Information Structure: Afterword[*]

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1 Information Structure: Afterword

In its present incarnation, the paper on Information Structure originally written in 1996 appears in the form in which it has been most circulated, a lightly revised version dating from 1998. These notes offer some background and history on the development of the framework discussed there, and a very brief overview of its subsequent development and my current views about the role of the context of utterance in interpretation. In the interest of brevity, I will not attempt to discuss all the details of the original paper which bear further consideration or revision — e.g. the details of the proposed treatment of prosodic focus. See the bibliography linked to Appendix A for subsequent discussions of many of these and other matters, by myself and others.

As a graduate student in Linguistics at UMass/Amherst in the 1980s, I was fortunate to be exposed to a number of new developments bearing on the relationship between formal semantics and pragmatics. In the 1970s under the influence of Cresswell, Lewis, Montague, and Partee, enormous progress in semantics was made possible by narrowing the focus of the field mainly to consideration of the conventional, truth conditional content of an indicative utterance, calculated compositionally as a function of the semantic contributions of its parts and its syntactic structure. Context was typically relegated to the background, in the form of indices of evaluation, though occasionally popping out for more serious consideration, as in the work of Kaplan, Karttunen, and Stalnaker. But eventually the nature of the rigorous

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formal enterprise itself, confronted with phenomena like Geach's donkey sentences, presupposition projection, and the context-dependence of tense and aspect, forced the field into a more careful, thorough re-consideration of the relationship between context and content. Hence were born the dynamic theories of interpretation, beginning with those of Kamp (1981) and Heim (1982), who were both at UMass during my stay there, Heim completing her dissertation and Kamp on the faculty in Philosophy. Such frameworks posit a dynamic interchange between content and context, each dependent on the other, even in the course of interpreting a single utterance. Mats Rooth was also a graduate student at UMass at that time, and wrote his influential dissertation (1985) proposing an alternative semantics for the interpretation of prosodic focus, *inter alia* shedding light on how focus contributes to the contextual domain restriction of various operators.

Another of my fellow students at UMass was Nirit Kadmon, and we soon discovered that both of us were interested in pragmatics; we read most of the classic literature in pragmatics together during our time at UMass. But from a theoretical point of view, pragmatics itself was hardly a unified field, more a hodgepodge of subjects with no connective tissue. The chapters of Levinson's influential and very useful *Pragmatics* (1983) are almost entirely independent of one another. An introductory course covering various topics in pragmatics and the philosophy of language would be quite disconnected — Grice and Horn one day, Searle and speech acts another, deixis yet a third. There were just a few exceptions: Gazdar (1979) looked at the interaction of presupposition projection with certain conversational implicatures, for example, while Heim (1982) played a crucial role in relating presupposition projection to anaphora. However, more generally, scholars working in one area — say, prosodic focus — rarely took into account the other — say, the semantics and pragmatics of interrogatives. Factors like mood and implicature played no role in compositional semantics at that time.

Moreover, pragmatics was viewed as an explanatory wastebasket (Bar-Hillel 1971a): Because pragmatic topics were treated in a relatively ad hoc and disjointed manner, claiming that some aspect of the meaning of an utterance was pragmatic effectively meant that one's account was not falsifiable, hence very weak. It is no wonder that most serious scholars went to great lengths to develop purely semantic accounts whenever possible (and many still do), since in contrast to the informal, post-hoc accounts typical in classical pragmatics, rigorous truth conditional semantics makes perspicuous, falsifiable predictions. It was clear that to make real progress in pragmatics

an integrated framework was required, one that satisfies two closely related desiderata: First, it must offer an explicit, explanatory account of the notion of *context of utterance*. Second, this account must be compatible with formal semantic analyses of the conventional content of an utterance, those which, like Montague Grammar, respect compositionality. Taking an utterance to be a content-context pair (Bar-Hillel 1971b), a theory satisfying these desiderata should yield clear predictions about the meaning of any given utterance, and hence an explanatory account of the way in which a context constrains and drives dynamic, compositional interpretation, which in turn updates context in the course of interpretation.

