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2 **Semantics, Coherence, and Intentions: Reply**
3 **to Carston, Collins and Hawthorne**
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8 The critical papers in this special issue are spot on. The authors have offered fair and
9 perspicuous summaries of our book (Lepore and Stone, 2015). We are delighted
10 by their sympathy to some of what we say—and we acknowledge the difficulties
11 of the challenges they raise for us. They have moved the debate forward; a full
12 response would require developing our views further. This is not the place to do
13 so. Perhaps, however, it is appropriate to review some of the distinctive features of
14 our explanatory strategy in *Imagination and Convention*—features that we think may
15 have to be pressed into broader service in light of the worries that Professors Carston,
16 Collins and Hawthorne raise in their reviews.

17 To start, we would like to emphasize the importance of *discourse coherence* to our
18 view. We offer a general discussion of discourse coherence in Chapter 6 of *Imagina-*
19 *tion and Convention*, but see Asher and Lascarides, 2003; Kehler, 2001; and Webber
20 *et al.*, 2003, as well. We use discourse coherence to make certain interpretive depen-
21 dencies and inferential relationships among linguistic expressions explicit in logical
22 form; in so doing, we reveal semantic constraints that in many cases appear to
23 be linguistically encoded. Discourse coherence has important applications within
24 sentences, for example, in specifying the interpretation of pronouns in ‘donkey sen-
25 tences’ (Heim, 1982; Kamp, 1981) or in capturing the specific temporal and causal
26 relationships between main clauses and when-clause adjuncts (Moens and Steedman,
27 1988). However, as we explain below, for our book and this reply, the key role of
28 discourse coherence comes in describing the structural and interpretive relationships
29 that hold between sentences in extended discourse.

30 In general, theories of discourse coherence can be compatible with traditional
31 conceptions of the semantics–pragmatics divide. For instance, Asher and Lascarides
32 (2003) use logical forms containing explicit coherence relations as a linguistic inter-
33 face between compositional semantics and familiar Gricean reasoning. Theories of
34 discourse coherence can also be developed in terms similar in spirit to the cognitive
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1 approaches suggested by Carston (§5) and Collins (§2). Kehler (2001), in particular,
 2 assumes that coherence relations describe the contribution of general psychological
 3 mechanisms to interpretation. Our understanding of the status of discourse coher-
 4 ence contrasts with previous work. We see coherence itself as conventional; it is the
 5 product of linguistic rules that interact closely with the rest of semantics.¹ And we do
 6 not think Gricean reasoning has a privileged place in processing; rather, we think
 7 logical form affords insights that interlocutors can reach through various kinds of
 8 imaginative engagement. This characterization of coherence is crucial to our project
 9 of reassessing the theory of conversational implicature, but it sharpens a number of
 10 longstanding problems facing approaches to discourse coherence.

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

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

- 20 1. A: I'm out of gas.
 21 B: There's a gas station around the corner.

22 *Imagination and Convention's* (6) (pp. 16 and 114).
 23

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

35 Evaluation moves, of course, wouldn't be possible if interlocutors could not
 36 choose actions rationally in pursuit of what they want. However, coherence theory
 37 argues that rationality alone does not suffice to explain the specific contributions
 38 interlocutors make to their collaborations with such utterances. Formal studies of
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 41 ¹ In *Imagination and Convention*, we offer a characterization of semantics which groups diverse kinds
 42 of linguistic meanings together, but we argue more explicitly that these semantic rules should be
 43 modeled as part of a single system in Lepore and Stone, 2016.

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

5
 6 [O]ur conventions for working together might have played out differently. For
 7 example, depending on the varying standards and expectations of the speech
 8 community, [(1B)] might have been a rude rejection of [(1A)'s] request for gas, a
 9 brusque rebuke for disturbing the speaker, an invitation for speaker and addressee
 10 to go to the gas station together, and so forth. All these alternatives should,
 11 we think, be regarded as part of speakers' knowledge of language, since they
 12 describe how sentences are conventionally interpreted (*Imagination and Con-
 13 vention*, p. 114).

14
 15 In other words, the content of (1) is compatible with many different possible coher-
 16 ence relations (not just *Solution*, but *Rejection*, *Invitation*, and so forth). Hence, Grice's
 17 interpretation of (1) is not dictated purely by rationality. Rather, it is a fact about
 18 how members of a particular community conventionally use their utterances as con-
 19 tributions to joint activity.

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

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

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

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

- 3
 4 2. A: Have you mailed that letter?
 5 B: I'm typing it right now.

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

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

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

28 Even if B leaves no doubt that the letter has not been sent, however, we think
 29 it is important for the content and implications of the discourse that B has chosen
 30 to answer a *different*, somehow more appropriate, question than the one A initially
 31 asked. This explains the further suggestions that B's choice of *Transponding* over
 32 *Answering* naturally invites. For example, we get a fuzzy sense of some relevant atti-
 33 tudes on B's part—perhaps that B appreciates the urgency of getting the letter out,
 34 perhaps that B thinks A should be at ease about how far the letter has progressed,
 35 perhaps that B is reluctant to become a target for A's criticism, and so forth. These
 36 open-ended, imaginative effects depend, we think, on the fact that B has *not* given
 37 A an answer.³

38 Our appeal to coherence relations is thus an apt target for criticism: our account
 39 leaves many gaps that need to be filled in. Much the same, our critics are also right

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41 ³ See also Pinker, Nowak and Lee, 2008, and our interpretive discussion of their work in Chapter
 42 4 of *Imagination and Convention*, for the importance of the distinction between what a speaker
 43 makes obvious and what she puts on the record.



