Presupposing

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1. Introduction: The intuitive notion of presupposition

The basic linguistic phenomenon of presupposition is commonplace and intuitive, little different from the relation described by the word *presuppose* in its everyday usage. In ordinary language, when we say that someone presupposes something, we mean that they assume it, or take it for granted. The term is used in the same way when we talk of a speaker presupposing something, although typically we are interested in those assumptions which are revealed by what the speaker says. To begin with the most venerable case of presupposing, first discussed by Frege 1892, when a speaker makes an assertion, "there is always an obvious presupposition that the simple or compound proper names used have reference." So a speaker who says:

(1)   President Obama is (not) in Afghanistan

clearly assumes – takes for granted – that there is someone called President Obama, and a place called Afghanistan. These are among the speaker's presuppositions. We gather that the speaker has these presuppositions, because it is hard to imagine any speaker using sentence (1), in either it's affirmative or negated version, if she did not. So we might also describe the sentence itself, or uses of the sentence, as presupposing the existence of the referents. In its affirmative version, sentence (1) entails the existence of the referents. Given standard logical views of negation, the negated version does not. Yet even use of the negated version presupposes the existence of the referents.

Sentences with main verb *know*, *regret* and *realize* are also standard inducers of presuppositions. Consider sentence (2):

(2)   Biden knows (doesn't know) that President Obama is in Afghanistan.

The speaker of sentence (2) (in either version) is naturally taken to be assuming that President Obama is in Afghanistan, even though, once again, the negated version of the sentence does not entail this. Moreover, there is something of a feeling that the speaker thinks that she shares this assumption with her addressee. If (2) were addressed to you, and you didn't previously know that Obama was in Afghanistan (and you cared), you might be inclined to say *Well wait a minute, I didn't know myself that Obama was in Afghanistan*. Again, it is natural to see this presupposition as attaching to the sentence uttered or to the fact of its utterance. Sentence (2), either affirmative or negative, seems like something you should say only if you already think your addressee believes that Obama is in Afghanistan; otherwise, you would seem to be taking for granted something that you ought first to have established as true. A similar intuition is that the content of the embedded clause feels like information which is being "backgrounded," that the "main point" of the utterance is the information about Biden's belief state. The same points can be made for the existential implication associated with the proper names in (1) and (2).

Even stronger intuitions arise with the *it*-cleft construction, illustrated in (3):

(3)   It was (wasn't) President Obama who went to Afghanistan.

The speaker of this sentence appears to take for granted that *some* salient individual went to Afghanistan, and to be making the point that it wasn't President Obama. Again, there is a strong sense that the speaker not only assumes this, but assumes that the assumption is shared by her addressee. This would be an extremely odd utterance to produce if no-one had previously been talking about anyone going to Afghanistan.

These brief examples are intended to stimulate the intuitions that underlie the theories of presupposition to be discussed in this chapter. The examples illustrate that presuppositions are a kind of implication. Upon hearing sentence (2), even in its negated version, one learns that (the speaker believes that) President Obama is in Afghanistan. On the other hand, presuppositions constitute some kind of restriction on the use of

sentences. Even though sentence (2) can serve to inform an addressee that Obama is in Afghanistan, it doesn't seem like the right sentence to use if your primary intention in making the utterance is to convey this information.

In what follows, we will see that different approaches to presupposition emerge from emphasizing one or the other of these views. In section 2, we will survey theories which take presupposition to be a special kind of implication, and try to characterize its source. We'll see that these theories tend to approach presupposition as an utterance-level phenomenon. In section 5, we will survey theories which focus on presupposition as a constraint, and derive presuppositional implications from the assumption of satisfaction of these constraints. These theories approach presupposition as a clause-level phenomenon. In the intervening sections, we will discuss Stalnaker's influential treatment of presupposition, which accommodates both views (section 3); and explore in more detail the interaction between presupposition and syntactic form (section 4) which theories of presupposition must account for.

2. Presupposition as an utterance level phenomenon

2.1. Frege and Strawson on the presuppositions of referring expressions

The notion of presupposition as implication first appears in Frege's "On Sense and Reference," cited above. Frege notes that the implication of existence associated with proper names arises with both affirmative and negated sentences, and argues that this implication is not part of "the sense of the sentence," but an implication of its use.

But the first extended discussion of this type of implication appears in Strawson 1950, in his famous response to Russell's Theory of Descriptions (Russell 1905). Strawson argues that Russell's theory is based on an error: that Russell mistakes an implication which arises from the *use* of a definite description with part of the *meaning* of the definite description. In making this case, Strawson distinguishes very clearly between *expressions* (simple or complex, hence including sentences) and *uses of expressions*. He then points out that the kinds of things which can be said of *expressions* cannot necessarily be said of *uses* of expressions, and vice versa. In particular:

> the *expression* [*the king of France*] cannot be said to mention, or refer to, anything, any more than the *sentence* [*The king of France is wise*] can be said to be true or false... 'Mentioning' or 'referring' is not something an expression does; it is something that someone can use an expression to do. Mentioning, or referring to, something is a characteristic of a *use* of an expression.

Strawson takes it that definite descriptions have, among their other functions, the function of being used to make a unique reference. In order for an act of unique reference via a definite description to succeed, at least two conditions must be met: first, there must be some entity of the type given in the description; and second, the "context of use" must "sufficiently determine" just which entity of that type the speaker intends to refer to. This second condition can most obviously be satisfied if there is exactly one entity of the relevant type, or a maximally salient entity of that type, in the context of use. These, then, are conditions that typically would have to be satisfied in order for a speaker to make a successful uniquely referring use of a definite description.

Now comes the account of the presupposition itself:

> Whenever a man uses any expression, the presumption is that he thinks he is using it correctly: so when he uses the expression, 'the such-and-such' in a uniquely referring way, the presumption is that he thinks both that there is *some* individual of that species, and that

the context of use will sufficiently determine which one he has in mind. To use the word 'the' in this way is then to imply (in the relevant sense of 'imply') that the existential conditions described by Russell are fulfilled.

