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# Presupposition and implicature\*

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## 1 Introduction

Once regarded as unruly and suspiciously non-logical (Horn 1996: 299), presupposition and implicature have risen, over the past few decades, to a pre-eminent place in semantics and pragmatics. They are now among the most trusted and widely explored sources of insight into how language and context interact, the role of social cognition in shaping linguistic behavior, and the nature of linguistic meaning itself.

This chapter provides a broad overview of these phenomena and current theories of them. Unfortunately, there is not space to develop any of these accounts in detail, so I rely largely on brief descriptions and extensive references to the primary and secondary literature. Section 2 discusses presupposition, Section 3 conversational implicature, and Section 4 conventional implicature. I close (Section 5) by trying to characterize the relationships between these classes of meaning and reviewing proposals for merging them.

Presupposition and implicature are defined in part by their collective opposition to the regular semantic content. I henceforth refer to this content as *at-issue*.<sup>2</sup> At-issue content corresponds to what Frege (1892/1980) calls the ‘sense’ and what Grice (1975) calls ‘what is said’. It is often labeled ‘truth-conditional content’, though that is confusing, since presuppositions and implicatures can generally be evaluated for truth and will thus affect the conditions under which a speaker’s utterance is judged true. Roberts (1996) calls it ‘proffered’ content, which, like ‘at-issue’, helps to convey that hearers will expect this information to constitute the speaker’s central message. I leave open whether the at-issue content is delimited by semantic or pragmatic considerations; the answer depends in part on how presupposition and implicature are defined, which, we will see, is still hotly contested.

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<sup>2</sup> This term is due to William A. Ladusaw, who began using it informally in his UCSC undergraduate classes in 1985 (Ladusaw, p.c. Jan 2013).

## 2 Presupposition

The presuppositions of an utterance are the pieces of information that the speaker assumes (or acts as if she assumes) in order for her utterance to be meaningful in the current context. This broad characterization encompasses everything from general conversational norms to the particulars of how specific linguistic expressions are construed. The current section explicates these notions, connects them with specific linguistic phenomena and interactional patterns, and reviews a range of methods for theorizing about them.<sup>3</sup>

Theories of presupposition are intimately related to theories of what discourse contexts are like and the ways in which they shape, and are shaped by, language use. Unfortunately, there is not space to review this literature here. Interested readers are referred to Thomason 1990 and Roberts 2004 for general introductions. Influential foundational work in this area includes the papers collected in Stalnaker 1998; the diverse approaches to modeling common ground in Gauker 1998, Gunlogson 2001, and Farkas & Bruce 2010; the theory of indexicals in Kaplan 1978, 1989; the dynamic approaches of Kamp 1981 and Heim 1982; the question-driven models of Roberts 1996 and Ginzburg 1996; and the goal-driven models of Perrault & Allen 1980, Allen 1991, Benz *et al.* 2005b, and Stone *et al.* 2007.

### 2.1 Kinds of presupposition

Starting from the broad characterization given above, we might impose a further distinction: *pragmatic* presuppositions are purely speaker actions, whereas *semantic* presuppositions trace to conventional aspects of the meanings of specific words and constructions.

#### Pragmatic presupposition

Stalnaker (1970, 1973, 1974) developed the theory of pragmatic (*speaker, conversational*) presuppositions (see also Stalnaker 1998 and Simons 2003 for recent expositions). Pragmatic presuppositions include the preconditions for linguistic interaction (for example, the mutual public knowledge that we are speaking the same language), the norms of turn-taking in dialogue, and more particularized information about conversational plans and goals. The clearest instances of pragmatic presuppositions are those that cannot easily be traced to specific words or phrases, but rather seem to arise from more general properties of the context and the expectations of the discourse participants.

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<sup>3</sup> Handbook articles devoted entirely to presupposition include Soames 1989; Thomason 1990; Beaver 1997; Simons 2006; Atlas 2004; Beaver & Geurts 2012.

### Semantic presupposition

Semantic (*conventional, lexical*) presuppositions are part of the encoded meanings of specific words and constructions, called presupposition *triggers*. The concept is often attributed to Frege (1892/1980) and Strawson (1950) (who, though, doubted the viability of a precise logical account; Horn 1996: 304). Chierchia & McConnell-Ginet (1990) and Heim & Kratzer (1998: §4) provide accessible general introductions to semantic accounts of presupposition. Although the label ‘semantic’ suggests a clean split from pragmatics, even semantic presuppositions are pragmatic in the sense that they must be evaluated in the discourse participants’ common ground; most presuppositions hold only in specific contexts, so one always needs to know at least what the background store of knowledge is in order to evaluate them. Karttunen (1974) and Soames (1982) define a related notion of *utterance presupposition* to capture this mix of semantic (conventional) and pragmatic properties. Semantic accounts are potentially compatible with pragmatic ones, in the sense that using a presupposition trigger is an excellent way to achieve the speaker action of presupposing. However, the semantic view at least allows for the possibility that a speaker’s utterance could presuppose a proposition *p* (as a matter of convention) even as that speaker did not intend to presuppose *p* (Soames 1982: 486; Levinson 1995), whereas this is impossible in an account founded entirely on speaker intentions.

### Semantic or pragmatic?

The question arises whether both semantic and pragmatic presuppositions exist. Stalnaker argued that all presuppositions should be understood in pragmatic terms; though he acknowledges that semantics has a major role to play in defining presuppositions in context, he writes, “I think all of the facts can be stated and explained directly in terms of the underlying notion of speaker presupposition, and without introducing an intermediate notion of presupposition as a relation holding between sentences (or statements) and propositions” (Stalnaker 1974: 50). Kempson (1975), Wilson (1975), Atlas (1976, 1977, 1979), Atlas & Levinson (1981), and Boër & Lycan (1976) sought to make good on this by showing that even fine-grained interactions between presuppositions and at-issue content can be explained using pragmatic principles. The rise of dynamic semantics throughout the 1980s and 1990s (Kamp, 1981; Kamp & Reyle, 1993; Heim, 1982, 1983; Groenendijk & Stokhof, 1991; Chierchia, 1995; Beaver, 2001) seemed to propel semantic accounts forward, to the point that Chierchia (2004: 48) even declares them victorious. However, more recently, Schlenker (2007a, 2008a) has led a revitalization of the pragmatic approach, with richer notions of logical form and additional pragmatic principles (Heim, 1991). And so the debate continues. Keenan (1971) argued that both kinds are real (cf. Shanon 1976), and his view is arguably the

dominant one, though, at present, it probably manifests itself largely as non-commitment about the full picture even as more and more of the heavy-lifting is assigned to the pragmatics (Abbott, 2006; Simons, 2001, 2005).

## 2.2 Presupposition triggers

Table 1 lists a variety of expressions that have been analyzed as presuppositional. In listing them this way, I do not intend to claim that the presuppositions are semantic. Rather, the ‘trigger’ designation can be understood here as reflecting claims that, at a descriptive level, these items correlate with the presence of specific presuppositions. For each item, one can ask whether this regularity stems from lexical encoding or more general pragmatic considerations. Two general themes might guide such investigations.

First, one might wonder how idiosyncratic the presuppositions are. Beaver & Condoravdi (2003) and Abrusán (2011) argue that the presuppositions attached to at least some triggers are predictable from their at-issue dimensions. This is a twist in the debate about whether presuppositions are semantic or pragmatic, because it suggests that (at least some) presuppositions might be emergent from the at-issue meaning and its interactions with general pragmatic pressures, but also conventionalized.

Second, we can roughly divide Table 1 according to the nature of the dependencies between the at-issue and presupposed content. For (ix)–(xvii), the dependencies seem weak in the sense that the falsity of the presupposed content does not make the whole sentence meaningless. For example, “*Kim managed to pass*” conveys the at-issue proposition that Kim passed and also potentially presupposes (roughly) that Kim was expected not to pass. These two propositions are logically independent and, in turn, if the speaker is wrong about the presupposition, the at-issue claim still goes through. In contrast, the at-issue dimensions in (i)–(viii) truly depend upon the truth of their presuppositions. For example, uttering “*The student is here*” in a room full of students might convey no at-issue content (unless further structure is imposed on the domain; Frazier 2008), because the presupposition that there is a unique salient student in the context is a precondition for meaningfulness. Of course, further inspection is likely to complicate these distinctions considerably (von Stechow, 2004; Schoubye, 2009), but it is worth keeping in mind, both for understanding presuppositions in their own right and for understanding how they relate to conventional implicatures (see especially Section 4.1).

