess and points up and back with raised eyebrows).
- Hostess: *It's the first door on the right.*

In this exchange the communicator did not use any linguistic form, but assumed that using simple hand and face gestures would be enough to communicate his meaning. In the particular context in which this happened, during a dinner party, it was sufficient for his meaning to be understood correctly, as evidenced by the host’s response and the guest’s subsequent successful finding of the bathroom. Notice the host assumed she understood correctly and used a minimum expression in replying and the guest assumed the host understood correctly and so followed the directions without question; neither of the interlocutors ever mentioned “bathroom”, but both assumed that is what they were talking about. If the guest had wanted to constrain the host’s inference of his communicative intention, he could have used a number of different linguistic forms to constrain the interpretation, such as saying “Bathroom?” while making the gestures, or by saying something like “Could I use your bathroom?” or “Where is your bathroom?” or “Is your bathroom down that hall? I’d like to wash my hands.” Each of these would

3. See also Grice (1957, pp. 387–388) on the similarity of inferring the intentions behind linguistic and non-linguistic behaviour.

4. All of the data and examples used in this paper occurred naturally, and were personally witnessed and/or experienced by me.

constrain the interpretation to a greater extent than not using linguistic forms, and would do so to different degrees. Adding an explanation would constrain the host's inference of why the person wants to go to the bathroom (which she would do in any case). Note how the grammatical or procedural marking (e.g. tense marking) and the so-called lexical meaning or conceptual items used are both constraining the creation of the context of interpretation.

In (2) is another example, which occurred when I was calling role just before a class in Hong Kong.

- (2) Teacher calling role: *Alain?*
 Student points to empty chair: *Toilet.*

In this exchange I said only one word, but the students understood I was asking if Alan was in the room. From the response I understood 'Alain had been there, sitting in that chair, but had gone to the toilet, and would be back, so do not mark him as absent'. The single word plus the gesture was enough to get all of that meaning across in that context, but it required a lot of relatively unconstrained inference on my part. Alternatively the student could have used a much more explicit linguistic form to constrain my creation of the context of interpretation more greatly, and/or constrain different aspects of the interpretation, such as by saying "Alain will be right back", or "He's in the toilet", or "Alain was here, but he is now in the toilet, but will be coming back, so please don't mark him as absent". Each of these constrains the interpretation more than the one before it, but they all can be used depending on the particular context and what the communicator assumes the addressee can infer. Again, in the more complex version there is both so-called conceptual and procedural information, but both are involved in constraining the interpretation more than would be the case without them.⁵

Even when there is an obligatory constraint on the interpretation, such as the use of tense in English, there is still much room for inference, as in (3):

- (3) a. *I have had lunch.*
 b. *I have been to the mainland.*

Here both clauses have been marked with past tense, and so the context of interpretation would be constrained so as not to include any assumptions that relate to future or present events, but how far back in the past the addressee understood the

5. Notice here that the usual lexical meaning of *toilet* is not what is crucial here. If you check any definition of *toilet*, you will not find what is crucial about its use here, which contrasts it with, for example, *the library* or *the cafeteria*, which would not have given the same sense: a toilet is a place you go to and come back very soon from, and that is what is important in this context.

event to have happened depended on inference from relative relevance based on the particular context. In the context of (3a) what was relevant was whether the person had eaten in the last hour or so, and in (3b) what was relevant was whether the person had ever been to mainland China.

The degree to which the hearer is forced to deduce a particular interpretation depends on the degree to which the form of the ostensive act constrains the hearer in choosing the contextual assumptions necessary to create a context of interpretation in which the particular action or utterance makes sense.