On this view, presuppositions attach to specific uses of an expression or sentence. They arise via a hearer's recognition of the type of act which the speaker intends to accomplish with the expression (e.g. unique reference), the hearer's knowledge of the conditions on successful performance of such an act, and the hearer's assumption that the speaker will try to carry out successful acts.

Like Frege, Strawson emphasizes that the presuppositions of definites are not part of their meaning, and are not part of what is asserted by utterance of a sentence containing a definite. (This is precisely where he takes Russell to have been mistaken.) Suppose that someone says (now) *The king of France is wise*, and one responds (naturally), *There is no king of France*. This response, Strawson says, is not a contradiction of the original claim; it is not a way of saying that the original claim was false. Rather, it is a way of saying that "the question of whether it is true or false simply does not arise."

This view of the existential commitments induced by the use of referring expressions, Strawson extends also to quantificational noun phrases in his discussion of classical logic (Strawson 1952). Strawson sees quantified NPs, too, as having referential uses; and for the same reason, considers that they give rise to a presupposition of existence and identifiability of an intended referent. In this case too, he emphasizes the distinction between the meaning of the quantificational expression and the conditions of its proper use, and derives existential presuppositions from the latter.

Later discussion of Frege's and Strawson's views on presupposition have been much occupied with the question of what each of them took to be the result of presupposition failure, the case when the presupposition of an utterance is not true. Limiting the discussion to the case of assertoric uses of sentences, two versions of the consequences are distinguished: either the utterance fails to express a proposition at all; or it expresses a proposition which is neither true nor false. Views differ both as to what each philosopher claims, and as to what claim is correct. Garner 1971 gives a detailed review of the literature on this question up to that date. Whichever version one adopts, though, the following consequence is unavoidable: If p is a presupposition of a statement S made by utterance of sentence s, and p is not true, then utterance of s does not result in a truth-evaluable statement. (Either it results in no statement at all, or in a statement which is not truth-evaluable.)

These observations about the impact of presupposition falsity on the truth values of statements led a number of researchers to formulate semantic concepts of presupposition. On the semantic conception, presupposition is a relation between sentences. Various equivalent formulations of this property have been given (see Burton-Roberts 1989 for a book-length exposition, Boër & Lycan 1976 for a briefer review). Burton-Roberts formulates what he calls the Standard Logical Definition of Presupposition as follows:

(4)   A presupposes B if and only if:
        a.   wherever A is true, B is true *and*
        b.   wherever B is not true, A has logical status other than true or false.

Note that this semantic conception requires a non-bivalent logic. The semantic conception of presupposition has been almost entirely discarded in the current literature, in part because a large question mark now hovers over the question of whether presupposition failure always leads to truth-valuelessness.[1]

While there are differences in detail between Frege and Strawson, it is not unreasonable to summarize what we might call the Frege/Strawson view on presupposition. First, presuppositions are a special kind of

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[1] For discussion with respect to failure of existential presuppositions, see von Fintel 2001.

implication. These implications attach to uses of sentences, that is, to attempts to use sentences in the performance of a speech act. They arise because of conditions which attach to the successful performance of acts of this type. Thus, although the focus has been on presuppositions as implications, the conception also makes sense of the idea of presuppositions as constraints.

2.2.   Further pragmatic accounts: Austin, Grice and neo-Grice

The Frege/Strawson view invokes the idea that the use of sentences to perform linguistic acts is subject to various kinds of conditions. This idea is fully developed, with different theoretical goals, in the work of Austin (Austin 1955, 1970) and Searle (Searle 1969). Austin dubs such conditions *felicity conditions*. Felicity conditions may be conditions on states of affairs in the world, but also on the beliefs or desires of the speaker or addressee (consider conditions on promising) or on the social relations between them (consider conditions on commanding). It is natural to apply the notion of presupposition to many of the proposed felicity conditions, in particular those which Searle 1969 identifies as *preparatory conditions* or as *sincerity conditions*. Suppose, for example, that Jane (sincerely) promises Mary that she will invite her to dinner. Then it would seem natural to say that Jane is taking for granted – is presupposing – that Mary would like to be invited to dinner; that she (Jane) will be in a position to invite Mary to dinner; and that it was not mutually known between Jane and Mary that Jane would invite Mary to dinner in the normal course of events. If any of these conditions, which are all felicity conditions on acts of promising, are not met, then the attempted speech act goes awry in a way rather similar to the failure of assertion in an utterance of a sentence with a non-referring proper name. Suppose, for example, that Jane is a small child and Mary an adult friend of Jane's parents; then Jane's utterance to Mary of:

(5)   I promise to invite you to dinner next week.

doesn't count as a promise. Similarly, if Mary has a standing invitation to dinner at Jane's house every Friday night, then Mary is likely to be puzzled by the apparent promise. In general, an act of promising will typically give rise to the implication that the speaker believes the conditions listed are met, just as the use of a definite description implies that the speaker believes that the description has a unique salient referent. Moreover, whether I say that I *do* promise to invite you to dinner or that I *don't* promise to invite you, the same implications arise.

Austinian felicity conditions, it must be remembered, are conditions on felicitous performance of acts, not conditions on the use of particular expressions. So, if felicity conditions are presuppositions, then (at least some) presuppositions are not to be seen as associated with linguistic forms, but with speech actions. Indeed, Searle 1969 proposes that the presuppositions associated with definite descriptions and other referring expressions are simply the felicity conditions for the speech act of referring. The proposal is very close to that of Strawson, but situates the account firmly within a general theory of speech acts.

After Austin, the next major step in pragmatic theory was Grice's introduction of conversational implicature (Grice 1967). Grice proposes that speakers and hearers share a standing presumption that utterances will be made in accord with a variety of norms: norms that determine what counts as a reasonable, appropriate conversational contribution. In order for an interpreter to see an utterance as being in accord with these norms, it is sometimes necessary for her to attribute certain presumptions to the speaker. This step in interpretation seems a natural place to locate the kinds of pragmatic implications which, in the Frege/Strawson view, constitute presuppositions.

A number of authors have argued for conversational-inference accounts of presupposition, or of certain cases of presupposition, including Atlas (1977 and elsewhere), Kempson (1975), Wilson (1975), Boër & Lycan (1976), Karttunen & Peters (1979), Atlas & Levinson (1981), Kadmon (2001), Simons (2004, 2009).

