1.3. Beyond saying: pragmatics

1.3.0. Overview

Our study of logic will be limited to deductive logic; and, even within those bounds, we will consider only the logical forms that are part of first-order logic. These limits imply some others that deserve consideration in their own right: although our study of deductive logic can be seen as the study of meaning, we will not study all aspects of meaning.

1.3.1. A model of language
  One simple picture of language sees it as a device for conveying information by way of the propositions expressed by sentences.

1.3.2. Some complications
  According to this picture, the meaning of a sentence lies in the way its truth value varies among possible worlds. But the truth value is not the only feature of sentences that is important for meaning, and the state of the world is not the only factor on which the truth value depends.

1.3.3. Speech acts
  Questions and commands do not appear to convey propositions, and even declarative sentences may play roles other than assertion.

1.3.4. Implicature
  Communication often exploits the assumption that what a speaker says is not only true but satisfies certain other requirements.

1.3.5. Indexicality
  When a sentence conveys a proposition, the proposition that is conveyed will usually depend on the context in which the sentence is used, and sentences are sometimes designed to convey information about his context.

1.3.6. Vagueness
  The range of application of many terms will have fuzzy boundaries even in a given context, and sentences that apply them to things falling in this gray area may have no determinate truth value.

1.3.7. Presupposition
  Another way of conveying information rests on the preconditions for a sentence to have a truth value at all.

1.3.1. A model of language

The idea of truth conditions or of a proposition suggests a simple picture of the way language works. According to this picture, each sentence has truth conditions that are determined by the semantic rules of the language. These truth conditions settle the truth value of the sentence in each possible world, something that is encapsulated in a proposition. The proposition expressed by a sentence is its meaning. The meaning of an expression smaller than a sentence is to be found in the contribution this expression makes to the propositions expressed by sentences containing it. From this point of view, the function of language is to convey propositions.

Just as the information content of a sentence is to be found by considering the range of possible worlds it rules out, the information that a person possesses is to be found by considering the possible worlds that he or she is able to rule out. The more you can rule out, the more information you have; and the kind of information you have is determined by the particular worlds you can rule out. This means that the sum total of your knowledge can be thought of as a proposition.

Anyone's aim in acquiring information could be described as an attempt to distinguish the actual state of the world among the various alternative possibilities—in short, to locate the actual world within the space of all possible worlds. The proposition representing your knowledge goes some distance towards in ruling out some possibilities. But it will leave many open, and the actual world could be any of those open possibilities. If someone conveys a proposition to you and you accept it, you are able to rule out a whole region of logical space, a region that can be added to the region ruled out by your existing knowledge. And, in general, this will reduce your uncertainty about the location in logical space of the actual world.

You can generate information to give to others by delimiting a region within the total area you know to be ruled out. Ideally, perhaps, you would simply convey the whole of what you know; but language limits your ability to do this since only a limited range of propositions are expressed by reasonably short sentences. To convey information, you select a sentence that is entailed by what you know and assert it, thereby conveying the proposition this sentence expresses.

This is process is illustrated in the following artificial example of sharing information. Figure 1.3.1-1 animates a conversation between two talking heads, each with a thought bubble indicating the content of that person's beliefs.
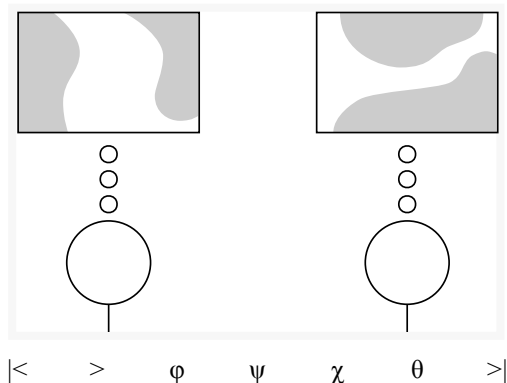
Fig. 1.3.1-1. An animation of a conversation in which information is shared. The button > will play the full conversation while the buttons φ, ψ, χ, and θ will each play one of its four stages. The buttons |< and >| move to the initial and final state, respectively.

Initially, the person on the left is able to rule out regions at the left and right of logical space as possibilities for the actual world while the person on the right is able to rule out regions at the top and bottom. The animation then shows a conversation in which each party in turn notices the truth of the one the sentences φ, ψ, χ, and θ and asserts it. The other person accepts this assertion as true and adds its content to the region ruled out by his or her beliefs, so the shared content increases over the course of the conversation. At the end, each is able to locate the actual state of the world as being somewhere in the middle of the full range of possibilities though the shapes of the areas they leave open still differ.