3. The nature of language: Language is culture

Although *culture* is a controversial term in some circles, I am using it here for the evolved sets of social conventions, personal habits, and conventionalized tools for carrying out particular tasks. Language is the set of conventions for carrying out the task of communication, and so the ‘rules’ of language use are evolved sets of social conventions for constraining the process of interpretation. Lexical and grammatical meaning is simply conventionalized use, so grammaticalization and lexicalization, the processes which create language structure (words, phrases, and grammatical forms), are in fact simply conventionalization of repeated patterns.⁶

Language is not a fixed system, it is human behaviour, and changes as we engage in it, like other aspects of our behaviour, such as styles of dress and cooking/eating. It isn’t purpose-built, and doesn’t exist as an entity anywhere. It is an emergent phenomenon (Hopper, 1987, 2011, 2012), a complex system that is more than the sum of its parts, and so cannot be explained by adding up the individual causalities (cf. Dryer, 2006). It is like an economy or a traffic jam: it comes into being as a by-product of our trying to communicate (Keller, 1994). It comes to be recognized, much like a path worn through a grassy field might be eventually paved, and so words are put into dictionaries and grammar books are written, but that is just a snap-shot of the uses of those words and patterns up to that point. Our knowledge of language is simply our experience of how words and structures have been used before to achieve a certain purpose. The “rules” of language are simply conventions, much like the convention of men wearing pants and women wearing skirts, and change all the time.

6. Although grammaticalization is conventionalization, not all conventionalization is grammaticalization: the speakers are free to conventionalize any sort of usage, including so-called ‘degrammaticalization’. See Burridge, this volume, for an example of degrammaticalization. See also Michael, this volume, on seeing sedimentation of activities into social practices in social practice theory and grammaticalization as having a common basis.

What gets repeated, and what extensions of meaning are evidenced in the usages, are related to the cognitive categories and construal of the world of the speakers in two ways. First, for some form to become conventionalized, it would have to have been repeatedly used until it became a habit on the personal level and a convention at the societal level. For the speakers to use the form over and over again to constrain the interpretation in the particular way that that form can constrain the interpretation would have required the speakers to want to constrain the interpretation in that particular way over and over again. For this to be the case having the addressee understand the particular aspect of the interpretation that is constrained by that form must have been important to the speakers. So the patterns that get repeated will reflect those aspects of meaning that are important to those speakers. They would not put the extra effort into constraining the interpretation of the meaning that way unless the aspects of meaning that were so constrained were important to the speakers. Put another way, the patterns that get conventionalized reflect an aspect of the culture of the people; the language will embody the culture of the people.⁷

Second, once the particular pattern of constraining the interpretation has become conventionalized, it will be passed down through the generations, and influence how the speakers understand the world, that is, what cognitive categories they will form (see for example Majid et al. 2004 and similar work by Melissa Bowerman and colleagues):

[L]anguage produces an organization of experience. We are inclined to think of language simply as a technique of expression, and not to realize that language first of all is a classification and arrangement of the stream of sensory experience which results in a certain world-order, a certain segment of the world that is easily expressible by the type of symbolic means that language employs. In other words, language does in a cruder but also in a broader and more versatile way the same thing that science does. (Whorf, 1956, p. 55)

Our language use is a set of habits we form, which are very hard to change. We are very much creatures of habit, and once we have a habit, it is hard to change, including habits of language and even thought. The simplest example is the habit we form in learning our first language: we learn to categorize certain sounds together

7. Lupyan & Dale, this volume, in trying to understand why languages develop complex morphological systems, consider the possibility that the redundancy that comes with complex morphological systems may facilitate language learning by children. The view presented here is consonant with their view in that the redundancy is seen as arising from repeated attempts to constrain the addressee's interpretation of the speaker's communicative intention, which of course includes situations where children are the addressees.

as allophones of a single phoneme, and to distinguish other sounds our language treats as distinct phonemes. This is entirely a habit, but as anyone who has learned a second language (or taken a class in phonetics) knows, it is difficult to break the habit and make distinctions we're not used to making.⁸ The habit even influences our perception. For example, at a meeting here in Singapore the speaker was talking about a sports ground using the word *pitch*, but pronounced [pitç], with an unaspirated voiceless stop in initial position. A monolingual English speaker sitting next to me 'heard' the voiceless unaspirated stop as a voiced stop and asked why he was talking about a beach. This is also what is involved in second language learner accents. The point is not that you can't learn another set of habits, just that it is difficult.