Grice himself (1981) offers a conversational implicature account of the presuppositions associated with definite descriptions. Of these authors, some argue that *all* cases of presupposition can be reduced to conversational implicature, while others target specific cases. Similarly, some authors argue that the notion of presupposition can be eliminated entirely, as theoretically spurious, while others see themselves simply as providing an account of how a certain special class of pragmatic implication arises.

Conversational-inference based (henceforward, neo-Gricean) accounts fall into two broad classes. In one class of accounts, presuppositions are analyzed along the lines suggested by the discussion so far, as propositions which the speaker can be inferred to believe. Such accounts all share the same basic structure. In the case of presuppositions which are (also) entailments, as with the affirmative versions of examples (1)-(3) above, no account is needed of why the implication arises: it is simply an entailment. A neo-Gricean account for these cases uses general principles of conversation to explain why, when the sentence is uttered, this particular entailment would be understood as backgrounded, and not part of the main point of the utterance. For cases where the observed presupposition is not an entailment, as for example with the negations of these examples, these accounts aim to explain, in the same terms, why utterance of the sentence is in accord with general conversational principles only if the speaker is taken to believe the relevant proposition. In these accounts, presuppositions are not clearly distinguished from any other conversational implicature.

Intuitively, it is natural to classify presuppositions as *background implicatures* (Thomason 1990, Simons 2009) as opposed to *foreground implicatures*. They can be distinguished in terms of the speaker's communicative intention: foreground implicatures are part of what the speaker means, in Grice's sense of this term, while background implicatures are not. However, there is as yet no clear way to make this distinction without relying on intuition about what is meant.

Grice's own account of the presuppositions of definites (Grice 1981) makes a clearer distinction between ordinary implicatures and presuppositions: the latter are cases where conversational principles lead to the conclusion that the speaker is treating the relevant proposition as *common ground*. (See also Kadmon 2001) This type of account provides a way of explaining the intuition that to utter a sentence with presupposition *p* is to act as if *p* is already established among the interlocutors.

There is a class of presuppositions which seems amenable to analysis only by some type of neo-Gricean account. Here is an example of a case. Suppose at the beginning of a meeting which I am chairing, I look at my watch and say in an attention-getting tone "OK, it's 3 o'clock." The relevance of my remark presumably derives from the fact that the meeting is supposed to start at 3:00, and my remark is a way of letting everyone know that it's time to start. In the right circumstances (say, you don't know anything about this meeting but happen to be in the meeting room talking to a colleague), you could probably infer that my utterance requires this presupposition for its relevance. And if in fact my presupposition was incorrect (perhaps I had forgotten that we had agreed to start the meeting at 3:15), the most reasonable response would be to correct the mistaken presupposition, just as in the case of standard presuppositions. These cases of *contextual presupposition* are not triggered by any expression in the sentence used, but arise by virtue of the use made of the sentence in the particular conversational context.

On the other hand, neo-Gricean accounts seem to have no traction in cases where presuppositionality is apparently linguistically encoded. Consider, for example, the case of clefts (example (3) above). On standard views, (3) expresses just the same proposition as its non-cleft variant, *President Obama is in Afghanistan*. So in this case, it is rather natural to assume that the presupposition is conventionally encoded in the cleft form.[2] But if presuppositions are sometimes conventional, then the notion of pragmatic implication cannot provide a fully general account of presupposition.

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[2] But see Atlas & Levinson 1981 for an alternative view of clefts.

In this section, we have surveyed a variety of approaches which view presupposition as an utterance-level phenomenon. All take presuppositions to be a special kind of implication, typically an inference about the speaker's beliefs. The inference in question is analyzed in these different accounts as arising from the interpreter's recognition of what is needed in order for the speaker's utterance to be fully felicitous.[3] Most of these accounts either assume or propose some kind of pragmatic account of how the implications arise, and attempt to explain other properties of presuppositional implications, such as backgrounding, in similar terms.

However, not all utterance-level analyses propose a pragmatic source for presuppositions. A notable exception is Abbott 2000. Abbott proposes that what makes presuppositions distinctive is not how they arise, but their status as non-main-point content. The presuppositions of an utterance, she proposes, are those propositions which are conveyed but are not main point. Abbott, however, takes presuppositional expressions such as definites and factive verbs to be conventional ways of marking information as non-main-point. So, although advocating an utterance-level view of presupposition, Abbott does not propose a pragmatic account of the presuppositions themselves.[4]

3. Speaker Presupposition and the Common Ground

The most influential work in the literature on presupposition is that of Robert Stalnaker. Stalnaker's account is embedded in a broad theoretical model of linguistic communication, first sketched in his short paper "Pragmatics" (Stalnaker 1972). The model has been developed in a series of publications spanning from this early paper up to the present, in which the details of the treatment of presupposition have evolved. Here, I will present the outlines of the account, focusing on the most current version.[5]

Stalnaker recognizes, as have many others, that conversational exchange does not go on in a vacuum, but against a background of assumptions shared among the interlocutors: the common ground. Stalnaker 2002 defines the common ground in terms of two notions: *acceptance* and *common belief*, defined as follows:

acceptance   A category of propositional attitudes and methodological stances toward a proposition, including belief, presumption and acceptance for the purposes of argument or an inquiry. To accept a proposition is to treat it as true for some reason. (Stalnaker 1984)

common belief p is common belief in a group G just in case, for every believer b in G, b believes p, b believes that every member of G believes p, b believes that every member of G believes that every member of G believes p, and so on ad infinitum.

common ground p is common ground for a group G iff it is common belief among the members of G that for all x in G, x accepts p.

The common ground represents what is taken for granted by all parties to the conversation. Therefore, "one cannot normally assert, command, promise or even conjecture what is inconsistent with what is [common

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[3] See also Thomason et al. 2006 for an account in terms of recognition of speaker plans.

[4] In fact, it remains unclear, on Abbott's account, how presuppositional contents come to be conveyed at all in the cases where they are not entailed.

