

Experimental Pragmatics: An Introduction for Philosophers

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Abstract

In the past several decades, psychologists and linguists have begun experimentally investigating linguistic pragmatic phenomena. They share the assumption that the best way to study the use of language in context incorporates an experimental methodology, here understood to comprise controlled studies and careful field observations. This article surveys some key projects in experimental pragmatics and relates these projects to ongoing philosophical discussions.

According to what has been called Grice's (1989) *Syntactic Correlation Constraint*,¹ a sentence means what it means "in virtue of the particular meanings of the elements of [the sentence], their order, and their syntactical character" (87). But, as Grice well knew, we use sentences to do much more than simply convey their meanings. Whereas *syntax* is the study of the formal/structural properties of sentences, and *semantics* is the study of sentence meanings, the study of the way people use sentences (and other linguistic expressions) in various circumstances to affect various communicative ends is known as *pragmatics*.²

It has sometimes been argued that core research projects falling under the purview of pragmatics are essentially non-empirical. For example, since Grice, much research in pragmatics has focused on how speakers use sentences to imply propositions other than their meanings. Saul (2002) argues that, in distinguishing between what is said and what is implicated, Grice was concerned with what rational language-users, grasping conventional meanings and operating according to certain general principles of cooperative behavior, would interpret sentences and speakers to mean. Such rational reconstructions, Saul points out, may lack psychological reality. Empirical projects investigating the psychology of implicature would be irrelevant to such reconstructions.

On the other hand, while experimental methods may be irrelevant on some interpretations of what Grice and other forebears of contemporary pragmatics were up to, as Breheny (2011) notes, "pragmatics has also flourished...as a branch of contemporary linguistics... where theory is ultimately aimed at explaining the cognitive psychological underpinnings of linguistic and pragmatic phenomena" (562). Clearly, experimental methods are among the most important tools for deriving such explanations. Furthermore, on other interpretations, experimental methods would have application to Grice's project *itself*. As Geurts (2010) notes, "Grice's theory is deeply imbued with such psychological notions as belief, intention, and so forth...[thus]...it is only a small step from a Gricean theory of pragmatics to a theory of experimental pragmatics" (67).

In any case, over the past several decades researchers have begun experimentally investigating linguistic pragmatic phenomena. They share the assumption that the best way to study the use of language in context incorporates an experimental methodology, here understood to comprise controlled studies and careful field observations. This article will survey some key projects in experimental pragmatics and relate these projects to ongoing philosophical discussions.

1. Outline

Assume that sentences express propositions, which I follow Stalnaker (1970) in understanding as abstract functions from worlds to truth-values. Then we can bifurcate the study of pragmatics. One branch, which, following Korta and Perry (2008), I will call “near-side pragmatics”, investigates how the use of sentences in particular contexts helps determine the propositions they express. Another branch, “far-side pragmatics”, investigates the way in which expressing particular propositional contents in particular contexts accomplishes further social and communicative aims. Section two investigates the experimental study of near-side pragmatics by focusing on the role of pragmatics in semantic reference. The third section focuses on far-side pragmatics, specifically, on the phenomena of promising.

According to one important and persistent picture within linguistics and the philosophy of language, contextual information contributes to the truth-conditional content of sentences only rarely and in very constrained ways. However, over the last several decades more and more philosophers, linguists, and cognitive scientists have questioned this traditional border between semantics and pragmatics. In the fourth section of this paper I will survey these “border wars,” focusing on the topic of scalar implicature, which constitutes prime contested territory in the ongoing battles over the dividing line between semantics and pragmatics.

2. The Near-Side

Consider the sentence, “I am under forty now.” The way in which this sentence is used—or, the context of utterance in which it is used—helps determine the proposition expressed by this sentence. For we cannot assess whether or not this sentence is true without knowing who ‘I’ picks out and what time ‘now’ picks out. And determining the referents of these words depends upon contextual features, such as who utters the sentence and when. Kaplan (1989a) argued that such indexical terms as ‘I’ and ‘now’ have as their meanings (in the sense of “what is known by the competent language users” (505)) rules, which he calls characters. In virtue of their characters, these words contribute referents, which help determine truth-conditions. Thus, Kaplan’s account allows for contextual contribution to reference determination, and thus to propositional content. But Kaplan’s early view was constrained in an important way. In “Demonstratives” Kaplan construed context as including specific situational indices such as agent, location, time and world, but as excluding speakers’ and hearers’ intentional states.³

A different conception of context is familiar from Stalnaker (2002). According to this view, context is constituted by shared acceptances, or common ground. Stalnaker’s (admittedly idealized) conception characterizes common ground as follows:

It is common ground that ϕ in a group if all members accept (for the purpose of the conversation) that ϕ , and all believe that all accept that ϕ , and all believe that all believe that all accept that ϕ , etc. (716).

