

Indexicality and Presupposition

Explorations beyond Truth-Conditional Information

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Abstract

This thesis consists of four essays and an introduction dedicated to two main topics: indexicality and presupposition.

The first essay is concerned with an alleged problem for the standard treatment of indexicals on which their linguistic meanings are functions from context to content (so-called characters). Since most indexicals have their content settled, on an occasion of use, by the speaker's intentions, some authors have argued that this standard picture is inadequate. By demonstrating that intentions can be seen as a parameter of the kind of context that characters operate on, these arguments are rejected. In addition, it is argued that a more recent, variable-based framework is naturally interpreted as an intention-sensitive semantics.

The second essay is devoted to the phenomenon of descriptive uses of indexicals on which such an expression seems to contribute, not its standard reference as determined by its character, but a property to the interpretation. An argument that singular readings of the cases in question are incoherent is shown to be incorrect, and an approach to descriptive readings is developed on which they arise from e-type uses akin to other well known cases. Further, descriptive readings of the relevant kind are seen to arise only in the presence of adverbs of quantification, and all sentences in which such an adverb takes scope over an indexical are claimed to be ambiguous between a referential and an e-type (descriptive) reading.

The third essay discusses a version of the variable analysis of pronouns on which their descriptive meanings are relegated to the so-called phi-features – person, gender and number. In turn, the phi-features are here seen as triggering semantic presuppositions that place constraints on the definedness of pronouns, and ultimately of sentences in which they appear. It is argued that the descriptive information contributed by the phi-features diverges radically from presuppositional information of both semantic and pragmatic varieties on several dimensions of comparison, and instead the main role of the phi-features is seen to be

that of guiding hearers' attempts to ascertain the speaker's intentions.

The fourth essay addresses an issue concerning the treatment of presuppositions in dynamic semantics. Representing a semantic treatment of pragmatic presuppositions, the dynamic framework is shown to incorrectly regard conversational infelicity as sufficient for semantic undefinedness, given the standard way of defining truth in terms of context change. Further, it is shown that a proposal for a solution fail to make correct predictions for epistemic modals. A novel framework is developed on which context change potentials act on contexts that have more structure than the contexts usually countenanced by dynamic semantics, and it is shown that this framework derives truth from context change while making correct predictions for both presuppositions and modals.

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DESPICIENDO SUSPICIO
– TYCHO BRAHE

1 Introduction

This thesis consists of four essays devoted to two main topics: *indexicality* and *presupposition*. In this introduction I aim to present these two topics and give some background.

1.1 Two Frustrations of One-One Semantics

The general theoretical field with which this thesis is concerned is that of *semantics*, the study of linguistic meaning. From its earliest days in the 19th century and all the way until roughly 1980, the task of semantics was more or less uniformly seen as that of giving a systematic account of the *truth conditions* of sentences.¹ There have been different ways of approaching this task. The tradition that is relevant for this thesis is particularly influenced by Frege (1892), (1918) and sees the project as that of associating *contents* or *propositions* with sentences.² The basic idea is the following: Sentences express propositions – intuitively what is said by, or the content of, the sentence. The way to identify the proposition a sentence expresses is to identify under what circumstances the sentence is true. For example, specifying that the sentence *Elephants have trunks* is true if and only if elephants have trunks is a way of specifying that the sentence expresses the proposition, or says, that elephants have trunks.

As this suggests, philosophers for a long time thought of the relationship between sentences and contents as *one-one*.³ Each (declarative) sentence expresses

¹See Coffa (1991) for an account of the history up until and including the Vienna Circle.

²Cf. for instance, Frege (1918, 327–328). The other major paradigm in truth-conditional semantics was inaugurated by Davidson (1967) who took his inspiration from Tarski (1935). See Larson and Segal (1995) for a contemporary instance.

³With some generalization, this approach is exemplified by Frege (1918), Quine (1960), Katz (1972). See Carston (2002, 31–32).

one proposition, its truth-conditional content, and further, this propositional content was seen as exhausting the information that semanticists should attempt to account for. Indexicality and presupposition have at least the following in common: they are both challenges to this picture. In fact, historically, they together spurred the main additions that had to be made to formal semantic systems once philosophers turned their attention to the semantics of natural languages.

The challenge raised by indexicality for the one-one approach is that the same sentence can express different propositions on different occasions of use. The challenge raised by presupposition is that the proposition expressed is not the only type of information that can lay claim to being semantically associated with sentences.

In what follows I use this theme to present my two topics. Section 1.2 concerns indexicality, and Section 1.3 presupposition. The aim is to provide some historical background to each topic and sketch the more recent theories that the essays engage with. These introductions are selective and largely non-technical. I focus on the aspects relevant for this thesis without going into details, which are given in the essays. Finally, Section 1.4 provides an overview of the essays to come and situates them in the landscape drawn up by the two previous sections.

1.2 Indexicality

1.2.1 Early History of Indexicality

The histories of both indexicality and presupposition, in this tradition, begin with Frege, who noted and discussed both phenomena along with a host of other topics that are now central to the study of natural languages. With respect to indexicality, Frege (1918) noted the context-sensitivity of adverbs such as *today*, *yesterday*, *here* and *there*, and of pronouns such as *I*:

If someone wants to say today what he expressed yesterday using the word ‘today’, he will replace this word with ‘yesterday’. Although the thought is the same its verbal expression must be different in order that the change of sense which would otherwise be effected by the differing times of utterance may be cancelled out. The case is the same with words like ‘here’ and ‘there’. In all such cases, the mere wording, as it can be preserved in writing, is not the complete expression of the thought; the knowledge of certain conditions accompanying the utterance, which are used as means of expressing the thought, is needed for us to grasp the thought correctly.⁴

A key thing to note here is Frege’s observation that the same proposition (thought) can be expressed by different sentences, depending of the situation in which the

⁴Frege (1918, 332).

sentence is uttered. As we will see, this fact was later accounted for by isolating a layer of meaning in indexical expressions which does not become part of the truth-conditional content of sentences containing them, although it helps determine that content. It is not too much of a stretch to see Frege as foreshadowing that conception in passages like the one above, although his view was different in many ways.⁵

More generally, what is being observed here is that several types of expressions and constructions in natural languages are *context-sensitive* in the sense that what they contribute to the truth-conditional content of sentences, and hence this truth-conditional content itself, differs on different occasions of use. The debate over exactly how many, and which, expressions are context-sensitive is ongoing.⁶ Here is a list of examples, some of which are more controversial than others:

- (1) a. **Pronouns:** He is bored.
Contextual contribution: Referent of *he*.
- b. **Adverbs of space and time:** It is warm here now.
Contextual contribution: Location for *here* and time for *now*.
- c. **Definite descriptions:** The computer is broken.
Contextual contribution: Referent of *the computer*.
- d. **Gradable adjectives:** Paul is tall.
Contextual contribution: Comparison class for *tall*.
- e. **Quantifiers:** Sarah is buying drinks for everyone!
Contextual contribution: Domain for *everyone*.

A caution is in order here. As it is used in this field of research, the term ‘indexical’ derives from later technical treatments of context-sensitivity.⁷ On this usage, some of the examples above might not count as indexicals.

Theorizing about the semantics of natural languages grew out of the study of formal languages in the work of Frege (1879), Tarski (1935), and others. These projects originated in the foundational problems of the sciences, chiefly mathematics, prevalent at the turn of the last century, and the goal was to establish a framework for conducting rigorous, error-free argumentation. The consensus

⁵See Perry (1977), Salmon (2002), Burge (2005) for some discussion.

⁶For a sample of this debate, see Bach (1994), (2005), (2007), Carston (2002), Recanati (2004), Cappelen and Lepore (2004), Stanley (2007).

⁷Perhaps the first to use the term in this way was Peirce, whose paper ‘The Icon, Index, and Symbol’ (published as Hartshorne and Weiss (1932, ch. 3)) contains many observations which reoccur in contemporary accounts. See in particular his (pp. 163–164) observations on the role of pronouns in interpretation. But it was used before Peirce in non-technical language with a similar meaning.

was that natural languages were ill-suited for this purpose, and among the main reasons for this stance was the recognition of topics like indexicality and presupposition – other important cases being empty names, opacity, and vagueness. From the point of view of this logico-mathematical project, these phenomena were defects that rendered natural languages hostile to the rigor required by proper scientific reasoning.⁸

The one-one approach to semantics was influenced by this climate. One-one semanticists shared the view that indexicality is problematic from the point of view of semantic theorizing; but many of them believed that fortunately it could be effaced for the purpose of rigorous analysis. For instance, following Quine (1960), Katz (1972) proposed that, for the purpose of semantic analysis,

indexical nominal elements like ‘I’, ‘he’, ‘it’ and ‘John’ will be replaced by precise specifications of the individual or objects that include whatever information about the vital statistics is required to make the specifications resist changes in reference.⁹

But even early on, some dissented from this stance. For instance, almost 20 years before, Bar-Hillel (1954) had argued that

Since our knowledge is limited, the use of indexical expressions seems [...] to be not only convenient in very many situations – nobody would doubt this fact – but also indispensable for effective communication. [...] I believe, therefore, that the investigation of indexical languages and the erection of indexical language-systems are urgent tasks for contemporary logicians.¹⁰

This view, then, sees indexicality as indispensable and as such rejects the revisionist attitude taken by theorists like Katz. As such it recommends abandoning the one-one correlation of propositions with sentences.

Bar-Hillel’s argument for the indispensability claim was based on a thought experiment that can be roughly reproduced as follows. Imagine I am asked to communicate to you that I am hungry without using any indexicals at all. Can I do it? The best strategy seems to be to construct some elaborate description to pick out myself and then try to predicate of that object that it is hungry. A first shot might be ‘Andreas Stokke, in St Andrews, on 27 April 2010, at 3:54 p.m. is hungry’. But I will still need you to realize that the person I have described in such detail *is me*, and it seems that the same will be true for most other descriptions that I can come up with given the communicative resources I have at my disposal.

Bar-Hillel refrained from drawing the strong conclusion that it is ultimately impossible to do without any indexical elements; instead he claimed that

⁸Frege is a notorious example. See for example Frege (1879, 50–51), (1892, 163–164).

⁹Katz (1972, 126).

¹⁰Bar-Hillel (1954, 368).

Not in every actual communicative situation could every indexical sentence be replaced, without loss of information, by a non-indexical sentence; but there is, on the other hand, no indexical sentence which could not be replaced by a non-indexical sentence, without loss of information, in some suitable communicative situation.¹¹

So Bar-Hillel believed that indexicality is indispensable in the sense that there are some (presumably many) situations in which the information the participants have is such that the only way of expressing a particular proposition they are interested in is to use indexicals. A lot could be said about this argument and its conclusion, but I will not pursue this discussion here. I bring it out merely to give the flavor of the kind of motivations that lead theorists to consider indexicality worthy of serious semantic study.¹²

The project of developing indexical semantics, recommended by Bar-Hillel, was given its modern foundations by Montague (1968), followed by Lewis (1970), Cresswell (1973), and others.¹³ Very briefly, their innovation was the following.

Through the work of Carnap (1956) and Kripke (1963), a sophisticated semantics for modal logic had been developed in which truth was relativized to possible worlds. In this kind of system, a sentence can be associated with the set of possible worlds that make it true, or equivalently with a function from worlds to truth values, representing the proposition expressed by the sentence. Carnap called such functions *intensions*.

Driven by their interest in the context-sensitivity of natural languages, Montague and his followers embellished this framework. Instead of merely relativizing truth to a possible world, truth was relativized to an *index* which was a sequence of a possible world and elements needed to fix the reference of indexicals. For example, in this semantics the sentence *I am hungry* is true with respect to the index $\langle \text{Andreas, 27 April 2010 3:54 pm, } w \rangle$ if and only if in w , Andreas is hungry at 3:54 pm on 27 April 2010. One can then associate sentences with functions from indices to truth values thus representing contents in very much the same way as in the modal systems, with the additional structure to the points of evaluation.

Does index-theory constitute a departure from one-one semantics? The question is delicate in that, on the one hand, there is only one function associated with each sentence, but on the other hand, the function's determining differ-

¹¹Bar-Hillel (1954, 369).

¹²Another important, but later, contribution came from Perry (1979) and Lewis (1979a) who showed that certain kinds of contents are essentially indexical. Again, these points were foreshadowed by Frege (see in particular Frege (1918, 332–334) and Perry (1977) for discussion). See Anand (2006), Ninan (2008), (2010) for some recent work on these issues. Moreover, the alleged indispensability of indexicality has played an important role in debates over the relation between theories and reality in philosophy of science. See van Fraassen (2008) for recent discussion.