It is also difficult to learn a new way of thinking, especially if you try to do it using words and concepts that are part and parcel of the old way of thinking. It isn't that language fully determines thought; the language evolves the way it does because of the importance the culture puts on constraining inference in certain ways, and this process is always on-going, as language is always changing, so the culture and cognition of the people (how they profile events, etc.) influences the language, but then once it becomes a convention in the language, it is passed on to future generations, and so will influence how people think about those things, and what they pay attention to. Once you have a word for something, e.g. *selfie*, it makes the phenomenon a lot easier to think about and talk about, and you end up thinking about it and talking about it more. Although thought is of course possible without language, when we generalize some fact about the world, we give it a name, and then we can talk about it more easily, and also pass the concept down to following generations. Very often the name we give to some generalization, or the way we conceive of a phenomenon, is in the form of a metaphor, and these metaphors help to structure our view of the world (Lakoff & Johnson, 1980; Lakoff, 1987). Language then encodes our view of the world, and also influences our view of the world (as we learn these concepts from our ancestors). When we speak a language we subscribe to the conventions of meaning associated with that language, and those conventions influence the way we talk about things and ultimately how we think about them (Whorf, 1956). A simple example of how the language we use to talk about something influences the way we think about it is something I experienced personally: growing up in the US, I always considered

8. This is the cause of the so-called 'critical period' for language learning. It is simply a matter that the longer one speaks only one language, the more ingrained the habits associated with speaking that language are, and so the harder it will be to learn another one (i.e. to change one's habits).

shrimp, prawns, and lobsters as three very different animals because they have very different names in English, but in Chinese they have the same basic name, and only differ in terms of size, *xiā* ('shrimp'), *dà-xiā* ('big shrimp'), and *lóng-xiā* ('dragon shrimp'). When I learned this I was able to think of them as just variants of the same type of animal.

In many discussions of ethnosyntax⁹ (see Enfield, 2002 for this term), the etymological opaqueness of certain structures is taken to be evidence that it is not possible to show a link between language and culture or cognition, but to say that the original development of a particular pattern is motivated does not imply that the motivation will always be transparent. As Michael, this volume, §5, argues, "it is not plausible to simply project modern communicative habitus into the past". In many aspects of our lives, once a particular way of doing something is conventionalized, the original motivation may be lost, while the conventionalized behaviour continues, simply because it is already a convention and a habit, such as the habit of pouring the milk before the tea in Britain.¹⁰ In English we have expressions and symbols, such as those in (4), that are still used even though the original motivation for using them is no longer motivating the expression and may not be transparent:

- (4) *pig in a poke*
- pass the buck*
- put it in the hopper*
- the stars in the firmament*
- carriage return*
- ka-ching!*
- dial a phone*
- RSVP*



9. The concept of *ethnosyntax* can be understood in at least two different ways: it can refer to the study of the interaction of (or the interface between) two separate entities, culture and grammar, or it can (on analogy with *morphosyntax*) refer to the view that language and culture form one entity. I am arguing for the latter position, that language *is* culture, in that a language is a set of social conventions which have evolved in a particular way in response to the need to constrain the inferential process involved in communication, just as conventions of, for example, eating with a fork and wearing clothes are social conventions that have evolved in response to the need to eat and stay warm, respectively.

10. When the English first started drinking tea, the porcelain was of poor quality, and would crack if the tea was poured directly into the cup. So the milk was poured first to protect the cup. Later this was no longer necessary, but the practice continues for many people.

All of these were fully motivated at an earlier time, but now most people who use these expressions don't know what a poke is or what the buck is that is passed or why a hopper is called a *hopper*, or why we can call the sky *the firmament*, and computers have no carriage return, and cash registers no longer make a *ka-ching* sound, and phones no longer have dials, and computers no longer have floppy discs, and most people don't know what *RSVP* stands for, but we still say *dial a phone* and use an image of a floppy disc for the 'save' function in computer software and use these other expressions.¹¹ We have to turn to books such as *Loose Cannons and Red Herrings, and Other Lost Metaphors* (Claiborne, 2001) and *Amo, Amas, Amat and More* (Ehrlich, 1985) to learn the original motivations for the expressions we use.¹²

Another aspect that affects transparency is the fact that the form can also be reduced due to its predictability, as with *God be with ye* being reduced to *Goodbye*.