On this view, common ground is analyzable in terms of speakers’ presuppositions about the context of utterance. Specifically, a speaker presupposes a proposition ϕ if and only if the speaker believes that everyone in the group accepts ϕ , believes that all believe that all accept ϕ , etc. Thus, when all speakers presuppose the same proposition, that proposition constitutes part of common ground.⁴ This notion of context is less constrained than the early Kaplanian conception discussed above, since it allows speakers’ and hearers’ intentional states to contribute to context.

Now, as a matter of historical fact, it is very unclear that we really have a substantive disagreement here between Kaplan and Stalnaker. For one thing, it is unclear whether Kaplan and Stalnaker are here introducing conceptions of context (or of indices) for the same purposes. Furthermore, even assuming such a disagreement, it is unclear whether it should be resolved using experimental methods. There is the well-known distinction between what makes it the case that the referent is x and how a hearer figures out that the referent is x . Obviously, experimental methods would be helpful in understanding how a hearer figures out that the referent is x . It is less clear how they could help us determine that the referent is x . Setting the historical issues aside, experimental pragmaticists have investigated the former question, how does a hearer figure out that the referent of a term is x ? And their investigation has largely focused on the question of whether or not hearers use information about a speaker's intentional states to determine reference.

In a series of important early studies, Clark et al. (1983), revealed how a hearer's assumptions about common belief can lead her to resolve reference in different ways. In their most famous study, an interviewer handed students a clipboard containing a photograph of then President Ronald Reagan and his director of the Office of Management and Budget, David Stockman. Participants were asked one of two questions:

1. "You know who this man is, don't you?"
2. "Do you have any idea at all who this man is?"

Of those asked 1, the vast majority indicated Reagan.⁵ Of those asked 2, about half gave indeterminate responses, while roughly the other half indicated Stockman. How is this pattern of responses explained? Consider question 1. Presumably, this question presupposes knowledge of the person to whom the interviewer is referring. To resolve the reference, participants must rely upon their beliefs about how well known each of the men would be to the general American public, including the interviewer. A Stanford University student in the early 80's would certainly know very well who Reagan is. Based upon her own high level of confidence in this recognition, she would likely assume common knowledge of Reagan. If she didn't recognize the other person in the photo, she would reasonably conclude that he was less well known than Reagan. (If she did, she would know he was!) Availing herself of this information about common belief, the participant would be able to resolve reference in favor of Reagan. (An analogous story is available for the other question, which presupposes that the participant probably *won't* know who the referent of the question is.)

Clark et al.'s work suggests that people determine reference according to a roughly Stalnakerian picture, by relying upon assumptions about commonly held belief. But these studies don't provide any evidence as to *when* precisely hearers consult intentional information. Perhaps hearers initially resolve reference according to some specific, codified indices (akin to a broadly early-Kaplanian picture) and only then—perhaps via a rational process similar to Grice's model of implicature calculation—modify this reference to accommodate collective intentionality. Keysar et al. (2000) presents evidence that hearers do just this. Their eye-tracking studies suggest that hearers initially ignore their interlocutor's perspective and instead direct their gaze according to specific verbally conveyed criteria. Their participants were seated on one side of a visual array consisting of 4x4 slots. Various items—an apple, a toy truck, several candles of various sizes—occupied various slots. A confederate of the experimenters (purported to be just another participant) sat on the other side of the array. The confederate was instructed to help the participant rearrange items in the array so that it resembled a picture only the confederate could see. Some of the items in the slots were occluded from the confederate's line of sight by small screens. But from the

experimental participant's perspective, all items were visible. For example, there might be three candles of different sizes. The participant could see all three, but the confederate could not see the smallest candle, since it was in one of the occluded slots.⁶ The experimental manipulation involved the occluded items. The experimenters recorded the participants' eye movements when they were instructed to, for example, move the small candle. They found that participants glanced at the small, occluded candle first, even though they knew it couldn't be seen from their interlocutor's perspective. (Sometimes they even reached for it!) Only subsequently did participants settle on the medium sized candle, which was known to be visible to the confederate. This finding suggests that reference is initially determined according to specific contextual indices; only subsequently is intentional information about one's conversational partner taken into account.

However, subsequent work has challenged this interpretation. In one study, Hanna and Tanenhaus (2004) had participants engage in a collaborative cooking exercise with an experimental confederate. The confederate, stationed at one end of a table, was the cook, while the participant, at the other end of the table, was the helper. Several items needed for the recipe were at the cook's end of the table, while others were near the helper. The cook read the recipe, mixed the ingredients, and manipulated objects on her side of the table; the helper helped the cook by handing over objects and performing simple tasks as needed. In some conditions, duplicate items were on both the cook and the helper's side of the table. For example, if the recipe was for cupcakes, there might be one box of cake mix on the confederate cook's side of the table and another on the participant helper's side. The crucial manipulation involved whether the cook's hands were full or empty when she asked for this duplicated ingredient (e.g., the cake mix). In conditions in which the cook's hands were full when she asked for the cake mix, the participant helper was significantly more likely to first look at the cake mix at the cook's end of the table than in conditions in which the cook's hands were empty or in which there were not duplicate items. Hanna and Tannenhaus's study thus suggests that addressees sometimes take speakers' intentional states into account when initially resolving reference. It's simply that, as they write, a hearer's tendency to do so "will vary with the salience and accessibility of that information and its importance for the goals of the addressee" (114).⁷