## 2.3 Presupposition projection

The *projection problem* for presuppositions (Morgan, 1969; Karttunen, 1973; Langendoen & Savin, 1971) concerns the way in which presuppositions introduced by embedded triggers interact with the semantic operators that take scope over them. The present section reviews the projection problem using

- i. Aspectual predicates like “*continue*” and “*stop*” (Simons, 2001; Abusch, 2002; Abrusán, 2011)
- ii. Attitude predicates like “*know*”, “*realize*”, and “*regret*” (Kiparsky & Kiparsky, 1970; Karttunen, 1973, 1974; Heim, 1992; Abusch & Rooth, 2004; Beaver, 2001, 2010)
- iii. Definite determiners and demonstratives (Strawson, 1950; Frege, 1892/1980; Russell, 1905, 1957; Kamp, 1981; Heim, 1982, 1983; Prince, 1981; Roberts, 2002, 2003; von Stechow, 2004; Elbourne, 2005, 2008; Schwarz, 2009; Schoubye, 2009)
- iv. Indefinite determiners (Karttunen, 1976; Kamp, 1981; Prince, 1981; Heim, 1982, 1983; Elbourne, 2005)
- v. Pronouns (Karttunen, 1976; Kamp, 1981; Prince, 1981; Heim, 1982, 1983, 1990; Elbourne, 2005)
- vi. Proper names (Prince, 1981)
- vii. Quantifier domains (Cooper, 1983; Gawron, 1996; Abusch & Rooth, 2004; Roberts, 1995, 2004)
- viii. Sortal restrictions (Thomason, 1972)
- ix. Additive particles like “*too*”, “*also*”, and “*either*” (Karttunen, 1974; Heim, 1992; van der Sandt & Geurts, 2001; Cohen, 2009)
- x. Adjunct clauses headed by prepositions like “*before*” and “*after*” (Heinämäki, 1974; Beaver & Condoravdi, 2003)
- xi. Appositives (Potts, 2002a,b; Schlenker, 2010, 2009)
- xii. Clefts (Soames, 1982; Delin, 1992, 1995; Prince, 1986)
- xiii. Discourse particles like “*even*” and “*only*” (von Stechow, 1999; Büring & Hartmann, 2001; Beaver & Clark, 2008), German “*überhaupt*” (Anderssen, 2011; Rojas-Esponda, 2014), German “*wieder*” (Blutner & Jäger, 2003)
- xiv. Implicative verbs like “*manage*” and “*fail*” (Karttunen, 1971; Karttunen & Peters, 1979)
- xv. Intonational contours, including topic and focus accents and verum focus (Jackendoff, 1972; Geurts & van der Sandt, 2004; Roberts, 1996; Büring, 1997)
- xvi. Evidentials (McCready, 2005; McCready & Asher, 2006; Sauerland & Schenner, 2007)
- xvii. Manner adverbs like “*quickly*” (Abbott, 2000)

**Table 1.** Alleged presupposition triggers. This list is partly derived from similar lists in Simons 2006 and Beaver & Geurts 2012.

the holes–plugs–filters typology first established by Karttunen (1973) and often called the *family of sentences* test for presuppositions (for more extensive introductions and discussion, see Chierchia & McConnell-Ginet 1990; Beaver 1997, 2001; Tonhauser *et al.* 2013).

The projection problem seems to fit more naturally within a semantic view of presupposition than a pragmatic one, since the lexically encoded presuppositions can interact directly with other operators as part of the compositional process. However, advocates of a pragmatic approach have worked hard to show that projection behavior can be reduced to interactions between sentence meanings and general pragmatic principles (Section 2.6).

### Presupposition holes

Karttunen (1973) introduced the notion of a presupposition *hole*: a semantic operator that allows presuppositions to slip through it, even as that operator targets the at-issue content. The major holes for presuppositions are negation, modals, conditional antecedents, and interrogative operators. I illustrate in (1a–1d).

- |  |                              |
|--|------------------------------|
| (1) Sam quit smoking.                    | $\varphi_p$                  |
| a) Sam didn't quit smoking.              | $\neg\varphi_p$              |
| b) Sam might quit smoking.               | $\diamond\varphi_p$          |
| c) If Sam quit smoking, he'll be grumpy. | $\text{IF}(\varphi_p, \psi)$ |
| d) Did Sam quit smoking?                 | $?\varphi_p$                 |

Assume that (1) has the at-issue content that Sam does not smoke at present ( $\varphi$ ) and the presupposition that he smoked in the past (subscript  $p$ ). The translations on the right in (1a–1d) have  $p$  in the scope of negation, a possibility modal, a conditional operator, and an interrogative operator. And yet, whereas  $\varphi$  is modified by these semantic operators (the *veridicality* of  $\varphi$  is reduced; Giannakidou 1999),  $p$  remains, in some sense, an entailment of all of these sentences.

The translations help reveal the common form of the hole generalization. Let  $H$  be a semantic operator and  $\chi$  a meaning that  $H$  can operate on. Then  $H$  is a hole for presuppositions if and only if  $H(\chi)$  presupposes everything that  $\chi$  presupposes. The holes in turn provide a necessary condition for presuppositions: if  $p$  is a presupposition in  $\chi_p$ , then  $p$  is entailed by  $H(\chi_p)$  for all holes  $H$ . The holes do not themselves provide a sufficient condition for classifying a meaning as presupposed, since non-presupposed material can also project past them (Beaver 2001: 20 and Section 4.3 below).

### Presupposition plugs

Karttunen's (1973) presupposition *plugs* block off the projection of presuppositions. The standard plugs are non-factive attitude predicates and verbs of saying:

- (2) a) CNN reported that Sam quit smoking. report(cnn,  $\varphi_p$ )  
 b) Kim believes that Sam quit smoking. believe(kim,  $\varphi_p$ )

Assume as before that  $\varphi_p$  has the at-issue content that Sam does not smoke at present ( $\varphi$ ) and the presupposition that he smoked in the past (subscript  $p$ ). Neither example in (2) need entail  $p$ . Rather, the examples can be construed so that  $p$  is ascribed to the denotation of the matrix subject. In other words, the presupposition is evaluated as part of the argument to the matrix verbs. The same pattern arises with adverbials like “*According to Kim*”, reenforcing the notion that the patterns are semantic rather than syntactic. Finally, tense morphemes can also exhibit plug-like behavior. For example, a speaker who utters “*In 1914, Princip assassinated the Archduke*” is not committed to the presupposition that there is currently a unique Archduke. Rather, the presupposition-triggering definite is evaluated relative to the past time-span established by “*In 1914*”.

Karttunen (1973) observed that plugs tend to “leak”, in the sense that presuppositions commonly do get through them to become commitments of another agent. For instance, a journalist who reports “*Acme said that it stopped making widgets*” will normally be construed as committed to the proposition that Acme made widgets in the past (Simons, 2007; de Marneffe *et al.*, 2012), even though we expect “*say*” to confine this commitment to Acme. The ways in which this happens are potentially various and not well understood. It could be that the presupposed content can be evaluated semantically at different places in the logical form, creating an ambiguity. On the other hand, the apparent ambiguity might be purely pragmatic, stemming from assumptions about how the speaker’s attitudes will align with those of the people she mentions. For discussion, see Beaver & Geurts 2012: §3.

Pluggability is perhaps a necessary condition for presuppositionality, but it isn’t a sufficient one. After all, regular at-issue entailments are plugged, and conversational implicatures can often give the appearance of having been plugged, depending on which contextual assumptions are in place (Russell, 2006; Geurts, 2009). Thus, the most we can say is the (rather weak) statement that if  $p$  is a presupposition, then  $p$  need not be a commitment of  $P(\varphi_p)$  for any plug  $P$ .

### Presupposition filters

Karttunen’s (1973) presupposition filters show a systematic mix of hole and plug behavior. I begin with conditional consequents. We saw above that the antecedent of a conditional is a hole: presuppositions introduced there slip right past the irrealis environment to become commitments. For the consequent of the conditional, we see both hole and plug behavior:

- (3) a) If Sam is smart, then he quit smoking. IF( $\psi$ ,  $\varphi_p$ )  
 b) If Sam smoked in the past, then he quit smoking. IF( $p$ ,  $\varphi_p$ )



Example (3a) presupposes that Sam once smoked, making it look like the consequent is also a hole position. In contrast, (3b) does not presuppose that Sam once smoked. After all, that's just what the speaker wants to conditionalize, as reflected in my informal translation. Therein lies the crucial difference: where the antecedent entails the presuppositions of the consequent, those presuppositions do not project. More precisely, a conditional of the form  $\text{IF}(\varphi, \psi_p)$  presupposes  $p$  unless  $\varphi$  entails  $p$ . In this sense, the entire conditional construction is a filter for presuppositions introduced in its consequent, catching the ones that are entailed by the antecedent and letting the others slip through.<sup>4</sup> The same pattern holds for conjunctions:  $\varphi \wedge \psi_p$  presupposes  $p$  unless  $\varphi$  entails  $p$ . This is important, but less striking than the conditional, since it corresponds to what one would expect from sequential interpretation of two pieces of at-issue content (though Schlenker 2008b notes flaws in this picture).

Disjunction is also a filter, though its filtering pattern is different from conditionals and conjunctions:

- (4) a) Either Sam took up watercolors or he quit smoking.  $\psi \vee \varphi_p$   
 b) Either Sam never smoked or he quit smoking.  $\neg p \vee \varphi_p$

Imagine (4a) is a conjecture about Sam's New Year's resolutions. The right disjunct presupposes that he smoked in the past, as does the entire sentence. In contrast, (4b) does not presuppose that Sam ever smoked. This is in virtue of the fact that the left disjunct entails the *negation* of the presupposition. More generally,  $\psi \vee \varphi_p$  and  $\varphi_p \vee \psi$  presuppose  $p$  unless  $\psi$  entails the negation of  $p$ . Thus, disjunctions are filters in the sense that the presuppositions of a disjunct project unless the other disjunct entails the negation of that presupposition, in which case it is plugged.

## 2.4 Presuppositions in discourse

This section reviews tests for presupposition that concern their status in the discourse. The overall picture is one of meanings that are backgrounded and presumed uncontroversial by the speaker, thereby placing hearers who want to object to them in an awkward rhetorical position.

### Backgrounding

Arguably the defining feature of presuppositions, at least in the pre-theoretical sense, is that the speaker acts as if he presumes them already to be in the common ground. As a result, it is generally possible for the speaker to explicitly articulate the presupposed content before relying on it presuppositionally:

<sup>4</sup> The projection pattern is actually more complex than this, depending on the pragmatic relationship between antecedent and consequent and the presuppositions of each. Geurts (1996) calls this the *proviso problem*; see also Beaver 2001; Singh 2007; Schlenker 2011; Lassiter 2012.

- (5) a) Sam once smoked, but she quit smoking.  
 b) Sam has a dog, and her dog is sick.

Of course, such examples might seem plodding, given the ease of accommodation (Section 2.5), but they are not perceived to be redundant. Unlike the properties discussed above, this might be a sufficient condition for counting something as presuppositional, assuming we can independently identify established content that is re-invoked (made salient again) for rhetorical purposes (Horn, 1991; Ward & Birner, 2004).