[5] See Simons 2003 for a more thorough treatment.

ground]. Neither can one assert, command, promise or conjecture what is itself [common ground]. There is no point in expressing a proposition unless it distinguishes among the possible worlds which are considered live options in the context." (Stalnaker 1972: 388). In this way, the common ground places constraints on the speech acts of conversational participants.

But the common ground is also affected by speech acts which are performed. In particular, when a proposition is asserted, and recognized by all conversational participants to have been asserted, then that proposition becomes part of the common ground. The common ground thus evolves continuously in the course of conversation.

Speakers, though, are not omniscient, nor telepathic. So each speaker has their own individual beliefs about what is in the common ground. These beliefs, for Stalnaker, are presuppositions. On this view, presupposition is primarily a property neither of sentences nor of uses of sentences, but of conversational agents. Presupposing is something a *person* does.

So how is this epistemic notion of presupposition connected to the linguistic notion? Stalnaker proposes that the use of certain linguistic expressions may be appropriate *only if* a speaker has particular beliefs about the common ground i.e. particular presuppositions. Applying this to the case of definite descriptions, Stalnaker would put things like this: to say that the use of a definite description gives rise to a presupposition of existence is to say that a speaker can appropriately use a definite description *the F* only if she presupposes that an *F* exists, that is, only if she believes that the current conversational common ground entails the existence of an *F*. Sentence presuppositions are required speaker presuppositions.

And what is the source of these requirements? Stalnaker rejects the view that there is a single answer to this question, arguing that in this sense, presupposition is not a homogenous phenomenon. In some cases, "one may just have to write presupposition constraints into the dictionary entry for a particular word" (1974:212). But throughout his work, Stalnaker has "conjectured that one can explain many presupposition constraints in terms of general conversational rules without building anything about presuppositions into the meanings of particular words or constructions" (1974: 212). This is an important thread of Stalnaker's thinking, which clearly ties to the original Frege/Strawson conception of presupposition, as well as to broadly Gricean ideas.

The idea that sentence presuppositions are propositions required to be presupposed gives an immediate explanation for observations about backgrounding and "being taken for granted." However, it seems to make a prediction which is not borne out, namely, that well-behaved speakers would never use sentences with presuppositional constraints when they did not believe the relevant propositions to be common ground; or at least that if speakers do this, there would be some obvious violation. But this does not seem to be the case: there are many situations in which speakers do use presuppositional sentences knowing full well that the relevant propositions are not common ground. To give a standard example: Arriving late at a meeting, I can quite legitimately say:

(6)   Sorry I'm late, my car wouldn't start

even if I am quite sure that some of my addressees didn't previous know that I had a car.[6] In fact, it would be odd here to use a non-presuppositional version of this assertion, to say:

(7)   Sorry I'm late, I have a car and it wouldn't start.

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[6] Note that for the proposition in question to be in the common ground, it would not be sufficient even if all the addressees did know that I have a car. They would all have to know that they all know that I have a car, etc.

The question is how such observations can be made compatible with the treatment of sentence presuppositions as required speaker presuppositions.

Stalnaker answers in the following way:

> As soon as there are established and mutually recognized rules relating what is said to the presumed common beliefs, it becomes possible to exploit those rules by acting as if the shared beliefs were different than they in fact are known to be. The existence and mutual recognition of the rules is what makes it possible to communicate such a pretense, and thus to use the pretense to communicate. (1973:451)

Stalnaker would thus treat our example along the following lines. Suppose it is not actually common ground, at the time of the utterance, that the speaker has a car, and the speaker knows that this is the case. By uttering the sentence, however, she acts as if she had this belief about the common ground. Her interlocutors recognize that she is acting as if she had this belief. They recognize further that a reason for her to act as if she had this belief is that she would like to make this belief actual, i.e. she would like it to become common ground that she has a car. Suppose that her interlocutors (as is reasonable) are willing to accept without further discussion that she has a car. As long as no-one challenges the claim that the speaker has a car, it is transparent to all that this claim has been recognized and accepted. Hence, it becomes common ground that the speaker has a car.

The core idea here is just this: that speakers can sometimes produce utterances that require beliefs about the common ground to be a certain way in order to cause their interlocutors to adjust their own beliefs, resulting in the desired change to the common ground. In this way, presuppositional constraints can be informative, in the sense of leading to change of the common ground. Following Lewis 1979, this kind of common ground change in response to a recognized speaker presupposition is dubbed *accommodation*. Lewis himself understood accommodation as a kind of repair, a way of fixing a context to guarantee the appropriateness of an utterance. Stalnaker (1998, 2002), on the other hand, has argued that accommodation is not really distinct from any other process of common ground change.[7] However, it should be emphasized that in any presuppositions-as-constraints approach, the ubiquitous phenomenon of informative presupposition is treated by the theory as a non-standard case. This constitutes a significant difference with the presupposition-as-implication view explored in the previous section.

4. Linguistic Presupposition and the Projection Problem

Most of the authors whose work we have discussed so far have focused on the conceptual and foundational issues surrounding presupposition. But undoubtedly, the conceptual analysis is successful only to the extent that it provides insight into the empirical properties of presuppositions. These empirical features have been the focus of most linguistic work on presupposition.

One of the relevant empirical observations is the large number and range of linguistic expressions or structures which trigger apparent presuppositions. In the introduction, we mentioned referring expressions, factives, and *it*-clefts. Levinson 1983 (181-185) lists ten additional categories of presupposition trigger, each with many sub-cases, noting that "there are other good candidates...which happen to have received less attention." Here are some of the categories in Levinson's list, with the associated presupposition marked by "=>":

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[7] For more details of the difference between these two positions, see Simons 2003.

(8)   **implicative verbs** (Karttunen 1971): e.g. *forget to V* (=>intended to V), *manage to V* (=>doing V involved some difficulty), *happened to V* (=> did not intend to V)

(9)   **change of state verbs** (Sellars 1954, Karttunen 1973) e.g. *leave, stop, start, begin* (=>presuppose holding of the start state for the change of state)

(10)   **additives** e.g. *again, another time, to come back, to repeat* (=> prior occurrence)

(11)   **wh-questions**: presuppose the propositions obtained by replacing the *wh*-word with an appropriate existentially quantified variable.