¹³Further early advances were made by Reichenbach (1947), Burks (1949).

ent truth values relative to different indices is taken to represent the fact that the sentences, in some sense, says different things on different occasions. At any rate, index-theory constitutes an important step towards recognizing the kind of variability denied by one-one theorists like Katz and Quine.

1.2.2 Kaplan's Double Index-Theory

The final break came with Kaplan (1977) who laid the ground for contemporary theorizing about indexicality by showing that the Montagovian treatment was inadequate in that truth must be relativized to both a *context* and an index.¹⁴ Kaplan's semantics was motivated from at least two directions. One was the goal of accounting for certain logical phenomena, most famously the fact that, as he saw it, some sentences such as *I am here now* are logical truths and yet contingent.¹⁵ This first motivation propelled his rejection of the index-theory. The argument is given in Section VII of Kaplan (1977), and can be summarized as follows.

Consider how the index-theory will treat the pair:

- (2) a. I am here now.
b. David Kaplan is in Portland on 26 March 1977.

Obviously, (2a) is true with respect to some indices and false with respect to others. For example, it is false with respect to the index ⟨Immanuel Kant, Edinburgh, 27 April 2010, @⟩, where @ is the actual world. And it is true with respect to the index ⟨David Kaplan, Portland, 26 March 1977, @⟩. The same is the case for (2b). If one varies the world parameter, some indices will make (2b) false and others will make it true. Hence, the index-theory treats both sentences in (2) on a par.

Against this, Kaplan objects:

But here we have missed something essential to our understanding of indexicals. Intuitively, [(2a)] is deeply, and in some sense, which we will shortly make precise, universally, true. One need only understand the meaning of [(2a)] to know that it cannot be uttered falsely. No such guarantees apply to [(2b)]. A Logic of Indexicals which does not reflect this intuitive difference between [(2a)] and [(2b)] has bypassed something essential to the logic of indexicals.¹⁶

He then considers a possible fix: just impose the condition that all indices must be *proper*, where a proper index is an index for which its agent is located at its time

¹⁴Lewis (1980) was another important work along these lines.

¹⁵See Kaplan (1977, Sec. VII).

¹⁶Kaplan (1977, 509).

and place in its world. So for example, the index $\langle \text{Immanuel Kant, Edinburgh, 27 April 2010, @} \rangle$ will be ruled out as improper.

Yet this will still not do. If all indices are proper, (2a) is true with respect to all indices. But so is

(3) Necessarily, I am here now.

Looking at the set of proper indices, no matter how you vary the world, (2a) is true, which is just to say that (3) is true. However, this is clearly wrong. For example, although Kaplan was giving his paper in Portland on 26 March 1977, he could have been elsewhere.

Kaplan concludes that what is needed is a system of *double indexing* so that the effects of operators like *Necessarily* can be isolated from the context-dependence of indexicals. So truth must be relativized to both a context and an index, which Kaplan calls a *circumstance of evaluation*. A circumstance of evaluation is an inventory of whatever we take truth to be relative to.¹⁷ For Kaplan this included a time and a possible world, and hence a circumstance of evaluation i was modeled as a pair:

$$i = \langle w_i, t_i \rangle$$

A context is an inventory of those aspects of the utterance situation that are relevant for determining content. In Kaplan's semantics the parameters of context were the agent a_c (usually, the speaker) and the time t_c , location l_c , and possible world w_c of the utterance. Formally, a context c is modeled as a tuple of these elements:

$$c = \langle a_c, t_c, l_c, w_c \rangle$$

We can then require that all contexts be proper, and yet, because we can vary the world of evaluation independently, avoid making (2a) equivalent to (3).¹⁸ Having thus relativized truth to both contexts and circumstances, Kaplan defined validity as truth in all contexts, where a sentence is true in a context c if and only if it is true with respect to $c = \langle a_c, t_c, l_c, w_c \rangle$ and the circumstance $i = \langle w_c, t_c \rangle$. On this definition, (2a) is a logical truth because all contexts are proper,

¹⁷For discussion of this notion, see Cresswell (1973), (1990), Lewis (1980), and more recently, Cappelen and Hawthorne (2009).

¹⁸Famously, Kaplan claims in the subsequent Section VIII, that double index-theory is problematic because it licenses what he called *monsters*, i.e., operators that shift parameters of contexts, which he thought not only did not exist but could not exist. Today, many doubt that parameters of context never shift. See Israel and Perry (1996), Schlenker (2003), Anand and Nevins (2004), Anand (2006).

while (3) is not because the necessity operator is allowed to shift the world of the circumstance.

Since Kaplan, the word ‘indexical’ has been used to refer, roughly, to the group of expressions whose reference depends on a parameter of context in the sense described above. Some theorists believe that not all context-sensitivity can be reduced to indexicality in this sense.¹⁹

1.2.3 Characters and Descriptive Meaning

In Kaplanian semantics one associates with sentences two kinds of functions. One is a function from circumstances of evaluation to truth values and is identified with the previous notion of an intension, which Kaplan explicitly takes to model the proposition expressed by the sentence. But sentences no longer express propositions *simpliciter*, they do so only relative to contexts. In addition to intensions, sentences are associated with functions from contexts to contents. These Kaplan called *characters*. So semantic evaluation can be visualized as two-dimensional: In the first dimension character acts on a context to determine a content, in the second the content acts on a circumstance of evaluation to determine a truth value. Thus the one-one approach is finally laid to rest.

This reflects the other kind of motivation that Kaplan had for his semantics, namely the intuitive observation that although terms like *I*, *you*, *today* and *here* contribute different things to the interpretation on different occasions of use, there is nevertheless a clear sense in which their meanings remain stable across contexts. In particular, Kaplan recognized that indexicals are associated with a layer of stable *descriptive meaning*. For example, *I* seems to mean something like ‘the speaker of this utterance’, *you* something like ‘the addressee of this utterance’, *today* something like ‘the day of this utterance’, and *here* something like ‘the place of this utterance’.

Characters capture this invariant aspect, and Kaplan explicitly identified characters with linguistic meanings:

Because character is what is set by linguistic conventions, it is natural to think of it as meaning in the sense of what is known by the competent language user.²⁰

In other words, the Kaplanian system separated meaning and content. The separation was watertight in the sense that character never spills into content.

¹⁹Cappelen and Lepore (2004, 2) point out that Kaplan (1977) did not make explicit the reason for his own way of delineating the set of indexicals. They defend the, relatively narrow, Kaplanian delineation as against arguments by, among others, Carston (2002), Recanatì (2004) to the effect that context-sensitivity is never reducible to indexicality in the Kaplanian sense.

²⁰Kaplan (1977, 505).

This separation was the basis of the doctrine that indexicals are *directly referential*. By this it is meant that their characters only serve to pick out a referent from the context, and never to determine an individual in the circumstance of evaluation.²¹ The motivation comes from examples like this one:²²

(4) In a hundred years, all that is now beautiful will be faded.

Suppose t is the time of utterance and t_{100} is a hundred years down the line. Then, intuitively, (15) is true if all that is beautiful at t is faded at t_{100} . So if *now* picked up its contribution from the circumstance, it would contribute t_{100} , and hence the sentence would say that everything that is beautiful at t_{100} is faded at t_{100} . Yet that is clearly the wrong result.²³

The distinction between character and content was a way of isolating different aspects of the semantics of expressions. Kaplan's semantics not only abandoned the one-one view because it allowed that sentences may express different propositions relative to different contexts. But by encoding descriptive meanings in characters, it also broke with the idea that the truth-conditional information is the only kind of information semantics should study. As mentioned, presuppositionality was the major example of this latter kind of phenomenon. And as we will see next, some have taken descriptive meanings to be a species of presupposition.

1.2.4 Variables and Phi-Features

We saw that direct referentiality was a key component of Kaplan's semantics. In the 'Afterthoughts' Kaplan says about his view:

This conception of direct reference takes the variable under an assignment as its paradigm. In evaluating " Fx " at a world w , we do not ask whether its value exists in w , we only ask what value was *assigned* to the variable before the process of evaluation at w began. Until a value is *assigned* we have nothing to evaluate.²⁴

He goes on to suggest that pronouns can be treated as variables and that an advantage of doing so is that it affords a natural way of accounting for the distinction between free (referential) and bound uses.

²¹Direct referentiality is thus to be distinguished from what Kripke (1980) called *rigid designation*. All directly referential expressions are rigid designators, but the converse is not true as witnessed by rigid descriptions such as *The smallest prime number*. Another way of characterizing direct referentiality is to appeal to the distinction between singular and general propositions. See Kaplan (1977, 494–495).

²²Slightly modified from Kaplan (1977, 498)

²³This kind of consideration also motivated the two-dimensional modal logic of Kamp (1971), Vlach (1973), Segerberg (1973). A later influential treatment was Davies and Humberstone (1980).

²⁴Kaplan (1989, 571). Footnotes omitted.

In a different tradition from the indexical paradigm that Kaplan was working within, the conception of pronouns as variables was being developed through the work of Geach (1962), Partee (1970), (1978), and others. Of special importance for this thesis is the version of this kind of treatment originating with Cooper (1983), which has been implemented by Heim and Kratzer (1998), Heim (2008), Sauerland (2008b), and others.

On this view pronouns are variables awaiting a contextually determined assignment of values. In turn, descriptive meaning is displaced to the so-called *phi-features* – i.e., person, gender, and number. Specifically, Cooper proposed that phi-features are *presupposition triggers*. So the descriptive meaning associated with pronouns, which Kaplan had encoded in characters, instead came to be seen as a species of presupposition.

For example, the pronoun *he* is analyzed as a variable with the features 3rd person, masculine and singular. The features act as preconditions on the reference of the pronoun by checking whether the object assigned satisfies the descriptive meaning they encode. If it fails to satisfy one or more of the features, the pronoun does not refer.²⁵

Imagine a context that determines an assignment which assigns a woman, say Nina, to an occurrence of *he*. The 3rd person is analyzed as encoding the descriptive meaning ‘distinct from speaker and addressee’. So supposing Nina is distinct from the speaker and addressee, she satisfies the 3rd person feature. Next, since Nina is singular, she satisfies the singular feature as well. But because Nina is female, the masculine feature is not satisfied. Hence, the pronoun does not refer. In turn, the sentence in which it occurs will fail to determine a truth value when applied to a point of evaluation – it will be neither true nor false, representing a presupposition failure.

So although the reference of a pronoun is still simply an object, as on the Kaplanian picture, the descriptive meaning is allowed to have truth-conditional effect.

1.3 Presupposition

In this section I provide some history of the notion of presupposition and outline the theories relevant for the essays in this thesis.

²⁵In a footnote Kaplan (1989, 571, n. 14) suggested that in the absence of an assigned value, a sentence with a free variable is neither true nor false.

1.3.1 Early History of Presupposition

The second problem for the one-one approach that I distinguished was that, even once one relativizes the expression of propositions to contexts, the proposition that one wants to assign as the truth-conditional content of a sentence relative to a context does not exhaust the information semantically associated with the sentence in that context. One of the earliest phenomena of this kind to be observed was that of presuppositions.

The phenomenon was noted by Frege (1892) while discussing the existence in natural languages of non-referring definite descriptions. Consider his example of (5).

- (5) The man who discovered the elliptic form of the planetary orbits died in misery.

Frege observed that (5) is closely associated with the information in (6).

- (6) There was someone who discovered the elliptic form of the planetary orbits.

Furthermore, Frege made the crucial observation that although the information in (6) is linked with (5), the former cannot be regarded as an entailment, or logical consequence, of the latter. Instead he called it a ‘presupposition’ (‘Voraussetzung’).

Frege had an argument for this, which turned on the recognition of the fact that the presupposition is unaffected by standard negation. Against the proposal that (5) entails (6), he counters that

If this were right, the negation would run

‘Either the man who discovered the elliptic form of the planetary orbits did not die in misery or there was nobody who discovered the elliptic form of the planetary orbits.’²⁶

We may take it that Frege has something along the following lines in mind. Classically, if A entails B , the truth of not- A is consistent with either the truth or falsity of B . In terms of the example, if (5) entails (6), the truth of the negation of (5) is consistent with either the truth or falsity of (6). But consider the negation of (5):

²⁶Frege (1892, 163). Here as in (5), I alter the translation of Frege’s original “Der die elliptische Gestalt der Planetenbahnen entdeckte” which in Frege (1892) is translated as “whoever discovered the elliptic form of the planetary orbits”. The definite description seems to me truer to the original and furthermore is now generally accepted as presuppositional.