### Hearer objections

Presuppositions are meanings that the speaker takes for granted and thus (acts as if she) assumes to be uncontroversial. Speakers might even go so far as to express certain pieces of information via presupposition triggers in order to signal what is and isn't up for debate. Thus, objecting to presuppositions can be difficult.

Standard denials are generally taken to *accept* presuppositions and target only the at-issue content. In (6), for example, the denials (6a–6c) all seem to join (6) in presupposing that Sam smoked in the past.

- (6) Sam quit smoking.  
 a) No/Wrong/Impossible.  
 b) No, he didn't.  
 c) I doubt it.

This behavior is expected given the hole status of negation (and, in the case of (6b), the preference for verb-phrase ellipsis to find its antecedent in actual linguistic material corresponding to the main assertion; Hankamer & Sag 1976; Johnson 2001; Frazier & Clifton 2005). When speakers do want to object to presupposed content, they typically have to resort to more specialized forms that first disrupt the flow of the conversation in order to re-invoke the presupposed content as an item for discussion. Shanon (1976) studies such devices, using 'Hey, wait a minute' and its variants as prototypical examples (see also von Stechow 2004):

- (7) Sam quit smoking.  
 a) Hey, wait a minute: I didn't know that Sam smoked!  
 b) Just a second: Sam never smoked!

Shanon's generalization is a necessary condition for presuppositionality: if  $p$  is a presupposition, then  $p$  can be denied with 'Wait a minute'-style devices. It is important that the generalization be stated this way because the same exclamations can be used to object to a wide range of non-at-issue-content, including conventional implicatures, appropriateness conditions, and conversational implicatures. (See Potts 2008 for corpus examples and Tonhauser *et al.* 2013 for discussion.) Thus, 'Hey, wait a minute' objections cannot, in

and of themselves, diagnose a meaning as a presupposition. However, they can play a valuable supporting role, because they avoid many of the linguistic and conceptual challenges that come with the embeddings necessary to run the projection tests reviewed in Section 2.3 above (Matthewson, 2006; von Stechow & Matthewson, 2008). In addition, the interactional nature of the test can shed light on the role of non-linguistic cognition in processing presuppositions.

## 2.5 Accommodation

Speakers routinely presuppose things that have not already been established as part of the common ground. When they do this, they are implicitly asking the other discourse participants to *accommodate* (Lewis, 1979) that information, by adding it to the common ground, or at least by adding to the common ground that the speaker is publicly committed to that information for the purposes of the current interaction. The ease with which this process happens depends on many factors. If the speaker is known to be knowledgeable and trustworthy, and the information is straightforward, then accommodation will be easy (as when I say to a stranger “My dog is energetic”). At the other end of the spectrum, surprising information from untrustworthy sources might trigger a reaction of the sort reviewed in Section 2.4 (as when a student says “My giraffe ate my homework”).

Thomason (1990) characterizes accommodation as something speakers do for a variety of social and communicative reasons: to speed the exchange of information along, to indicate that certain information should be adopted as uncontroversial, and to be discrete or polite as part of a broader negotiation. For example, he imagines a sign hanging on the gate to a pool area reading “*We regret that, due to renovations, our swimming pool will be closed to guests during the week of February 3*”. Suppose we say that “*regret*” presupposes the truth of its complement. Then the sign seems initially rather surprising, in that its purpose is to *inform* swimmers that the pool is closed, whereas our analysis says that it presupposes this content. Thus, on the presuppositional analysis, swimmers must accommodate the most important new information. And yet the effect of the sign is a desirable one: it places the management’s regrets in the spotlight, and the accommodation is harmless (even hard to notice) because the authors of the sign are presumed to be experts on the matter. (See also von Stechow 2008 on informative presuppositions.)

Accommodation is also intimately tied up with the projection problem; Beaver & Zeevat (2007) observe that the patterns of presupposition projection can be recast as patterns of accommodation. Suppose a presupposition trigger is embedded inside a plug, as in “*Joan said that Sam quit smoking*”, where the plug “*say*” embeds the trigger “*quit*”. Then there could be ambiguity about whether to resolve the presupposition globally (the speaker too believes Sam smoked in the past) or only inside Joan’s belief state. Put in other terms, this is a question about where we decide to accommodate the presupposition. A great deal of research has been devoted to understanding preferences for different

accommodation sites for various presuppositions (Heim, 1983; van der Sandt, 1988; Beaver & Zeevat, 2007; von Stechow, 2008; Schlenker, 2008a).

## 2.6 Theoretical approaches

### Partial functions

Arguably the dominant semantic account of presuppositions analyzes triggers as denoting partial functions. For example, assume that “*both*”, as in “*both linguists*”, presupposes that exactly two salient objects have the property named by its first argument. On a partial-function analysis of this presupposition, we say that “*both*” denotes a function with only two-membered properties in its domain. Attempting to apply such a function to a property with one or three members results in *undefinedness* — a freeze-up comparable to trying to cram Canadian money into a vending machine that accepts only American coins (that has only American coins in its domain). This analysis captures the presumptive nature of presuppositions: a presupposition failure anywhere causes a breakdown in semantic composition, so hearers are forced to accommodate in order to obtain something meaningful. The account helps explain the backgrounded, inaccessible nature of presuppositions, since they are not directly represented, but rather exist only as meta-properties of denotations. And it goes a long way toward deriving the projection behavior reviewed in Section 2.3. The technique translates easily to dynamic approaches in which sentences denote functions from contexts to contexts, defined only for contexts that entail their presuppositions (Heim, 1982, 1983, 1992).

### Trivalent logics

Accounts based in partial functions implicitly use an ‘undefined’ value in addition to True and False. This leads to a mismatch between the syntax of the language and its models (Carpenter 1997: 45; Muskens 1995: §2): in looking at an expression  $\text{both}(A)$ , we have something that is well-formed but might be meaningless, depending on the cardinality of  $A$  in the current context. Explicitly trivalent accounts handle this by introducing a third truth value and associating it with presupposition failure. Such accounts can then be defined so as to model the projection patterns we saw above (Beaver 1997; Beaver 2001: §2.2). Trivalent accounts include some of the earliest in formal semantics (Keenan, 1972; Karttunen, 1973) and have recently enjoyed a revival (George, 2008; Schlenker, 2008b).

### Supervaluations

Van Fraassen (1969) shows that supervaluations can capture the intuition of approaches based in partial functions or trivalent logics while sticking with total, two-valued logics (see also van Fraassen 1975; Thomason 1972, 1979;

Martin 1979). In essence, we think of presupposition triggers as denoting sets of functions of their usual type (the supervaluations). For “*both*”, these denotations all agree on the values assigned to two-membered sets and assign inconsistent values to the others. The areas of inconsistency correspond to presupposition failure. For additional discussion of supervaluations, in the context of vagueness and prototypes, see Kamp & Partee 1995 and Sorensen 2012.

### Anaphoric

One of the central early achievements of dynamic approaches to semantics was an elegant set of techniques for tracking the anaphoric connections between a wide range of nominals across discourses (Karttunen, 1976; Kamp, 1981; Heim, 1982; Groenendijk & Stokhof, 1991; Chierchia, 1995; Beaver, 2001; Bittner, 2001). In such systems, much of the work is handled by presuppositions: indefinites presuppose that their referents are novel (discourse new), while definites, pronouns, and proper names presuppose that their referents are discourse old. Where these presuppositions aren’t met, the speaker is implicitly asking the hearer to accommodate the needed discourse referents. Anaphoric approaches to presuppositions, pioneered by van der Sandt (1988, 1992), extend this basic insight to a much wider range of presupposition triggers. For example, a factive predication like “*realize p*” requires an anaphoric connection back to *p* earlier in the discourse. Van der Sandt proposes that all presuppositions are anaphoric in this sense, but it is common to find mixed approaches in which clearly anaphoric devices like referential expressions and additive particles are analyzed as anaphoric whereas others are modeled with different techniques. For extensive discussion, see Krahmer 1998, van der Sandt & Geurts 2001, Geurts & van der Sandt 2004, and Kripke 2009.

### Non-monotonic logics

Gazdar (1979a,b) offered a theory that sought to model both conversational implicatures and presupposition projection using a system that generated a wide range of presuppositions (and other kinds of meaning) and then explicitly canceled them via interactions with the surrounding logical form or the context of utterance. Such behavior was later codified in research on default and non-monotonic logics (Antonelli, 2012), which Mercer (1987, 1992) explicitly applies to the study of presuppositions in a broadly Gazdarian fashion. These approaches came into their own with the advent of explicit systems of *abductive* inference (inference to the best explanation), which paved the way to modeling presuppositions as default assumptions the hearer makes in order to ensure that the speaker’s behavior emerges as maximally cooperative given the current plans and goals (Stone & Thomason, 2003; Stone *et al.*, 2007). These approaches naturally give rise to a view of presupposition and accommodation as less tied to the grammar than to social cognition and interactional norms.

### General pragmatic pressures

As I mentioned in Section 2.1, Stalnaker (1970, 1973, 1974) argues that all presuppositions are pragmatic, but he did not himself show how to reconcile this view with the fine-grained details of the projection problem or the apparently sub-sentential nature of some accommodation. However, Atlas (1976, 1977, 1979), Atlas & Levinson (1981), Boër & Lycan (1976), Kempson (1975), Wilson (1975), and others working in ‘radical pragmatics’ sought to do just this by deriving all presuppositions from a semantics involving only at-issue content, and a pragmatic theory of the sort described by Grice (1975) (discussed in Section 3). We can get a flavor of the general strategy by considering the presupposition holes (Section 2.3). A pragmatic approach to those facts would reject the translation of (1a) as  $\neg\varphi_p$ , analyzing it instead as  $p \wedge \neg\varphi$  and relying on general considerations of informativity to explain why this logical form is so clearly preferred over  $\neg(p \wedge \varphi)$  and  $\neg p \wedge \varphi$ . For more recent analyses along these lines, see Schlenker 2007a, 2008a.