4. How the grammars of languages differ

Each language has its own history of development, and so each language is unique. The cognitive categories manifested by the language will be unique to that language (even translation equivalents will differ in terms of the prototype of the category and in terms of the items or phenomena that the expression can be used for).¹³ In the process of trying to communicate, the speakers of each language will, according to what they think is important to get across to the addressee, constrain different aspects of the inferential process of the addressee, and even if they constrain the same semantic domain as speakers of other languages, they may constrain it to different degrees, and may do so with different formal means. Languages, or, more correctly, the constructions of languages, then can differ in three ways:

11. *RSVP* is used as a noun to mean '(make) a reservation' in Australian English, e.g. *Please note this event is now fully booked out. No further RSVPs will be taken* (announcement of an event at La Trobe University). What I am calling the image of a floppy disc is actually the image of the 3.5 inch hard shell disc that replaced the true floppy disc. The former was not floppy, but in that case we kept the name *floppy disc*, even though it was no longer motivated by the flexibility of the disc.

12. Loss of motivation and transparency is also what motivates reinforcement and layering (see Hopper, 1991 on these phenomena).

13. Except in the case of cultural convergence in language contact areas. See LaPolla (2009) for discussion.

Do they constrain or not constrain the interpretation of a particular semantic domain?

For example, English constrains the interpretation of the time of an action with reference to the speech act time (or some other reference point) obligatorily (i.e. it has grammaticalized tense), whereas Chinese does not. In Chinese it is possible to use adverbials and aspect marking to constrain the interpretation, but it is also possible to have an utterance as in (5a), where there is no constraint on the interpretation of the time of the action, and so it corresponds to three different possibilities in English. Notice also English constrains the interpretation of the gender of the 3rd person referent, whereas Chinese does not.

- (5) a. *Tā qù xuéxiào.*
3.SG go school
b. *She went to school./He went to school.*
c. *She is going to school./He is going to school.*
d. *She goes to school./He goes to school.*

If they constrain the interpretation of a particular domain, how much do they constrain it?

For example, English obligatorily constrains the interpretation of the time of the action to being before, at the same time as, or after the speech act time. Other languages may cut this up differently. Japanese has only past and non-past. English (and also Japanese) does not constrain the interpretation of how far in the past an action is, as pointed out in reference to Example (3) above. Rawang (a Tibeto-Burman language of northern Myanmar) also constrains temporal reference, but to a greater extent than English or Japanese, in that it requires the speaker to constrain the interpretation of how far in the past an action has happened, that is, it has four past tenses.¹⁴

- (6) a. *àng dī á:m-i.*
3SG go DIR-INTR.PAST
'S/he left, went away (within the last 2 hours).'
b. *àng dī dá:r-i.*
3SG go TMHRS-INTR.PAST
'S/he went (within today, but more than two hours ago).'

14. Data from my own fieldwork. Abbreviations used: DIR: directional adverb; INTR.PAST: intransitive past tense marker; NPAST: non-past tense marker; R/M: reflexive middle voice marker; TMdays: tense marker for actions within the past few days up to a year; TMhrs: tense marker for actions within the past few hours; TMYrs: tense marker for actions more than one year ago.

- c. àng dī ap-mì.
3SG go TMDYS-INTR.PAST
'S/he went (within the last year).'
- d. àng dī yàng-i.
3SG go TMYRS-INTR.PAST
'S/he went (some time a year or more ago).'

If they constrain the interpretation of a particular domain, how do they constrain it?

For example, in the Chinese utterance in (7a) there is no constraint on the interpretation of whose hair the person is washing. In English we would say *He is washing his hair*, with the interpretation of the owner of the hair obligatorily constrained by the possessive pronoun. In the Rawang example in (7c), the interpretation of the owner of the hair also is obligatorily constrained, but not by a possessive pronoun on the noun for 'hair', but by a reflexive marker on the verb.