1 to press us on the relation of coherence to grammar, as Prof Collins does particularly
 2 strongly. We think Collins's comments on the grammar of *forceP* (§3) are indicative of
 3 the kinds of challenges we face in accounting for the interactions between discourse
 4 coherence and sentence level grammar. For example, as he surveys, modifiers that
 5 address the imposition associated with an utterance, such as 'please', have to adjoin
 6 to a specific level of syntactic structure. But the imposition may have a variety of
 7 sources, including conventional sentence meaning, conventional indirection, and
 8 perhaps discourse coherence as well. Many ambiguities seem to be involved, yet
 9 hearers naturally find interpretations that satisfy all the relevant constraints. How
 10 does that work?

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

24 Further research is required to determine the right strategy, however. If the most
 25 promising strategy is to derive the two meanings from a lexical ambiguity, we should
 26 probably think of the alternative meanings as specified by a rule in the lexicon that
 27 applies to general classes of words, as a default with exceptions, as suggested by Asher
 28 and Lascarides (2001). Such rules offer an attractive way to capture the partial pro-
 29 ductivity characteristic of polysemy. However, there might be evidence to associate
 30 the two meanings with different syntactic derivations (for example, involving the
 31 association of specific items with *forceP*), in which case it might be better to build
 32 an appropriate meaning for each derivation by exploiting the way the lexical items
 33 are combined. We could also try to explain it in terms of different ways to apply
 34 general operations such as type shifting (Partee, 1987), which are a staple of formal
 35 semantics. The matter is largely open. As Carston (§3), Collins (§3) and Hawthorne
 36 (§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.

37 Despite the gaps that we have acknowledged here, we think the linguistic orga-
 38 nization of discourse motivates a conception of semantics that accommodates the
 39 meanings of coherence relations. In the book, we draw similar conclusions from
 40 the linguistics of presupposition and anaphora (Chapter 7) and from the linguistics
 41 of information structure (Chapter 8). In response to this data, we advocate
 42 grouping together as semantic all the rules that describe the contributions linguis-
 43 tic expressions conventionally make to the conversational record. Such meanings

1 may not necessarily be involved in the traditional philosophical domains of fixing
 2 truth conditions or fixing what's said. If truth conditions or what's said matter for
 3 your philosophical projects, you will probably wind up with a narrower notion of
 4 semantics than we do—a point we make in the book.⁴

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

22 But does it matter if our characterization of semantics goes beyond what is
 23 provided by the language faculty? What if we admit that meaning conventions
 24 might not be linguistic, both in the sense that they are not constrained by the
 25 innate, domain-specific principles of grammar and in the sense that they may
 26 apply to a wide range of different communicative actions, including gesture (e.g.
 27 Lascarides and Stone, 2009), demonstration (e.g. Stone and Stojnic, 2015) and even
 28 film (e.g. Cumming *et al.*, 2012)? We think philosophers and cognitive scientists
 29 ought not to be troubled by the mismatch. Our characterization of semantics
 30 matches our concerns in defending the publicity of semantic content. To say
 31 that content is not linguistic—in some privileged, Chomskyan sense—does not
 32 entail that it is not public. What makes semantics public, on our view, are the
 33 institutions that enable us to coordinate on an arbitrary link between form and
 34 meaning. This is the theoretical glue that ties together our conception of semantics.
 35 But different scientific concerns may call for different standards in delimiting
 36 semantics.

36 We close with some comments about intentions in communication. This is
 37 another rich area for future research. Cognitive scientists are used to thinking
 38 of communicative intentions in Gricean terms—as recognizable, self-referential
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41 ⁴ Also, perhaps naively, we took the identification of the forms of language—that is, phonology,
 42 morphology and syntax—to be independent of and prior to semantics. Hawthorne's comments
 43 (§4) remind us that more care may be needed here.

1 intentions to affect others. We think that it is important to consider alternative
 2 ideas. In *Imagination and Convention*, as Hawthorne (§3) aptly summarizes, we
 3 explore a direction that combines standing intentions with representations that
 4 determine the intended grammatical analyses of particular utterances.⁵ There
 5 are other approaches on offer: Lascarides and Asher (2009) explain discourse
 6 coherence via the commitments of speakers. Cumming (2013) simply analyzes
 7 dispositions to produce and to interpret language. The right thing may just be to
 8 view meaning—like any construct of social science—as a theoretical primitive of
 9 our explanation without any straightforward reduction to psychology (much less
 10 biology). The details we offer for direct intentionalism probably go overboard in
 11 terms of making the philosophical point, but we thought we needed to say more to
 12 make it clear that what we're doing is compatible with the collaborative nature of
 13 conversation.

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

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

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