Semantics, coherence, and intentions: Reply to Carston, Collins and Hawthorne

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The critical papers in this special issue are spot on. The authors have offered fair and perspicuous summaries of our book. We are delighted by their sympathy to some of what we say—and we acknowledge the difficulties of the challenges they raise for us. They have moved the debate forward; a full response would require developing our views further. This is not the place to do so. Perhaps, however, it is appropriate to review some of the distinctive features of our explanatory strategy in *Imagination and Convention*—features that we think may have to be pressed into broader service in light of the worries that Professors Carston, Collins and Hawthorne raise in their reviews.

To start, we would like to emphasize the importance of *discourse coherence* to our view. We offer a general discussion of discourse coherence in Chapter 6 of *Imagination and Convention,* but see Asher and Lascarides (2003), Kehler (2001), and Webber et al (2003) as well. We use discourse coherence to make certain interpretive dependencies and inferential relationships among linguistic expressions explicit in logical form; in so doing, we reveal semantic constraints that in many cases appear to be linguistically encoded. Discourse coherence has important applications within sentences, for example, in specifying the interpretation of pronouns in 'donkey sentences' (Heim 1982, Kamp 1981) or in capturing the specific temporal and causal relationships between main clauses and when-clause adjuncts (Moens and Steedman 1988). However, as we explain below, for our book and this reply, the key role of discourse coherence comes in describing the structural and interpretive relationships that hold between sentences in extended discourse.

In general, theories of discourse coherence can be compatible with traditional conceptions of the semantics-pragmatics divide. For instance, Asher and Lascarides (2003) use logical forms containing explicit coherence relations as a linguistic interface between compositional semantics and familiar Gricean reasoning. Theories of discourse coherence can also be developed in terms similar in spirit to the cognitive approaches suggested by Carston (§5) and Collins (§2). Kehler (2001), in particular, assumes that coherence relations describe the contribution of general psychological mechanisms to interpretation. Our understanding of the status of discourse coherence contrasts with previous work. We see coherence itself as conventional; it is the product of linguistic rules that interact closely with the rest of

semantics.[1] And we do not think Gricean reasoning has a privileged place in processing; rather, we think logical form affords insights that interlocutors can reach through various kinds of imaginative engagement. This characterization of coherence is crucial to our project of reassessing the theory of conversational implicature, but it sharpens a number of longstanding problems facing approaches to discourse coherence.

For one thing, it is notoriously hard to pin down the inventory of possible coherence relations and their meanings. There's no getting around this challenge—on any view that gives coherence in discourse a key interpretive role. We see the kind of data that Carston (§2) provides as indicative of the interpretive detail that a characterization of coherence relations must ultimately provide. Let us elaborate on this point—since we are keen to engage researchers across cognitive science in developing more precise accounts of coherence in discourse.

In the book, we use Grice's gas station example to illustrate the generality, abstraction and significance of coherence relations. The example is given as our (1) here.

1. A: I'm out of gas.
   B: There's a gas station around the corner.
   Imagination and Convention's (6) (pp16 and 114).

Our approach hypothesizes that, at the level of discourse, (1) instantiates a specific conventional pattern for organizing discourse: it shows the statement of a problem followed by a proposal for a solution to the problem. In other words, we capture the intuition that A's being out of gas is a problem and B is presenting the gas station as a solution to that problem by formalizing the logical form of B's utterance as including an appropriate coherence relation: what we might call, provisionally, a *Solution* relation. Solution, on this analysis, would be a special case of the family of coherence relations Hobbs (1985) calls *Evaluation* relations. These relations tie utterances together as steps in plans that achieve interlocutors' goals. The relevant goals here involve the formulation of strategies (such as getting help from a gas station) for solving problems (such as being out of gas).