### 3 Conversational implicature

Conversational implicatures are the centerpiece of Gricean pragmatics (Grice, 1989) and its subsequent developments. On Grice's conception, they require speakers to reason not only in terms of their language but also their understanding of the context and each other's goals and intentions. This places conversational implicatures at the center of debates about the distinction between semantics and pragmatics and guarantees them a leading role in investigations of language and social cognition. This section reviews the theory of conversational implicature and then briefly describes the prominent approaches that researchers have taken to understanding them.<sup>5</sup>

#### 3.1 Conversational maxims

Grice's (1975) cooperative principle and its specific submaxims are the driving force behind conversational implicature:

- (8) **The Cooperative Principle:** Make your contribution as is required, when it is required, by the conversation in which you are engaged.
- a) **Quality:** Contribute only what you know to be true. Do not say false things. Do not say things for which you lack evidence.
  - b) **Quantity:** Make your contribution as informative as is required. Do not say more than is required.
  - c) **Relation (Relevance):** Make your contribution relevant.
  - d) **Manner:** (i) Avoid obscurity; (ii) avoid ambiguity; (iii) be brief; (iv) be orderly.

The maxims are like rules of the road for normal interactions between rational agents: we are expected to follow them, we expect others to follow them, and interesting things happen when those expectations aren't met. Grice (1975: 49) identified three ways in which an otherwise cooperative speaker might fail to live up to their demands: she might *opt-out* of one or more maxims, as when a politician or defendant refuses to answer a direct question; she might experience an unavoidable *clash* between two or more maxims (for example, when the need to be informative conflicts with the need to be truthful); or she might *flout* ("blatantly fail to fulfill") one or more maxims. We will shortly see that both clashes and floutings are closely associated with conversational implicature.

The original maxims are not the only pressures at work on us when we speak. For example, the pressure to be polite can be powerful (Grice 1975: 47); in some situations, it can overwhelm all the other pragmatic pressures (Lakoff, 1973, 1977; Brown & Levinson, 1978, 1987). In a similar vein, Davis (2010) offers the maxim "Be stylish, so be beautiful, distinctive, entertaining, and

<sup>5</sup> Handbook articles devoted entirely to conversational implicature include Walker 1975; Horn 2004; Davis 2010.

interesting”, a pressure that might cause one to violate manner and perhaps other maxims, say, by using obscure slang to help construct a particular social identity.

There is evidence that Grice offered the maxims tentatively, as examples to be refined later (Chapman 2005: §5). They have shown remarkable staying power, but variants have been explored. Lewis (1976) defines quality (assertability) in terms of subjective probabilities. Joshi’s (1982) quality requires the speaker to model the hearer in order to head-off misleading inferences she might make. Horn (1984, 1989, 1996) reduces the maxims to directly opposing principles governing speaker effort and hearer enrichment. Levinson (2000) reduces the maxims to three, also seeking to capture the division of pragmatic labor. Relevance Theory (Sperber & Wilson, 1995, 2004) seeks to reduce the maxims to just one, though with internal oppositions derived from the often opposing needs of speakers and hearers. Recently, decision-theoretic approaches have sought to state the maxims more precisely or derive their effects from more basic considerations of utility and probability (Lewis, 1969; Merin, 1997; Lewis, 1975; Clark, 1996; Blutner, 1998, 2000; Parikh, 2001; Benz, 2005; van Rooy, 2004; Franke, 2009; Jäger, 2012). Finally, Asher & Lascarides (2013) argue for a more complete overhaul; focussing on discourses in which the participants’ goals are not fully aligned, they develop a coherence-driven model (Hobbs, 1979, 1985; Asher & Lascarides, 2003; Kehler, 2004; Kehler & Ward, 2006; Stone *et al.*, 2007) with variable levels of cooperativity and, in turn, a very different path to deriving conversational implicatures than the one Grice followed.

### 3.2 Defining conversational implicature

Grice (1975) does not define conversational implicature, but rather uses the above framework for pragmatics to “characterize” them:

“I am now in a position to characterize the notion of conversational implicature. A man who, by (in, when) saying (or making as if to say) that  $p$  has implicated that  $q$ , may be said to have conversationally implicated that  $q$ , PROVIDED THAT (1) he is to be presumed to be observing the conversational maxims, or at least the cooperative principle; (2) the supposition that he is aware that, or thinks that,  $q$  is required in order to make his saying or making as if to say  $p$  (or doing so in THOSE terms) consistent with this presumption; and (3) the speaker thinks (and would expect the hearer to think that the speaker thinks) that it is within the competence of the hearer to work out, or grasp intuitively, that the supposition mentioned in (2) IS required.” (Grice 1975: 49–50)

This is a dense read. In general, textbooks and other major reference works have sought to unravel it somewhat but have stayed close to its basic outline



(Levinson 1983: 113; Davis 2010). Hirschberg (1985: §2) criticizes such definitions for leaving crucial pieces of information implicit and unstated (e.g., “it must be assumed”, “to preserve 1”), and she develops a richer definition that fills in the gaps. The following is in the spirit of her revision but seeks to stay totally aligned with Grice’s clauses:

- (9) Proposition  $q$  is a *conversational implicature* of utterance  $U$  by agent  $A$  in context  $C$  if, and only if
- a) it is mutual, public knowledge of all the discourse participants in  $C$  that  $A$  is obeying the Cooperative Principle;
  - b) in order to maintain (9a), it must be assumed that  $A$  believes  $q$ ; and
  - c)  $A$  believes that it is mutual, public knowledge of all the discourse participants that (9b) holds.

Hirschberg does not stop here. She argues that we need to insist in addition that the inferences be cancelable, reinforceable, and non-conventional. (Grice seems to assume that these things follow from the definition; see Section 3.4 below for discussion.) Otherwise, Hirschberg argues, we do not fully distinguish conversational implicatures from regular at-issue entailments (see Section 3.3 for an example). Despite the problems, one can make out the guiding intuition: a conversational implicature is an inference that the hearer is *compelled* to make if he is going to continue to maintain that the speaker is cooperative. In turn, it is often possible to derive conversational implicatures by assuming that the implicature is false and then reasoning to a clash with the cooperativity assumption (Clause 9a).

On the above conception, conversational implicatures are derived from first principles during conversation; everything flows from cooperativity and the discourse participants’ modeling of each other’s intentions. However, Grice (1975: 56) allowed that this might not be the whole story, suggesting that the above definitions are primarily concerned with “particularized conversational implicature”, which depend on specialized features of the context to arise. He contrasted these with “generalized conversational implicature”, where “the use of a certain form of words in an utterance would normally (in the ABSENCE of special circumstances) carry such-and-such an implicature or type of implicature.” He observed that making the distinction is inevitably difficult, since generalized implicatures will be derivable as particularized ones, but he seems to endorse it. This has been an active area of research, receiving extensive theoretical and experimental attention (Section 3.5).

### 3.3 Examples and non-examples

This section derives some conversational implicatures using the Gricean maxims and Definition 9. I also work through a pragmatic inference that is not a conversational implicature, in an effort to show that ‘conversational implicature’ is a specialized term, not a concept that covers all contextual inferences.

### Scalar implicatures

Scalar implicatures were the first to be recognized (Chapman 2005: 94; Horn 1996) and are by far the most widely studied. Here is an informal definition of this class of implicatures; the crucial property is ‘communicative strength’:

- (10) An utterance  $U$  conveys a scalar conversational implicature iff there are alternative utterances  $U'$  that are at least as relevant as  $U$  in the discourse and that are communicatively stronger than  $U$ . (The content of this implicature will depend on the context, the nature of the utterance competition, and other pragmatic factors.)

The following reviews a basic scalar implicature calculation centered around numerical expressions:

- (11) Kyle to Ellen: “I have \$9.”                      Implicature: Kyle does not have  $>$  \$9.  
 a) *Contextual premise*: both Kyle and Ellen need \$10 for their movie tickets.  
 b) *Contextual premise*: it is mutual, public information that Kyle has complete knowledge of how much money he has on him.  
 c) Assume Kyle is cooperative in the sense of the cooperative principle and the maxims.  
 d) Then he will assert what is maximally relevant, informative, and true.  
 e) By (11a), the proposition  $p$  that Kyle has \$ $n$  for  $9 < n \leq 10$  is more informative and relevant in this context than the proposition that he has \$9.  
 f) Therefore, Kyle must be experiencing a clash between the maxims: he cannot assert  $p$  because he lacks sufficient evidence to do so.  
 g) By (11b), he must lack evidence for  $p$  because it is false.

This implicature (despite likely being one of the generalized implicatures that Grice alluded to) is heavily dependent upon the contextual assumptions we made. For example, if tickets cost \$9, then “I have \$9” is as informative as is required. Step (11e) is false, and the implicature cannot be derived. (Indeed, Kyle’s saying “I have \$10” might be regarded as immodest in such a context.) Similarly, if Kyle has already said that he can’t get some of his pockets open (say, the zippers are broken), then contextual assumption (11b) is not true, and we can’t derive the implicature, because (11g) doesn’t hold.

It is often assumed (if only implicitly) that the basic scalar implicature will be that the speaker does not know the stronger form. We reached this point at step (11f). Together with the ‘expert assumption’ in (11b), we were able to strengthen this to the conclusion that the speaker knows the stronger form to be false. This is basically a quantity–quality interaction. However, there can be many other reasons for scalar implicatures to arise. The stronger meaning might be impolite or immodest, for example, which would lead us to a conclusion that the speaker knows the implicature to be impolite, immodest, etc., rather than false as in (11g).