- (7) a. Tā zài xǐ tóufa.
3SG PROG wash hair
- b. He is washing his hair.
- c. àng nī zýl-shì-ē.
3SG hair wash-R/M-NPAST
'S/he is washing her/his hair.'

5. Final remarks

The view I am presenting here is that the fundamental aspect of communication is not the linguistic structure, but the interaction of the speaker and hearer in performing a communicative activity. The role of the context in the performance of this activity is not to simply supplement semantic meaning; the context is the base on which all communicative activity depends. That is, rather than saying that the context constrains the interpretation of the linguistic form, I argue that it is the linguistic form that constrains the context (i.e. constrains the creation of the context of interpretation by the addressee). Culture and cognition are the fundamental organizers of experience, and so necessarily influence the construction of the context of interpretation.

As language structure is formed from repeated discourse patterns that constrain the hearer's interpretation in particular ways, it *necessarily* must be the case that those aspects that were being constrained were salient to the speaker and also assumed by the speaker to be salient or relevant to the hearer, at least in the

contexts where the pattern was used, otherwise the extra effort to constrain the interpretation in that way would not have been necessary. That is, though we give examples of the most striking connections, the point is that *all* aspects of language are determined by the culture and cognition of the speakers.

Bibliography

- Claiborne, R. (2001). *Loose Cannons, Red Herrings, and Other Lost Metaphors*. New York: W. W. Norton & Company.
- Deutscher, G. (2002). On the misuse of the notion of ‘abduction’ in linguistics. *Journal of Linguistics* 38: 469–485. DOI: 10.1017/S00222670200169X
- Dryer, M.S. (2006). Descriptive theories, explanatory theories, and Basic Linguistic Theory. In F. K. Ameka, A.C. Dench, & N. Evans (Eds.), *Catching Language: The Standing Challenge of Grammar Writing* (pp. 207–234). Berlin: Mouton de Gruyter.
- Ehrlich, E.H. (1985). *Amo, Amas, Amat, and More: How to Use Latin to Your Own Advantage and to the Astonishment of Others*. New York, NY: Harper & Row.
- Enfield, N.J. (2002). *Ethnosyntax: Explorations in Grammar and Culture*. Oxford: Oxford University Press.
- Givón, T. (1989). *Mind, Code, and Context: Essays in Pragmatics*. Hillsdale, NJ: Lawrence Erlbaum.
- Green, G.M. (1996). *Pragmatics and Natural Language Understanding, Second Edition* (2nd ed.). Mahwah, NJ: Laurence Erlbaum Associates.
- Grice, H.P. (1957). Meaning. *The Philosophical Review*, 66(3), 377–388. DOI: 10.2307/2182440
- Grice, H.P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), *Syntax and Semantics, Volume 3: Speech Acts* (pp. 41–58). New York: Academic Press.
- Grice, H.P. (1978). Further notes on logic and conversation. In P. Cole (Ed.), *Pragmatics* (pp. 113–128). New York, NY: Academic Press.
- Grice, H.P. (1989). *Studies in the Way of Words*. Cambridge, MA: Harvard University Press.
- Gumperz, J.J. (1977). Sociocultural knowledge in conversational inference. In M. Saville-Troike (Ed.), *Linguistics and Anthropology, Georgetown University Round Table on Languages & Linguistics 1977* (pp. 191–211). Washington, DC: Georgetown University Press.
- Gumperz, J.J. (1982). *Discourse Strategies*. Cambridge: Cambridge University Press.
DOI: 10.1017/CBO9780511611834
- Gumperz, J.J. (1989). Contextualization cues and metapragmatics: The retrieval of cultural knowledge. In C. Wiltshire, B. Music, & R. Graczyk (Eds.), *Chicago Linguistic Society 25: Papers from the Parasession on Language in Context*. Chicago, IL: Chicago Linguistic Society.
- Gumperz, J.J. (1992a). Contextualization and understanding. In A. Duranti & C. Goodwin (Eds.), *Rethinking Context* (pp. 229–252). Cambridge: Cambridge University Press.
- Gumperz, J.J. (1992b). Contextualization revisited. In P. Auer & A. di Luzio (Eds.), *The Contextualization of Language* (pp. 39–53). Amsterdam: John Benjamins.
DOI: 10.1075/pbns.22.04gum
- Harman, G.H. (1965). The Inference to the Best Explanation. *The Philosophical Review*, 74(1), 88–95. DOI: 10.2307/2183532