Evaluation moves, of course, wouldn't be possible if interlocutors could not choose actions rationally in pursuit of what they want. However, coherence theory argues that rationality alone does not suffice to explain the specific contributions interlocutors make to their collaborations with such utterances. Formal studies of

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[1] In *Imagination and Convention,* we offer a characterization of semantics which groups diverse kinds of linguistic meanings together, but we argue more explicitly that these semantic rules should be modeled as part of a single system in Lepore and Stone (2016).

joint problem solving, such as Allen et al (2002), suggest that interlocutors must learn specific taxonomies of actions to flesh out and agree on their plans, and that they must rely on a shared taxonomy to coordinate in interactions such as (1). As we put it in the book:

> [O]ur conventions for working together might have played out differently. For example, depending on the varying standards and expectations of the speech community, [(1B)] might have been a rude rejection of [(1A)'s] request for gas, a brusque rebuke for disturbing the speaker, an invitation for speaker and addressee to go to the gas station together, and so forth. All these alternatives should, we think, be regarded as part of speakers' knowledge of language, since they describe how sentences are conventionally interpreted. (*Imagination and Convention*, p114)

In other words, the content of (1) is compatible with many different possible coherence relations (not just *Solution,* but *Rejection, Invitation,* and so forth). Hence, Grice's interpretation of (1) is not dictated purely by rationality. Rather, it is a fact about how members of a particular community conventionally use their utterances as contributions to joint activity.

The coherence account of (1) differs from Grice's not only in the role of convention but also in what we take speaker B to be committed to. On our view, this case carries some of the flavor of *hinting,* as we describe it in Chapter 12 of *Imagination and Convention.* We take B's utterance, in part, as an *open-ended* invitation to *imagine* the gas station as a way to resolve A's problem. Our view leaves lots of room for such open-ended imaginative reasoning. One idea, of course, springs to mind immediately: A goes to the gas station, finds it open, obtains a suitable container, fills it with gas, returns to the car and fuels the tank. But other ways are perhaps not far behind. If the right container can't be procured, the gas station might arrange for A's car to be towed in. Or the gas station might be able to offer some other kind of roadside assistance instead. We think that appreciating the full range of possibilities is important for getting clear on what B is up to here—B's utterance is not merely trying to get across that the gas station is open. Moreover, we think the example shows why capturing such effects need not privilege intention recognition or Gricean calculation: the point is for A to think through the significance of the gas station for himself (much as we do when confronted with metaphorical speech).

We think there is a very similar division of labor between abstract coherence relations and potentially open-ended imagination in the creative scalar implicatures studied by Hirschberg (1991) and cited by Carston (§2).[2] These discourses also depend on suitable abstract patterns of coherence that direct the hearer to the

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[2] Hawthorne's worries about scalar implicatures (§2), and Collins's about indirect requests (§3), seem to us to invite a similar response, and so, to require similar developments in our theory.

appropriate conclusions. For example, consider Carston's (2), which is repeated as (2) below:

2. A: Have you mailed that letter?
   B: I'm typing it right now.

The frequently-used strategy exhibited in (2) seems to lend itself to an analysis in terms of semantic relationships among questions in discourse, such as those proposed by Ginzburg (1995), van Kuppevelt (1995) or Roberts (2012). In particular, what B says here seems to get to the heart of the line of inquiry suggested by A's question by providing the overall status of the course of events involved. In other words, B answers a broader, but related, question to the one posed by A: not "have you mailed the letter" but "what is the status of the letter." The status is: B is typing it right now.

Ultimately, coherence theory should describe this interpretive effect in terms of the distinctive relation between the question and its response. Developing an account of such a relation would represent a significant—and necessary—development of our view, though we think it would be compatible with the theories of coherence suggested by Kehler (2001) or Asher and Lascarides (2003), and with the overall picture of the semantics–pragmatics interface we advance in *Imagination and Convention.* In fact, the relation in question so far lacks even a name. As befits the correspondingly speculative nature of this discussion, we'll refer to the relation, somewhat facetiously, as *Transponding*.