Discussions of scalar implicatures are often reduced to lists of lexical items ordered by entailment: <“some”, “most”, “every”>, <“might”, “must”>, <“or”, “and”>, and so forth (for an extensive list, see Levinson 1983: 134). Such examples suggest that we can reduce scalar implicatures to logical relationships between lexical items, with appropriate adjustments for the semantic environment in which they occur.<sup>6</sup> However, as Hirschberg (1985) shows at length, the label ‘scale’ (and the associated concept of a total ordering) is misleading for this class of inferences. Needed is the more general notion of a contextually-determined partial order. This allows for scalar implicatures where the relationship is not logical entailment (<“dating”, “married”, “engaged”>), where the lexical items involved cannot be totally ordered, and where the relationships vary by context (e.g., “cold/warm/hot coffee/champagne”) or exist only in certain contexts (Horn, 1972).

There is ongoing debate about whether scalar implicatures are truly conversational implicatures. This is one of the central issues distinguishing different theoretical approaches (Section 3.5).

### Relevance implicatures

Relevance implicature are so-called because they arise when a speaker seems to flout the maxim of relevance. They are common in indirect responses to direct questions, which are powerful in determining what is immediately relevant. In (12), I illustrate with an example adapted from Hirschberg 1985.

- (12) Ann: Do you sell paste?  
 Bill: I sell rubber cement.                      Implicature: Bill does not sell paste.
- a) *Contextual premise*: it is mutual, public information that Bill has complete knowledge of the items he sells.
  - b) *Contextual premise*: there is no contextual relationship between selling rubber cement and selling paste (some shops like Bill’s sell both, some sell one or the other, some sell neither).
  - c) Assume Bill is cooperative in the sense of the cooperative principle and the maxims.
  - d) By (12a), Bill can fully resolve Ann’s question, and by (12c), he will.
  - e) By the semantics of unbiased polar questions, the only fully resolving answers to Ann’s question are the proposition that Bill sells paste and the proposition that he does not sell paste.
  - f) By (12b), there is no way to infer from Bill’s answer to the proposition that he does sell paste. Since Bill is cooperative, he will avoid such obscurity.
  - g) Therefore, we conclude that Bill does not sell paste.

<sup>6</sup> The nature of these adjustments is itself controversial (Horn, 1972; Fauconnier, 1975; Levinson, 2000; Sauerland, 2001; Russell, 2006; Horn, 2006; Gazdar, 1979b,a; Hirschberg, 1985; Horn, 1989; Chierchia, 2004; Chierchia *et al.*, 2012; Geurts, 2009; Fox & Katzir, 2009).

As before, the inference is highly context dependent. If we replace (12a) with the assumption that Bill is known to be poorly organized and uncertain about what he has in stock, then we might reach only the weaker inference that he does not know whether he has paste. If paste is more expensive and Bill is a notorious up-seller, then we drop (12c) and almost no conversational implicatures go through, since Bill's reputation gets in the way of the assumption that he will provide maximally relevant information. If we replace contextual assumption (12b) with the (highly specialized and unusual) assumption that any shop selling rubber cement also sells paste, then Bill's answer simply contextually entails 'yes' and there is no need to invoke conversational implicatures.

Assuming cooperativity, indirect answers of this form give rise to additional conversational inferences about the set of questions (issues, goals) in play in the discourse (Ginzburg, 1996; Roberts, 1996; Büring, 1999; Büring, 2003; de Marneffe *et al.*, 2010). This too is relevance-based; once the conversational implicature is taken into account, Bill in fact over-answers the direct question. By relevance and quantity, we expect the additional information to be supplied only for good reasons. In the present case, Bill has inferred that, though Ann asked a specific question, her general goal is to stick light-weight materials together, making relevant any answer to "What do you sell for sticking things together?"

### Manner implicatures

The maxims of quality, quantity, and relevance do not govern language per se, but rather information more generally, and Grice (1975) sought to show that they were in effect in non-linguistic social exchanges. The maxim of manner is different in this regard, because it specifically targets linguistic forms and their relationships.

Manner implicatures were peripheral to the theory of conversational implicature until Horn's (1984) proposal for the division of pragmatic labor:

- (13) Normal events are reported with normal language; unusual events are reported with unusual language (Horn, 1984; Levinson, 2000).

Without this principle, most manner implicatures cannot be derived. Example (14) works through a classic manner implicature (McCawley, 1978) that exploits the specific submaxims 'be brief' and 'avoid obscurity', and depends crucially on Definition 13.

- (14) To show that she is pleased, Sue contracts her zygomatic major muscle and her orbicularis oculi muscle.  
*Implicature:* Sue's expressions of happiness are cold, clinical, and robotic.  
 a) Assume the speaker is cooperative.  
 b) Assume scientific language is associated with being cold and clinical.

- c) There is a shorter, less obscure form, “*smiles*”, competing with “*contracts her zygomatic major muscle and her orbicularis oculi muscle*”. The speaker has thus flouted manner.
- d) By Definition 13, Sue’s smiles must be unusual.
- e) By (14b), her smiles are unusual in being cold and clinical.

Strictly speaking, the pragmatic theory takes us only to (14d). We really need a theory of connotations to understand the interactions between (14d) and (14b) that get us to (14e).

Like our other examples, this implicature is context dependent. For example, if the speaker is known to be cold and clinical himself, then we do not draw the implicature, because we can’t interpret his choices as related to Sue in particular, nor can we be sure that the competition in (14c) is real or salient for him. Similarly, if the context is an anatomy class, then (14c) breaks down, because there is other communicative value in the longer expression.

Blutner (1998, 2000) inspired a number of attempts to formalize these inferences in broadly decision-theoretic terms (see also Jäger 2002, 2012; van Rooy 2003; Bergen *et al.* 2012), and he also expanded the empirical domain to include a wide range of lexical blocking patterns (Kiparsky, 1982).

### Non-implicatures

Conversational implicatures are rarefied meanings according to Definition 9. Many inferences that seem to be pragmatic clearly do not belong under this heading. The simplest examples of this form involve lexical entailments:

- (15) a) A: Was the movie good?  
 b) B: It was outstanding!

B’s response conveys “yes” as a response to the original question, though “yes” is not encoded. However, this is an entailment rather than an implicature; as a fact about the lexicon, “*outstanding*” entails “*good*”. The maxims are involved only peripherally (quality ensuring truthfulness; relevance ensuring that the answer engages the original issue). However, it should be said that we’re in a danger-zone here. We *can* push Definition 9 to include this inference: if we assume (i) B is cooperative but (ii) does not believe “yes (the movie was good)”, then B has contradicted herself (by the lexicon), which is uncooperative, contradicting our original premise (i). However, if this suffices for a conversational implicature, then *all* inferences (even semantic ones) will be classified as conversational implicatures. This is one reason why Hirschberg (1985) extends the definition to explicitly demand cancelability and non-conventionality.<sup>7</sup>

It seems desirable to exclude these examples from the class of conversational implicatures. However, there are other inferences that seem intuitively

<sup>7</sup> Gauker (2001) employs similar reasoning to argue that many apparent conversational implicatures follow as contextual inferences, without any need for the mutual mental modeling of Definition 9.

like conversational implicatures but that are excluded by Definition 9. In particular, because the definition is limited to situations in which the speaker's intentions are properly recognized, it leaves out cases where the hearer makes an inference that the speaker didn't intend. Similarly, Definition 9 is not stated in a way that makes it easy to come to grips with deception by conversational implicature (Solan & Tiersma, 2005; Asher & Lascarides, 2013), again because of its grounding in speaker intentions.

### 3.4 Properties

A variety of other properties of conversational implicatures are commonly identified. It is sometimes unclear whether they are presumed to follow from the basic definition or constitute an extension of it. This unclarity begins with Grice 1975, where the language is ambiguous. The most detailed discussion of these issues is by Hirschberg (1985).

**Calculability** Levinson (2000: 3) calls calculability “The more or less transparent derivation of the inference from the premises that include the assumption of rational conversational activity”. This is certainly intended to be part of the definition; if a meaning is present but cannot be derived from the maxims, then we have to attribute it to something else (lexical presupposition, conventional implicature, contextual entailment, etc). However, it is not definitional of conversational implicatures in virtue of the fact that other inferences flow from the maxims without meeting the strict definition of conversational implicature.

**Non-conventionality** In this context, a meaning is conventional just in case it is the result of the arbitrariness of the signs (lexical items, constructions). Thus, this is just another perspective on calculability — the inferences should derive, not (solely) from lexical or constructional idiosyncrasies, but rather from pragmatic interactions.

**Non-detachability** For implicatures deriving from the information-theoretic maxims — quality, quantity, and relevance — forms do not matter, because the pressures govern only content. We therefore predict that synonymous forms generate all the same implicatures. Manner implicatures create exceptions to this, in that they are driven by competition between forms that are synonymous in context but differ in a property like length or lexical frequency.

**Indeterminacy** Hirschberg (1985: 24) writes, “a conversational implicatum is often a disjunction of several possible interpretations of an utterance and is often indeterminate”. This is a consequence of the complex reasoning process involved in deriving implicatures. If there is any doubt about the relevant aspects of the context, the knowledge of the speaker, the speaker's assumptions about the capabilities of the addressee, and so forth, then there will be doubt about the implicatures. Since there is always some doubt, conversational implicatures are always somewhat uncertain.

**Re-enforceability** Levinson (2000: 15) writes, “It is often possible to add explicitly what is anyway implicated with less sense of redundancy than would be the case if one repeated the coded content”. For example, where “*A*” and “*B*” are event descriptions, “*A and B*” tends to conversationally implicate that “*A*” happened before “*B*”. Thus, there is no redundancy in “*and then*” or a follow-up “*in that order*”. In contrast, “*A then B*” entails that “*A*” happened before “*B*”, making “*in that order*” sound redundant. This contrast is arguably a consequence of indeterminacy: because there is always doubt about the presence of a conversational implicature, it is never totally redundant to explicitly encode it.