Setting aside the question of when specifically intentional information enters into reference resolution, further experimental research suggests that even young children rely upon (at least some) aspects of common belief in settling on a referent. Ackerman et al. (1990) suggests that kindergartners have difficulty using information about common belief derived from behavioral cues, and that both kindergartners and 2nd graders have trouble using information like that invoked in the Reagan study—information about the intentional states of an interlocutor that follow from his status (e.g., as an American).⁸ Recently, however, research by Liebal et al. (2013) has suggested that very young children are able to use information about the status of their interlocutor to determine reference. In Liebal et al.'s study, children were presented with a pair of objects, one of which was culturally well-known, the other of which was novel. For example, one pair consisted of a yellow rubber duck and a yellow sponge object with googly eyes in a white rubber base. When the experimenter entered the room, she asked (without looking at or indicating either object), "What is that?", either as a request for information or in a recognitory way" (88). Both three and five year old participants were significantly more likely to give the experimenter the novel object when her response seemed to constitute a request for information.⁹ This suggests that even by the age of three children are able to recognize an interlocutor's status as a cultural compatriot, as well as the common beliefs such status entails.

3. *The Far-Side*

The study of the far-side of pragmatics is the study of how we use communicated propositions to achieve various communicative ends. Any time we utter a sentence (or perform a speech act) we typically simultaneously perform multiple communicative acts. John Austin (1962) distinguished three important types. Locutionary acts are acts that it is appropriate to describe as ‘saying something’. These include acts of producing some sounds, uttering some words, and, most importantly, expressing a proposition. Illocutionary acts comprise the many acts we perform *in* the very act of saying something that are not typically described as acts of saying something. Examples of this type run the gamut from fully conventional acts such as pronouncing judgment and voting to non-conventional acts of expressing one’s specific psychological attitude towards a proposition, as in the act of assertion, in which one expresses an attitude of belief. Finally, Perlocutionary acts encompass the other-related aims we intend to achieve *by* saying something. These include acts of causing certain mental reactions in our audience or of getting them to perform certain actions.

Austin and, in later work developing the account of speech acts, Searle (1969, 1976) and Bach and Harnish (1979) focused particularly on the class of illocutionary acts. One example that received substantial attention was the act of promising. Promising (as a *commissive* illocutionary act) was conceived as consisting in communicating one’s commitment to undertake a future course of action. Searle (1969) analyzed the “successful and non-defective performance of the act of promising” as consisting in several jointly necessary and mutually sufficient conditions (54).¹⁰ I summarize these conditions as follows:

1. *Propositional Condition* The utterance says something about a future action, *A*, of the speaker, *S* (in the sense that, “I will write the article,” says *that* I will do something.)
2. *Preparatory Conditions* There are two:
 - a. The hearer, *H*, prefers that *S* perform *A*.
 - b. It is not obvious to *S* and *H* that *A* would be performed simply in the normal course of events.
3. *Sincerity Condition* *S* actually intends to perform the action.
4. *Essential Condition* *S*’s utterance places *S* under an obligation to do *A*, because it is conventionally recognized as a promise.

Experimental pragmatic research has investigated the use of promises by adults and the natural development of the concept of promising in children with an eye to these conditions. Do promises really function as Searle suggested?

In several studies, Gibbs and Delaney (1987) found that competent adult promisers emphasize some of these conditions over others. Specifically, Gibbs and Delaney found that utterances are considered promises only if the first preparatory condition (2.a) and the essential condition (4) are both met. However, participants considered some utterances promises even when condition (2.b) was not met.¹¹ On the basis of these findings, Gibbs and Delaney suggest that a promise may sometimes constitute a reminder of an existing commitment, rather than the undertaking of such a commitment.¹² Nonetheless, Gibbs and Delaney’s findings largely conform to Searle’s analysis of promising. And later research on adults has also supported Searle’s general picture.¹³ By the time we are adults, it seems, we come to understand promises as satisfying conditions similar to Searle’s 1–4.