After I completed my dissertation, I was fortunate to spend two years as a postdoctoral fellow at the Center for the Study of Language and Information at Stanford University, where I was exposed to work in a completely different vein that was crucial to the development of the proposal laid out in the 1996 paper. It is no coincidence that Jonathan Ginzberg, who independently came to see the value of questions under discussion for pragmatic analysis, was a graduate student at Stanford in the same era. We were both exposed there to interdisciplinary work on the role of plans, goals and intentions in artificial intelligence, computational linguistics, and practical reasoning, including the work of Cohen & Perrault (1979) on the role of plan recognition in speech acts, Grosz & Sidner (1986) on discourse structure, Bratman (1987) on intentions in practical reasoning, and Thomason (1990) on the role of plan recognition in conversational implicature. Later at OSU, while teaching a seminar on sentential information structure (syntactic reflexes of pragmatic role) with Louise McNally, I read Carlson's (1983) book on the role of interrogatives in a Hintikka-style language game, and it clicked. I saw that we could use questions — not interrogative sentences (as in Carlson) or speech acts (as in Cohen and Perrault), but the semantic objects proposed by Hamblin (1973) or Groenendijk & Stokhof (1984) — as the foundation for an alternative *pragmatics*, one which would permit the required link with formal semantics. Besides its obvious relationship to the preceding work on presupposition and anaphora resolution, domain restriction, prosodic Focus, and mood, this synthesis was especially exciting because a re-consideration of Grice on meaning (1957) and implicature (1967), Lewis on convention (1969) and scoreboards (1979), and Stalnaker on the Common Ground (1978) showed illuminating connections between their foundational work and the new framework. The "purposes of the conversation" had been lurking around the margins all

along, only waiting to be brought into focus.[1] In the intervening years, the framework has proven useful to investigations in a number of *prima facie* unrelated domains. Appendix A is a map of some of the relevant issues, with arcs hinting at pertinent relationships between them. Click on a subject to access a bibliography of recent work on that subject that draws on the relationship to the QUD (or in some cases criticizes that proposed foundation for pragmatic analysis).

Given Grice's characterization of meaning$_{nn}$, it should not be terribly controversial to claim that intention-recognition is crucial to meaning$_{nn}$-recognition, for a meaning$_{nn}$ itself is a particular, complex set of intentions, which must be recognized as such in order to be successful:

> "U meant$_{nn}$ something by uttering x" is true if and only if, for some audience A, U uttered x intending:
>
> (1) A to produce a particular response *r*
>
> (2) A to think (recognize) that U intends (1)
>
> (3) A to fulfill (1) on the basis of his fulfillment of (2).   (Grice 1957)

In general the conventional content of an utterance, compositionally determined, radically underdetermines the meaning of the utterance, as intended by the speaker and grasped by the addressee. If you have any doubts about the truth of the last statement, see Ginzburg 2012, as well as Sperber & Wilson 1986: Ellipsis and non-sentential utterances abound in actual human discourse, as do anaphoric elements, domain restriction, implicatures which bear on truth conditional content, and interactions between all these factors (e.g., see Roberts 1989, 1991/1995, 1996 and especially 2011b for many detailed examples). But in view of our notable communicative success through language, it seems intuitively correct that we must have good reason to expect that our interlocutors can grasp our intended meanings. In fact, on the assumption that one can only rationally intend to do something if it is rational to believe that it can be achieved, the following principle follows from Grice's definition:

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1 As is often the case, a novel perspective on well-known problems in science often becomes evident at about the same time, independently to different investigators. Besides acknowledging the work of Carlson, Thomason, Grosz & Sidner, and Ginzburg, I should also note the closely related work of van Kuppevelt (1996), which was brought to my attention in the late 1990s, and which was also apparently influenced by Grosz & Sidner's work.

> **Retrievability**: In order for an utterance to be a rational, cooperative act in a discourse interaction *D*, it must be reasonable for the speaker to expect that the addressee can grasp the speaker's intended meaning in so-uttering in *D*.