- (7) The man who discovered the elliptic form of the planetary orbits did not die in misery.

Clearly, there is a strong sense in which this sentence *requires* the truth of (6). (7) seems to convey that there was someone who made the great discovery but who did not die in misery. Hence, (6) is not an entailment of (5). Rather, the relation appears to be stronger than entailment.

In accordance with the attitude alluded to earlier, Frege takes his discovery as another example of the defects of natural languages:

Now languages have the fault of containing expressions which fail to designate an object (although their grammatical form seems to qualify them for that purpose) because the truth of some sentence is a prerequisite. [...] A logically perfect language (*Begriffsschrift*) should satisfy the conditions, that every expression grammatically well constructed as a proper name out of signs already introduced shall in fact designate an object, and that no new sign shall be introduced as a proper name without being secured a *Bedeutung*.²⁷

In other words, Frege maintained that for the definite description in (5) to refer (to have *Bedeutung*), the truth of (6) is required. Frege also held that sentences refer to truth values, and that sentences containing names or descriptions that fail to refer inherit this lack of reference. Hence, he held that such sentences are neither true nor false.

So, on Frege's conception, a presupposition is a precondition on a sentence having a truth value. This conception of presuppositions has survived all the way up to the present day. Indeed, we saw that this notion is the one involved in the presuppositional treatment of the phi-features of pronouns.

A little over 10 years after Frege's treatment of definite descriptions, Russell (1905) famously argued for an alternative view.²⁸ Roughly, the claim was that existence is *asserted* not presupposed by sentences containing definites, and hence if the description turns out to be non-referring, the whole sentence is false, not neither true nor false. This view was largely uncontested until Strawson (1950) revived the presuppositional view. Like Frege, Strawson claimed that definite descriptions carry an existence presupposition, and that presupposition failure results in a truth value gap induced by the lack of reference.²⁹ In an often quoted

²⁷Frege (1892, 163).

²⁸Russell's paper also inaugurated the notion that sentences of natural languages do not necessarily wear their logical form on their sleeves, which gave rise to a whole tradition in analytic philosophy and was a prerequisite for generative linguistics. See Soames (2003, ch. 5) for discussion.

²⁹Strawson (1954) qualified this view by identifying the phenomenon sometimes called 'non-catastrophic presupposition failure'. See von Stechow (2004b), Yablo (2006), Schoubye (2010) for discussion.

passage, Strawson wrote:

Now suppose someone were in fact to say to you with a perfectly serious air: “The King of France is wise”. Would you say, “That’s untrue”? I think it’s quite certain that you wouldn’t. But suppose he went on to *ask* you whether you thought that he had just said was true, or was false; whether you agreed or disagreed with what he had just said. I think you would be inclined, with some hesitation, to say that you didn’t do either; that the question of whether his sentence was true or false simply *didn’t arise*, because there was no such person as the King of France.³⁰

More generally, the Frege-Strawson observation was that a particular class of expressions (chiefly, definite descriptions) depend for their semantic definedness on the truth of some piece of information that is not entailed by sentences containing such expressions, but nevertheless is in this way semantically associated with them. With respect to referential terms, this conception gained momentum in the field of formal logic where it was implemented by van Fraassen (1968a), (1968b). And over the years theorists came to recognize a wider range of expressions as triggering presuppositions of this kind. Today, all of the following are uncontroversial examples:³¹

- (8) a. **Aspectual verbs:** A Yakuza war continues to rage in central Tokyo.
Asserts: A Yakuza war continues to rage in central Tokyo.
Presupposes: A Yakuza war has been raging in central Tokyo.
- b. **Clefts:** It is Marvin who is addicted to video games./What Marvin is addicted to is video games.
Asserts: Marvin is addicted to video games.
Presupposes: Someone is addicted to video games./Marvin is addicted to something.
- c. **Definites:** The rodeo clown got chased by a bull.
Asserts: The rodeo clown got chased by a bull.
Presupposes: There is a (unique) rodeo clown.
- d. **Factive verbs:** Tommy learned that his car had been stolen.
Asserts: Tommy learned that his car had been stolen.
Presupposes: Tommy’s car had been stolen.

It is widely agreed that, in all of these cases, the presupposed material acts as a precondition on the semantic definedness of the assertion in the sense that if the presupposition is false, the assertion is neither true nor false.

³⁰Strawson (1950, 330).

³¹See also the lists in Levinson (1983, 181–184), Beaver (2001, 10–12) both of which contain references to important work.

Through certain parts of its history, the notion of presuppositionality has been in competition with that of *conventional implicature*, which was first introduced by Grice (1975) in order to distinguish it from the phenomenon that he was interested in, i.e., what he called *conversational implicature*.³² The issue here concerns to what extent presuppositional information is separable from truth-conditional information, and large parts of the debates over presuppositionality, as we shall see, pertain to whether or not facts about the presuppositions triggered by a particular class of expressions or constructions are built into their semantics.

1.3.2 Semantic and Pragmatic Presuppositions

A turning point in the study of presuppositions came with the work of Stalnaker (1970), (1974), who observed certain facts about presuppositionality suggesting that the Frege-Strawson conception of the phenomenon failed to capture important aspects of the role presuppositional information plays in communication. As he explains:

Roughly, the received view was that Q presupposes that P if the truth of P is required for either the truth or falsity of Q . But [...] it seemed to me that the relevant notion of presupposition is one that should be characterized independently of the truth-conditions of what is said by speakers making presuppositions. [...] It is speakers who make presuppositions; what they presuppose are things they take for granted when they speak – things they take to go without saying.³³

There are two notions in play, then, one semantic and the other pragmatic, often summarized like this:

Semantic Presupposition

ψ is a semantic presupposition of a sentence ϕ if and only if the following holds: An utterance of ϕ in a context c is true or false only if ψ is true in c .

Pragmatic Presupposition

ψ is a pragmatic presupposition of a sentence ϕ if and only if the following holds: An utterance of ϕ in a context c is felicitous only if ψ is commonly accepted among the participants of c .

³²Karttunen and Peters (1979) argued that a range of phenomena that had been regarded as presuppositional were better explained as conventional implicatures. This view was rejected by Gazdar (1979) and Heim (1983). More recently, the category of conventional implicature has been reinvigorated by Potts (2003), (2007).

³³Stalnaker (1999, 7).

All the expressions and constructions on the list in (1) trigger both semantic and pragmatic presuppositions. For example, consider the case of (1a). The presupposition is semantic because, as is intuitively clear, if a Yakuza war has not already been raging in central Tokyo, then it is neither true nor false to say that it continues to do so – it is simply unintelligible to claim of something that has not already been taking place that it continues to do so.

Further, the presupposition is pragmatic in that unless it is commonly accepted by the conversational participants that a Yakuza war has already been raging in central Tokyo, the utterance will be infelicitous in the sense that it will cause a conversational break-down, which must be repaired by, for instance, asking a question to make the presupposition explicitly asserted. Alternatively, this kind of situation often leads to what Lewis (1979b) called *accommodation*, the process by which audiences tacitly take on board a presupposition of the speaker, which they did not previously accept.

An important difference between semantic and pragmatic presuppositions is the following. While semantic presuppositions are required to be *in fact true*; pragmatic presuppositions are merely required to be *accepted* for the purpose of the exchange. To illustrate, suppose you and I are having a conversation, and I wish to assert (1a). All that is required for my utterance to be felicitous is that you accept (or are willing to accommodate) that the gang war has already been going on. Even if it turns out that there has never been a Yakuza war in central Tokyo, this will not matter for the felicity of my utterance. But, of course, in that case what I said is neither true nor false, even if no one realizes this. Semantic and pragmatic presuppositions, then, are clearly distinct phenomena.

All semantic presuppositions are also pragmatic presuppositions.³⁴ But some believe that, in addition to standard triggers like those in (1) for which the converse is also true, there is a class of non-standard triggers that are *purely* pragmatic. An example comes from iterative adverbs like *too* and *again*:³⁵

(9) **Iterative adverbs:** Sam is having dinner in New York *too/again*.

Asserts: Sam is having dinner in New York.

Presupposes: Some salient individual distinct from Sam is having dinner in New York./Sam has had dinner in New York before.

The presuppositions triggered are pragmatic in that if they are not commonly accepted, the sentence will be infelicitous. But it is less clear that these cases should be considered cases of semantic presupposition. For example, even it

³⁴This was already observed by Stalnaker (1970, 38).

³⁵Cf. Kripke (2009). See also Beaver and Zeevat (2006), von Stechow (2008) for discussion.

turns out to be false that Sam has had dinner in New York before, the utterance of the sentence containing *again* still seems to be true or false depending on whether or not Sam is currently having dinner in New York.

1.3.3 Two Conceptions of Context

Stalnaker (1970), (1974), (1978), (1998), (2002) developed an influential framework for modeling the interaction between assertion and pragmatic presuppositions. The basic observation is that communication requires a background of shared information – pragmatic presuppositions shared by the participants in the conversation – called a *common ground*. The common ground delineates a set of possible worlds called the *context set*. The context set is the set of worlds w such that for all the propositions p in the common ground, p is true in w .

Following the tradition described above in which propositions are modeled as sets of worlds, Stalnaker proposed that assertion could be modeled as a matter of intersecting the proposition asserted with the context set representing the current common ground of the conversation. When I tell you that a Yakuza war continues to rage in central Tokyo, and if all goes well, this information becomes common ground between us, and we model this fact by intersecting the current context set with the set of worlds in which a Yakuza war continues to rage in central Tokyo. The result is a context set in which all worlds are such that a Yakuza war continues to rage in central Tokyo.

My assertion pragmatically presupposes that the war has been raging already, that is, this information is required to be common ground for my assertion to go through. So we will require that prior to the intersection with the asserted proposition, all the worlds in the context set must be such that a Yakuza war has been raging in central Tokyo. If this is not the case, the intersection will not take place, unless you are willing to accommodate. If you do, the common ground is appropriately adjusted, and this will be reflected in the context set. So in the cases where the assertion does go through, what we end up with is a context set in which all the worlds are such that a Yakuza war has been and continues to rage in central Tokyo.

As this suggests, Stalnaker's framework introduced a notion of context that departs from the Kaplanian conception. For Kaplan, a context was a tuple of elements representing those facts about the utterance situation relevant for determining the content of indexicals. Instead, the common ground is a collection of information, which may or may not correctly represent the facts.

The latter point is important. As we saw earlier, a crucial feature of pragmatic presuppositions is that they are not required to be in fact true but merely

to be accepted among the participants. Correspondingly, the attitude that participants have towards their pragmatic presuppositions – acceptance – is a non-factive propositional attitude weaker than both knowledge and belief.³⁶ This means that common ground information is not factive – in terms of worlds, the actual world is not necessarily included in the context set. If it were, this would amount to the contention that for an utterance of a presuppositional sentence to be felicitous, its presuppositions must be actually true, which is clearly too strong.

Kaplanian context and Stalnakerian context, then, constitute two different ways of representing different aspects of how both truth-conditional and non-truth-conditional information depends on, and influences, context.

1.3.4 The Dynamic Turn

At almost the same time as its inception, the Stalnakerian conception of contextual interaction gave birth to a new approach to semantics, which engendered a replacement of the truth-conditional paradigm. These new theories became known as *dynamic semantics*. Dynamic frameworks differ among each other in many respects, but all share the fundamental notion that meaning is not a static truth-conditional content, but a potential for building up contextual information.

When this thesis is concerned with dynamics, it is concerned with the branch originating in the work of Heim (1982), (1983), which was heavily influenced by Karttunen (1973), (1974), (1976) and Stalnaker (1970), (1974), (1978).³⁷ This type of dynamic semantics, which I call the *Context Change Theory*, is similar to that of Veltman (1996) and has been developed in detail by Beaver (2001), Roberts (2002), (2003), and others.

As implied above, dynamic semanticists propose to supplant the truth-conditional conception of meaning.³⁸ The heart of the latter was the idea that specifying the circumstances under which a sentence (in context) is true is a way of characterizing what it says, the proposition it expresses (in that context). In place of this conception, dynamic semanticists see the meaning of sentences as given by their ability to affect discourse.

In the Context Change Theory this takes the form of a proposal to semantically encode Stalnaker's framework. So treating contexts as sets of worlds, the

³⁶See Stalnaker (2002).