But when and how do we acquire this understanding? Because promises occupy a central place within both our linguistic pragmatic and moral practices, answering this question could

inform debates between nativists and empiricists within language *and* ethics. To answer this question, Astington (1988) investigated which of various speech acts children would describe as promises. Children between the ages of 5 and 9 appeared to identify promises with true descriptions of past or future actions. Children's recognition that one can promise only what is within one's control (e.g., that one can't promise Johnny will be well tomorrow) seems to develop between ages 9 and 13. Astington's research also suggests that children under 13 have trouble understanding insincere promises. They tend not to call a speech act a promise if the promised action later goes unperformed. Astington points out that there are two potential explanations for this. Either, children thirteen and under have a promise-concept that requires the eventual performance of the promised act or, alternatively, children are more forgiving when it comes to the intentions of others. On the latter explanation, if a speaker does not eventually perform an act, children take that as evidence that he did not intend to perform the act in the first place. But if he didn't intend to perform the act, then he couldn't have been promising to perform it when he said he promised he would perform it (because he fails to satisfy condition 3).

Maas and Abbeduto (2001) provide evidence that by the age of nine children grasp the basic concept of promising, they simply attribute intentions differently. They point out that Astington's materials did not include specific explanations as to why unfulfilled promises went unfulfilled. Thus, Maas and Abbeduto asked three separate groups of participants (seven year olds, nine year olds, and adults) about a series of vignettes in which the agent did not perform the promised act (though Searle's conditions were otherwise met). In one condition, the agent did not perform the promised act because she suffered an unforeseen obstacle (e.g., an illness or injury), in the other, she simply failed to perform the act for no apparent reason. Adults identified a promise in both conditions, whether the agent was prevented from performing the act because of an obstacle or not. Nine-year olds, on the other hand, claimed that a promise was made when an obstacle prevented performance of the promised action, but not when there was no obstacle. Together with the previous studies by Astington (1988), this suggests that 9–13 year olds tend to understand that promises can go unfulfilled, it's just that they give people the benefit of the doubt. It's as though children think that everyone does what they intend to do provided they are able to do it. In that case, someone's failure to perform an act they said they would perform suggests that they did not intend to perform it in the first place.

The previous studies provide no evidence that children seven and under recognize promises in anything like the broadly Searlean way that adults seem to. In Maas and Abbeduto (2001) for example, seven year olds were not sensitive to the presence of obstacles. Instead, they identified promises only if promised acts were eventually performed. Recently, however, researchers centered around Michael Tomasello's lab have suggested a fundamental revision of the way in which joint commitments (such as promises) are studied. In this vein, Gräfenhain et al. (2009) defend the possibility "that verbal tasks with verbal measures are not the most appropriate way to test for young children's understanding of joint commitments and other social obligations" (1431). In the second of their studies, Gräfenhain et al. found that 3 and 4 year olds were more likely to acknowledge their leaving a cooperative game (by handing over a tool, verbally indicating they were leaving, etc.) when they had asked the experimenter to play the game in the first place than when the experimenter had initiated play. This and other research suggests that very young children may intuitively understand commitment in something like the way in which adults do, though lacking an explicit understanding of the concept of promising.¹⁴

4. Border Wars

This article began with an allusion to what has been called Grice's Syntactic Correlation Constraint, which holds that a sentence's meaning (or, "what is said," in Grice's favored sense of that term) "is closely related to the conventional meaning of the words" (25). However, Grice also maintained that a sentence's meaning is propositional in nature, for he clearly held that sentence meanings determine truth conditions. After all, he took intuitions about when an utterance of a sentence would be *strictly speaking* false—i.e., intuitions about the truth conditions of a sentence—as indicative of sentence meaning, or what is said.¹⁵ In fact, the entire Gricean framework of conversational implicature is one of rational calculation from conventional maxims of communication, which emphasize properties closely tied to truth-conditions, such as accuracy and informativeness. Thus, sentence meaning is often construed not simply as propositional content, but as *effective* propositional content, the content that actually grounds implications.¹⁶ But can these two properties of sentence meaning happily coexist? Do sentences generally determine effective propositional contents in virtue of the conventional meanings of the words that compose them and their syntactic properties alone?¹⁷ Answers to these questions could reshape the border between semantics and pragmatics. Experimental pragmatic research into the nature of scalar implicatures has helped inform these debates.

Suppose Audrey is in a position to know where all of Brody's cats are. If Audrey says, "Some of Brody's cats are under the bed," she would often be understood to mean *that some of Brody's cats are under the bed, but not all of Brody's cats are under the bed*. Audrey's utterance is amongst the class of scalar implicatures, so called because of one influential (soon to be discussed) account of how they work. Other locutions constituting this class involve the logical operator "or" (utterances of which are often understood exclusively, to mean *or not and*), mental states such as "believes" (often understood to mean *believes but doesn't know*), and numerical statements (e.g., "Brody has two cats," which would often be taken to mean *that Brody has two cats and not more*). The key question about scalar implicatures is where does the extra information (e.g., that not all of the cats are under the bed) come from?