In view of the gap between conventional content and conveyed meaning, this is a strong principle, since it requires that cooperative speakers expect that their *uniquely* intended meaning$_{nn}$ can be recognized as such by an addressee. For example, in Roberts 2011 I argue that Retrievability enables us to derive the uniqueness implications associated with anaphoric expressions like English definite descriptions, without stipulating those as part of the conventional content of *the* (contra Russell and the subsequent Russellian or E-type interpretations proposed in the literature). And Retrievability leaves no room for felicitous ambiguity (thereby, one might argue, entailing Grice's Manner implicature).[2]

What might be the grounds for the assumption of Retrievability on the part of a speaker? My hypothesis is that **the structure of a discourse interaction is designed to help satisfy Retrievability**, to make it be reasonable to intend that one's audience will recognize that one intends them to both grasp the proposition one intends to express and recognize that one proposes that this proposition is true (or not, in the case of ironic statements).

At least within linguistic semantics and pragmatics it had not been clear prior to 1995 how central a role intentions and intention-recognition might play in interpretation. I proposed that we model the shared intentions central to discourse structure in terms of a particular type of alternatives: questions. These alternatives, I claim, play a role in retrieving any facet of the intended meaning$_{nn}$ of an utterance which is not explicitly given by the conventional content of the utterance — any aspect of utterance meaning$_{nn}$ which is not compositionally determined on the basis of the conventional content of the parts of the expression uttered.

The solution arguably involves a functional organization of the interchange around the QUD, intended to facilitate this efficient, effective exchange of information, in view of other goals which the interchange subserves. More generally, we can characterize the relevant goals in a discourse as the intentional structure of the interlocutors' exchange, sketched as a

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2 This does *not* mean that Retrievability makes vagueness infelicitous. If one's meaning is vague, then in order for one's utterance to be successful, the addressee need only Retrieve a vague meaning.

formal extension of the InfoStr in Roberts 2004 (offered in slightly modified form in Appendix B). Informally, the idea is that, in keeping with Grice, meaning recognition is intention recognition. So interlocutors who want to track each others' meanings must track each others' evident intentions. Thus, in a full model of the conversational scoreboard for a discourse, in addition to the elements from the InfoStr of the earlier paper,[3] we expand the tuple of kinds of information to include a set of interlocutors and, for each interlocutor, their evident goals at that point in the discourse. At any given point in discourse, the set of sets of individual interlocutor goals for all the interlocutors, G, also includes their common goals at that point, G_{com}. G is closely related to the QUD: Each accepted question corresponds to a common goal of the interlocutors, and hence is also reflected in the personal goals for each. Since the sincere adoption of a goal involves the intention to achieve that goal (and in a rational agent, the assumption that it is reasonable to attempt to do so), the resulting structure over the interlocutors' goals is intentional in character. This elaboration of the InfoStr of the original paper (along with other constraints on the relationship between QUD and CG made explicit there) is intended to make it clear that goals and the corresponding mutually evident intentions of the interlocutors form the central structure of a discourse interaction. Just as intentions generally are constrained by beliefs and drive action, so the intentions in G and QUD, constrained by CG, both drive and constrain interpretation.

Given this general set-up, we can characterize sincere, competent and cooperative interlocutors as holding two kinds of goals at any given point in a discourse, their **discourse goals** — aiming to address particular questions in the QUD — and the rest, their **domain goals** — intuitively, those things they want to accomplish in the world (as opposed to their narrowly discourse goals). If an agent is rational, then ideally her intentions are consistent. Hence, one's discourse goals are ideally consistent with, and presumably subservient to one's domain goals (on the assumption that one might have higher priorities than conversation). Of course, if it is clear that particular interlocutors have individual domain goals which are not common, and

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3 In recent work I have stopped using the name *Information Structure* for the structured information serving as the context of utterance, for two reasons: First, many linguists — perhaps the majority — use the term (or one closely related) to refer to a structure of the utterance itself — for example, Vallduví (1993), Vallduví & Engdahl (1996), Steedman (2000). I see no need to add to the already rampant terminological confusion in Pragmatics. Further, as I sketch below, I now find it useful to emphasize that the backbone of this structure is not just a set of questions, but a set of publicly evident intentions.

which limit their willingness to share information, this can be captured in the proposed scoreboard. For example, if a hostile witness in a trial is asked whether the accused took money from his firm and answers *He regularly wrote checks to cover his expenses*, one should not take this reply to necessarily be a complete answer to the question, as all good prosecuting attorneys know. That is, the witness will uncooperatively construe the question itself in the narrowest possible way, to avoid having to lie or to give information that might serve the prosecution; but given her obvious overarching personal goal of giving as little information as possible, this is predictable.