- Hopper, P. (1987). Emergent Grammar. *Proceedings of the Thirteenth Annual Meeting of the Berkeley Linguistics Society*, 139–157.
- Hopper, P.J. (1991). On some principles of grammaticalization. In E. C. Traugott & B. Heine (Eds.), *Approaches to Grammaticalization, Volume 1* (pp. 17–36). Amsterdam: John Benjamins. DOI: 10.1075/tsl.19.1.04hop
- Hopper, P. (2011). Emergent Grammar and temporality in interactional linguistics. In P. Auer & S. Pfänder (eds.), *Constructions: Emerging and Emergent*, 22–44. Berlin: Walter de Gruyter.
- Hopper, P. (2012). Emergent grammar. In J. P. Gee & M. Handford (Eds.), *The Routledge Handbook of Discourse Analysis* (pp. 301–314). London: Routledge.
- Josephson, J. & Josephson, S. (1996). *Abductive Inference*. Cambridge: Cambridge University Press.
- Keller, R. (1994). *On Language Change: The Invisible Hand in Language*. (B. Nerlich, Trans.). London: Routledge.
- Lakoff, G. (1987). *Women, Fire, and Dangerous Things. What Categories Reveal about the Mind*. Chicago, IL: University Of Chicago Press.
- Lakoff, G., & Johnson, M. (1980). *Metaphors We Live By*. Chicago: University of Chicago Press. DOI: 10.7208/chicago/9780226471013.001.0001
- LaPolla, R.J. (2003). Why languages differ: Variation in the conventionalization of constraints on inference. In D. Bradley, R.J. LaPolla, B. Michailovsky, & G. Thurgood (Eds.), *Language Variation: Papers on Variation and Change in the Sinosphere and in the Indosphere in Honour of James A. Matisoff* (pp. 113–144). Canberra: Pacific Linguistics.
- LaPolla, R.J. (2009). Causes and effects of substratum, superstratum and adstratum influence, with reference to Tibeto-Burman languages. In Yasuhiko Nagano (ed.), *Issues in Tibeto-Burman Historical Linguistics (Senri Ethnological Studies 75)*, 227–237. Osaka: National Museum of Ethnology.
- Levinson, S.C. (1995). Interactional biases in human thinking. In E. N. Goody (Ed.), *Social Intelligence and Interaction* (pp. 221–260). Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511621710.014
- Lipton, Peter. (1993). *Inference to the Best Explanation*. London: Routledge.
- Majid, A., Bowerman, M., Kita, S., Haun, D.B.M., & Levinson, S.C. (2004). Can language restructure cognition? The case for space. *Trends in Cognitive Sciences*, 8 (3), 108–114. DOI: 10.1016/j.tics.2004.01.003
- Peirce, C.S. (1940). Abduction and induction. In J. Buchler (Ed.), *Philosophical Writings of Peirce* (pp. 150–156). New York, NY: Routledge.
- Sperber, D., & Wilson, D. (1996). *Relevance: Communication and Cognition, Second Edition*. Cambridge, MA: Harvard University Press.
- Whorf, B.L. (1956). Linguistics as an exact science. In J. B. Carroll (Ed.), *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf*. Cambridge, MA: MIT Press.
- Xu, J., Gannon, P.J., Emmorey, K., Smith, J.F., & Braun, A.R. (2009). Symbolic gestures and spoken language are processed by a common neural system. *Proceedings of the National Academy of Sciences*, 106(49), 20664–20669. DOI: 10.1073/pnas.0909197106