(12)   **focus**: non-focused content of a sentence shows presuppositional behavior, e.g. *JOHN didn't leave* presupposes that someone left.

In all of these cases, the presuppositions are typically thought of as being specifically associated with a particular linguistic item or structure. And with the presupposition closely linked with a linguistic element, it becomes more natural to view the presupposition as a conventional property of the clauses which contain the triggering items. Thus, we will now see a shift from the utterance-level view of presupposition discussed so far, towards a clause-level view, with presuppositions seen as properties of specific linguistic forms. This view of presuppositions is presumed in standard formulations of the issue to which we now turn, the so-called *projection problem for presuppositions*. We dwell on this issue at some length, because it represents the central empirical phenomenon which any account of presupposition is ultimately responsible for explaining.

4.1.   Projection

The projection problem is characterized by Langendoen & Savin 1971 as "the question of how the presupposition and assertion of a complex sentence are related to the presuppositions and assertions of the clauses it contains" (p.55). This formulation clearly presumes (one is inclined to say *presupposes*!) that presuppositions (and assertion) attach directly to clauses, and hence that one can talk about a presupposition of a clause regardless of what that clause is used to do.

   Both Morgan 1969 and Langendoen & Savin thought the projection problem had a rather simple solution. Both proposed, more or less, that a complex sentence inherits all of the presuppositions of the subordinate clauses which it contains. So consider, for example, sentences (13)-(15):

(13)   The King of France is not bald.
(14)   It seems that the King of France is not bald.
(15)   Abe regrets that the King of France is not bald.

Sentence (13) presupposes the existence of a King of France. (For the space of this discussion, we adopt the "presuppositions as properties of sentences" terminology.) Sentence (14), which embeds sentence (13) under *seems*, inherits the presupposition of the embedded sentence: the new sentence, as a whole, also presupposes the existence of a King of France. Similarly, sentence (15) inherits the presupposition that there is a king of France, added to the presupposition produced by the matrix clause that it is not the case that the king of France is bald.

   However, it soon became apparent that the predictions of the "cumulative hypothesis" were not consistently borne out. Karttunen 1973 was the first major step in systematic characterization of patterns of projection. Karttunen observed that different embedding predicates give rise to different patterns of projection and non-projection. He identified three classes of embedding expressions, which he called *holes*, *plugs* and *filters*. Presupposition *holes* are predicates which let all the presuppositions of the embedded clause

become presuppositions of the clause which they head. The embedding predicates in (14)-(15) fall into this category. Interestingly, many predicates which are themselves presupposition triggers – the factives, change of state verbs and many implicatives – are presupposition holes, as are negation, epistemic modals and ability predicates.

The non-factive propositional attitude verbs such as *believe* and *want* show somewhat different behavior from standard holes. Karttunen 1974 observes that if one of these verbs occurs with a complement with presupposition *p*, then the sentence as a whole presupposes that the holder of the attitude believes *p*. Hence, the sentence:

(16)   Lucy wants Phil to sell his cello.

does not presuppose that Phil has a cello, but only that Lucy believes that he does.

The class of *plugs* contains, as the name implies, those embedding predicates which block the presuppositions of their complement from becoming presuppositions of the embedding clause. This class is mainly made up of the "verbs of saying." So consider:

(17)   Bill said / argued / denied that the King of France is not bald.

These, as the reports of speech acts of others, do not (typically) share the presuppositions of the embedded clause. However, Karttunen also noted that "all the plugs are leaky." For perhaps any plug, it is possible to construct special contexts in which presuppositions do in fact project. Karttunen notes the case where a verb of saying is used performatively, as in:

(18)   I beg you to stop eating eggs.

In this case, the presupposition of the embedded clause, that the addressee has been eating eggs, intuitively becomes a presupposition of the whole sentence.

Karttunen's class of *filters* contains only the logical connectives. The name reflects the observation that the presuppositions of clauses combined by these connectives sometimes do and sometimes do not become presuppositions of the sentence as a whole. Filtering is the consequence of a relation of *contextual entailment* between the content of one clause and the presupposition of another. The specific patterns of projection can be summarized as follows:

(19)   **Karttunen Filtering Conditions**

    a. Let S be any sentence of the form *If A then B* or *A and B*. Then:
        i. If A presupposes C, then S presupposes C.
        ii. If B presupposes C, then S presupposes C **unless** A contextually entails C.

    b. Let S be any sentence of the form *A or B*. Then:
        i. If A presupposes C, then S presupposes C **unless** the negation of B contextually entails C.
        ii. If B presupposes C, then S presupposes C **unless** the negation of A contextually entails C.[8]

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[8] This is the condition proposed in Karttunen 1974.

This filtering behavior is illustrated by the sentences in (20) for the conditional case, and in (21) for the case of disjunction. The relevant observation is that both the (a) sentences inherit the presuppositions of their second clause, while both the (b) sentences do not.

(20) a. If baldness is hereditary, then the King of France is not bald.
      b. If there is a king of France, then the king of France is not bald.

(21) a. Either John is exercising more, or he has stopped eating donuts for breakfast.
      b. Either John has never eaten donuts for breakfast, or he has stopped doing so.

The notion of contextual entailment employed in (19) above (the term comes from Chierchia & McConnell-Ginet 1990: 296) is defined as follows:

(22) **A** contextually entails **B** iff there are propositions $p_1...p_n$ entailed by the conversational context such that the conjunction of **A** with $p_1...p_n$ entails **B**.

What the correct definition of "conversational context" is for these purposes, we set aside for now. What is crucial is the recognition that context affects how and whether presuppositions project from a constituent clause to the matrix sentence. As Karttunen puts it, "we can no longer talk about the presuppositions of a compound sentence in an absolute sense, only with regard to a given set of background assumptions." (p.185).

The facts about presupposition projection reviewed here are very robust, largely (although not entirely) uniform across all types of presupposition trigger. The observation encourages the view that presupposition projection should be explained in roughly compositional terms, as a by-product of other strictly linguistic processes. We will see this view spelled out in the approaches to projection that follow.