The resulting scoreboard for the language game constitutes a theory of the **context of utterance**, intended to satisfy the first desideratum for an adequate pragmatic theory. It is idealized, so as to permit us to make predictions about what a speaker *reasonably* meant by a given utterance. As in the original paper (and following Stalnaker 1978, Heim 1982), it is important to understand that not all the information in the CG of the scoreboard need be introduced linguistically. Some propositions in CG may represent background information of the participants, perceptually accessible information, reasonable abductive inferences, etc. And questions may similarly be implicitly posed, or even accommodated to satisfy focal presuppositions (as in the *China* example, (47), in the original paper).

Given this overall intentional structure, we can characterize three principal kinds of moves in a discourse game, all guided and constrained by the interlocutors' discourse goals as reflected in the QUD. The first are captured in the paper by the Stalnakerian Pragmatics of Assertion and the proposed Pragmatics of Questions. The third emerges as a natural characterization of the type of move canonically performed with an imperative (Portner 2007, Roberts 2004):

> **Pragmatics of Suggestions:**
> If a suggestion posed by !P, P a one-place predicate, is accepted by the intended addressee i in a discourse D, $|P|^D$ is added to G_i, the set of i's goals in D, and $|\text{intend}(i, [P(i)])|^D$ is added to CG.
> Once an intention has been fulfilled or it is determined that the intended agent i cannot practically fulfill it, it is removed from G_i.

As in the Pragmatics of Questions, and unlike the Pragmatics of Assertions, here we have not only the principal effect involved in accepting the move in question, but also instructions for removing the corresponding intention after it is fulfilled or abandoned as impractical. That is to say, while the CG

is ideally monotonic, the set of goals G_i for a given agent i is non-monotonic, like the QUD.

Since a rational agent's intentions are ideally intrinsically bound up with her plans for action (Bratman 1987), we can derive:

Rational Cooperation in a Discourse D: Make your utterance one which promotes your current intentions in D. (cf. Grice's Cooperative Principle 1967, and its counterpart in Thomason 1990)

Since one of those intentions for a cooperative interlocutor is the common discourse goal, any rational, cooperative interlocutor should address the QUD. That is, given the intentional structure of the scoreboard, this characterization of rational cooperation entails that one's utterances should be Relevant, in the sense defined in the paper.

Over the years since this paper was written, a number of those with whom I've discussed it have suggested that it might be desirable to weaken the condition on Relevance which requires that a Relevant utterance contextually entail a partial answer to the question. For example:

This [Roberts'] definition of Relevance is overly restrictive and should be weakened at least to allow for discourse moves which merely raise or lower the probability of some answer to the QUD being correct. Consider for example the sequence: Q: "Is it going to rain?" A: "It's cloudy." A's utterance does not contextually entail an answer to the QUD (at least not in Pittsburgh, PA). Intuitively, it is relevant because it somewhat raises the probability of an affirmative answer to the QUD.

(Simons et al. 2010)

Though I am sure that the facts may warrant some modification of the original principle of Relevance defined in this paper, I am loathe to weaken it significantly without careful consideration of all the ramifications of a particular modification. As in generative linguistics generally, our goal is to construct the most restrictive theory consistent with the data. And in the theory proposed here, the principle of Relevance is the central factor constraining what it is reasonable and cooperative to say and to presuppose at any given time in discourse. Hence, we should be careful to explore a variety of possibilities before weakening the original requirement.

Related issues pertain to the simple assumptions I made in the original paper about the question-answer relationship. For example, an anonymous

reviewer for the present publication points out that there are a number of unresolved issues with the definition of partial answerhood in (3), appealing to the following exchange:

> A: Who brought dessert?
>
> B: Mary or John did.