In this conversation, each party is depicted as accepting what the other says as true and adding it to his or her own beliefs. The person accepting the assertion could be said to modify his or her beliefs in a way that makes it something he or she might assert. This is an example of a process that the philosopher David Lewis labeled *accommodation*. In this case of accommodation, one's beliefs are altered to accommodate an assertion someone else has made.

Of course, we do not always accept what others say—i.e., we do not always alter our beliefs to accommodate their assertions—for we may doubt that they are sincere or that they know what they are talking about. But this cannot be the ordinary case. Words can acquire and maintain a conventional meaning only if people usually mean what they say. And the act of asserting a sentence could not have the significance it does unless people were usually willing to accept assertions as well-founded. A critical attitude is important; but, at least practically, it must be the exception. Even when we are critical and ask for the grounds of someone's assertion, our request can be met only if we are at some

point willing to accept the grounds we are offered; and, when we do accept these grounds, it will rarely be because there is no room for further doubt. In short, while we do not always accommodate what others say, accommodation is central to the aspects of language this model captures. And the reasons that it is central suggest it will be important for any sort of shared understanding.

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1.3.2. Some complications

Probably no one ever believed that the simplified model of language we have been considering was entirely accurate. But it, or something like it, was until recent decades the working model most logicians used for thinking about the function of language. Around the middle of the 20th century, philosophers became interested in a number of features of language that suggest this picture is inadequate; and these features have been incorporated into a number of richer models of language. The norms of deductive logic that we will study do not rest on the richer structure of these new models, so we will not consider such models in detail. But some of the further features of language that they attempt to capture are intertwined with those we will study, so we need to take some time now to disentangle ourselves from a few of these features once and for all and to lay the groundwork for disentangling ourselves from others at later points in the course.

The complicating phenomena that we need to consider have come to be studied under the rubric of *pragmatics*. This term was originally introduced (by Charles Morris) as an alternative to *semantics* in order to distinguish issues concerning the relation of language to its users from the issues concerning the relation of language to what is spoken of. The use of the term *pragmatics* is no longer closely tied to this definition, and I know of no definition that really captures the way it is now used. Probably the best way to understand current usage is to consider some commonly agreed examples of pragmatic phenomena. I will note four of them.

The first two concern aspects of meaning that are not captured by the idea of truth conditions.

- *Sentences are not always used to express propositions*. When a sentence is used to express a proposition, the question of its truth value is a significant one. But not all sentences have truth values or raise questions of truth value. And even when a sentence does have a truth value, its truth value may not be its most important feature. There are ways of using sentences besides assertion—questions and commands are only the most basic examples of other *speech acts*—and the way a sentence is used is one aspect of its meaning. The term *force* is often used for this aspect of meaning.

- *The information we derive from the use of sentences is not limited to what follows from assuming them to be true*. Even assertions can be expected to have properties other than truth, and the assumption that an assertion has a given property can be the basis for deriving information from it. In short, there can be forms of accommodation associated with properties other than

truth. This produces the phenomena of *implicature*, in which a sentence suggests more than it says. Even when everything a sentence literally says is true—so its *implications* are all true—an additional false suggestion, a further *implicature,* can make it misleading.

These two complications suggest that propositions are not quite as central to the use of language as the simple model suggests: sentences do not serve merely to convey the propositions they express.

Several further complications concern the relation between sentences and propositions.

- *The proposition expressed by a sentence may vary with the context in which it is used*. For example, there is no way to judge the truth value of a sentence like `I put that here yesterday` when it is taken out of context. This dependence on context is due to various phenomena known collectively as *indexicality* or *deixis*. These terms are etymologically related to terms for pointing, and the functions of words `this` and `that` are paradigm examples of such phenomena. The term *character* has been used for the way the proposition that is expressed by a sentence depends on the context of its use.
- *Even with regard to a given context, a sentence may not express a fully determinate proposition*. This can happen for a couple of reasons. First, the meaning of *vague* terms like `small` and `hot` will vary with the context; and even in a given context there will be no sharp delineation of the cases where they apply truly. That means that the content and coverage of a sentence like `That's hot` may not be divided by a sharp line, and some possibilities may lie in a gray area between them.