³⁷The two other major dynamic paradigms are the Discourse Representation Theory of Kamp (1981) and Kamp and Reyle (1993), and the Dynamic Predicate Logic of Groenendijk and Stokhof (1991).

³⁸For discussion of this, see for instance, Groenendijk and Stokhof (2000), Breheny (2003), Dever (2006).

meaning of a sentence is modeled as a function from contexts to contexts called a *context change potential* (CCP). For instance, the meaning of *Elephants have trunks* is no longer a proposition – a set of worlds that make it true – but a function which takes any context set and turns it into one that contains only worlds where elephants have trunks. Concretely, its meaning is a potential to add to a context the information that Elephants have trunks.

Mirroring Stalnaker’s account, presuppositionality is modeled by making CCPs partial functions. That is, for some context sets, the CCP of a presuppositional sentence is undefined, there is no result of updating. The context sets for which the CCP fails to deliver a result are exactly those that reflect a common ground which does not include the presupposition in question. For example, the CCP of (1a) only applies if all the worlds are worlds in which a Yakuza war has already been raging. When defined, the effect, as expected, is that the context set is turned into one in which all the worlds are such that a Yakuza war continues to rage in central Tokyo.

The dynamic turn is a turn because the recursively assigned semantic values are now CCPs, and not contribution to truth conditions. A crucial motivation for this comes from the attempt to account for the problem of *presupposition projection*, that is, the problem of predicting how the presuppositions of compound sentences are determined by those of their parts.³⁹

Since satisfaction is no longer the recursive notion of the system, truth must be defined in terms of CCPs. So the Context Change Theory makes CCPs play the role of basic semantic values, and then derives both truth-conditional content and projection facts from these.

The Context Change Theory is thus a concrete attempt at an integrated treatment of truth-conditional and other kinds of information such as presuppositional information. It is integrated in that it subsumes these different kinds of information in one semantic theory. This blending of factors previously conceived of as distinctly semantic and pragmatic is visible directly in the treatment of presuppositionality within the Context Change Theory. Briefly, as the above suggests, this treatment can be described as a semantic account of pragmatic presuppositions. That is, by encoding preconditions on contextual updates in CCPs,

³⁹Stalnaker (1974) claimed that his framework could account for projection facts associated with conjunctions and factive verbs in pragmatic ways. Karttunen (1973), (1974) pioneered the conception on which presuppositions are semantically encoded requirements on context, which came to fruition with Heim (1983) who showed how the Context Change Theory offered an elegant and powerful solution to the projection problem. This solution was criticized by Rooth (1987) and Soames (1989), and recently this criticism has motivated Schlenker (2008a), (2008c), and others, to abandon the dynamic paradigm. I defend the Context Change Theory’s account of projection in Stokke (2010).

the Context Change Theory involves a lexicalization of preconditions on felicity.

1.4 Overview of Essays

As the rundown above suggests, the study of semantics has been continuously driven towards accounting for more and more complexities in the informational structure of language, indexicality and presupposition being key examples. This development gives rise to both conquests and questions. This thesis is an attempt at addressing some of these questions, and of making at least the beginnings of new conquests. In this section I provide an overview of the essays it contains.

Essay 2. Indexicality and Intentions

Essay 2 is concerned with a particular aspect of the debate (mentioned in 1.2.2 above) over how much context-sensitivity is reducible to indexicality in the Kaplanian sense.⁴⁰ For a range of the expressions traditionally thought to be indexicals, the contribution they make to truth conditions often depends on the speaker's intentions. I call these terms *intention-sensitive*. Some, like Bach (1994), Carston (2002), and Recanati (2004), have argued that this fact shows that this contribution is not determined by a character operating on a contextual parameter. In turn, these arguments are typically employed in defense of the more general view that truth-conditional content is semantically underdetermined, even within the range of these cases the context-sensitivity of which was traditionally supposed to be semantically benign.

In Essay 2 I argue against this view. While accepting that most indexicals are intention-sensitive, I reject that this entails that their meanings cannot be construed as characters. In particular, I take the speaker's intention to be a parameter of Kaplanian context, and accordingly the character of an intention-sensitive expression is a function from a context to a content. To implement this, I argue that the variable-based approach to context-sensitivity (see 1.2.4 above) is naturally interpreted as an intention-sensitive semantics of this kind where the speaker's intention is modeled by the assignment function.

Since intentions are parameters of context, and thus their contribution to truth conditions is determined by characters, intention-sensitive terms can all be regarded as indexicals. Intention-sensitivity is therefore shown to pose no threat to the fundamentally Kaplanian approach to context-sensitivity, and hence its ability to motivate views about semantic underdeterminacy is at best limited.

⁴⁰An earlier version of this essay appeared as Stokke (2009). The version presented here has been substantially revised.

Essay 3. Descriptive Indexicals and Adverbs of Quantification

Essay 3 addresses issues arising from Nunberg's (1992), (1993), (2004) observation that indexicals have *descriptive uses* such as the one in (10).

(10) *Condemned Prisoner*: I am traditionally granted a last wish.

Descriptive reading: A condemned prisoner is traditionally granted a last wish.

The claim is that rather than contributing its standard reference, the speaker, *I* in (10) contributes a property, that of being a condemned prisoner, to the interpretation. In other words, the observation is that the descriptive meanings of indexicals sometimes generate contents that differ from the ones usually expressed.

Nunberg's claim is that these descriptive contents are semantically generated. Recommending a modification of Kaplan's direct reference view, he therefore claims that the characters of expressions like *I*, *here* and *you* are more complex than what Kaplan had posited. By contrast, I argue that all sentences like (10) are ambiguous between referential readings and so-called *e-type* readings. The syntactic structure of these examples is then seen to be closely related to that of other notorious cases in which a pronoun appears to be neither bound nor referential.

The chief motivation for Nunberg's reaction to the examples comes from the claim that descriptive readings are not optional. However, I demonstrate that descriptive readings can be suspended, or canceled, in the right circumstances. But while this might appear to be a reason to think that descriptive readings are pragmatically generated contents like conversational implicatures – a view which Nunberg's argument concerning optionality was originally directed against – I argue that a pragmatic view of this kind will be inadequate. Instead, the *e-type* view is seen to naturally explain cancelability and handle data from embeddings that cannot be accommodated by an approach that sees descriptive readings as conversational implicatures.

Essay 4. Descriptive Meaning, Presupposition, and Interpretation

Essay 4 argues against the view sketched in 1.2.4 on which phi-features of pronouns are presupposition triggers. The main observation is that descriptive meaning is used by audiences to settle the truth-conditional content of indexicals, i.e., to identify what the speaker intended, whereas presuppositional information is not used for this purpose, in the relevant sense.

Generally, there are two possibilities for how to see phi-features as influencing reference. Either one holds that speakers can only succeed in referring if their intended referent satisfies the relevant feature, or one holds that speakers can succeed in referring even while their intended referents do not satisfy the feature-information. A combination might be right – and indeed, I claim that while the former is correct for the 1st and 2nd person features, the latter is correct for the rest of the features. However, I argue that either way, construing phi-features as triggering semantic presuppositions is undesirable. So feature-information is either a species of pragmatic presupposition, or it does not seem to fit the description of presuppositional information in the first place.

After objecting to a sophisticated proposal put forth by Sauerland (2004a), (2008b) on which feature-information is classified as a particular brand of pragmatic presuppositional information, which shares important characteristics with so-called *scalar implicatures*, I then consider whether feature-information can be regarded as the kind of purely pragmatic presuppositions I described in 1.3.2. Again, there are important mismatches, which suggest that the role of descriptive meaning in interpretation is significantly different from that played by presuppositional information.

I suggest that the information contributed by the phi-features have a characteristically *pre-assertoric* role but although presuppositional information is similar in some respect, the two are nevertheless not created equal, and I end by briefly touching on the possibility of assimilating feature-information to conventional implicatures.

Essay 5. How to Fuse Contexts

The last essay discusses the conception of presuppositionality in the Context Change Theory described in 1.3.4, and specifically the attempt to derive truth conditions for presuppositional sentences from CCPs. I demonstrate the inadequacy of some of the ways this has been done in the literature. In particular, the original proposal in Heim (1982), (1983) is seen to be incorrect because it makes infelicity sufficient for truth value gaps. This predicament is a direct consequence of what I described in 1.3.4 as the semantic account of pragmatic presuppositions engendered by the Context Change Theory.

Yet, what seems at first to be a solution to this problem is next seen to result in incorrect predictions for another class of expressions, namely *epistemic modals*. I show that providing a definition of truth in terms of CCPs that will give the right results for both presuppositional sentences and epistemic modals is precluded by the framework as it stands. To amend this situation, I propose to re-

gard CCPs as operating on contexts that have more structure than the ones the Context Change Theory usually involves.

As described, Kaplan had proposed that the contexts relevant for semantics are representations of concrete aspects of the utterance situation such as who the speaker is, where and when the utterance takes place, etc. By contrast, on the Stalnakerian conception adopted by the Context Change Theory, contexts are collections of information represented by sets of possible worlds. My proposal in this essay fuses these two conceptions so that CCPs operate on contexts that represent both factual aspects of the utterance situation and information shared among the participants of the conversation.

Finally, a practical remark. Although linked by their common themes, the essays in this thesis are independent in the sense that they can each be read on their own. However, to avoid exasperation on the part of the reader, I have tried to minimize repetitions.

2 Indexicals and Intentions

2.1 Introduction

Many context-sensitive expressions have their content determined, on a particular occasion of use, at least in part as a result of the speaker's *intentions*. Examples include *he, we, you, here, now*, etc. What is characteristic of these expressions is that figuring out what they contribute to interpretation necessarily requires figuring out what the speaker's intentions were in making the utterance. I call this phenomenon *intention-sensitivity* and expressions which exhibit it *intention-sensitive*.

To illustrate, consider the following few simple cases:

- (1) a. *Looking at Tom and Jerry*: He is a nice man.
- b. *Reporter on the news*: The President is now considering further reinforcements in Iraq.
- c. *Sitting in a reading room on the 6th floor of a library*: It's warm here.
- d. *Upon being shocked by teenagers*: Young people today have no respect!

Intention-sensitivity presents a *prima facie* problem for a familiar view according to which these terms are *indexicals*. On the picture in Kaplan (1977), an indexical is, roughly, a term whose content depends on a parameter of context, where a context is a restricted set of features of the utterance situation, namely the speaker, the time, place and possible world of the utterance. In turn, Kaplan took content to be settled by functions from contexts of this sort, which he called *characters* and which he identified with linguistic meanings. But if the Kaplanian parameters are all there is to contexts, then nothing about contexts will settle the contents of the intention-sensitive expressions in examples like those above.

Confronted with the fact that many of the terms she takes to be indexicals are intention-sensitive, the proponent of the character-based picture is therefore pre-

sented with a dilemma: Either she must take intentions as themselves parameters of contexts providing arguments for characters, or she must concede that these expressions do not have their contributions to interpretation determined as a function of context. Clearly, the second horn of this dilemma is anathema to this type of semanticist. So the question really boils down to the viability of the first horn. That is, is there a coherent and theoretically attractive way of construing speaker intentions as parameters of the kind of contexts that provide arguments for characters?

This essay answers this question in the affirmative. It thereby opposes several arguments found in the literature according to which intentions cannot be parameters of context. Further, it is often claimed that, for this reason, the phenomenon of intention-sensitivity diminishes the hope of a semantic approach to context-sensitivity, or at least a subset of this broad phenomenon.¹ The question of whether intention-sensitivity can be integrated into standard character-based semantics thus bears directly on central issues in the debate over the semantics-pragmatics distinction.

One way of looking at this debate is as one concerning to what extent, if any, contents of utterances (what is said) are underdetermined by the linguistic meanings of the sentences used to express them. Those who believe that intention-sensitivity cannot be handled semantically usually employ this claim in a wider defense of such theses of underdetermination. In other words, given that my argument to the effect that intentions can be thought of as parameters of the kind of context which characters operate on is successful, it immediately has wider implications for this more general debate concerning the semantics-pragmatics distinction. The prospects for semantic approaches to context-sensitivity in general will be brightened by showing that intention-sensitivity can be subsumed under the traditional, character-based, approach to indexicality.

The arguments to the effect that intentions cannot be parameters of context that I will consider are championed by Bach (1994), (2005), (2007) and Recanati (2004) and rely on a distinction between two types of context, or two roles played by context, named *wide* and *narrow* context. The conclusion is that intentions cannot be part of either type of context. I accept that intentions are not part of wide context, but I will argue that they are part of narrow context.