Though B's reply doesn't resolve any elementary question of the form *Did x bring dessert?*, it does seem that it should count as a partial answer to A's question, since it completely eliminates some possible complete answers to the question posed by A — those in which someone other than Mary or John brought dessert. (3) also allows over-informative answers, in which complete answers give more information than required to answer the question; I would be inclined to leave that as-is, but both my reasons and the data are complex. These and other important issues are discussed in some detail in more recent work by others on questions and answers; see the bibliography linked to Appendix A, especially the section on Implicature/Exhaustivity in questions, and with respect to disjunction in particular, the recent work by Groenendijk and his associates on Inquisitive Semantics cited in the section on Relevance.

The more general intentional structure of discourse outlined above also suggests a generalization of the notion of Relevance to other goals and intentions, as well as to the QUD. Consider this exchange:

> Nurse: Don't eat on the morning before your test.
>
> Patient: May I drink water?

One might say that the patient's question is Relevant to the goal proposed by the nurse's suggestion (here, an order) because it requests clarification about the nature of the proposed goal, hence facilitating its successful achievement. This suggests that it might be interesting to explore a more general definition of Relevance, wherein behavior is Relevant to a goal to the extent that it potentially contributes to achieving that goal:

> A move m is **Relevant** at a given point in a collaborative, task-oriented interaction if and only if it promotes the achievement of an accepted goal of the interlocutors.

Again, this deserves more careful consideration than I can give it here, but offers interesting possibilities for connecting discourse relevance to more

general processes in practical reasoning. One might take this generalization as the over-arching notion of Relevance, with the original proposal in the 1996 paper as a specific sub-case, and both might be appealed to profitably. As Thomason (1990) argues, we can conceive of implicature as rule-facilitated intention-recognition. Grice's detailed discussion of many of his examples of conversational implicature (1967, 1968, 1969, 1978) make it clear that the recognition of the speaker's intentions as a function of domain goals plays a central role in implicature generation. For example, recall Grice's (1967) classic illustration of his maxim of Relation: a car is broken down by the side of the road, the gas tank cap open, the motorist beside the car. A good Samaritan stops and approaches in a friendly manner, saying "There's a gas station around the corner." Then, assuming that the goal adopted by the Samaritan was to help the driver find petrol, it is reasonable to take him to implicate that so far as he knows the station is open and has petrol to sell. Thus, the theory of context-of-utterance presented here is fundamentally Gricean in spirit.

So now we have an explicit, Gricean model of the *context of utterance*. But what of the second desideratum mentioned above, compatibility with formal semantic analyses of the conventional content of an utterance? Certainly, the use of questions — sets of propositions intended to model alternative possible answers — facilitates the connection of this theory of context with existing semantic theories in the Montague Grammar tradition. We can see this in the discussion in the original paper of how Relevance can be characterized in terms of logical relations between the QUD and the semantic content of a new utterance, as well as in the technical characterization of the congruence constraint on felicitous prosodic focus of an utterance. But to adequately explore the extent to which the theory of context can interact fruitfully with semantics, we need a dynamic formal semantic theory taking something like the InfoStr of the original paper as the context of utterance (scoreboard, or file, or discourse representation). This context should both (i) feed and constrain interpretation and (ii) be updated dynamically, that is to say, in the course of interpretation. Work along these lines is now underway in several quarters. For example, Ginzburg (2012) develops a grammar based on Type Theory with Records. Dynamic frameworks developed by Asher & Lascarides in SDRT (e.g. Asher & Lascarides 2003), Muskens (1996), and Martin & Pollard (2010) could also in principle be modified to reflect the kinds of assumptions about context modeled in Appendix B, in particular the QUD and associated domain goals.