According to one family of answers (Horn 1972, 1989; Gazdar 1979; Hirschberg 1991, and Geurts 2010), such extra information is conversationally implied by the propositional content of the sentence in particular contexts of utterance. On these views (and these views only), the additional information is actually an *implicature*, so I will call these *Real Implicature Views*. According to Horn (as summarized in 2004) the key maxim in the Gricean system is the first quantity sub-maxim, which holds that an interlocutor should make their contribution as informative as the current talk-exchange requires. Clearly, it is less informative to point out that some of Brody's cats are under the bed than that all of his cats are under the bed, since all entails some. From this perspective, "some" occupies a lower place on what can be construed as a scale of informativeness. According to the Gricean picture, since speakers are presupposed to be committed to the sub-maxim of informativeness, if Audrey says, "Some of Brody's cats are under the bed," hearers will wonder why she didn't say the more informative, "all of the cats are under the bed." They will infer (and Audrey intends for them to infer) that she didn't say that because she didn't believe all of the cats are under the bed. Together with the further (generally made) contextual assumption, that Audrey either believes all of the cats are under the bed or she believes it is not the case that all of the cats are under the bed, it follows that Audrey believes that not all of the cats are under the bed.¹⁸ Along these lines, in addition to saying that some of the cats are under the bed, Audrey implies that not all of the cats are under the bed.¹⁹

According to *Real Implicature Views*, the extra information conveyed by scalar implicatures follows from a rational (though unconscious) recognition that the proposition conveyed by the uttered sentence is insufficient to satisfy the purposes of the talk exchange. Another family of proposals (Levinson 2000; Chierchia 2004; and Storto and Tanenhaus 2005) construes the extra information as closely related to the lexical content of specific words, such as “some” and “or”. These views suggest that extra information is conveyed by these words by default and as a matter of course, not because the sentence of which they are a part falls short of certain conversational aims. Importantly, these views do not allege that “some” strictly means *some and not all*. Nor does the upper bound (*not all*) constitute a conventional implicature in Grice’s sense, for it is cancellable (as when Audrey says, “Some of the cats are under the bed. In fact, all of them are”).²⁰ Nonetheless, according to this view, scalar information is very similar to lexical content. Crucially, it is not interpreted via a rational process, like a conversational implicature, after the truth-conditional content of a sentence is understood. Nor does it constitute a context-specific, *optional* enrichment of the concept lexically encoded by the relevant word. Instead, it is part of what the word conveys and it is interpreted by default and simultaneously with the meaning of the relevant word itself. According to these proposals, scalar information could be seen as satisfying the first of Grice’s constraints on sentence meaning, the syntactic correlation constraint.²¹ Thus, I will call these *Syntactic Correlation Views*.

Finally, a third family of proposals (Sperber and Wilson 1987, 1995; Carston 1995, 1998; Bach 2006) splits the difference between the previous two. It suggests that scalar information is the result of localized enrichment of concepts lexically encoded by specific words, not further propositional content inferred because the sentence’s meaning fails to satisfy certain conversational maxims. But it denies that such information is associated with sub-sentential expressions by default. Inherent in this third family is a revision of the Gricean, bifurcated picture of communication suggested above. Grice divided conversational conveyances into the class of sentence meanings, on the one hand, and the class of implications, on the other. The present views suggest a tripartite picture of communication. Sentences do not always determine propositional contents, proponents of these views argue, and even when they do the propositions supplied are unlikely to be the effective propositions, which actually ground the implications hearers draw. Instead, these *Revisionists* suggest that uttered sentences encode a schematic representation, which is subsequently enriched in various ways by pragmatic processes informed by the context of utterance. These processes deliver effective propositional contents, which I will dub “interpretations”.²² These propositional interpretations—and not schematic sentence meanings—ground implicatures. On the best worked out version of these views, relevance theory, hearers sometimes adjust the lexical meanings of words to yield an interpretation that best fits their expectations of relevance.²³ Thus, although “some” encodes a default meaning consistent with *some and possibly all*, if context recommends, an ad hoc meaning for this word can be generated on the fly. Scalar information is the result of such localized, optional enrichment. “Some” is understood to convey *some but not all* when that would contribute to an interpretation that is as relevant as the speaker’s utterance is expected to be.²⁴

It should be clear that both the *Real Implicature* and *Syntactic Correlation* views are consistent with a traditional, broadly Gricean picture of semantics. Only the *Revisionists* depart from the Gricean fold by suggesting the unbounded intrusion of pragmatic processes into the determination of effective propositional content. Which view best fits the way we actually arrive at scalar information?

Experimental pragmatics casts significant doubt on *Syntactic Correlation* views. In one influential study reported in Bott and Noveck (2004), participants were asked to assess

whether each of a series of six similar statements containing the quantifiers “some” and “all” were true or false. For example, one series contained the following sentences:

Reference:	Example Sentence:
T1	Some elephants are mammals.
T2	Some mammals are elephants.
T3	Some elephants are insects.
T4	All elephants are mammals.
T5	All mammals are elephants.
T6	All elephants are insects.