  A second reason for indeterminacy in the proposition expressed by a sentence is that there may be preconditions for the sentence to have any truth value in a given possible world. Such a sentence will be neither true nor false at a possible world that does not satisfy these preconditions, which are said to be *semantic presuppositions* of the sentence. A common example of this is a sentence that contains terms that may refer to nothing if the facts are not right. For example, the question whether `John's car is red` is or is not the case has no good answer when John does not in any sense "have" a car, so him having a car is something that `John's car is red` presupposes.

These phenomena all constitute ways in which the truth value of a sentence may depend on factors affecting the meaning of component vocabulary. And this dependence can take two forms: the truth value may vary as these other factors do or it may fail to exist if they are not present.

The force, the implicatures, the character, the degree of vagueness, and the

presuppositions of a sentence are parts of its meaning in the fullest sense of the term, and we will consider them each at least briefly to distinguish them from the narrower sense of meaning that will be our focus. It is easy to disentangle our topic from some of these phenomena but others require more detailed consideration, and some forms of entanglement are more likely to trip us up later than are others. As a result we will consider some of these sorts of meaning only to dismiss them quickly, and we will set others aside without completing disentangling ourselves from them. Implicature is the only one of these aspects of meaning that we will need to pay much attention to in later parts of the course.

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1.3.3. Speech acts

Although we have been speaking of sentences as if they all had truth values, there are some sentences that not only do not have truth values but cannot have them. It would be crazy to respond to a question like `Is it time for lunch yet?` by saying `True enough` or `You're wrong!` And these responses would be equally out of place in the case of an imperative sentence like `Please shut the door`.

Questions and imperatives are clear cases of sentences where truth values are irrelevant. But truth values may be beside the point in the case of some declarative sentences, too. Saying `True enough` or `You're wrong!` would be out of place in response to a sentence like `I promise to be here tomorrow` or `I apologize for what I said`, but the reasons they would be out of place are different here than in the case of questions and commands. The verbs `promise` and `apologize` can be used to describe certain sorts of actions that can be performed in using language; that is, they express *speech acts*. And, when they are used in the first person present tense (as in the sentences above) by the right person under the right circumstances, they can be used to perform the sort of actions they describe. That is, by saying `I apologize for what I said`, I can do something that can be described truly by the sentence `He apologized for what he said`; that is, given the right circumstances, I apologize simply by saying I do. Verbs that may be used in this way to perform the actions they describe were labeled *performative* by J. L. Austin, the philosopher who did the most to call attention to the variety of speech acts. When I use a performative verb correctly, what I say is true; but the fact that it is true is not very interesting because my saying it is what made it true.

Austin estimated that the performative verbs in English number "on the order of the third power of 10." If this estimate is accurate, there are thousands of kinds of speech act besides assertion and thousands of varieties of force beyond the sort of force we will focus on. Of course, much of this vocabulary marks only subtle differences of force between speech acts, but the fact that we have vocabulary for making such subtle distinctions indicates how important it is to us to know the specific force of an utterance. Moreover, we need not use performative verbs to perform the acts that these verbs describe. Under the right circumstances, I can apologize without saying `I apologize` and I can make a promise without saying `I promise`. So we can expect that, even when we use declarative sentences, many, and perhaps most, of things we say are not simply assertions. For example, the statement `I will be there` might be a simple assertion predicting the speaker's future location, but it will often (perhaps

most often) be a promise.

In spite of this, we will not consider speech acts other than assertion, and our interest in assertion itself will be limited to one aspect of its force: the expression of a proposition. Although this will cut us off from much of the richness of language, it will not cut us off from much that is central to deductive reasoning. Of course, there is a sense in which conclusions can be drawn from apologies and promises, but such inferences will tend to be matched by conclusions drawn from ordinary assertions using performative verbs to describe apologies and promises (rather than make them). Moreover, propositions are important components of the meaning of many speech acts. A **yes-no** question requests information about the truth of a proposition, and a commands directs someone to make a proposition true. This gives a study of assertions that focuses on the propositions they express a central place in the study of all speech acts.

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1.3.4. Implicature

As we have been using the term imply, a sentence implies anything whose content is included in the proposition it expresses. Thus we can say that the sentence My class was taught this morning implies A class was taught. The philosopher H. Paul Grice employed the term implicates to capture a different idea but one that is sometimes expressed by the ordinary use of the term implies.