5.   Presupposition as a clause level phenomenon

5.1.   The Karttunen/Heim approach: back to presuppositions as constraints on context

As discussed above, Stalnaker 1972, 1973 proposed a model of conversation in which the common ground plays a central role: it is both the target of conversational contributions, the entity which these contributions are expected to modify; but it also, indirectly, imposes constraints on those contributions. The common ground imposes its effects only indirectly in Stalnaker's model, because the actual constraints Stalnaker proposes are related to speaker's beliefs about the common ground, that is, to speaker presuppositions. In particular, sentence presuppositions are identified with required speaker presuppositions.

Karttunen 1974 adopts from Stalnaker the idea of the common ground as the conversational target, and of presuppositions as constraints, but eliminates the subjective notion of speaker presupposition from the picture. In Karttunen's model, sentence presuppositions are construed as constraints on the conversational context itself, modeled (as in Stalnaker's work) as a set of propositions or of possible worlds. Karttunen then gives an account of how the context is incrementally updated, and thereby provides a solution to the projection problem which accounts for his earlier observations that the presuppositions of complex sentences are determined in part by the assumed conversational background. Karttunen's groundbreaking model of projection was further elaborated by Heim (1983, 1992), and we will set out the details of the account in her terminology.

Heim's treatment of projection is embedded in a semantic theory called *context change semantics*, according to which the semantic value of a clause is a contextual update function.[9] A context is taken to be an information state, modeled as a set of possible worlds: the worlds at which the propositions in the information state are true. The basic update rule for an atomic sentence S is this: Let c be an arbitrary context. Then the result of updating c with S is the set of all worlds in c at which S is true. Formally:

(23) $c+S = c \cap \{w: S \text{ is true at } w\}$.

Now, presuppositions enter the picture. Following Karttunen, Heim assumes that for each atomic clause S, the presuppositions of S are conventionally given. She then defines the *admittance* relation: a context c *admits* a sentence S iff c entails all presuppositions of S. If c does not admit S, then c+S is undefined i.e. c cannot be updated with the content of S. Thus, presuppositions have the effect of turning sentences into *partial* update functions, functions which are defined for some but not all contexts.

The final ingredient needed for the solution of the projection problem is the account of update for complex sentences. On the Karttunen/Heim view, the process of updating a context with a complex sentence involves a sequence of sub-updates, one for each embedded clause. Each type of complex sentence is assigned a *context change potential* (CCP), which characterizes the specific procedure for updating a context with sentences of that form. Let's illustrate this, and see how it provides an account of projection, beginning with the case of conjunction.

The CCP for conjunction is shown in (24):

(24) $c + A \text{ and } B = (c + A) + B$

This says that to update a context with *A and B*, one updates the starting context with *A*, and then updates the *result* of this process with *B*. This reflects the natural intuition first expressed by Stalnaker 1973, that when a speaker says *A and B*, he can already take *A* for granted as part of the background for *B*. The context required to entail the presuppositions of *B* (what we will call the *local context* for *B*) is thus not c itself, but c updated with *A*, i.e. c+*A*.

In the ordinary case, where there is no logical relation between the content of *A* and the presuppositions of *B*, this requirement will be satisfied only if c entails the presuppositions of *B*. So in the ordinary case, the presuppositions of *A* and the presuppositions of *B* both impose constraints on the starting context c. This is what gives rise to the intuition that the presuppositions of both conjuncts "project" to the conjunction as a whole: all are constraints on the starting context.

But in the special case in which the presuppositions of *B* are entailed by *A*, the context to which *B* is added will satisfy its presuppositional requirements whatever the content of c. The starting context is thus unconstrained by the presuppositions of B. Hence the intuition that in such cases, the presuppositions of *B* do not become presuppositions of the conjunction as a whole. In other words, the apparent cancellation or suppression of presuppositions is explained as involving satisfaction of the presuppositional requirements of an embedded clause by an intermediate context.

In a similar vein, Heim proposes that for update of a context c with a conditional of form *If A, B*, c constitutes the local context for *A*, but c+*A* constitutes the local context for *B*. Again, this corresponds to a natural way of thinking about conditionals: that the antecedent provides the 'background' for consideration of the consequent. The proposed CCP again allows one to account for the observed projection facts about conditionals: the presuppositions of the antecedent always project (i.e. impose constraints on the starting

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[9] Heim's theory is compositional, so that the update function of a clause is determined by the update properties of its constituents.

context); while the presuppositions of the consequent project *unless* entailed by the content of the antecedent. In the latter case, these presuppositions impose no constraints on the starting context.[10]

Now, let's compare these cases with that of negation. Recall that negation is a presupposition *hole*. In terms of Heim's theory, this means that the presuppositions of clauses embedded under negation should always impose constraints on the starting context. Heim accomplishes this with the following CCP for negated sentences:

(25) $c + \text{not } S = c - (c + S)$ (i.e. intersect c with S; then keep those worlds from c which are *not* in that intersection)

Thus, in order to update c with not-S, it is necessary to update c with S itself. But c can be updated with S only if c entails the presuppositions of S. Hence, update of c with not-S imposes the same constraints on c as update with S itself.

The Karttunen/Heim view clearly models the intuition that presuppositions are information treated as backgrounded or already available. But it makes an even stronger prediction of infelicity than does Stalnaker's for utterances whose presuppositions are not in fact entailed by the current conversational context. According to this model, such utterances should completely fail to bring about context update.

Like Stalnaker, Heim solves the problem by allowing for accommodation: missing presuppositions can be added to the context as needed "ceteris paribus and within certain limits" (Lewis 1979). In her treatment of accommodation, Heim follows Lewis rather than Stalnaker; the process involves fixing a context to allow an otherwise inadmissible assertion. In this case, the procedure for updating c with S, where S conventionally carries presupposition p, involves first updating c with the required presupposition p, and then updating the result with S.

The procedure we have just described involves updating the starting context with a necessary presupposition. This is known as *global accommodation*. When it is the presupposition of an embedded clause which requires accommodation, it is possible for the procedure to be applied to an intermediate context, with differing final effects. We will illustrate with the following example:

(26)   Either Sue has just got married or she has just got divorced.