Only when such explicit frameworks are available can the central question be posed: To what extent is such a formal theory of interpretation in context explanatory? In this connection, one of the most exciting current areas of investigation using the QUD-based approach to context is in experimental psycholinguistics. In Roberts 2011b I present an overview of the psycholinguistic work with which I am familiar that bears on the role of the QUD in interpretation (some of this cited in the section on Language Acquisition and Processing of Appendix A). On the basis of this and other work in processing and acquisition, I present a thesis about why we would expect the QUD and domain goals of the interlocutors to play a crucial role in guaranteeing Retrievability, across a broad array of pragmatic phenomena. That is, I seek to explain the following hypothesis:

> **The centrality of Relevance**: Interpretation is driven and constrained by the interlocutors' publicly evident intentions and goals, as reflected in the requirement of Relevance to the QUD. The interlocutors' recognition of and cooperative commitment to those intentions is essential to their collaboration in conveying and Retrieving meaning$_{nn}$.

Broadly, I argue in that paper that since intention-recognition is central in the successful conveyance of meaning$_{nn}$ — especially via constraining interlocutors' attention and, thus, what it means to be salient — we organize our interaction so as to facilitate that intention-recognition. That is *not* to say that we can or should reduce pragmatics to the intention-based framework proposed here. Rather, it is to argue that the intentional structure of discourse is central to meaning-Retrieval, and that we should keep it in mind in investigating how context bears on interpretation, if for no other reason than to avoid re-inventing an already-motivated wheel or unnecessarily complicating our theories. This should be kept in mind in developing semantic theories, as well. To the extent that dynamic theories along the proposed lines can be shown to make robust predictions about the kinds of meanings that felicitously arise in a given context of utterance, and do so in an explanatorily satisfactory fashion, we should avoid building into the semantics (the purely conventional content of a linguistic constituent) what we get for free from such a pragmatics (compositional consideration of that content in a dynamically updated context of utterance). One area worth (re-)considering in this light might be the role of alternatives in interpretation: Since, the proposed framework amounts to an alternative pragmatics (one

built on question-alternatives), to what extent do we need to build alternatives into the semantics? And to the extent that the latter is warranted (e.g. in the semantics of interrogatives, disjunction and/or indefinites), how do the semantically-generated alternatives interact with the salient alternatives in the context?[4] Another relevant aspect of the current literature is the lively on-going debate over the status of scalar implicatures in syntax and semantics (e.g. Chierchia 2004, Chierchia, Fox & Spector 2011, Geurts 2010, Simons 2011). As Simons (2011) points out, one of the underlying assumptions of many of the authors in this debate is that implicatures are essentially and necessarily globally generated. But what if that assumption is neither warranted nor (as she argues) empirically sustainable? What, then, might a dynamic pragmatics have to say about local implicature?

That is not to say that the present framework always offers ready answers to such questions (although see the work in the bibliography linked to Appendix A for arguments that it sometimes does). Instead, it offers a useful, more concrete way of posing the questions, which should lead to clearer, better-motivated answers. This pragmatics is no wastebasket. As Kadmon (2001: pp. 341–343) argues, it permits one to make concrete predictions about felicity in context, which can be tested in constructed contextual minimal pairs, through controlling for the appropriate contextual parameters in the construction of experimental materials, and in working with on-line corpora, where it is important to extract and analyze context along with tokens of the type of interest.

All this, of course, bears on the general issue of the division of labor between semantics and pragmatics. I won't weigh in on that here, since I think that to some extent it is a terminological red herring; instead I would propose a slightly different way of looking at matters. Some authors pose the question *What is the nature of the semantics-pragmatics interface?* without a well-articulated conception of the nature of context or of how it interacts with conventional content in the course of interpretation. I think it more useful to first assume a concrete account of the dynamic, compositional derivation of conventional content, interfacing with an independently motivated but com-

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4 This is related to the work on the interpretation of Focus in the 1996 paper. I take it up again in Roberts 2006, 2010, investigating the meaning of *only* and responding to Beaver & Clark (2008). On disjunction see the work of Groenendijk and his associates on Inquisitive Semantics — e.g. Groenendijk 2009, Groenendijk & Roelofsen 2009. And for indefinites, see the work following on Kratzer & Shimoyama 2002. See AnderBois 2012 for arguments that the alternatives associated with questions arise from indefinites and disjunction.

patible theory of context, and then pose the question: **To what extent is a robust, falsifiable pragmatic account (in the chosen framework) independently available and empirically ("descriptively") preferable to one solely built on conventional content?** The devil is in the details, as always. But it is through the detailed exploration of such analyses in concrete pragmatic frameworks satisfying the desiderata outlined above that the outlines of an answer will eventually emerge.