**Cancelability** Cancelability is the most important property of conversational implicatures. The term is used to cover at least three situations:

- i. *Direct cancellation*: the speaker utters lexical content that entails the negation of the implicature (“Some, indeed all, of the students passed the test.”).
- ii. *Suspension*: the speaker utters lexical content that indicates that she is not committed to the implicature or its negation (“Some, maybe all, of the students passed the test.”).
- iii. *Lack of contextual support*: the context is one in which an expected implicature does not arise. For example, “*and*” typically implicates temporal ordering, but not for stative predications.

Grice (1975: 57) seems to write as though cancellation were a consequence of his theory of conversational implicatures. Hirschberg (1985: 27) argues persuasively that this is incorrect and adds it as a separate requirement. However, one might question whether cancelability is even a necessary condition. Eckardt (2007) and Lauer (2013) observe that, within the confines of Grice’s theory, it is possible for a meaning to be a conversational implicature and yet have no contexts in which it can be rationally canceled. Similar observations are made by Magri (2009), who uses the evidence to motivate grammatical theories of conversational implicatures.

### 3.5 Theoretical approaches

There is continued debate about the best way to characterize and model conversational implicatures. This section charts out the major positions evident in the literature today. The divisions are adapted from those used by Horn (2006) and Geurts (2009).

#### Griceanism

The Gricean position, according to Horn (2006), is that “non-truth-conditional aspects of meaning are read off the output of semantically interpreted logical forms”. For conversational implicatures more narrowly, the central tenet is that, with the exception of manner, these meanings are purely information-theoretic; language is an efficient means of conveying complex propositional

information, but the enrichment itself is not narrowly linguistic. The founding paper is presumably Grice 1975, but the position is probably more extreme than that of Grice himself, who allowed for narrow linguistic influences in the area of generalized conversational implicatures.

Griceanism is often saddled with the additional tenet that one must first obtain a complete semantic meaning before beginning pragmatic enrichment. This is likely true of Grice's (1975) conception, but criticisms based on this idea tend to presuppose a static view of semantic interpretation. In dynamic accounts, where many subparts of a sentence correspond to meaningful units (Bittner, 2001, 2003), there is hardly ever a wait for propositional information, so even Griceanism need not preclude incremental pragmatic enrichment (Sedivy, 2007; Grodner & Sedivy, 2008) or local implicatures.

Griceanism is sometimes associated with the label 'noncism', which pertains to the notion that implicatures are derived via pragmatic mechanisms every time. That is, every inference of this form is the result of reasoning in terms of the meanings, the context, and the maxims. This is like a null hypothesis for the Gricean, to be rejected only if there is compelling evidence for something like generalized conversational implicature. The most extensive recent defenses of noncism are Russell 2006 and Geurts 2009. For partial or more focussed endorsements, see Sauerland 2010 and Ippolito 2010.

### Neo-Griceanism

Neo-Griceanism is most closely associated with Horn (1984), who reformulated the maxims along two lines: clearer tension between speaker goals and hearer goals, and increased emphasis on the role that specific form-based meanings can play in the calculation of conversational implicatures (the division of pragmatic labor; Definition 13). The hallmark distinction between Gricean and neo-Griceanism is that the neo-Gricean allows for a greater role for the grammar, especially in the area of scalar and manner implicatures.

### Grammaticism

Grammaticism holds that some conversational implicatures (generally scalar ones) arise, not through the complex process of social cognition that Grice outlined, but rather because they are conventionally associated with specific lexical items and derived compositionally. The clearest statement of this position is Chierchia (2004) (who cites earlier influences, especially Kadmon & Landman 1993 and Krifka 1995).

Grammaticist arguments tend to take the following form: one argues that a felicitous sentence is contradictory unless a proper subconstituent of that sentence is treated as having been locally enriched with a conversational implicature. For example, the sequence of sentences in (16) is contradictory if the antecedent clause "*you take phonology or semantics*" is treated as a classical



inclusive disjunction, the conditional is analyzed as a material conditional, and we assume that one cannot attend both meetings:

- (16) If you take phonology or semantics, you attend meeting A. If you take both, you attend meeting B.

However, if the antecedent “*you take phonology or semantics*” can be locally enriched to an exclusive disjunction, then there is no contradiction. Similar arguments have been made for comparatives (“*It is better to take phonology and semantics than to take phonology or semantics*”), the scope of non-monotone quantifiers (which do not support the inference patterns required for standard scalar implicature calculation), and meta-linguistic negation (among others; for extensive discussion, see Levinson 2000; Chierchia *et al.* 2012; Fox 2009; Russell 2006; Geurts 2009). Advocates of grammaticism have used these facts to develop and motivate their position (Fox, 2009; Chierchia *et al.*, 2012), while others have sought to explain them via Gricean or neo-Gricean argumentation (Sauerland, 2001; Russell, 2006; Geurts, 2009). The nature and prevalence of apparently local implicatures has also received experimental scrutiny (Geurts & Pouscoulous, 2009; Chemla, 2009; Ippolito, 2010; Sauerland, 2010; Clifton & Dube, 2010; Chemla & Spector, 2011).

Underspecification views are closely related to grammaticism. Such views argue that some things traditionally classified as conversational implicatures (mostly, scalar implicatures) are in fact derived via a process of taking an underspecified logical form and fleshing it out. Bach (1994, 2006c) calls these ‘conversational *implicitures*’. Relevance Theorists take a similar view, classifying them as ‘*explicatures*’ (based on the idea that they involve making an underspecified logical form more explicit). The differences between these two views seem to be small and mostly related to general issues of how to conceptualize pragmatic theory (Bach 2006a; Carston 2004: 650).

It should be born in mind that all forms of grammaticism come, not to abandon Gricean pragmatics, but rather to argue that (some) conversational implicatures are not derived using that theory. That is, the pressures of the maxims are still presumed to be in force. For example, on the grammaticist theory of Chierchia *et al.* (2012), local implicatures are derived from implicit exhaustification operators. Such operators are free to appear anywhere in a logical form, but context-specific pragmatic considerations of relevance and informativity favor some positions over others. Thus, even when the implicatures are local and grammatical, their nature and distribution still trace to broadly Gricean principles.

## Defaultism

The defaultist view is that some conversational implicatures are default inferences — presumptive meanings — that the hearer makes unless given reason not to by the speaker. Such reasons typically derive from Gricean factors. The

founding works are Levinson 1995, 2000, though the approach is certainly inspired by Grice's comments linking generalized implicature to presumptions (normal inferences). This proposal is related to grammaticism, but it differs from it philosophically: presuming is something that speakers do, not something that grammars do. Whereas we have precise implementations for localism, we do not have them for defaultism, though Levinson (2000) suggests that default logic (as in Gazdar 1979a,b) might capture the reasoning. However, it is not clear that scalar implicatures are as prevalent as this approach would have it (Paris, 1973; Geurts, 2009). The debate between (neo-)Griceanism and defaultism has been the subject of experimental work recently (Breheny *et al.*, 2006; Huang & Snedeker, 2009; Grodner *et al.*, 2010; Stiller *et al.*, 2011), with suggestive but inconclusive results.

## 4 Conventional implicature

Grice (1975) defines two major classes of meaning that are supposed to fall outside of “what is said (in the favored sense)”: conversational implicatures, discussed above, and conventional implicatures. The two classes share the ‘implicature’ designation, but it’s an uneasy union; as we’ll see, conventional implicatures have more in common with presuppositions and at-issue entailments than they do with conversational implicatures. In Potts 2007a (written in 2005), I wrote, “The history of conventional implicatures is rocky, their current status uncertain”. Since then, there has been an uptick in proposals for and against this class of meanings. In this section, I advocate for conventional implicatures, which offer insights into semantic composition and pragmatic enrichment that neither presupposition nor conversational implicature can.<sup>8</sup>

### 4.1 Defining conventional implicature

The guiding intuition for conventional implicatures is that they are entailed by lexical and constructional meanings but distinct from the regular at-issue content of the sentence. Bach (1999) and Neale (1999) credit Frege (1892/1980) with first identifying this class of meanings. Frege diagnosed the concessive adverb “*although*” as contributing, not to the ‘sense’ (roughly, the at-issue content) but rather to “illuminating it in a particular fashion” (p. 155; see also Frege 1918/1994 on the connotations of nouns like “*cur*”). Grice (1975) echoes this basic intuition when he first offers the term ‘conventional implicature’:

“In some cases the conventional meaning of the words used will determine what is implicated, besides helping to determine what is said. 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.” (Grice 1975: 44–45)

Grice’s intuition seems to be that the at-issue content of his example (“what is said (in the favored sense)”) is simply a conjunction  $E(x) \wedge B(x)$ , while the conventional implicature conveyed by “*therefore*” is more like  $E \Rightarrow B$ , where  $\Rightarrow$  is some kind of default inference relation. It is presumably this separation that leads him to classify  $E \Rightarrow B$  as an implicature, despite the fact that it is a lexical entailment (“I have certainly committed myself”) and thus unlike a conversational implicature.

<sup>8</sup> Handbook articles devoted entirely to conventional implicature include Potts 2007a,c, 2012; Horn 2007.

Like Frege, Grice did not give a precise definition or formalization of conventional implicatures. In later work, he toyed with the idea that they might relate to non-central speech acts (see also Rieber 1997; Gutzmann 2012), but he seems never to have moved past ostensive descriptions like the one above. To a strikingly high degree, the literature on conventional implicature has followed suit, eschewing rigorous treatments in favor of lists of examples. This has surely contributed to their playing only a minor role in semantic and pragmatic theories; whereas presuppositions were given precise, predictive formal treatments starting in the 1970s (Section 2.6), conventional implicatures seemed stuck at the terminological level (but see Section 4.4).