Before proceeding, I want to flag a disclaimer already at this point. Some maintain that the reference of expressions such as *he* or *that* is settled not by in-

¹This has been argued by, among others, Bach (1994), (2005), (2007), Carston (2002), Neale (2005), Recanati (2004), Schiffer (2005). Among the opponents of these arguments are Cappelen and Lepore (2004), Borg (2004), King and Stanley (2005). I consider some of these theorists below.

tentions but by demonstrations.² Although this essay assumes the intention-based view, it should be stressed that none of my arguments *turn on* taking intentions to be the relevant reference-fixers rather than demonstrations. Everything I will have to say can be reformulated in terms of demonstrations playing the reference-fixing role.

I begin by briefly presenting the Kaplanian picture in Section 2.2. In Section 2.3 I review the arguments presented by Bach and Recanati involving the distinction between wide and narrow context, and I show that, although they are right to claim that intentions cannot be part of wide context, they fail to give good reasons against seeing them as part of narrow context. Section 2.4 argues that a version of a well known semantic framework can be interpreted as character-based semantics which treats intentions as parameters of (narrow) contexts. I call this an *intention-sensitive semantics* (ISS). Section 2.5 compares this framework with another type of ISS that has been suggested by Gauker (2007) and Predelli (2005), and I argue that there are reasons for preferring the former over the latter. In Section 2.6 I defend my view against a potential problem. Finally, Section 2.7 closes by relating the preceding to the aforementioned debate over the relation between semantics and pragmatics.

2.2 Kaplanian Semantics

2.2.1 Characters, Singular Terms, and Operators

Kaplan's innovation with respect to his predecessors (chiefly, Montague (1968) and Lewis (1970)) was his proposal to relativize semantic interpretation to both a *context* and a *circumstance of evaluation*. To present the Kaplanian framework, I will use a notation that is more up to date than the one Kaplan employed. In particular, we will take $\llbracket \]$ to be a function that assigns extensions to expressions of the language. We call it the *denotation function*. The denotation function will be relativized to a context c and a circumstance i .

A context in Kaplan's semantics consisted of the parameters the agent a_c (usually, the speaker), and the time t_c , place l_c and possible world w_c of the utterance. Formally, a context c is modeled as a tuple of these elements:

$$c = \langle a_c, t_c, l_c, w_c \rangle$$

Further, Kaplan took circumstances to include a time and a possible world, and hence a circumstance of evaluation i was modeled as a pair:

²See for instance Kaplan (1977) (who recanted in Kaplan (1989)), McGinn (1981), Reimer (1991).

$$i = \langle w_i, t_i \rangle$$

With this setup, we can now give clauses for the expressions we are interested in. So for example, here are the clauses for *I* and *here*:³

- (2) a. $\llbracket I \rrbracket^{c,i} = a_c$.
 b. $\llbracket here \rrbracket^{c,i} = l_c$.

Further, Kaplan distinguished between character and content. Both are obtained by abstracting over the elements to which $\llbracket \]$ is relativized. Content is obtained by abstracting over i , character by abstracting over both c and i . So generally, Kaplanian characters and contents are defined in the following way:

Kaplanian Character

For any ϕ , the character of $\phi = \lambda c. \lambda i. \llbracket \phi \rrbracket^{c,i}$.

Kaplanian Content

For any ϕ , the content of ϕ relative to $c = \lambda i. \llbracket \phi \rrbracket^{c,i}$.

In this essay I am mainly concerned with the notion of character, and I will rarely have anything to say about Kaplanian contents.

Sometimes it will be convenient to write characters slightly differently by bypassing the denotation function. For instance, we can write the characters of *I* and *here* as follows:

- (3) a. The character of *I* = $\lambda c. a_c$.
 b. The character of *here* = $\lambda c. l_c$.

In what follows I notate characters in either of these two ways depending on what is most illustrative for the point at hand.

So a character is a function which takes a context as argument and delivers a content. In turn, a content is a function from circumstances to extensions. In the case of sentences, extensions are truth values, and hence contents are functions from circumstances to truth values, which we identify with propositions. In the case of singular terms, extensions are referents and hence the function from circumstances is constant and therefore of no particular interest. Note that for expressions like *I* and *here*, referents are just parameters of context. But for other singular terms, e.g., proper names, referents are going to be objects that are not also parameters of contexts. This is what we mean by saying that the former are indexical, whereas the latter are not (presumably).

To see how this system works in practice, consider the sentence

³Cf. Clauses 12 and 13 of Kaplan (1977, 546).

(4) I left my car here.

Given the clauses in (2), and ignoring tense, we will derive that

(5) $\llbracket (4) \rrbracket^{c,i} = 1$ iff in w_i , a_c left his/her car at l_c .

Put differently, the character of (4) takes the context c and outputs a proposition, roughly, the proposition that the speaker left his/her car at the location of the context. This content is a function which maps a circumstance of evaluation i to truth if and only if the world of that circumstance is correctly described by the proposition, that is, if the speaker of c left his/her car at the location of c in the world of i .

But while Kaplan treated *I* and *here* as indexical singular terms in this way, other context-sensitive expressions were treated as indexical *sentential operators*. Examples include *now*, *today*, *yesterday* and *actually*. I will illustrate with the case of *yesterday*.

Using our more contemporary notation, and rendering the circumstance of evaluation explicitly for clarity, the Kaplanian semantics for *yesterday* is given as follows:⁴

(6) $\llbracket Yesterday \phi \rrbracket^{c,\langle w_i, t_i \rangle} = 1$ iff $\llbracket \phi \rrbracket^{c,\langle w_i, t_c - 1 \rangle} = 1$.

Here we are assuming that -1 is an operation on a time parameter t which sets it to roughly 24 hours earlier than t (although this is probably ultimately too imprecise). Note that it is misguided to speak of the character of operators such as *yesterday* since these are not complete expressions of the language but require a syntactic complement for completion. We can speak of the character of *Yesterday* ϕ , which is given as follows:

(7) The character of *Yesterday* $\phi = \lambda c. \lambda i. \llbracket \phi \rrbracket^{c,\langle w_i, t_c - 1 \rangle}$.

In this semantics, then, *yesterday* is a circumstance-shifting operator.⁵ The same goes for *now* and *actually*.⁶ What the context contributes, in these cases, is a

⁴Cf. Clause 10, iii of Kaplan (1977, 545).

⁵Following Partee (1973), an alternative tradition believes that expressions like *yesterday* should be analyzed as quantifiers that can bind tense-variables, which otherwise appear referentially. See King (2003), Cappelen and Hawthorne (2009) for some discussion.

⁶Furthermore, something similar is true of Kaplan's analysis of (true) demonstratives, his treatment of which turns on the use of his *dthat*. Briefly, in the informal sections of 'Demonstratives', *dthat* is treated as singular term, and the expression *dthat* $[\delta]$ is then seen as including an indication of the demonstratum on that occasion; so here δ simply marks the object demonstrated and thereby serves to distinguish one syntactic occurrence of the demonstrative from another. But in the formal Logic of Demonstratives, *dthat* is treated as an operator, which is syntactically

value for the relevant parameter of the circumstance of evaluation. To illustrate, consider the case of

(8) I left my car here yesterday.

The result of the semantics is that

(9) $\llbracket (8) \rrbracket^{c, \langle w_i, t_i \rangle} = 1$ iff $\llbracket (4) \rrbracket^{c, \langle w_i, t_c - 1 \rangle} = 1$ iff in w_i , a_c left his/her car at l_c the day before t_c .

And similarly for the other operators.

2.2.2 The Challenge from Intention-Sensitivity

In this essay I will understand the notion of indexicality in the following way:

Indexicality

A term α is an indexical iff α 's contribution to the content of a sentence in which it occurs, or to the evaluation of the content of such a sentence, is determined as a function of a parameter of context.⁷

The debate this essay is engaged with concerns which terms (if any) fit this description. In particular, we are taking it as a datum that a lot of the expressions in the area are intention-sensitive. So the question is whether intention-sensitivity rules out indexicality.

The reason one might think so is relatively straightforward. Take the examples in (1). First, *he* in (1a) is an obvious case: asking what *he* refers to in this kind of case simply seems to be a way of asking what the speaker's intentions were. With respect to the next example, on a simple Kaplanian analysis, *now* is an operator that shifts the time parameter of the circumstance to the time of the context. But this will give the wrong result, because (1b) does not express a proposition which is true if and only if the President is considering reinforcements in Iraq at the time the utterance is made. Similarly, it would be wrong to predict that (1d) is true if and only if young people have no respect on the day the utterance is made. And the same holds, *mutatis mutandis*, for the example with *here*. In all of these cases, what we want is for the contribution to the content (the evaluation in the case of the operators) to be determined by the speaker's intentions.

completed by the demonstration, δ . See Kaplan (1989, 579–582) and Salmon (2002) for some discussion. Although I screen off demonstratives from the discussion in this essay, I note for the record that I favor an analysis according to which *that* is a singular term on a par with the pronouns.

⁷Of course, we are ignoring non-standard environments like quotation, binding, etc.

So the proponent of the kind of semantic framework Kaplan inaugurated seems to be pressed into arguing that intentions are themselves parameters of contexts. I will do so in the next section.

2.3 Intentions and Wide and Narrow Context

In this section I turn to the arguments against taking intentions to be parameters of context. I then sketch a view of how referential intentions figure in interpretation.

2.3.1 Wide and Narrow Context

As mentioned, several arguments against intention-sensitive semantics turn on the distinction between wide and narrow context. This is a distinction between those aspects of context that determine reference (narrow context) and those aspects that the audience uses in reasoning about the speaker's intentions (wide context). Here is how Bach describes the difference:

There are two quite different sorts of context, and each plays quite a different role. Wide context concerns any contextual information relevant to determining the speaker's intention and to the successful and felicitous performance of a speech act [...]. Narrow context concerns information specifically relevant to determining the semantic values of [indexicals] [...].⁸

Note that 'determining' in 'determining the speaker's intention' is to be understood as 'ascertaining'. So the distinction is one between an *epistemic*, or evidential, and a *metaphysical*, or constitutive, role of context.

When it comes to intention-sensitive expressions, the metaphysical work is done by the speaker's intention. The speaker's intention determines reference. On the other hand, the epistemic work is done by a host of factors, some linguistic and some not. Neale (2007) writes:

The important metaphysical question is: what *determines* what a speaker said on a given occasion? And the Gricean answer I subscribe to is this: certain specific *intentions* the speaker had in producing his utterance. [...] The important epistemological question is: What knowledge or information does a hearer use in *identifying* what the speaker said? And the Gricean answer I subscribe to is this: his tacit grasp of syntax, of the meanings of the words used, and of the way rational co-operative beings function, his beliefs about the speaker, about the context, and about the topic of conversation, and just about anything else he can get his hands on.⁹

⁸This quote is taken from a handout of a 1996 talk by Bach, cited by Recanati (2004, 56). The same distinction is appealed to by many other writers including Carston (2002), Perry (2001), Recanati (2004).

⁹Neale (2007, 359, n. 7).

So the metaphysical aspect of context consists of those features of the utterance situation that determine reference; on the other hand, the epistemic aspect of context comprises the full range of information the audience will use in order to ascertain the speaker's intentions.

2.3.2 Why Intentions are not Part of Wide Context

Bach (1994) writes:

The view that meaning does determine reference as a function of context [...] misrepresents the role of context in determining reference. What context does, together with the meaning of the expression, is to provide the hearer with the information, in the form of mutual contextual beliefs [...] needed for determining what the speaker intends him, in that context, to identify as the referent.¹⁰

So Bach clearly thinks that it is wrong to take intentions to be part of wide context. I agree with this, and I think there is a convincing reason to do so, although this particular reason is not made explicit by any of the theorists I am concerned with here.

The argument that intentions are not part of wide context is simple. In its briefest form it can be put as follows. By definition, wide context consists of the information that the audience will use in order to ascertain what the speaker's intentions were on a particular occasion. But if the fact that a speaker has so-and-so intentions automatically becomes part of the contextual information available to the audience, then the audience should be expected to always get it right. But they do not! Hence, what the speaker's intentions were in making a particular utterance is not part of the collection of information that the audience uses in order to ascertain those intentions.

I call this argument *The Argument from Inaccessibility* because it starts from the observation that the speaker's intentions, just by their very nature, are not directly accessible to her audience. Instead, the audience is required to use a host of clues and pieces of information – that is, wide context – in order to work out what those intentions are.