Participants in a “logical” condition were instructed to give a logical reading to “some,” that is, to understand it as meaning *some and possibly all*. Participants in a “pragmatic” condition were instructed to understand “some” as *some but not all*. If scalar information were part of the default interpretation of “some,” as *Syntactic Correlation* proposals suggest, then participants should be quick to respond that T1 is false in the pragmatic condition, since the pragmatic interpretation would accord with their default interpretation. Furthermore, they should be relatively slow to respond that T1 is true in the logical condition, since the logical interpretation would require them to adjust away from their default interpretation. If, on the other hand, either of the other two views of scalar implicatures were correct, the instructed reading in the logical condition would accord with the default interpretation of “some.” In that case, we would expect faster responses in the logical condition and slower responses in the pragmatic condition for T1. Contrary to *syntactic correlation*, participants in the pragmatic condition were significantly slower to respond to T1 than those in the logical condition. Participants in the pragmatic condition were also significantly more likely to give incorrect (from the perspective of their assigned reading) true/false responses than those in the logical condition.²⁵

Breheny et al. (2006) support these findings using a different experimental paradigm and with more natural sounding sentences. In one study, one group of participants read typical scalar sentences, such as, “The director had a meeting with some of the consultants,” while another group read sentences that clearly specified only a subset of consultants were involved, such as, “The director had a meeting with only some of the consultants”. The experimenters then timed how long it took participants to read the sentence, “The rest did not manage to attend”. If the syntactic correlation view were correct, then participants would presumably read the target sentence at the same speed regardless of which sentence they read first. After all, on that view “some” is understood to convey by default *some but not all*, therefore each initial sentence would convey that the director met with some but not all of the consultants. In fact, contra the *syntactic correlation* view, the target sentence was read more quickly when the experimental sentence explicitly specified that some but not all of the consultants met with the director.²⁶ In other research (Pouscoulous et al. 2007), children were found more likely to infer scalar information when overall cognitive load was decreased, which is readily explicable if such information is optionally inferred on the basis of background knowledge, but not if such information is conveyed by default.²⁷

The debate between *revisionists* and *real implicature* theorists is far less decisive. Few studies have pitted the predictions of these two views against one another, in part because many *revisionists* long assumed that all proponents of the Gricean bifurcated view of communication were committed to some version of the *syntactic correlation* view.²⁸ Recently, studies designed to tease apart these two families of hypotheses have focused on the distinctive architectural

models of communication proposed by Grice and his followers, on the one hand, and revisionists such as relevance theorists, on the other. As discussed above, Grice's model holds that sentence meaning is effective propositional content: Sentence meaning grounds and will typically (though perhaps not invariably) figure in the cognitive processes that constitute the pragmatic calculation of implicatures. Thus, according to the Gricean view, sentence meaning will typically be calculated *before* implicatures—or, to put it another way, semantic processes occur before pragmatic processes. By extension, *real implicature* accounts of scalar inferences hold that we must understand Audrey's uttered sentence to mean *that some and perhaps all of the cats are under the bed* before we grasp her implication *that not all of the cats are under the bed*. On the other hand, *revisionist* views hold that semantic and pragmatic processes operate co-temporally. On the relevance theoretic view, for example, hearers interpret what a speaker says so that it satisfies their expectations of relevance; and it is the total package of an interpretation together with whatever implications follow from that interpretation that either satisfy or fail to satisfy expectations of relevance. Thus, revisionist accounts such as relevance theory hold that scalar information is arrived at simultaneously with the hearer's interpretation of what is said and the implications that follow from that interpretation. Taking these predictions about the time-course of interpretation to heart, Huang and Snedeker (2009) present results that favor a *real implicature* view, according to which sentence meaning is derived before, not simultaneously with, scalar information. In their experiments, participants were presented with a story in which four children (two boys and two girls) end up with various items. In one story, for example, one girl and one boy end up with two socks each. The other girl ends up with three soccer balls, whereas the other boy ends up with nothing. This story was paired with a visual array, divided into four quadrants, with one of the characters in each of the quadrants along with the items he or she ended up with at the end of the story. Participants were then asked, "Which girl has (some/all/two/three) of the (socks/soccer balls)?" Participants' eye-movements were tracked to see when they looked at the correct target. The interesting comparison was between how long it took participants in the "some of the socks" condition compared to the other conditions to look at the appropriate target. On the assumption that the contextual knowledge necessary to derive scalar information was already present at the time the target sentence was uttered,²⁹ a revisionist view would suggest that participants should be able to enrich the meaning of "some" when they first hear it, concurrent with deciphering other components of the sentence, and before they hear the disambiguating phrase "socks". In fact, for all of the other conditions (all/two/three) participants had begun looking at the correct target before they heard the disambiguating noun phrase (socks/soccer balls). But Huang and Snedeker found that it took participants significantly longer—about 1 second longer—to disambiguate between the girl with two socks and the girl with three soccer balls in the "some" condition. This, they argue, favors a view according to which sentence meaning must be interpreted before scalar information is worked out, which would seem to favor the *real implicature* view over the *revisionist* approach.