It is not uncommon for information to be suggested by a sentence even though it is not entailed and thus is not part of what the sentence literally says. For example, my assertion of the sentence My class was taught this morning would, in most contexts, suggest that I did not teach the class myself. However, this is not part of what I said since my statement would be perfectly true if I taught the class, so My class was taught this morning implicates I did not teach my class this morning but does not imply it.

The contrasting vocabulary say and suggest was used in passing in the previous paragraph, and it is a convenient way of expressing the difference between implications and implicatures. Still, it makes a difference how the term suggest is understood. In particular, an implicature is not a mere subjective association. What a sentence implicates can be as much the product of rules of language as what it implies. The difference between the two lies in the fact that the rules leading to implicature are not (or are not only) rules assigning truth conditions.

To see what sort of rules they might be, let us consider an extension of our simple model of language use that incorporates implicature; in its outlines, this richer model is due to Grice. To account for implicature, we extend the scope of accommodation to include not only the truth of assertions but also certain other features that assertions ought to have. The maxim *Speak the truth!* is no doubt the key rule governing assertions, but other maxims, such as *Be informative!* and *Be relevant!*, also play a role. Someone who assumed I was obeying all maxims of this sort when I said, "My class was taught this morning," might reason as follows:

> Although Helman's assertion My class was taught this morning would have been perfectly true if he had taught his class, it would have been a strange thing to say in that case because the proposition expressed by I taught my class this morning would have contained more relevant information. So I can best accommodate his use of language if I assume he did not teach the class.

Let us say that an assertion is *appropriate* when it is in accord with all max-

ims governing language use and otherwise say that it is *inappropriate*. An assertion could be inappropriate even though true, so we go further when we assume it is appropriate than when we merely assume that it is true. We usually do go further in this way: we usually accommodate our beliefs about the world to the assumption that the assertions others make are not only true but appropriate for the context in which they are made.

These ideas can be used to state contrasting definitions for implication and implicature. First let's restate our definition of implication in a way that will make the comparison easier:

φ implies ψ (in a given context) if and only if φ cannot be true (in that context) when ψ is false (in that context).

To define implicature, we follow the same pattern using the concept of appropriateness instead of truth.

φ implicates ψ (in a given context) if and only if φ cannot be appropriate (in that context) when ψ is false (in that context).

That is, while implications are conditions necessary for truth, implicatures are conditions necessary for appropriateness. (Notice that the term implicature is used here both for the things a sentence implicates and for the relation between a sentence and what it implicates. Our use of the term implication follows the same pattern.)

One aspect of the relation between implication and implicature depends on whether we understand truth itself to be one of the requirements of appropriateness. It is convenient to understand appropriateness to include truth because anything that is implied is then also implicated and implicature is a broader relation than implication. This the way I will use the terms; however, there is no consensus about using the terms in this way, and many would use *implicature* more narrowly to cover only those conditions necessary for appropriateness that go beyond what is necessary for truth.

Both definitions above refer to the context in which sentences are used. Even when the phenomenon of indexicality doesn't force consideration of the context of use in deciding truth value, consideration of the context is crucial for other aspects of appropriateness. While the contextual dependence of truth values is tied to specific vocabulary, appropriateness in the wider sense is always dependent on the specific context in which a sentence is used. In the example used above, if it was well known that I had made a bet that I could avoid using the word I for the next 24 hours, no one would be misled by my saying My class was taught this morning when I had in fact taught it myself. We are expected to provide all the relevant information we can only under

the qualification *all things being equal*, and whether all things are equal depends crucially on the context in which something is asserted.

Even though appropriateness as a whole depends on the context, there are specific conditions attached to particular words that can lead to implicatures in every context. Consider, for example, this bit of dialogue:

Q: Was the movie any good?
A: Yes. Even John was laughing.

The assertion Even John was laughing has a number of implicatures that depend on the conversational setting (e.g., that John was at the movie and, perhaps, that it was a comedy), but it also has one that derives from presence of the word even. This implicature is easier to recognize than to state, but it comes to something like the claim that it isn't easy to make John laugh. It is implicatures attached to particular vocabulary that are the hardest to distinguish from implications, and they will be the chief reason that we will need to consider the idea of implicature later in the course.