I accept this argument. But, as I now go on to argue, intentions should nevertheless be thought of as part of narrow context.

2.3.3 Why Intentions are Part of Narrow Context

Since intentions do the metaphysical-constitutive work of reference determination in the case of intention-sensitive expressions, and since narrow context is

¹⁰Bach (1994, 179).

made up of just these kinds of metaphysical-constitutive factors, the proposal that intentions are part of narrow context is natural. So what could be the reasons for rejecting it? I will go through three types of considerations found in many places in the literature.

The first kind is exemplified by Recanati (2004) who writes:

One can say that the character of a demonstrative is the rule that it refers to what the speaker intends to refer to. [...] Formally that is fine, but philosophically it is clear that one is cheating. We pretend that we can manage with a limited, narrow notion of context of the sort we needed for handling indexicals, while in fact we can only determine the speaker's intended referent [...] by resorting to pragmatic interpretation and relying on the *wide* context.¹¹

This objection should not worry the proponent of ISS, though.¹² She *agrees* that audiences cannot ascertain what the speaker intended without recourse to wide context. However, there is nothing in this objection as such directed against the proposal to let intentions figure as part of narrow context.

Secondly, many commentators hold that the distinction between wide and narrow context works in tandem with the one between intention-sensitive and non-intention-sensitive terms.¹³ On this picture, narrow context is *defined* as comprising just those facts – like who the speaker is – relevant for determining the reference of the latter. But since we have already established that intentions cannot be part of wide context, the implication will be that intentions are not to be seen as part of either narrow or wide context. Bach (2005) makes this explicit:¹⁴

The communicative context (context broadly construed) enables the audience to determine (in the sense of ascertain) what [the speaker] is referring to, but it does not literally determine (in the sense of constitute) the reference. [...] So neither sort of context, narrow or broad, determines the reference of demonstratives and discretionary [i.e. intention-sensitive] indexicals. Unlike pure indexicals, they do not refer as a function of the contextual variables, the narrow context, given by their meanings. Nor does the broad, communicative context determine the reference, in the sense of making it the case that the expression has a certain reference. That merely enables the audience to figure out the reference.¹⁵

But there is no *argument* here to show that we cannot think of intentions themselves as part of narrow context, that is as simply another of those facts which

¹¹Recanati (2004, 57).

¹²Cappelen and Lepore (2004, 148–149) argue that this objection relegates the dispute to a merely terminological issue. Cappelen (2007) expresses a similar attitude to the semantics-pragmatics distinction *per se*.

¹³See for instance Perry (2001, 59), Recanati (2004, 56–57), Bach (2007, 405).

¹⁴Similar considerations are found in Bach (1999), (2002), (2007).

¹⁵Bach (2005, 39–40).

determine reference. It is no good just to *stipulate* that narrow contextual facts are those relevant for determining reference of non-intention-sensitive expressions. This simply begs the question against the proponent of ISS.

This brings us to the third and final objection I wish to consider. I find this to be the most serious challenge, and I will therefore dwell on it longer than the two preceding ones. I call it *The Argument from Open-Endedness*.

According to this objection, speaker intentions are fundamentally dissimilar from the things normally assumed to be part of narrow context. The thought is that questions like who the speaker is radically diverge from the question of what the speaker's intention is. The way they differ, so the thought goes, is that answering the latter but not the former requires recourse to a range of evidence which is potentially *open-ended*.¹⁶

I suspect that this kind of consideration underlies large parts of the motivation for the claim that speaker intentions cannot be part of narrow context. For instance, Recanati (2004) takes this to be the most important difference between the interpretation of intention-sensitive expressions and that of non-intention-sensitive expressions.

Recanati distinguishes between what he calls 'semantic' vs 'pragmatic' interpretation. The former "is the process whereby an interpreter exploits his or her knowledge of a language, say L, to assign to an arbitrary sentence of L its truth-conditions."¹⁷ On the other hand, Recanati describes pragmatic interpretation as the process of recovering the speaker's intentions.

An integral part of Recanati's position on the semantics-pragmatics distinction is precisely the claim that this kind of pragmatic interpretation process is essentially open-ended:

there is no limit to the amount of contextual information that can affect pragmatic interpretation.¹⁸

What I want to note is the following. Supposing that what Recanati means by 'semantic interpretation' is something like the computation of truth conditions from compositional rules, syntactic structure and lexical entries, it is no doubt true that the difference he is describing is very real. But it does not follow that intentions are not fit to be part of narrow context. For what is *not* true is that there is a difference in this sense between discovering facts like who the speaker is and what the speaker's intentions are.

¹⁶Cf. Neale (2005, 166) who provides references to others expressing the same concern.

¹⁷Recanati (2004, 54).

¹⁸Recanati (2004, 54).

Imagine, for instance, that John Perry utters (10) with the intention of referring to Saul Kripke with *he*.

(10) I think he is a great philosopher.

Both sides of the debate will agree that two facts are relevant for determining the reference of *I* and *he*, respectively.

F1 Perry is the speaker of (10).

F2 The speaker of (10) intended to refer to Kripke with *he*.

In normal cases discovering facts like F1 is easy. We simply hear the person speaking and thereby take her to be the referent of *I*. But the same is really true for facts like F2. Normally finding out who the speaker intended to refer to with a pronoun like *he* is effortless. Indeed, the speaker will strive to make it so.

It is true that, in more unusual cases, we will require more information to be able to ascertain what the speaker intended. But the same is really true for facts like F1. Cases in which it takes some effort to find out who the speaker is are not so uncommon that they can be justifiably set aside as anomalous. In fact, we often encounter tokens of *I*, both written and spoken, that we are not able to immediately resolve.¹⁹

Consequently, this third objection will not stand to scrutiny either. There is no principled difference between the evidential work an interpreter has to undergo in order to ascertain who the speaker is compared to ascertaining what the speaker intended. The only difference is one of degree in normal cases. So intentions cannot be disqualified from narrow context for being of a different nature than other factors of this kind of context.

2.3.4 A General Constraint on Intention-Formation

I now go on to spell out in more detail the view of intentions and how they figure in interpretation that I subscribe to.

It is widely agreed that, in general, intention-formation is constrained by *beliefs*. For instance, Neale (2005) writes:

the formation of genuine intentions is severely constrained by beliefs. I cannot intend to become a prime number, intend to digest my food through my lungs on alternate Tuesdays, or swim from New York to Sydney because (roughly) I cannot intend *what I believe to be impossible*.²⁰

¹⁹See Perry (2001, 73) for an example.

²⁰Neale (2005, 181).

The idea has intuitive backing. Suppose we are standing on the Brooklyn Bridge looking in on the city. If I ask you, ‘How are you going to get in there?’, it will be odd for you to reply, ‘I intend to fly by flapping my arms.’ Given that reply, I seem to have only two options available to me: Either you have clearly false beliefs about what you can do by means of flapping your arms, or you are not speaking sincerely.

A principle such as (C1) stating a general constraint on intention-formation therefore seems highly plausible:²¹

(C1) *a* intends to ϕ only if *a* believes that she can succeed in ϕ ’ing.

Transposing this to referential intentions is seamless in that an instance of (C1) is (C2):

(C2) *a* intends to refer to *x* by uttering referential expression *e* in context *c* only if *a* believes that she can succeed in referring to *x* by uttering *e* in *c*.

The right hand side of (C2) prompts two questions, namely what is to be understood by successful reference, and what it means to believe that one can succeed in referring by uttering a particular expression.

2.3.5 Weak and Strong Intentionalism

To begin with the first question, if one endorses the Argument from Inaccessibility, it is natural also to endorse a principle like (C3).

(C3) *a* succeeds in referring to *x* by uttering referential expression *e* in context *c* only if, partly as a result of their recognizing *a*’s intention, *a*’s audience in *c* are in a position to interpret *a* as referring to *x* with *e*.²²

²¹Grice (1973) endorsed the stronger thesis that *a* intends to ϕ only if *a* believes she will ϕ . In arguing against this thesis, Davidson (1974) explicitly assumes the weaker (C1): “For if an agent cannot intend what he believes to be impossible, then he asserts neither more nor less by saying, ‘I intend to do it if I can’ than he would by saying, ‘I intend to do it.’” (p. 93)

²²I refrain from the stronger biconditional principle to leave room for cases in which the audience correctly grasps the speaker’s intention and yet there is no reference. My chief reason is that it might turn out that there are non-denoting, intention-sensitive expressions. One example might be the complex demonstrative *that King of France*, leaving it up to the speaker’s intentions to determine *which* King of France. And if the speaker intends to refer to the present King of France, then plausibly she will not be referring, even if the audience perceives her intention. Such cases, however, lie beyond the scope of the present discussion.

(C₃) is hardly uncontroversial. In fact, the principle is the main point of contention between what I will call *Weak* and *Strong Intentionalism*. The Weak Intentionalist accepts (C₃); the Strong Intentionalist rejects it. In other words, the Weak Intentionalist holds that in order for a speaker to refer by using an intention-sensitive expression, it is a necessary condition that her audience grasp her intention and (at least partly) as a result hereof is able to figure out what the speaker wants to refer to. By contrast, the Strong Intentionalist maintains that all that is required is that the speaker has a certain intention.

Like most of the theorists in this area, I accept the view on successful reference encapsulated by (C₃), and hence I am a Weak Intentionalist. Accepting (C₃) means accepting what I will call an *Uptake Constraint* on referring.²³ It requires that, in order for a speaker to refer, her audience must be ‘in a position to’ recognize her intention. The phrase ‘in a position to’ is of course deliberately vague. Spelling out the idea behind the Uptake Constraint will no doubt be difficult, but I take it to have sufficient intuitive substance to justify leaving it unexplained in detail.

The Uptake Constraint accords with a larger, broadly Gricean, approach to communication. As we saw, Neale (2007) explicitly proclaims himself a Gricean; and he also seems to endorse something like (C₃):

There is nothing to be gained by looking for a notion of “reference” that transcends the two notions that actually play a role in a theory of interpretation: (i) what the speaker intends to refer to and (ii) what a reasonably well-informed rational interpreter of the speaker’s remark takes the speaker to be referring to.²⁴

Similarly, Bach (1994) writes:

A referential intention is part of a communicative intention intended to be recognized by one’s audience. [...] You do not say something and then, as though by inner decree (an intention), determine what you are using it to refer to. [...] Rather, you decide to refer to something and try to select an expression whose utterance will enable your audience, under the circumstances, to identify that object. Referential intentions, if they are to be fulfilled, must satisfy the rational constraints on communicative intentions generally.²⁵

This passage also suggests an answer to our second question from above, i.e., the question of what it means to believe that one can succeed in referring.

Suppose – in accordance with the general belief-constraint on intentions – that one cannot intend to refer to something unless one believes that one can

²³I am borrowing the term ‘uptake’ from Austin (1962) who used it to describe what he took to be a constraint on a broad range of illocutionary acts.

²⁴Neale (2005, 359–360, n. 7).

²⁵Bach (1994, 314).

succeed in doing so. Further, suppose that what it means to succeed in referring is that one's audience is in a position to recognize one's intention. Then it simply follows that one cannot intend to refer to something unless one believes just that. In other words, if one accepts both (C2) and (C3), one must also accept that:

(C4) *a* intends to refer to *x* by uttering referential expression *e* in context *c* only if *a* believes that, partly as a result of their recognizing *a*'s intention, *a*'s audience in *c* are in a position to interpret *a* as referring to *x* with *e*.

(C4) is simply entailed by the conjunction of (C2) and (C3).

2.3.6 Failure to Refer

Consequently, these three principles form a package. Just as it delineates a view about succeeding in referring, this package also engenders a take on failure to refer. On the view advocated here, for a speaker to succeed in referring by using an intention-sensitive expression, two things must be in place: The speaker must have a genuine intention to refer, and the audience must be in a position to grasp this intention. This means that there are two broad types of situations in which reference fails. First, reference can fail if the speaker has a referential intention, but the audience is nevertheless not in a position to recognize it. Secondly, reference can fail if the speaker does not have a genuine referential intention. In the first kind of situation, the speaker has what I will call a *misfiring intention*. I return to the issue of misfiring intentions in Section 2.6. Here I want to comment briefly on the other kind of situation.

Consider the following example. A Customs Officer says to a man who speaks no English and whom the Customs Officer knows speaks no English:

(11) Now I'm going to explain to you why you are in violation of your visa so that you can't say that you haven't heard it.