In using (2B), then, B is not *Answering* (2A) but *Transponding* to it. B commits to this coherence relation; and in so doing, B represents the status of the letter as in preparation. Likewise, A must recognize this coherence relationship to get B's point. From here, it's quite a short step indeed to the more precise interpretive effects—the "scalar implicature" that the letter has not been sent—that Hirschberg or Carston take to be part of what B says here.

Even if B leaves no doubt that the letter has not been sent, however, we think it is important for the content and implications of the discourse that B has chosen to answer a *different*, somehow more appropriate, question than the one A initially asked. This explains the further suggestions that B's choice of *Transponding* over *Answering* naturally invites. For example, we get a fuzzy sense of some relevant attitudes on B's part—perhaps that B appreciates the urgency of getting the letter out, perhaps that B thinks A should be at ease about how far the letter has progressed, perhaps that B is reluctant to become a target for A's criticism, and so

forth. These open-ended, imaginative effects depend, we think, on the fact that B has *not* given A an answer.[3]

Our appeal to coherence relations is thus an apt target for criticism: our account leaves many gaps that need to be filled in. Much the same, our critics are also right to press us on the relation of coherence to grammar, as Prof Collins does particularly strongly. We think Collins's comments on the grammar of *forceP* (§3) are indicative of the kinds of challenges we face in accounting for the interactions between discourse coherence and sentence level grammar. For example, as he surveys, modifiers that address the imposition associated with an utterance, such as 'please', have to adjoin to a specific level of syntactic structure. But the imposition may have a variety of sources, including conventional sentence meaning, conventional indirection, and perhaps discourse coherence as well. Many ambiguities seem to be involved, yet hearers naturally find interpretations that satisfy all the relevant constraints. How does that work?

Previous work has tended to describe discourse structure as *analogous* to sentence-level syntax—not identical to or continuous with it (see Asher and Lascarides 2003 or Webber et al 2003). That's not enough to account for the effects Collins is after. We need an integrated, compositional theory. The first step is to get clear on the interpretations we want to assign to the individual sentences in a discourse. In a follow up to the book (Lepore and Stone, to appear), we make the case that utterances like 'Can you pass the salt?' encode complex meanings that simultaneously commit the speaker to several updates to the state of the discourse. Concretely, the 'request' interpretation of 'Can you pass the salt?' raises the question of whether it's possible for you to pass the salt, and then, if it is possible, expresses the preference that you do so. Once we formalize such meanings in a suitable logic, it is possible to use any of the tools of formal semantics to derive the meanings compositionally.

Further research is required to determine the right strategy, however. If the most promising strategy is to derive the two meanings from a lexical ambiguity, we should probably think of the alternative meanings as specified by a rule in the lexicon that applies to general classes of words, as a default with exceptions, as suggested by Asher and Lascarides (2001). Such rules offer an attractive way to capture the partial productivity characteristic of polysemy. However, there might be evidence to associate the two meanings with different syntactic derivations (for example, involving the association of specific items with *forceP*), in which case it might be better to build an appropriate meaning for each derivation by exploiting the way the lexical items are combined. We could also try to explain it in terms of

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[3] See also Pinker, Novak and Lee (2008), and our interpretive discussion of their work in Chapter 4 of *Imagination and Convention,* for the importance of the distinction between what a speaker makes obvious and what she puts on the record.

different ways to apply general operations such as type shifting (Partee 1987), which are a staple of formal semantics. The matter is largely open. As Carston (§3), Collins (§3) and Hawthorne (§1) all make clear, more work is needed before we could really tell what theoretical baggage we incur when we claim that the question is polysemous.