One test that can be used to distinguish implicatures from implications is to ask a *yes*-*no question*. When asked Was even Tom laughing? about someone who had laughed at the movie but who was known to laugh easily, we would not answer with a simple No but rather say something like, Well, yes, but he'll laugh at anything. Such yes-but answers grant that the sentence we were asked about is true but go on to reject an implicature, so by answering in this way, we distinguish the implicature from whatever is required for the sentence to be true. Other qualified affirmative answers can play a similar role, and we will refer to them also as *yes-but answers* even when they do not use the term but. To simply answer Yes in cases where a sentence is true but has a false implicature could mislead our audience into thinking that the sentence is entirely appropriate and thus that the implicature is true. Indeed, a true sentence with a false implicature could be described as true but *misleading*. Yes-but answers acknowledge the truth of such a sentence while correcting its misleading suggestions. (There are further tests that can be used to distinguish implicatures and implications, and we will consider some others in 4.1.2.)

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1.3.5. Indexicality

We will give less direct attention indexicality than to implicature, but it would be hard to ignore the phenomenon. Although indexicality is most obvious in sentences with indexical words like I, that, here, and yesterday, there are other features of a sentence, most notably its tense, that can make the proposition it expresses vary with context in which it is asserted. The tense of It's sunny binds it as closely to the time of its utterance as would use of the word now. And, while not every sentence contains indexical words, it is only very special sentences that are not indexical in virtue of tense.

If the propositions expressed by sentences vary with the context, it seems that the logical properties and relations of these sentences (which we trace to the propositions they express) may vary as well. Let's look at one example. The proposition expressed by the sentence I am here will depend on the speaker, the speaker's location, and the time of utterance. And this sentence may express the same proposition as the sentence You are there when the latter is used by a second speaker in an appropriately related context. There are also many contexts in which these sentences might be asserted where they would not express the same proposition. But sentences are supposed to be logically equivalent when they express the same proposition, so it seems these sentences would be equivalent when used in some contexts and not equivalent when used in others. And the same issue arises for deductive properties as well as relations; a sentence that is a tautology when used in one context might not be a tautology when used in a different context.

More broadly it may seem that we really should not speak of sentences as having deductive properties and standing in deductive relations. If a sentence expresses no fixed proposition independent of the context in which it is asserted, we can really only talk about the deductive properties and relations of sentences-in-context, of sentences each taken together with a context of use. The term *statement* has sometimes been used to speak of a particular use of a sentence. If we use this terminology, we can say that certain statements made using the sentences I am here and You are there are equivalent and that it statements rather than sentences have deductive properties and stand in deductive relations. Something like this approach would be required if we really were to study the phenomenon of indexicality. However, the logical forms on which we will focus do not include indexical elements, so it will be possible for us to ignore this aspect of meaning.

Even when indexical elements are present, we can set aside explicit reference to contexts of use when speaking only of logical properties and relations

that do not vary from context to context. And there are many cases of logical properties and relations that do not vary. Although the propositions expressed by The package will arrive next Wednesday and The package will arrive next week will vary depending on the time of utterance, the content of the first sentence will always include the content of the second, so a relation of implication will always hold between them.

Since we are studying formal logic, we are interested in generalizations about properties and relations that hold in virtue of certain forms of expression; and the particular forms of expression we will study do not change their significance from the context to context, so we will only be interested in logical properties and relations that are not context dependent. Although the propositions expressed by I put that here yesterday and I didn't put that here yesterday vary significantly with the context, the function of the word not insures that in any given context, the two sentences will express contradictory propositions. And this invariable function of not is the sort of thing that we will study.

In fact, we can ignore the role of context entirely. When comparing The package will arrive next Wednesday and The package will arrive next week in 1.2.3 we simply took it for granted that sentences were being compared with respect to some one context, and we spoke freely of the propositions they expressed in that context without bothering to note that they expressed different propositions in other contexts. That is we treated the expressions next Wednesday and next week in the way we would treat references to specific dates or time periods—such as September 5, 2012 and the week of September 3, 2012. This procedure is legitimate if we are careful not to assume anything special about the context of use, and it will be easy not to make special assumptions about the context because the deductive properties and relations we are interested in do not depend on this context.

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1.3.6. Vagueness

One way of understanding vague terms is to suppose that their significance varies with the context of use but is not completely determined by it. The meaning of a word like small depends on the line to be drawn between what is and what is not small. This line is settled to some degree by features of the context of its use—whether the word appears in a discussion of molecules or of galaxies, for example—and some contexts will pin it down more precisely than others. But there is usually, and perhaps always, some indeterminacy remaining, and the class of things that count as small in a given context will have fuzzy edges.