However, as noted, Huang and Snedeker's explanation of their finding is supported only on the assumption that the background knowledge necessary for working out the scalar interpretation was actually available to participants at the time the relevant word ("some") was uttered. If not, participants would presumably have to wait until the specific nominal phrase was uttered to disambiguate the appropriate reference. Focusing on this point, Breheny et al. (2013) challenge Huang and Snedeker's explanation by presenting results that suggest scalar information is accessed simultaneously with non-scalar sentence interpretations when relevant contextually information is sufficiently primed. This result suggests that the revisionists' view may be the correct one after all.

5. Conclusion

Experimental pragmatics provides a model for productive interdisciplinary research. Across each of the topics discussed in this article, we see a division of labor. Theories of pragmatic phenomena developed by philosophers and theoretical linguists make empirical predictions, which are in turn tested by psychologists and experimental linguists.³⁰ Thus, experimental pragmatics avoids the criticism made against certain other empirical approaches to philosophy, that those (philosophers) who conduct the experiments lack the proper training and sophisticated tools required to do meaningful experimental research. At the same time, the compelling results uncovered by experimentalists should give pause to those all too familiar voices who deny the relevance of empirical findings to core topics in philosophy. A philosopher interested in pragmatics who ignores experimental research on the topic courts obsolescence.³¹

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Short Biography

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Notes

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¹ By Kent Bach (2001).

² This tripartite division of linguistics was first proposed by Charles Morris (1938), who specifically defined pragmatics as, “the study of the relations of signs to interpreters” (6).

³ This non-intentional view has been defended by others (e.g., Reimer 1991, 1992), however, Kaplan himself ultimately rejected the position in 1989b.

⁴ Implicit in this statement is another idealization, that we cannot be mistaken in our self-reflective beliefs.

⁵ Reagan indications comprise either an outright selection of Reagan, or a more hesitant pointing at Reagan while asking, “this one?” Analogously for Stockman identifications. An indeterminate response is either a question of, “which one?”, or an indication of both Reagan and Stockman.

⁶ The experimental design insured that the participant knew which slots were occluded from the confederate’s perspective.

⁷ Important follow up work on the time-course of referential communication includes Hanna et al. (2003), Hanna and Brennan (2007), Richardson and Dale (2010), and Brown-Schmidt (2012).

⁸ In one vignette, for example, participants were asked to determine which of several different looking mugs a character (Mr. Smith) was referring to when he asked, “Would you hand me the mug?” Only one of the mugs had a letter on it, the letter ‘S’. In addition, participants were either told that only the mugs with letters on them were clean (in this case relevant information was supplied through direct statement), or they were told that Mr. and Mrs. Smith had just finished washing the lettered mugs (information supplied through joint activity), or they were told that Mr. Smith’s first name was Steven and he had a special mug (information supplied in virtue of Mr. Smith’s status).

⁹ Results were not significant for those cases in which the experimenter expressed recognition. The authors conjecture that this might have been due to the experimenter’s overall high level of expressed excitement.

¹⁰ In some cases, if a condition wasn’t met, the act might be nonetheless successfully performed but defective, as in the case of lying promises, which fail to meet condition 3. Thus the “successful and non-defective” qualifier.

¹¹ In one of Gibbs and Delaney studies, participants assessed whether the final utterance made by a character in a vignette constituted a promise. Vignettes varied as to whether each of the preparatory conditions (2.a and 2.b) and the essential condition (4) were met. For example, one vignette, involving a stated commitment to go shopping in which condition 2.b was not met, contained the lines, “You usually do the shopping for the household every Thursday on the way home from school. In fact everyone knows you do this every Thursday and they even expect you to.” Whether or not 2.b was violated made no difference to promising ratings. Violations of 2.a and 4 did make a difference.

¹² Note, this would seem to constitute a reminder of something that is already obvious to speaker and hearer anyway.

¹³ The developmental studies on promising discussed below included adult conditions as controls. Results from these conditions broadly conformed to Searle’s model.

¹⁴ Other important research on this topic includes Hamman et al. (2012) and Warneken et al. (2012). See Tomasello and Vaish (2013) for a theoretically informed review of work on this and related topics.

¹⁵ See, for example, his discussion of conventional implicature: “If I say (smugly), *He is an Englishman*; *he is, therefore, brave*, I have certainly committed myself, by virtue of the meaning of my words, to its being the case that his being brave is a consequence of (follows from) his being an Englishman. But while I have said that he is an Englishman, and said that he is brave, I do not want to say that I have *said* (in the favored sense) that it follows from his being an Englishman that he is brave, though I have certainly indicated, and so implicated, that this is so. I do not want to say that my utterance of this sentence would be, *strictly speaking*, false should the consequence in question fail to hold” (25–6).

¹⁶ This does not entail that it contributes to the *calculation* of implicatures (see, for example, Saul 2002). However, many of the studies discussed in this section are premised on the assumption—consistent with many neo-Gricean approaches—that it does.