The pronoun *you* is an intention-sensitive referential expression. To refer to her interlocutor with *you*, therefore, the Officer must have an intention to do so. And given the view I am sketching, to have such an intention, the Officer must believe that the man is in a position to recognize that intention. But since the Officer knows the man speaks no English, she cannot have such a belief. Hence, she does not have a genuine intention to refer. And therefore, she does not succeed in referring to the man with *you*. In my view, this description of the above example is intuitively compelling. There is a strong sense in which the Officer is not engaged in what we take to be earnest communicative practice.

Finally, it is worth pointing out that, on this view, situations in which the audience could recognize the speaker's intention – and hence the speaker's belief in their abilities is true – but nevertheless fail to do so, for whatever reason, count as cases of reference. That is, the Uptake Constraint (C₃) does not require that the audience *in fact* recognize the speaker's intention. All that is required is that their epistemic situation be such that they could reasonably be expected to do so. Intuitively, a speaker succeeds in referring if she has arranged things in such a way that the audience can reasonably be expected to recognize her intention. If for some abnormal reason they do not, the speaker still counts as having referred.

Let me sum up what we have seen in this section. First, we saw that even though intentions cannot be taken as part of wide context, there is no good arguments against the natural suggestion that they are part of narrow context. Secondly, we saw that intention-formation is constrained by beliefs, and that given Weak Intentionalism, the formation of referential intentions is constrained by beliefs about what the audience is able to grasp.

2.4 Intention-Sensitive Semantics

In this section I outline how intention-sensitivity can be incorporated into a character-based semantics, and in particular, how we can do so while thinking of intentions as parameters of the contexts that serve as arguments for characters.

2.4.1 Variables and Assignments

The kind of treatment that I want to adopt is relatively uncontroversial. It overlaps at certain points with treatments of pronouns on which they are *variables* awaiting a contextually determined assignment of values. Kaplan himself expressed sympathies with this picture in the 'Afterthoughts' (Kaplan (1989)). However, usual presentations of this kind of semantics, such as that in Heim and Kratzer (1998), often remain more or less neutral on what the assignment is supposed to represent, although Heim (2008) suggest in passing that

For the pronouns, the relevant assignment is given by the utterance context and represents the speakers intentions.²⁶

By contrast, I will be explicit that this is to be understood as an intention-sensitive semantics.

Furthermore, the framework I will present differs from these standard implementations in two important ways. First, I explicitly take assignments as param-

²⁶Heim (2008, 35–36).

ters of contexts, rather than just an additional feature to which $\llbracket \]$ is relativized, apart from context and circumstance. In discussing the variable-based approach, Kaplan noted:

Taking context [...] as providing the parameters needed to generate content, it is natural to treat the assignment of values to free occurrences of variables as simply one more aspect of context.²⁷

Although from a purely technical point of view, this can be regarded as a minor matter, Kaplan is right to argue that there are important conceptual reasons for doing things this way:

The element of content associated with a free occurrence of a variable is generated by an assignment. [...] The assignment, as I am arguing we should conceive of it, is not ‘evaluating’ the variable at a world, rather it is generating an element of content, and it is the content which is then evaluated at a world.²⁸

Secondly, I am going to take *all* indexical expressions – singular terms and operators alike – to have variables associating with them, and hence this treatment goes beyond the treatment of pronouns that Heim and Kratzer exemplifies. (Essay 3 takes this slightly further.)

2.4.2 Intention-Sensitive Characters

To implement the idea of intentions as parameters of context, we add an assignment function to the list of Kaplanian parameters, which we explicitly interpret as representing the speaker’s intention. I use the standard notation for the assignment function g_c to represent the speaker’s intention in c . So a context now looks like this:

$$c = \langle a_c, t_c, l_c, w_c, g_c \rangle$$

These tuples will provide arguments for characters. In the case of intention-sensitive expressions, the value of their characters will align with the intention that is part of the context at hand.

Assignments are functions from indices to contributions to interpretation, where an index is a numerical subscript used to mark different syntactic occurrences of intention-sensitive expressions. This means that characters are now defined as follows:

²⁷Kaplan (1989, 591).

²⁸Kaplan (1989, 591).

Intention-Sensitive Character (Singular Terms)

If α is an intention-sensitive singular term, and j is an index, then
The character of $\alpha_j = \lambda c. g_c(j)$.

Intention-Sensitive Character (Temporal Operators)

If Ω is an intention-sensitive temporal operator and j is an index,
then
The character of $\Omega_j \phi = \lambda c. \lambda i. \llbracket \phi \rrbracket^{c, \langle w_i, g_c(j) \rangle}$.

I now illustrate this system with some examples.

First, consider the following sentence, where the indices of the pronouns have been made explicit:

(12) He₁ and he₂ are both logicians.

Suppose someone utters this sentence in a context with the intention of saying something about two individuals, John and Mike. We model this situation as a context of the above sort, where

$$\begin{aligned} g_c(1) &= \text{John} \\ g_c(2) &= \text{Mike} \end{aligned}$$

We then apply the character of *he* to this context and get the two intended referents, respectively, as values. In turn the character of the whole sentence, given c as argument, returns a proposition namely the proposition that John and Mike are both logicians, which is true if and only if John and Mike are both logicians.

What happens when the intention-sensitive term in question is a plural pronoun, as in (13)?

(13) We₁ are logicians.

Roughly, what happens in cases like this is that the speaker intends to refer with *we* to a set of individuals which includes herself.²⁹ To illustrate, suppose the setting of the utterance in (13) is as follows. The two logicians, Phil and Chris, are being introduced for the first time to the two phonologists, Bill and Patrick. When asked what they do, Phil utters (13), intending to refer to himself and Chris with the pronoun. In this case g is set as follows:

$$g_c(1) = \{\text{Phil, Chris}\}$$

²⁹Strictly, we will want to say instead that referents of plural pronouns are plural individuals. (See Essay 3.) But this is not important here.

Given the obvious definition of the character of *we*, we get the proposition that Phil and Chris are logicians, which is the intuitively correct result.

For the operators, the intuitive idea is that the speaker's intention shifts the relevant parameter of the circumstance of evaluation. Technically, I propose to associate indices with occurrences of intention-sensitive operators like *now*, *today*, etc. And as above we then treat the speaker's intention as a function from indices to values which will now be contributed to the circumstance.

Consider for example the case of (1d) repeated here:

(1d) *Upon being shocked by teenagers*: Young people today have no respect!

Let us agree on a rough analysis of what the speaker intends with *today* in this utterance. In particular, let us assume that she intends for *today* to contribute 'in my adult lifetime'. So this utterance is true if and only if during the speaker's adult lifetime, young people have no respect.

Here is how we will treat this kind of case. An index, say 1, is associated with the occurrence of *today*. And we then represent the speaker's intention as follows:

$$g_c(1) = a_c\text{'s adult lifetime.}$$

In turn, we let *today* shift the time parameter of the circumstance to this value. For convenience, let us label the embedded sentence in (1d) as (1d')

(1d') Young people have no respect.

Given this, we derive that

$$(14) \llbracket (1d) \rrbracket^{c, \langle w_i, t_i \rangle} = 1 \text{ iff } \llbracket (1d') \rrbracket^{c, \langle w_i, g_c(1) \rangle} = 1.$$

In other words, (1d) is true if and only if during a_c 's adult lifetime, young people have no respect.

This approach extends to all the circumstance-shifting operators that we take to be intention-sensitive. Given that we can find suitable values for the intention-function in each type of case – and there is no reason to think that we cannot – we derive the right results for the cases in (1). So the proposal will be successful for the whole range of intention-sensitive expressions.

2.4.3 Descriptive Meaning

Words of the kind we are concerned with are associated with what is usually called *descriptive meaning*. For example, *I* carries the descriptive meaning 'the speaker

of this utterance', *here* 'the location of this utterance', *today* 'the day of this utterance', etc. Kaplan was adamant that his account was not to be seen as rejecting this obvious fact:

Indexicals, in general, have a rather easily storable descriptive meaning. But it is clear that this meaning is relevant only to determining a referent in a context of use and *not* to determining a relevant individual in a circumstance of evaluation.³⁰

Rather, he thought of these descriptive meanings as captured by his characters.

However, given the way I just defined the notion intention-sensitive characters, all of these terms have the same characters. Hence, characters cannot be identified with descriptive meanings. How, then, are descriptive meanings to be incorporated into this framework?

Following Cooper (1983), variable semantics for pronouns usually incorporate an analysis of the so-called *phi-features* – i.e., person, gender and number – on which they are presupposition triggers. Roughly, this means that the assignment of variables is constrained by the features of the pronoun in question in such a way that if the object assigned fails to satisfy one or more of the features, then the pronoun will fail to refer. For example, if the assignment assigns a man to an occurrence of *she*, this will be a case of presupposition failure due to the feminine gender feature of the pronoun, and hence the sentence in which this occurrence appears will be neither true nor false.

To incorporate descriptive meanings into the intention-based framework just outlined, one could adopt this analysis of the phi-features of pronouns. To be sure, this would not be a complete solution because one would have to say something about the descriptive meaning of the other indexical singular terms, and of the operators.³¹ However, I do not want to endorse this treatment since I believe that there are serious problems with the presuppositional analysis of phi-features. (See Essay 4.)

On the other hand, one cannot deny that the kinds of expressions we are concerned with are associated with descriptive meanings. And furthermore, it is obvious that this descriptive meaning is a critical factor in helping the audience to decide what the speaker intended to refer to. Indeed, given Weak Intentionalism, it is natural to hold something roughly like the following. Speakers know that indexicals are lexically associated with certain descriptive meanings. So when they want to refer, they will choose an expression with a descriptive meaning that will be conducive to the process of ascertaining their intentions. In other words, choosing an expression with a particular descriptive meaning is simply one of

³⁰Kaplan (1977, 498).

³¹For some discussion of this, see Wolter (2009), Levinson (1983, ch. 2).

the many ways in which speakers try to make it as easy as possible for their audiences.³²

I do not want to try to answer what it means to say that descriptive meanings are lexically associated with expressions of this type in this essay.³³

2.4.4 Incorporating Direct Referentiality

Kaplan's warning that descriptive meanings do not determine contents in the circumstance is an expression of his general claim that indexicals are *directly referential*. One of the motivations for this was that indexical operators like *now* seem to be unaffected by other operators taking scope over them. To illustrate, consider the following example:³⁴

(15) In a hundred years, all that is now beautiful will be faded.

Intuitively this sentence does not mean that everything that is beautiful a hundred years from the time of utterance will be faded at that time but that everything that is beautiful at the time of utterance will be faded a hundred years hence.

How does our proposal fare with respect to this fact? Let us assume that *In a hundred years* is not intention-sensitive, that is, it always shifts the time parameter of the circumstance to a hundred years after the time of utterance; and let us designate that time as t_{c+100} . Further, let us label the embedded sentence, remembering that *now* will be indexed:

(15') All that is now₁ beautiful will be faded.

As things stand, we predict that g assigns a value to 1 which will go into the circumstance. Simplifying to avoid having to give explicit clauses for quantifier phrases like *everything*, which we are not concerned with here, we can state the analysis of this example as follows:

(16) $\llbracket (15) \rrbracket^{c,i} = 1$ iff $\llbracket (15') \rrbracket^{c,\langle w_i, t_{c+100} \rangle} = 1$ iff for all x s.t.
 $\llbracket Beautiful(x) \rrbracket^{c,\langle w_i, g_c(1) \rangle} = 1, \llbracket Faded(x) \rrbracket^{c,\langle w_i, t_{c+100} \rangle} = 1.$

³²In another setting, Schlenker (2008b, 25–26) proposes, briefly put, to represent some indexicals as bare variables, while constraining the range of *admissible* assignments to those which assign values that accord with the relevant descriptive meanings. There are some similarities between this idea and the one presented here in the sense that descriptive meanings are not seen as having direct semantic influence. Yet on Schlenker's proposal, the values of the terms in question are constrained to those that would be assigned by the traditional Kaplanian semantics, while on mine the speaker's intention are less constrained.

³³One promising candidate is to classify descriptive meanings as the kind of *conventional implicatures* recently persuasively argued for by Potts (2003), (2005), (2007).

³⁴Slightly modified from Kaplan (1977, 498)

But this means that we are allowing the speaker's intention to determine when x has to be beautiful in order for (15) to be true. Yet, the intuition about the direct referentiality of *now* requires that x *has to be* beautiful at t_c .