Although the context dependence of vague terms means that vagueness is somewhat analogous to indexicality, the fact that sentences containing vague terms may not have definite truth values even when the context is specified means that we cannot handle such sentences in quite the same way as we do sentences exhibiting ordinary forms of indexicality. We can understand logical relations among sentences involving indexical terms—such as

The package will arrive next week ⋈ The package won't arrive next week

—to hold even without specifying the context in which they are used because the propositions expressed by the two sentences are related in a certain way in every context of use. But we cannot understand the relation

Crawfordsville is small ⋈ Crawfordsville is not small

to hold for the same reason because the sentences involved may not express fully definite propositions in any context of use. In most contexts small is not perfectly precise, and there will be some possibilities for the population of Crawfordsville that will put it in the gray area. That means that for such a context, we will not be able to say that Crawfordsville is small and Crawfordsville is not small have opposite truth values in every possible world because there will be some possibilities under which neither has a definite truth value.

Still, there is a way of extending our approach to indexicality to provide an approach to vagueness. In both cases we can understand deductive properties and relations to hold for sentences because of the propositions that *would be* expressed by the sentences if certain factors were specified. In the case of the first example above, the relevant factor, the time of utterance, is specified by any actual context of use. In the second example, the relevant factors are precise *delineations* of the class of things that the term small is true of. These de-

lineations are not fully determined by an actual context of use, but we can still say that the propositions expressed by the sentences in the second example would represent a case of contradictory sentences no matter how these delineations were specified. If we limit consideration to logical properties and relations that hold no matter what delineation is chosen, we will be able to take the same attitude to delineations as we do to contexts of use. That is, just as we will always take for granted an unspecified context of use, we will take for granted but leave unspecified precise delineations of all vague terms. And that means that we will speak of sentences as if no terms were vague.

Of course, some terms *are* vague, so perfectly precise delineations of their application are not real features of at least some contexts of use. This means that our approach to vagueness has at least a somewhat different character than our approach to indexicality. How far different it is depends on aspects of vagueness that are controversial. If the second pair of sentences is taken to be equally as contradictory as the first in spite of their vagueness, then delineations are simply an artificial device used to capture real relations (just as the artificial assignment of coordinates can be used to capture real geographic relations). On the other hand, if the second pair of sentences is taken to be less than fully contradictory due to their vagueness, our use of delineations will count as an idealization (comparable to assuming the absence of friction) that might help simplify the study of logic but that will yield results that hold only with some qualification.

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1.3.7. Presupposition

When the **yes** answer to a **yes**-**no** question would be tantamount to making a true but misleading assertion, it is appropriate to answer **yes** only if we add a qualification. But it is still possible to give an affirmative answer in such a case, and no qualification would make the answer **no** appropriate. Another of the complications of the simple picture of language appears in connection with **yes**-**no** questions for which neither answer seems legitimate.

Take, for example, consider the question

<div align="center">

Is John's car red?

</div>

asked about someone who does not have a car. In such a case, we would be at a loss to answer the question directly. This is usually explained by saying that the question *presupposes* that John has a car and has no appropriate direct answer when this presupposition does not hold. And we can say something similar about the following declarative sentences, which correspond to affirmative and negative answers to the question, respectively:

<div align="center">

John's car is red
John's car is not red

</div>

That is, just like the question, we can take each of these assertions to presuppose **John has a car**.

We could capture these limits on appropriateness by regarding presupposition as a sort of implicature. That is, we might say that John having a car constitutes a necessary condition for the appropriateness of either of the assertions above. But many have held that in contexts where John has no car, it is not only the case that neither sentence is appropriate but the case that neither is true. Since one would be true if the other was false, this means that neither claim would have a truth value. If this point of view is correct, what is missing in these assertions when John has no car is not some quality like informativeness or relevance that we expect in addition to truth but instead something that is a precondition for either truth or falsity. Something that is a presupposition in this strong sense is said to be a *semantic* presupposition. If John having a car is a semantic presupposition of the two sentences above, it is easy to see why they seem equally inappropriate when John has no car: each would have no truth value so the two would be in the same position as regards truth and falsity.