¹⁷ With the exception of a limited class of indexical and demonstrative expressions, which, as already discussed, are generally understood to lexically encode rules that require us to consult context of utterance.

¹⁸ *Particularized* conversational implicature would imply this *only* in special or marked contexts. *Generalized* conversational implicature would imply this *in all but* marked contexts. I set aside questions as to which specific kind of implicatures scalar implicatures are.

¹⁹ Proponents of real implicature views face the problem of explaining why scalar implicatures appear to embed (e.g., within the scope of the antecedent of a conditional). After all, true implicatures are grounded by genuine speech acts—the propositional content that is said, not simply any truth-conditional component of that propositional content. See Geurts (2010) for a recent divide-and-conquer strategy for dealing with different varieties of so-called ‘embedded implicatures’. He claims that there are a few marked uses of utterances that generate legitimate “embedded implicatures,” but that most purported embedded implicatures are not genuine, and, therefore, not a problem for real implicature views. Thus, he claims that the real implicature view is, by and large, correct.

²⁰ Grice held that conventional implicatures, as discussed in footnote fifteen, were attached to specific words, so detachable (i.e., they did not persist replacement of these words by semantically equivalent terms), but not cancellable (i.e., if *p* implies *q*, then *q* is cancelable if and only if one can say, “*p*, but not *q*,” without contradiction).

²¹ Echoing this constraint, Storto and Tanenhaus (2005) write that, “Like lexical content, the exclusive meaning of or should be ‘closely tied’ to the utterance of this lexical item and become available as soon as the disjunction is heard” (433).

²² No authoritative term for this enriched content has emerged. Bach (1994) refers to this as “conversational implicature”, to distinguish it from implicature. Relevance theorists (such as Sperber and Wilson 1986/95) call it “explicature”. And Recanati (2004) identifies it as “what is said,” though Bach (2001), cleaving close to Grice, explicitly rejects that term’s application.

²³ Here, ‘relevance’ is a technical term. Sperber and Wilson (1986/95) explain that a belief (of which interpretations are a subset) is relevant to the extent it strengthens or defeats existing beliefs or combines with existing beliefs to yield some new implications and “to the extent that the effort required to achieve these positive cognitive effects is small” (266).

²⁴ Importantly, in any instance the interpretation that one settles on will not necessarily be the most relevant possible interpretation. Rather, it is a belief that closely matches a presumption of relevance conveyed by verbal cues and other aspects of the communicative act.

²⁵ The processing time results were replicated in a follow up study that did not instruct participants to read the sentences in a certain way. Those participants who, of their own accord, interpreted T1 pragmatically (as revealed by their responses) were observed to respond slower than those who interpreted it logically.

²⁶ See Geurts (2010, 91–93) for a more complete review of this intricate study. For some test sentences, results actually corresponded to the predictions of *syntactic correlation* views. However, reading times for these sentences are also readily explicable according to *revisionist* and *real implicature* views, whereas results like those discussed above do not seem explicable according to *syntactic correlation* views. Thus *syntactic correlation* views seem to conform least well to the totality of the evidence. But, see Huang and Snedeker (2009) for careful criticisms of both Bott and Noveck (2004) and Breheny et al. (2006).

²⁷ Other studies that cast doubt on *syntactic correlation* views include Bezuidenhout and Cutting (2002), Noveck and Posada (2003), Bezuidenhout and Morris (2004), De Neys and Schaeken (2007), Geurts and Pouscoulous (2009), Pijnacker et al. (2009), and Grodner and Sedivy (2011).

²⁸ Among those who overgeneralize in this way are Carston (1995), Bott and Noveck (2004), Bezuidenhout and Morris (2004), and Noveck and Reboul (2008).

²⁹ What contextual knowledge would suggest the derivation of the scalar information in this instance? Presumably, the knowledge that if there are two girls to which one could be referring, and one of the girls has all of something (the soccer balls), whereas the other has only some and not all of something (the socks), using the phrase “the girl with some” would be suboptimal and confusing if one was talking about the girl with the soccer balls.

³⁰ Of course, we wouldn’t want to overemphasize this division of labor. Nowadays it is often a single theorist who proposes and tests a theory.

³¹ Here I have given a selective overview of several topics in experimental pragmatics. Were it not for limitations of space, I might have covered a number of other topics, including irony, metaphor, presupposition, and linguistic vagueness. A number of other resources are available to readers interested in gaining a more comprehensive overview of this dynamic area of research. Such readers might begin further investigations with the collection of essays, *Experimental Pragmatics*, edited by Noveck and Sperber (2004). Other useful introductory resources include review articles by Noveck and Reboul (2008), Breheny (2011) and Gibbs (In Press). Finally, one additional work that has been of enormous help to me in untangling the complicated literature on scalar implicatures is Geurts’ (2010) book on the general topic of *Quantity Implicatures*.

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