Despite the gaps that we have acknowledged here, we think the linguistic organization of discourse motivates a conception of semantics that accommodates the meanings of coherence relations. In the book, we draw similar conclusions from the linguistics of presupposition and anaphora (Chapter 7) and from the linguistics of information structure (Chapter 8). In response to this data, we advocate grouping together as semantic all the rules that describe the contributions linguistic expressions conventionally make to the conversational record. Such meanings may not necessarily be involved in the traditional philosophical domains of fixing truth conditions or fixing what's said. If truth conditions or what's said matter for your philosophical projects, you will probably wind up with a narrower notion of semantics than we do—a point we make in the book.[4]

This characterization of semantics may have implications for cognitive science as a whole, not just for philosophy, as Carston (§5) and Collins (§2) observe. We ourselves are working within the tradition of formal semantics, where meaning is understood to be part of the language faculty. Formal semantics has its philosophical defenders, such as Borg (2004), but we are also impressed by the ability of fine-grained, formal theories of discourse content to capture cross-linguistic variation in meaning in precise, parametric, compositional models—as shown by work such as Bittner's (2014)—hinting at the place of an innate, universal grammar in constraining semantics, broadly understood. Of course, there are other views of the relationship of meaning and grammar. Collins, in particular, seems sympathetic to Chomsky's influential 'minimalist' conception of the language faculty (1992) as having an exclusively syntactic basis. That's one extreme. On the other extreme, researchers such as McNeill (1992) see language just as one part of a broader system for externalizing thought that also embraces a wide range of nonverbal behaviors. There are many theories of language where our conception of semantics would fit naturally, but Carston and Collins are right: not all of them.

But does it matter if our characterization of semantics goes beyond what is provided by the language faculty? What if we admit that meaning conventions might not be linguistic, both in the sense that they are not constrained by the innate, domain-specific principles of grammar and in the sense that they may apply to a wide range of different communicative actions, including gesture (e.g., Lascarides and Stone

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[4] Also, perhaps naively, we took the identification of the forms of language—that is, phonology, morphology and syntax—to be independent of and prior to semantics. Hawthorne's comments (§4) remind us that more care may be needed here.

2009), demonstration (e.g., Stone and Stojnic 2015) and even film (e.g., Cumming et al 2012)? We think philosophers and cognitive scientists ought not to be troubled by the mismatch. Our characterization of semantics matches our concerns in defending the publicity of semantic content. To say that content is not linguistic—in some privileged, Chomskyan sense—does not entail that it is not public. What makes semantics public, on our view, are the institutions that enable us to coordinate on an arbitrary link between form and meaning. This is the theoretical glue that ties together our conception of semantics. But different scientific concerns may call for different standards in delimiting semantics.

We close with some comments about intentions in communication. This is another rich area for future research. Cognitive scientists are used to thinking of communicative intentions in Gricean terms—as recognizable, self-referential intentions to affect others. We think that it is important to consider alternative ideas. In *Imagination and Convention*, as Hawthorne (§3) aptly summarizes, we explore a direction that combines standing intentions with representations that determine the intended grammatical analyses of particular utterances.[5] There are other approaches on offer: Lascarides and Asher (2009) explain discourse coherence via the commitments of speakers. Cumming (2013) simply analyzes dispositions to produce and to interpret language. The right thing may just be to view meaning—like any construct of social science—as a theoretical primitive of our explanation without any straightforward reduction to psychology (much less biology). The details we offer for direct intentionalism probably go overboard in terms of making the philosophical point, but we thought we needed to say more to make it clear that what we're doing is compatible with the collaborative nature of conversation.

As Carston notes (§4), there's powerful evidence that intention recognition is crucial for language learning (Bloom 2000), for understanding creative language use (Clark 1983), and in recognizing the information that speakers do not encode, but simply reveal (Pinker, Novak and Lee, 2008). This is compatible with our view—and a theory of linguistic interaction will put it front and center. That does not establish, however, that intention recognition also figures front and center in semantics. Our contention in *Imagination and Convention* is that the conventions of meaning go much further in settling the content of our utterances than our critics believe.

Acknowledgements

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[5] Our computational framework links these representations to steps of deliberation rather than to units or levels of linguistic structure. The same grammatical type might be selected as the result of many separate choices (when used creatively) or "compiled" into a single one (as with the repeated use of stock phrase). There need be no general answer—even empirically—about what units our linguistic intentions ground out in. They must ground out eventually, of course, before we can act.

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