If either of the disjuncts of (26) were uttered independently, it would give rise to a presupposition: that Sue was until just recently unmarried, or that she was until just recently married. However, utterance of (26) itself presupposes nothing.

Let's assume the following CCP for disjunction (Simons 2000):

(27) $c + A \text{ or } B = (c + A) \cup (c + B)$[11]

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[10] Actually, the predictions about conjunctions and conditionals are somewhat more complex. The CCP account predicts that in constructions of form *A and B* or *If A, B*, if *B* has a presupposition p not entailed by *A*, the sentence will require the context to entail $A–>p$. This issue is dubbed *the proviso problem* by Geurts 1996, who holds this prediction to be incorrect. The issue is discussed quite extensively in the literature: see Beaver 1999, Singh 2007 and references therein.

[11] This CCP does not produce the standard presupposition filtering behavior seen in disjunctions. Simons 2000 provides an alternate, pragmatic, account of these facts.

Let's use p to stand for the presupposition of the first disjunct, and q to stand for the presupposition of the second. One way to attempt to guarantee satisfaction of these presuppositions is just to add them directly to the global context before updating that context with (26), i.e. to try to carry out:

(28) $(c \cap p \cap q) + (26)$

But this is not possible: the propositions p and q are inconsistent, so adding both of them to the context would leave us with an empty context.

    However, the CCP in (28) gives us another option: to add each required presupposition just in the place that it is needed, i.e. to carry out:

(29) $((c \cap p) +$ *Sue has just got married*$) \cup ((c \cap q) +$ *Sue has just got divorced*$)$

This is a case of *local accommodation*: the required presuppositions are added to the local context which is updated with the presupposing clause. The result is that the utterance is interpreted as:

(30)   Either Sue was until recently unmarried and just got married, or she was until recently married and just got divorced.

which is an intuitively correct interpretation. The possibility of both global and local accommodation thus provides the Karttunen/Heim framework with the flexibility otherwise lost by assuming presuppositions to be fixed properties of atomic clauses.

5.2.   Presupposition as anaphora

Heim's Context-Change Semantics is one of a family of semantic frameworks known as Dynamic Semantics, in which sentence meaning is characterized in terms of context update. Discourse Representation Theory (Kamp 1981, Kamp and Reyle 1993) is another member of this family. However, in DRT, the contexts in question are formal structures called Discourse Representation Structures (DRS). A DRS is a hierarchical structure which represents the content of multi-sentence linguistic sequences. Similarly to the CCP theory, these structures are built incrementally on the basis of sentence content.

    Van der Sandt 1992 proposes an account of presupposition within DRT. The account is motivated by an observed parallelism between the binding of anaphoric pronouns in complex sentences, and the now familiar patterns of projection and non-projection of presuppositions. A pronoun in a subordinate clause can be anaphoric on a noun phrase in another under some syntactic configurations, but not others. What van der Sandt observed is that the configurations under which pronominal anaphora is allowed are just the configurations under which a presupposition of an embedded clause can be satisfied by content of another. The following examples are illustrative:

(31)   a.   John owns a donkey and he beats it.
         b.   John owns a donkey, and he beats his donkey.
         c.   Someone is going to solve this problem and it will be a linguist who does.

(32)   a.   If John owns a donkey, he beats it.
         b.   If John owns a donkey, he beats his donkey.
         c.   If someone is going to solve this problem, it will be a linguist who does.

(33) a. Either John doesn't have a donkey, or he beats it.
      b. Either John doesn't have a donkey, or he beats his donkey.
      c. Either no-one will ever solve this problem, or it will be a linguist who does.

On the basis of these observations, van der Sandt proposes that presuppositionality simply is a special case of anaphora. Presuppositions, he proposes, are elements of the meaning of a clause which require an antecedent in a syntactically accessible position, just as anaphoric pronouns do. A pronoun used without an explicit linguistic antecedent gives rise to the presumption that a referent is available in the context. Similarly, where a presuppositional expression is used without the presuppositional content being explicitly expressed, there is a presumption that the presupposition is somehow contextually available. This is the presupposition-as-anaphora version of projection.

The presuppositional content of a clause is represented as a small piece of a DRS. This content is anaphoric in that it is required to be matched up with an isomorphic DRS element in the existing DRS. Thus, presuppositional anaphors are rather different from ordinary pronominal anaphors. The latter require an antecedent in order to be fully interpreted. The antecedent is a linguistic expression whose content fixes the content of the anaphor. Presuppositional anaphors have fully specified content which is required to match something already in the DRS[12].

To be more precise, the antecedent (whether for a pronominal anaphor or a presuppositional anaphor) is not merely required to be in the DRS, but to be in an accessible position in the DRS. Accessibility relations within DRSs are structurally defined. Not surprisingly, there is a parallelism between the specification of local contexts in the CCP account and the accessibility relations in DRSs. In the CCP account, presupposition satisfaction behavior in conjunctions is captured by making the content of the first conjunct part of the local context for the second conjunct. In the DRT account, the information in the first conjunct is assumed to be added to the DRS before the second conjunct is processed, thus guaranteeing that the first conjunct can provide antecedents for anaphors in the second, but not vice versa. Similarly in the case of conditionals, the CCP account stipulates that the content of the antecedent is part of the local context for the consequent; in the DRT account, the antecedent is stipulated to be accessible to the consequent, but not vice versa. Thus, the configurations in which there is an option for local satisfaction of presuppositions in the CCP approach are just the configurations in which presuppositions can be locally bound in the DRT approach. In DRT, as in the CCP approach, presuppositions are taken to be non-cancelable conventional properties of atomic clauses. Filtering (non-projection) of presuppositions in complex sentences is attributed to local binding, i.e. it arises in cases where the antecedent for the presuppositional-anaphor is found in an accessible clause of the same complex sentence. Projection is the case where a presuppositional-anaphor finds its antecedent at the highest level of the DRS — the DRT equivalent of the starting context.