The following is a minimal definition, seeking to simply express the abstract principles in Grice’s passage:

- (17) Meaning  $p$  is a *conventional implicature* of phrase  $S$  if, and only if:
- a)  $p$  is a conventional (encoded) property of a lexical item or construction in  $S$
  - b)  $p$  is entailed by  $S$
  - c)  $p$ ’s truth or falsity has no effect on the at-issue content of  $S$

Horn (2007: 39) gives a definition that I read as equivalent to this:

“For Grice ([1967] 1989), a conventional implicature  $C$  associated with an expression  $E$  manifests the following two definitional properties: (i) by virtue of being conventional,  $C$  constitutes a non-cancelable aspect of the meaning of  $E$ , and (ii) by virtue of being an implicature,  $C$ ’s truth or falsity has no effect on the truth conditions of  $E$ .”

Horn’s (i) combines Clauses 17a and 17b. My separation allows that there might be conventional properties of words and constructions that are nonetheless not entailed. (Connotations are candidates for such meanings.) Horn’s clause (ii) corresponds to Clause 17c. His version is noteworthy for explicitly defining ‘implicature’ so as to pick out everything that is independent of the at-issue content. Once we factor out the conversational implicatures, conventional implicatures become an ‘elsewhere’ category, covering all non-at-issue content. Since this might be a heterogeneous class, one might feel pessimistic about achieving a unified theoretical understanding of it. Nonetheless, the definition has a number of striking consequences, which I discuss in detail in Section 4.3. First, though, it is useful to look briefly at the sort of items that researchers have analyzed as contributing conventional implicatures.

## 4.2 Examples

Table 2 lists a wide range of conventional implicature items. The list is partly adapted from Bach’s (1999: 333) list of ‘alleged conventional implicature devices’, but it also reflects more recent empirical claims. In terms of the linguistic phenomena, there is significant overlap between this list and the list of purported presupposition triggers in Table 1. This partly reflects the

continued uncertainty about how these concepts are delimited and partly reflects uncertainty about the underlying empirical phenomena. Unfortunately, there is not space to discuss any of these items in detail, to say nothing of trying to explicate how presuppositional and conventional-implicature analyses of them would differ. However, it is worth reviewing briefly how the conventional-implicature account is supposed to go for a few representative items.

- i. Adverbs: “*almost*” (Horn, 2002, 2011), “*already*”, “*barely*” (Horn, 2002), “*even*” (Karttunen & Peters, 1979; Horn, 1979; Bennett, 1982; Francescotti, 1995), “*only*” (Horn, 1979), “*still*”, “*yet*”, Japanese “*motto*” (Sawada, 2010)
- ii. Additive particles like “*too*”, “*also*”, and “*either*” (Horn, 2007)
- iii. Anaphoric epithets like “*the jerk*” (Corazza, 2005; Potts *et al.*, 2009)
- iv. Connectives: “*but*” (Rieber, 1997), “*nevertheless*”, “*so*”, “*therefore*” (Grice, 1975)
- v. Diminutives (Fortin, 2011)
- vi. Discourse particles (Kratzer, 1999, 2004; Gutzmann, 2012)
- vii. Exclamatives (Castroviejo Miró, 2010)
- viii. Honorifics and anti-honorifics (Potts & Kawahara, 2004; Potts *et al.*, 2009; McCready, 2010)
- ix. Implicative verbs (Karttunen, 1971; Karttunen & Peters, 1979): “*bother*”, “*condescend*”, “*continue*”, “*deign*”, “*fail*”, “*manage*”, “*stop*”
- x. Intonational contours: (Ward & Hirschberg, 1985; Kratzer, 2004; Constant, 2012; Gutzmann & Castroviejo Miró, 2008)
- xi. Parentheticals: supplementary (nonrestrictive) relative clauses (Chierchia & McConnell-Ginet, 1990; Potts, 2005), nominal appositives (Potts, 2007a), “*As*”-parentheticals (Potts, 2005)
- xii. Racial epithets (McCready, 2010)
- xiii. Swears (Potts, 2007b; Gutzmann, 2008; Barker *et al.*, 2010)
- xiv. Subordinating conjunctions: “*although*” (Frege, 1892/1980), “*despite (the fact that)*”, “*even though*”
- xv. Others: epistemic “*would*” (Ward *et al.*, 2003), epistemic “*must*” (Salmon, 2011), datives in English (Horn, 2007, 2008) and German (Gutzmann, 2007)

**Table 2.** Alleged conventional implicature items, partly adapted from Bach 1999.

The alleged conventional implicature device with the longest pedigree is “*but*”, which (at least in terms of the concessive intuition) traces all the way back to Frege (1892/1980), as we saw above. If nothing else, it is an ideal illustrative example, because its at-issue content can be described as logical conjunction, with the conventional implicature adding a separate and more general meaning:

- (18) Shaq is huge but agile.
- a) At-issue: Shaq is huge and Shaq is agile
  - b) Conventional implicature: (roughly) being huge normally precludes being agile<sup>9</sup>

For Karttunen & Peters (1979), the secondary meanings of verbs like “*manage*” are conventional implicatures:

- (19) Bart managed to pass the test.
- a) At-issue: Bart passed the test
  - b) Conventional implicature: (roughly) Bart’s passing defied expectations<sup>10</sup>

In Potts (2005, 2007a), I renounced my earlier presuppositional analysis of appositive clauses (Potts, 2002a) in favor of a conventional implicature analysis (see also Blakemore 1990, 1996 for different, but I think compatible, approaches):

- (20) Charlie, the pizza delivery person, is at the door.
- a) At-issue: Charlie is at the door
  - b) Conventional implicature: Charlie is the pizza delivery person

These examples look extremely heterogenous, perhaps as befits the ‘elsewhere’ nature of Definition 17. One striking property of the list, though, is that, with the exception of appositives, the alleged conventional implicature content is extremely hard to articulate (Potts, 2007b). Relatedly, it is context-dependent, not in the sense that it can be suspended or canceled, but rather in the sense that the particular meaning expressed is highly variable, often indexical, and greatly influenced by the speaker’s overall communicative goal and the nature of the surrounding at-issue content.

### 4.3 Properties

The goal of this section is to draw out the major consequences of Definition 17 and connect them with the kinds of examples in Table 2 above.

#### Semantic

Conventional implicatures are not really part of pragmatics. Unlike their conversational brethren, they are encoded in specific lexical item and constructions in a more or less idiosyncratic fashion. Indeed, Definition 17 makes no reference to the context of utterance, paving the way to including conventional implicatures entirely in the semantics. Of course, the precise nature

<sup>9</sup> For more serious attempts to characterize the secondary meaning of “*but*”, see Lakoff 1971; Blakemore 1989, 2000.

<sup>10</sup> I do not know of work attempting to explicate this meaning. However, Egan 2008 and Karttunen 2012 give extended analyses of phrasal implicatives.

of the conventional implicature might be highly context-dependent, as I remarked above, but this is arguably a routine example of lexical vagueness, which is pervasive in the at-issue dimension as well (Partee 1995: 332). This makes the label ‘implicature’ seem somewhat inapt (which Bach (1999) uses as a conceptual argument against conventional implicature).

### Independence

By Clause 17c, conventional implicatures are separate from the at-issue content. This is a clear theme in Table 2; in each case, the alleged conventional implicature seems to be logically independent of the central at-issue content of the items in question. This is relevant to the question of how we distinguish conventional implicatures from presuppositions. I touched on this point briefly in Section 2.2, where I observed that the (alleged) presupposition triggers in (i)–(viii) create dependencies between the at-issue and presupposed content, whereas those in (ix)–(xvii) seem to involve two independent dimensions of meaning. Horn (2007) regards this as distinguishing conventional implicatures from presuppositions; his remarks suggest that he would analyze all of (ix)–(xvii) as conventional implicatures on these grounds. The extensive citations in that part of the list suggest that this is a minority position. Karttunen & Peters (1979) embrace the uncertainty surrounding this question by using ‘conventional implicature’ as a broad cover-term that potentially includes all presuppositions (Section 4.4).

### (Strongly) projective

In Potts (2005), I regard the independence property as entailing a very strong form of projectivity in the sense of Section 2.3: if conventional implicatures are truly independent, then not only should they slip through presupposition holes, but they should also invariably evade plugs and filters, because any plug behavior would intermingle the at-issue and conventional implicature content. I argue that this is true of appositives and expressives, building on previous claims by Thorne (1972: 553), Boër & Lycan (1976: 21), Karttunen (1976: 367), Emonds (1976: §II9), and McCawley (1998: 451). These generalizations are called into question by Wang *et al.* (2005), Amaral *et al.* (2007), and Schlenker (2007b). Harris & Potts (2009a,b) seek to explain the apparent exceptions in pragmatic terms that leave the original claims about projection intact. Schlenker (2010, 2009) offers additional rejoinders.

Whatever the facts for appositives and expressive turn out to be, though, it is clear that not all of the items in Table 2 are strongly projective; most are plugged by plugs and slip past holes (the filter behavior is more uncertain), making their projection properties comparable to what we find for presuppositions. This leads Karttunen & Peters (1979) to define a projection theory for conventional implicatures that largely mirrors earlier projection theories

for presuppositions. The results seem to compromise the independence of conventional implicatures, since they can end up being merged with the at-issue content during semantic composition (Bach, 1999). However, it opens up new avenues in the study of projection behavior, since it decouples projection from backgrounding (accommodation) and helps introduce new empirical phenomena into the debate (Simons *et al.*, 2010; Tonhauser *et al.*, 2013).

### Secondary

If we accept that the at-issue content constitutes the primary content, then conventional implicatures emerge as secondary meanings. In tracing the historical origins of conventional implicatures (as a concept), Horn (2007) finds this secondary aspect of these meanings to be especially prominent in Frege 1892/1980, 1918/1994. Here at last are truly pragmatic notions: conventional implicatures are generally supporting content, designed to contextualize the at-issue content, assist with setting reference, establishing free contextual parameters, and so forth (Potts 2012: §3). This diagnosis helps to unify a wide range of empirical observations that have been made about the function of the items in Table 2 — for example, the role of appositives and expressives as providing ‘color’ and ‘commentary’ (Kaplan, 1999; Asher, 2000) and even the editorializing flavor of Grice’s original “*therefore*”. In my view, understanding this pragmatic role is the major issue for the study of conventional implicatures at present — the area most likely to yield fundamental insights into the multifaceted nature of linguistic meaning.