In this example, the presupposition is something that is required for the term **John's car** to have anything to refer to. That is a common source of semantic presuppositions but not the only one. Another is *category mistakes*, where

what fails is not the reference of terms but the proper meshing of different terms. There is no problem of reference in the sentences The square root of 2 is blue and The square root of 2 is not blue, but it is natural to suppose that neither has a truth value because the adjective blue simply does not apply to numbers: it does not serve to distinguish between those that are and those that are not blue. Here the failed presupposition is that the square root of 2 falls in the category to which blue does apply, that the square root of 2 is colored.

Semantic presupposition is unlike the phenomena we have considered so far in that it requires fundamental changes to the simple model of language and not merely additions to it. The simple model is built around the assumption that a sentence has a truth value in every possible world, and this assumption can be retained in the face of indexicality and vagueness by adding the context of use and delineations of terms as further factors on which the truth value depends. Even when delineations are seen as an idealization, they are an ideal limit of features whose reality is not in doubt. But only more radical additions will preserve truth values in the case of semantic presupposition, and accepting the absence of truth values would force equally radical changes to the simple model of language. There is little consensus, even among logicians who accept the idea of semantic presuppositions, about the sort changes that are best, but here we will follow the first path and assume that the missing truth values have been somehow specified. As in the cases of indexicality and vagueness, we will be interested only in logical properties and relations that hold no matter which truth values are specified, but at a couple of points in the course, we will need to pay a little more attention to the devices used to specify these values.

The classic examples of semantic presupposition arising from the requirements of reference are sentences containing phrases employing the definite article the to refer to something by way of a description of it. Such phrases, which logicians classify as *definite descriptions*, cause problems because their success in referring depends on the existence of objects satisfying the descriptions they offer. For example, both the sentence The building between Center Hall and Sparks Center is occupied and the sentence The building between Center Hall and Sparks Center is unoccupied seem inappropriate when no such building exists because then the definite description the building between Center Hall and Sparks Center has nothing to refer to. Definite descriptions that refer contingently are so common that we must take some account of them. The use of possessives that we saw in the example of John's car are also common, and they represent a closely related sort of case because John's car might be paraphrased by the definite description the car

John has.

The approach we will take to these sorts of semantic presupposition does share one feature with our approaches to other complicating phenomena: just as we do not attempt to capture relations of implicature in our study of logic, we will not attempt to capture relations of presupposition as such. However, the line between implication and presupposition is controversial, and relations between sentences like The building between Center Hall and Sparks Center is occupied and There is a building between Center Hall and Sparks Center fall in the disputed area. In 8.4.2 we will consider an account of definite descriptions according to which the first of these sentences implies the second, and comparing this approach to one that does not recognize this implication will force us to consider what is to be said when the second sentence is false. We will lay some groundwork for this later discussion in ch. 6, when we first analyze sentences into expressions that are not sentences and begin to consider expressions whose function is to refer rather than to have truth values. Until then, we will simply assume that all sentences, even those containing definite descriptions or possessives, have truth values in all possible worlds without considering what devices might be employed to achieve this.

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1.3.s. Summary

1 The idea that the norms of deductive reasoning reflect a system of relations among propositions fits into a simplified picture of the function of language. According to this picture, a person's beliefs amount to a proposition that rules out a certain range of possibilities for the actual history of the universe. The desire to know more is in part the desire to narrow the range of possibilities that are left open. When language is used cooperatively, we share our abilities to rule out possibilities by using assertions to convey propositions. The sentences we can sincerely assert are the ones that are entailed by the sum total of our beliefs, and we accommodate someone else's assertion by adjusting our beliefs so that what they asserted is now entailed by our beliefs.

2 This picture is oversimplified and something must be said about several respects in which the actual operation of language is more complex. Each is associated with an aspect of meaning:

  (i) the force of a sentence that marks it as an assertion or one of the many other speech acts,

  (ii) implicatures, which convey information that a sentence does not imply,

  (iii) the character of a sentence, which reflects the way the proposition it expresses varies with the context of use due to the phenomenon of indexicality, and

  (iv) a greater or lesser degree of vagueness, and semantic presuppositions, requirements for the sentence to have a truth value.

While an account of how sentences express propositions is the province of semantics, these complicating phenomenon are usually said to be the subject matter of pragmatics.

3 Although assertion is the only speech act we will study, not even all declarative sentences have this force. J. L. Ausin estimated that `assert` was only one of thousands of performative verbs that can be used to both perform and describe speech acts. Although many of these speech acts do not serve to convey propositions, their force can often be described with reference to propositions.