As noted, presuppositional elements of content are largely specified: it is trivial to determine what form the required antecedent must have. Hence, when the DRS does not make an antecedent available prior to processing of the presuppositional clause, it is possible to accommodate one: to add the relevant DRS content in an appropriate position. As in Heim's framework, accommodation can be either global or local. Van der Sandt 1992 specifies a number of constraints which determine preferences among these accommodation sites. (For elaboration of van der Sandt's account, see Geurts 1999.)

It should be evident that this DRT based theory of presupposition and presupposition projection has a good deal in common with the CCP theory. The two differ in the details of their predictions. One significant

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[12] Very often, however, presuppositional anaphora and pronominal anaphora interact, as in the b. and c. versions of examples (31)-(33) above. In these cases, the presuppositional content itself has an anaphoric element.

difference is that the DRT account does not suffer from the Proviso Problem (see fn.10 above). For discussion of similarities and differences between the two accounts, see Beaver 1997, 2002, Geurts 1996, 1999.

5.3. Conventional Presupposition and Inferential Accommodation

The central concern of both of the theories just considered is the projection problem. Both theories focus on the behavior of presuppositions which are triggered by specific lexical items, and both make the assumption (sometimes explicitly, sometimes not) that these presuppositions are part of the conventional lexical content of their triggers. These accounts thus seem to leave little if any room for conversational inference to play a role in the account of presuppositional behavior; and do not appear to cast light on cases of what I above called contextual presupposition (p.5).

A few authors have proposed a way of synthesizing this conventional view of linguistic presupposition with a broader understanding of the general phenomenon: see in particular Beaver 1999, 2001, but also Geurts 1996, Asher & Lascarides 1998, Beaver & Zeevat 2007, von Fintel 2008 and, for a somewhat different approach, Thomason 1990. The basic idea that all these authors articulate and expand on in different ways is this: The standard cases of presupposition are indeed linguistically encoded, and what is encoded is some kind of constraint on context (with context construed in different ways by different authors). The use of a presuppositional expression by a speaker thus provides the interpreter with a clue as to the context which the speaker is assuming, or wishes to be assumed in the conversation from this point. But the trigger is only a partial clue: the contextual requirement imposed by the trigger may be weaker than the context refinement intended by the speaker. If the interpreter infers that this is the case, she will choose to accommodate the stronger (or perhaps simply alternate) proposition that allows her to best make overall sense of the speaker's utterance. This accommodated proposition is what the utterance will intuitively be taken to presuppose.

This type of approach introduces a distinction between linguistic presupposition (conventionally encoded constraints on contexts) and pragmatic presupposition (inferable speaker assumptions about context). The approach allows that intuitions about presupposition are typically about pragmatic presuppositions, but proposes that these intuitions are often to be explained on the basis of facts about linguistic presupposition. Instances of contextual presupposition could then be taken to be cases of pragmatic presupposition lacking any linguistic trigger.

However, on this approach all standard cases of presuppositions, all those which are linguistically triggered, must be assumed to be conventionally encoded. This pragmatic enrichment of the theory is still considerably distant from the Strawson/Grice/Stalnaker idea that (some subset of the) basic presuppositions themselves can be explained in conversational terms.

6   Open Questions

I have attempted in this chapter to survey the major contributions to the linguistic literature on presupposition, although a complete and thorough survey would require much more space than this chapter is allowed. I have tried, though, to bring out a distinction between approaches which is not typically emphasized: the distinction between those who view presupposition as an utterance level phenomenon, and those who view it as a clause level phenomenon (with clause-level effects "projecting up" to the utterance level). Those who adopt the utterance-level view also typically (but not universally) prefer inferential accounts of the phenomenon: presuppositions viewed as implications derivable from an utterance on the basis of general conversational considerations. The clause-level view is typically associated with a conventionalist stance: presuppositions as linguistically encoded constraints attached to particular linguistic forms.

One question clearly worth exploring is whether and how the utterance-level and clause-level perspectives can be connected and reconciled. The approaches briefly discussed in section 5.3. offer a certain degree of rapprochement. Approaches to conversational inference which allow for inference below the level of the sentence might bring more. This area remains unexplored.

An entirely different question which remains largely open, and which has not been touched on in this chapter, is whether or not presupposition is at all a homogeneous phenomenon. Boër & Lycan 1976, aiming to dismantle the category of semantic presupposition, argued that it is not. Similarly, Karttunen & Peters 1979 argued that many purported cases of presupposition were really cases of conversational implicature, identifying "real" presuppositions with the category of conventional implicature.

But the more recent literature on presupposition suggests a very different approach to sub-classification. Scattered throughout the linguistic literature on presupposition of the last ten to fifteen years are all kinds of observations about differences between different cases of presupposition with respect to such properties as their amenability to accommodation and to local satisfaction, the ease with which they can be suspended, and the consequences of presupposition failure for the interpretability of the triggering utterance. No systematic study of these differences has yet been attempted. Beaver, Roberts, Simons & Tonhauser 2009 and Roberts, Beaver, Simons and Tonhauser 2009, following on unpublished work of Beaver & Zeevat, make initial steps towards such a systematic study, with the goal of identifying sub-classes of presuppositional or presupposition-like phenomena solely on empirical grounds. The goal of theorizing should then be to account for similarities and differences among sub-types of presuppositions. Roberts et al. (BRST) make the initial proposal that the common ground account is applicable only to one sub-class of presuppositions, those which have an anaphoric element. That anaphors require (something like) the salience of the antecedent to be common ground seems to follow rather naturally from the fact that interpretation requires recovery of the intended antecedent. The proposal thus points the way towards reconstructing the common ground constraint, at least in this case, as a type of Strawsonian condition on use.

But BRST take as the target of their study not presupposition per se, but any element of meaning which projects. As they note, although projection has for many years been taken as the central diagnostic for presupposition, not everything which projects is a standard, classical presupposition. It remains an open question whether the class of cases which has, for the last thirty years or so, generally been assumed to constitute a theoretically coherent class of presupposition triggers, will emerge as such in the light of the proposed detailed empirical study.

Whether it does or not, the pragmatic phenomenon of presupposition – the intuition that some of what is implied by an utterance is about the assumed background for the utterance – will not go away. An account of this pragmatic notion remains central to the endeavor of explaining what presupposition is.

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