In this connection, in a recent talk at MIT, Partee (2011) noted two areas she takes to be at the leading edge of research in formal semantics: pragmatics and lexical semantics. I agree with her, and moreover I believe there is good reason to think that making real progress in the latter depends on a deeper understanding of the former. In the early days of Montague Grammar, we tended to strategically assume a fairly simple lexical semantics for the meanings of words, the "parts" in a compositional analysis, focusing on how those parts composed to yield the whole. Having made great progress in that arena, much of the interesting work in semantics today focuses on a reconsideration of the meanings of the parts: lexical content and its context dependence. In the Bibliography linked to Appendix A, consider the work cited in the sections on Rhetorical relations, Anaphora Resolution, Presupposition, and Lexical Meaning; as well as the literature on lexical coercion (typically driven by the need to make sense of the content of a given word in context); that on the lexical semantics and context-sensitivity of modal auxiliaries; the recent exciting body of work on discourse particles; and that on scalarity, vagueness, and standards (in predicates of personal taste). All this work argues that the more closely you look into the meaning of a word, the more vividly the world looks back at you. Or at least, the world as we humans conceive of it. Words are linked by the mutual knowledge of native speakers to a rich web of presumptions and associations, all of which can be evoked in a given context to resolve lexical context-dependence and enrich or coerce conventional lexical content. But how do we know which associations and presumptions are Relevant to Retrieval of intended meaning in a given context? This is where I take the frontier of semantics to be at present, and I recommend the general approach to context proposed here as a useful adjunct to that exploration.

Finally, I think that the perspective this work offers on the relationship between conventional content and context in the course of interpretation will eventually lead us to new and fruitful reconsideration of some of the basic questions posed by Chomsky in the 1950s about the nature of language

and the mind, as reflected in the acquisition of language by young children. See Roberts (2011b) for some speculation along these lines. But, as in syntax, hypotheses are only contentful when we know more about the details. And it is in the hope that the present framework will prove useful in that endeavor that I finally publish this doggone essay, incomplete and ragged though it still may be.

A Map of the Relevant Issues and Literature

http://www.ling.ohio-state.edu/~croberts/QUDbib/

B The Intentional Structure of Discourse

Scoreboard of a rational discourse interaction D:
At any given point t in D, the information shared by the interlocutors is structured as follows:

I, the set of interlocutors at t

G, a set of sets of goals in effect at t, such that

for all $i \in$ I, there is a (possibly empty) G_i which is the set of goals which i is committed at t to trying to achieve, and

$G = \{ G_i \mid i \in I \}$

$G_{com} = \{ g \mid \forall i \in I : g \in G_i \}$, the set of the interlocutors' common goals at t

$G_Q = \{ g \in G_{com} \mid$ there is some $Q \in$ QUD and g is the goal of answering $Q \}$

M, the set of moves made by interlocutors up to t, with distinguished sub-sets:

A $\subseteq$ M, the set of assertions

Q $\subseteq$ M, the set of questions

S $\subseteq$ M, the set of suggestions

Acc $\subseteq$ M, the set of accepted moves

$<$ is a total order on M, the order of utterance

CG, the common ground, the set of propositions treated as if true by all $i \in$ I at t (This includes propositions about the discourse scoreboard itself.)

DR, the set of discourse referents, corresponding to entities entailed to exist in CG

QUD $\subseteq$ Q $\cap$ Acc, the ordered set of questions under discussion at t, such that for all Q $\in$ QUD, there is a g $\in G_{com}$ such that g is the goal of answering Q, and

for all $Q \in$ QUD, it is not the case that CG entails an answer to Q

For all $i \in$ I, if i is a sincere, competent and cooperative interlocutor in D, we can use G_Q to characterize two kinds of publicly evident goals held by i (at time t):

Discourse Goals of $i = G_Q$

Domain Goals of $i = G_i \backslash G_Q$

$G_{com} \backslash G_Q$: the set of common Domain Goals of all the interlocutors

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Information Structure: Afterword

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