4 We will consider only what is implied by a sentence as part of its truth conditions and not further information that may be implicated as conditions for appropriate assertion beyond the requirements for truth. A false implicature will make a sentence misleading but may leave it true. One indication of this sort of case is a `yes`-`but` answer to the `yes`-`no` question corresponding

to the sentence.

5 Indexicality means that the propositions expressed by sentences—and thus their deductive properties and relations—can depend on the contexts in which they are used. It would be possible to compare sentences only when each was associated with a specified (but perhaps different) context—such sentences-in-context are sometimes called *statements*. However, we will compare sentences only within a single context of use and consider only properties and relations of sentences that hold no matter what that context is. As with implicature and presupposition, accommodating sentences to the rules governing indexical phenomena provides a way of extracting information that goes beyond entailment.

6 Vagueness poses problems analogous to those posed by indexicality and presupposition. As with indexicality, we will assume a context of use; and, as with presupposition, we will assume supplementary specifications of truth value (in this case precise delineations of the boundaries of vague terms).

7 Since a semantic presupposition is something that must hold in order for a sentence to have a truth value at all, sentences with non-tautologous presuppositions can fail to have truth values. The pervasiveness of definite descriptions—which can fail to refer to anything if the facts are not right—makes it hard to simply ignore sentences with non-trivial presuppositions, so we will assume that something is added to insure they always have truth values.

1.3.x. Exercise questions

1. For each of the following sentences, give a sentence it implies and a sentence it implicates (but does not imply) in the context described:

   a. My plate is clean, as reported by a small boy who has been told to finish his vegetables by a parent saying, "Clean your plate."

   b. There is a cooler in the trunk, said in reply to someone's expressed wish to have a beer.

   c. I saw the director's last movie, said in reply to someone who asked whether the speaker has seen a certain new movie.

2. Many philosophers would argue that the sentence I'm Adam, when true, expresses the same proposition as Adam is Adam; that is, if it is true at all, it is true in every logically possible world. The phenomenon of indexicality or deixis can help to explain how I'm Adam could be informative even if these philosophers are correct and it expresses a tautology when it is true. To see how this might work, ask yourself what information can be derived about a context of utterance by accommodating the use in this context of the sentence I'm Adam.

3. J. L. Austin, the philosopher who made people aware of the variety and importance of speech acts, suggested a way of identifying them. Look for verbs that can fit in the context I hereby … (e.g., I hereby assert that … or I hereby apologize). That is, look for, verbs that (in grammarians' jargon) can be used in "first person indicative active sentences in the simple present tense" along with the adverb hereby. These are the "performative verbs" mentioned in 1.3.3. Austin suggested that there are such verbs for most speech acts. Find half a dozen as varied in character as possible.

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1.3.xa. Exercise answers

1. The following are perhaps the most likely answers though they are not the only correct ones:

   a. implies: No vegetables are on the boy's plate

      implicates: The boy has finished his vegetables

   b. implies: The trunk is not empty

      implicates: There is beer in the cooler

   c. implies: The speaker has seen a movie by the director in question.

      implicates: The speaker has not seen the new movie [with further implicatures depending on the tone of voice]

2. The truth value of I'm Adam depends on features of the context in which it is uttered—specifically, on the identity of the speaker. So, it is not true in some contexts of utterance. And that means that, if we assume it is used correctly, it can tell us something about the context—who the speaker is. We derive this information not simply by assuming that the actual world is a world in which the sentence is true but by assuming, more specifically, that the sentence has been uttered in a context that makes it express a true proposition. And even if it tells us nothing about the actual world to know that the person Adam is himself, it does tell us something about the context to know that the person Adam is the speaker.

3. If Austin was right, thousands of answers are possible. I will simply note a five-fold classification of speech acts along with examples of performative verbs for each sort of act. (This classification is due to the philosopher John Searle but based on Austin's ideas.) (1) *representatives* (e.g., assert and conclude) commit the speaker to the truth of something. (2) *directives* (e.g., order and ask) are attempts to get the speaker's audience to do something. (3) *commissives* (e.g., promise and threaten) commit the speaker to some future action. (4) *expressives* (e.g., apologize and congratulate) express a psychological state. (5) *declarations* (e.g., sentence and promote) effect a change in an institution.

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