### Backgrounded?

As with presuppositions, the speaker likely assumes that her conventional implicatures will be uncontroversial. In the terms of Horn (2002, 2009), they are generally *assertorically inert*. This raises the question of whether conventional implicatures are obligatorily new or old. Definition 17 is silent on this matter, potentially allowing that the two classes of meaning might overlap. Karttunen & Peters (1979) embrace this in reducing presuppositions to conventional implicatures; for them, presuppositions are a special case of conventional implicatures, namely, those which, for pragmatic reasons, are presumed to be true already. In contrast, Potts (2005) and Horn (2007) (incorporating ideas from Frege 1892/1980, 1918/1994) assume that conventional implicatures are distinguished from presuppositions in being new. Thus, where the conventional implicature is old, it takes on the status of evoked content (known information that the speaker brings to salience), but the unmarked case is for conventional implicatures to quietly *impose* their content on the common ground (Farkas & Bruce, 2010; AnderBois *et al.*, 2010; AnderBois, 2010).



#### 4.4 Theoretical approaches

This section traces the development of theoretical and formal perspectives on conventional implicature. (See Section 5 for discussion of approaches seeking to reduce conventional implicatures to presuppositions.) The guiding idea of all the approaches discussed here is that individual words and phrases can be associated with different independent dimensions of meanings. For example, “*p but q*” denotes a pair of meanings:  $\langle \varphi \wedge \psi, R(\varphi, \psi) \rangle$ , where  $R$  stands for the concessive, argumentative meaning associated with “*but*”. The compositional process manages these two meanings, perhaps treating them in different ways (as they interact with semantic operators that take scope over them; Section 4.3). In the end, sentences denote  $n$ -tuples of meanings, with the first element modeling the at-issue dimension and the others capturing the conventional implicature dimension(s). The dimensions might play different roles in discourse as well, with the first normally giving the primary message and the others giving ancillary meanings (Section 4.3).

Karttunen & Peters (1979) pioneered this multidimensional approach, by combining the logical notions of Herzberger (1973) with the compositional theory of Montague (1973). The result is a fragment of English in which individual expressions are associated with ‘*e*’ (‘entailed’; our at-issue) meanings and ‘*i*’ (conventional implicature) meanings. In addition, expressions are associated with heritage functions, which operate on ‘*i*’ dimensions to manage projection (in the sense of Sections 2.3 and 4.3). These functions behave similarly to those of Keenan (1971) and Karttunen (1973, 1974), further blurring the distinction between conventional implicatures and presuppositions.

Karttunen & Peters (1979) are clear that they come to dismantle the notion of presupposition, which they see as having evolved to take on too many distinct uses and to cover too many different kinds of phenomena. However, at least at a terminological level, the effect went in the other direction: the term ‘conventional implicature’ came to be treated as a synonym of ‘presupposition’. In addition, the multidimensional approach appeared, at least initially, not to be a strong competitor for other formalizations of presupposition (as discussed in Section 2.6). This is likely due to the fact that Karttunen & Peters (1979) close their paper with an appendix pointing out that their fragment does not properly handle quantified cases. This came to be known as the ‘binding problem’ for their logic. Although the necessary fixes are straightforward, the damage was done, and it wasn’t until decades later that multidimensional approaches to presupposition were regarded as viable again (see Dekker 2002).

Karttunen & Peters’ (1979) model of conventional implicatures might be criticized on the grounds that it does not in fact achieve the sort of independence from at-issue content that Definition 17 specifies. After all, on their account, many conventional implicatures will have to be part of the arguments to attitude predicates, tense operators, and other plugs. Though they might retain some of their autonomy, they are still entwined with the at-issue content, compromising their independence. In a series of papers (Potts, 2005,

2007a,b), I argued that conventional implicatures are totally independent from the at-issue content. As a result, they cannot be the arguments to attitude predicates, quantifiers, tense operators, and so forth. This derives their strong projectivity (Section 4.3). It also limits the class of true conventional implicatures. Indeed, following Bach (1999), I am forced to conclude that many of the items listed in Table 2 are just secondary at-issue entailments. This logical approach is explored further by Barker *et al.* (2010), and related ideas are given a dynamic treatment by Nouwen (2007) and AnderBois *et al.* (2010).

Bach (2006b) and Horn (2007) argue that my formalization is not true to Grice's (1975) intentions, and McCready (2010), Gutzmann (2008, 2012), and others have developed modifications of my original multidimensional logic that exist somewhere between Karttunen & Peters' and my own in the sense that they allow for some dimensional interactions (non-trivial projection) while still identifying the strongly projective cases as a natural class.

## 5 Conclusion

I have so far discussed each of the three major dimensions of meaning largely in isolation, making comparisons only to illuminate their properties or address unavoidable controversies (Section 2.6, Section 4.1). To close this chapter, I'd like to make more systematic comparisons and devote some attention to research efforts aimed at combining these meaning classes.

Class	Conventional	Backgrounded	Projective
1. Semantic presupposition	yes	yes	yes
2. Local semantic presupposition	yes	yes	no
3. Pragmatic presupposition	no	yes	yes
4. Local pragmatic presupposition	no	yes	no
5. Conventional implicature	yes	no	yes
6. At-issue entailment	yes	no	no
7. Conversational implicature	no	no	yes
8. Local conversational implicature	no	no	no

**Table 3.** A typology of meaning classes.

Table 3 is an informal framework for thinking about how the meaning classes relate to each other. The columns correspond to the three major descriptive properties that form the backbone of this article. ‘Conventional’ stands in for the property of being lexically encoded. In the current context, one could also say ‘non-calculable and entailed’. This distinguishes conversational implicatures from the rest. ‘Backgrounded’ is the pragmatic property of being a meaning that the speaker presumes to be mutual public knowledge (or else acts as if he is making such a presumption, to encourage accommodation; Section 2.5). This identifies presuppositional content. ‘Projective’ gathers together the meanings that project past at least the presupposition holes. The projection patterns of presuppositions and conventional implicatures are discussed in Section 2.3 and Section 4.3, respectively.

Assuming we can always issue a firm ‘yes’ or ‘no’ verdict for each property, we have eight possible combinations, all of which I’ve included, along with descriptive labels. This chapter concentrated largely on classes 1, 3, 5, and 7.<sup>11</sup> However, all the other classes are arguably well attested. Class 2 identifies presuppositions that are (perhaps obligatorily) locally accommodated (Schlenker, 2008a; Beaver, 2008). Local accommodation for pragmatic

<sup>11</sup> These happen to be the ‘projective’ classes. From the perspective of Simons *et al.* (2010), this is not an accident. This chapter is devoted to non-at-issue content, and those authors argue that being not-at-issue systematically correlates with being projective (see also Tonhauser *et al.* 2013).

presuppositions (class 4) also seems fully expected, at least on purely pragmatic approaches (Section 2.6); on such accounts, apparent local presuppositions just reflect preferences for certain kinds of logical forms over others. In any event, the distinction between class 2 and class 4 really traces back to Section 2.1 and the debates surrounding the more general distinction between classes 1–2 and classes 3–4.

Distinguishing class 7 from class 8 is more challenging. Gricean and neo-Gricean accounts (Section 3.5) do not invoke any notion of projection, so it seems inappropriate to force this distinction on them. Empirically, they are able to achieve many local effects (Russell, 2006), but perhaps not all of them (Chemla & Spector, 2011). Grammaticist accounts (Section 3.5), on the other hand, do raise questions of projection. It seems fair to say that they predict class 8 to be robust, at least in the sense that they predict many conversational implicatures to be evaluated locally and interact with semantic operators that take scope over them. (On the leading grammaticist account of Chierchia *et al.* (2012), the distinction between class 7 and class 8 reduces to preferences regarding the adjunction of covert exhaustivity operators.)

Table 3 also suggests methods for combing rows, thereby reducing the complexity of the taxonomy. As discussed in Section 2.1, the most prominent and systematic attempt at reduction is one that seeks to model all presuppositions as a species of conversational implicature. In a similarly reductionist vein, Bach (1999) judges conventional implicatures a ‘myth’ on the grounds that the meanings involved are indistinguishable from at-issue entailments. For conventional implicature and presupposition, the attempted reductions have gone in both directions. Karttunen & Peters (1979) argue for breaking up the class of things called ‘presuppositions’ into a mix of regular entailments, conversational implicatures, and conventional implicatures, with the label ‘presupposition’ standing in for a class of conventional implicatures that are typically backgrounded due to general pragmatic considerations. Going in the other direction, researchers exploit the fact that both classes create multidimensional meanings. This insight paves the way to viewing Definition 17 as simply picking out a special class of presuppositions. Researchers who pursue this reduction generally seek to show that, to the extent conventional implicatures appear special, it is merely a by-product of interactions between the content of the presuppositions involved and independent facts about the variability of projection behavior, indexicality, and the flexible nature of accommodation. From this perspective, it would be natural to find cases that appear to be intermediate between the prototypical presupposition and the prototypical conventional implicature, and proponents of this kind of reduction have sought to identify such cases (Lasnik, 2007; Sauerland, 2007; Schlenker, 2007b, 2010, 2009).

Perhaps all this talk of splitting and lumping is misguided, though. What we need are rich theories of properties like ‘conventional’, ‘backgrounded’, and ‘projective’, the way those properties interact, and the effects of those interactions on language and cognition. Clustering different combinations of these

properties using labels like ‘presupposition’ and ‘implicature’ does not necessarily help with these theoretical challenges, and it might even lead us astray, by suggesting boundaries where there are none. It is easy to imagine future theoretical developments leading us drop all of these terminological distinctions in favor of more abstract concepts from language and social cognition.

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