One option here is to propose that there is a constraint on the intentions that a speaker can have in this kind of case, and that due to this constraint, the value of the intention-function can only be t_c . So in the case above,

$$g_c(1) = t_c$$

If this is so, we will predict the right truth conditions for (15).

The challenge here is to specify how this constraint is secured. To be sure, from a purely technical point of view, this issue can be regarded as not critical; we could simply stipulate in accordance with the data that this is so. From the point of view of giving the semantics, we are allowed to defer the question of *why* the constraint exists, just like Heim and Kratzer defer the more general question of what their assignment function represents.

But I think there is a straightforward explanation that we can appeal to here. It is highly plausible that the fact about *now* exemplified by (15) is a fact about that particular type of construction. Indeed, it simply looks like *now* as it appears in (15) is not intention-sensitive. So how can one expressions sometimes be intention-sensitive and sometimes not?

In fact, this is not mysterious. Something similar is true of just about all the expressions we are considering here. The most familiar example comes from non-referential uses of pronouns, such as bound uses and 'donkey' anaphora. These kinds of cases are not under discussion. (See Essay 3.) But I want to mention the following. The standard conception is that what determines whether a pronoun is referential or non-referential has to do with the syntactic environment in which the pronoun appears in the particular case under discussion. That is, the reason *she* is referential in (17a) but non-referential on the relevant reading of (17b) is not to be found in the pronoun itself but in the fact that in the latter case it is c-commanded by a variable binder.³⁵

- (17) a. She deserves better.
 b. Every failed student thinks she deserves better.

The idea is that the same kind of consideration applies to *now* in (15). In particular, the claim will be, very roughly, that when *now* appears in the scope of another temporal operator, it receives its Kaplanian interpretation, that is, it sets the time parameter of the circumstance to t_c .

³⁵See Heim and Kratzer (1998, ch. 5) for definitions of these notions.

But if this is so, then it is obvious that speakers cannot intend for *now* in this kind of construction to shift the time parameter of the circumstance otherwise. What speakers can expect their audiences to be able to figure out is constrained by the syntactic properties of the sentences they utter. Hence, since it is a fact about the syntactic construction of (15) that *now* must contribute the time of utterance, Weak Intentionalism together with the belief-constraint on intention-formation imply that speakers cannot intend for it not to do so.³⁶

2.5 Getting the Facts Right

In this section I want to compare the framework I have just presented to an alternative that, as mentioned earlier, have been considered by Predelli (2005) and Gauker (2007).³⁷ We will see that the two frameworks are empirically equivalent. But I argue that, nevertheless, one is preferable to the other. Seeing this will require noting certain distinctions, which are crucial in their own right, and which shed light on the different aspects of context we looked at in Section 2.3.

2.5.1 An Alternative Framework

In the framework I presented above, intention-sensitivity is accommodated by letting intentions figure as parameters of context in the guise of the assignment of values to variables. By contrast, in the alternative to be considered here, intention-sensitivity is accommodated by letting *intended referents* be parameters of context. As Predelli (2005) puts it, the idea is that:³⁸

the [context] taken into consideration by the system contains co-ordinates intended by the speaker as semantically relevant, even if distinct from the obvious items within the context of utterance/inscription [...].³⁹

³⁶If one thinks that one *can* get intention-sensitive readings of operators like *now* even in this kind of case, then of course that is not a problem. Some sympathies for these kinds of readings are expressed by Predelli (2005).

³⁷Ultimately Gauker (2007) argues that *no* expressions are intention-sensitive and merely presents the view in question as what he takes to be the most plausible way for the semanticist to implement intention-sensitivity.

³⁸Predelli's main examples are cases of what is often called *context-shifts*, i.e. cases where indexicals refer to other objects than the ones which are the values of their relevant parameters in the context of utterance. Predelli's position is that these cases are cases of what I have called intention-sensitivity and hence the I-theory handles them. See Perry (2006), Corazza, Fish, and Gorvett (2002) some alternative views on the cases.

³⁹Predelli (2005, 44).

To have some terminology, let us call the first proposal, the one I favor, the *I-theory* and the other one the *R-theory*. I will sketch what I take to be the most viable way of developing the R-theory.⁴⁰

On the R-theory a context contains, in addition to the Kaplanian parameters, a list of parameters used to handle intention-sensitivity. In the case of singular terms, the extra parameters will be referents, in the case of operators, they will be values to go into the circumstance. So a context will now look like this

$$c = \langle a_c, t_c, l_c, w_c, x_1 \dots x_n \rangle$$

And characters are then defined in the following ways:

R-Theory Character (Singular Terms)

If α is an intention-sensitive singular term and j is an index, then
The character of $\alpha_j = \lambda c. x_j$.

R-Theory Character (Temporal Operators)

If Ω is an intention-sensitive temporal operator and j is an index,
then
The character of $\Omega_j \phi = \lambda c. \lambda i. \llbracket \phi \rrbracket^{c, \langle w_i, x_j \rangle}$.

I take it that it is clear how this theory will derive the same results as the I-theory. To take one example, the context relevant for interpreting (12) will look like this:

$$c = \langle a_c, t_c, l_c, w_c, \text{John}_1, \text{Mike}_2 \rangle$$

Given the R-Theory character of *he*, we derive that (12) is true if and only if John and Mike are both logicians.

As this suggests, the I-theory and the R-theory are *equivalent* when it comes to making predictions about the truth conditions of utterances. This in itself is an interesting result: For the purpose of simply calculating the truth conditions of utterances containing intention-sensitive expressions it does not matter whether we think that these intentions are themselves parameters of contexts or just determine the relevant aspects of contexts. However, there is an important sense in which the frameworks do nevertheless differ, and in fact, as we shall see, this difference is stark enough that it should prompt us to reject the R-theory.

⁴⁰This is a version of the kind of approach to context sensitivity exemplified by Larson and Segal (1995). See in particular their ch. 6.

2.5.2 Four Kinds of Facts and how Reference Works

We have seen that the I-theory and the R-theory are equivalent in terms of predicting truth conditions of utterances. Yet, obviously, the frameworks differ – at least they appear to do so. How should we describe the way in which they differ? Answering that question requires noticing some distinctions between different kinds of *facts* surrounding utterances and their interpretation. Furthermore, as we shall see, drawing these distinctions also clarifies the difference between the metaphysical question concerning what constitutes or decides reference and the epistemic question of the evidence used by audiences.

For illustrative purposes I will use our example of Perry's utterance of (10), repeated here.

(10) I think he is a great philosopher.

We already noted one type of fact associated with utterances of this kind, exemplified by F₁ and F₂.

F₁ Perry is the speaker of (10).

F₂ The speaker of (10) intended to refer to Kripke with *he*.

Facts of this type, so I argued, are what narrow context comprises. Let us therefore call them *narrow-contextual facts*. Narrow-contextual facts are relevant for reference-determination.

Further, that a given expression refers to a particular object on a particular occasion of use is itself a fact. Let us call such a fact a *referential fact*. In the case at hand, there are two relevant referential facts, namely F₃ and F₄.

F₃ Perry is the referent of *I*.

F₄ Kripke is the referent of *he*.

There is a dependence here. F₁ determines F₃, F₂ determines F₄. But they do so only because *I* and *he* have the meanings (i.e., characters) they have. Let us call facts like these *semantic facts*.

This allows us to state precisely a fundamental view of how reference works, which everyone should agree to. I call it *Combinatorial Reference*.

Combinatorial Reference. Referential facts are determined by (a) narrow-contextual facts and (b) semantic facts.

Combinatorial Reference proposes an answer to the metaphysical question of what determines reference on a particular occasion. For instance, the referential fact that Perry is the referent of *I* (F₃) depends on the narrow-contextual fact that Perry is the speaker (F₁) and the semantic fact that *I* has the character it does. I argued that what the speaker's intention is in making an utterance is as fit to be a narrow-contextual fact as is a fact like who the speaker is. So my claim can be rephrased as the claim that Combinatorial Reference is right for both intention-sensitive expressions and non-intention-sensitive expressions.

2.5.3 Discovering Narrow-Contextual Facts

What about the epistemic question? I accepted the picture, originally proposed by the opponent of ISS, on which the collection of facts which the audience uses as evidence in order to discover narrow-contextual facts make up what we call 'wide context'. But what kinds of facts *do* make up wide context? In terms of our example, how *would* Perry's audience go about finding out that he intended to refer to Kripke with *he*?

There are many ways this could go depending on the situation. Let us suppose, for simplicity, that Perry is pointing at Kripke when he utters (10). Then the relevant fact the audience will use as evidence in order to discover his intention is F₅.

F₅ Perry was pointing at Kripke when he uttered *he* in (10).

A fact such as F₅, then, is a *wide-contextual fact*. Of course, we are often confronted with much more complicated cases in which the relevant wide-contextual facts are more complex. A wide-contextual fact, for instance, may be that Kripke has made himself salient by acting conspicuously in some way or other and so no gesture like pointing is needed. In a footnote, Kaplan (1977) called this an 'opportune demonstration':

a demonstration may also be opportune and require no special action on the speaker's part, as when someone shouts "Stop that man" while only one man is rushing toward the door.⁴¹

Presumably, even facts about what the speaker's intentions are for other expressions may be part of the evidence that an audience will use to recover other intentions.

I argued that there is no principled difference between how *I* and *he* is interpreted. The only difference is, I claimed, that in the normal case, we simply

⁴¹Cf. Kaplan (1977, 490, n. 9).

realize that the sounds we are hearing are coming from a particular source, in this case Perry, and we painlessly infer that that source is the speaker. So too in this case. In other words, the wide-contextual fact relevant for *I* is something like F6.

F6 The sound of (10) came from Perry.

So F₅ and F₆ are wide-contextual facts in the sense that they are the kind of facts audiences will use in order to solve the epistemic-evidential problem of how to ascertain the narrow-contextual facts which will, together with semantic facts that are shared among competent language users, determine reference.

To sum up, then, we have a four-way distinction between referential facts, semantic facts, narrow-contextual facts and wide-contextual facts. All of these are important for a proper description of how utterances are produced and interpreted.

2.5.4 Settings

I want to make one more remark along these lines before returning to the difference between the I-theory and the R-theory. Given the picture above, Kaplanian contexts are meant to model narrow contextual facts. As such, a Kaplanian context can be understood in the way suggested by Lewis in the following often quoted passage:

Whenever a sentence is said, it is said at some particular time, place and world. The production of a token is located both in physical space-time and in logical space. I call such a location a *context*.⁴²

An utterance always takes place at a spatio-temporal-modal point. For short, let us call such points *settings*. Only certain features of settings are narrow contextual facts. But it should not be inferred that everything else is wide context. A setting contains a myriad of facts. For instance, a fact about the setting I am in right now is the angle my knees are bent, how many hairs I have on my scalp, or the precise amount of water in my water bottle. But only some of these facts will qualify as wide-contextual facts and none will qualify as narrow-contextual facts. For instance, Perry might have felt a strong pain in his left index finger at the moment he uttered (10). But this fact is of course irrelevant both epistemically and metaphysically to the interpretation of the utterance.

To be sure, as Neale suggested in the passage quoted earlier, just about any fact about a setting is a *potential* wide-contextual fact. But a distinction should

⁴²Lewis (1980, 85).

be made between wide context and setting, since audiences only have access to a limited subset of the facts that make up the setting, and hence these are the only facts that deserve to be included in the wide context.

2.5.5 What is Wrong with the R-Theory

The problem with the R-theory can now be seen clearly. The problem is that the R-theory falls foul of Combinatorial Reference because it ends up treating referential facts as themselves narrow-contextual facts. For example, take the R-Theory's proposal for modeling the context for (12):

$$c = \langle a_c, t_c, l_c, w_c, \text{John}_1, \text{Mike}_2 \rangle$$

The referents of the pronouns appear directly and they are indexed to the corresponding occurrences. The only way to understand this, I think, is as modeling the fact that he_1 refers to John and he_2 refers to Mike. These are referential facts. So narrow context is seen as containing referential facts. This violates Combinatorial Reference. Since narrow context is defined as comprising those facts that determine reference (in the metaphysical sense) together with characters, the R-Theory is committed to the claim that the fact that he_1 refers to John, together with the character of he , determines the fact that he_1 refers to John. And this is clearly unsatisfactory.

By contrast, notice that, on the I-theory, all contexts will look the same:

$$c = \langle a_c, t_c, l_c, w_c, g_c \rangle$$

What is represented here is the fact that speaker has a certain intention. This is not a referential fact. So the I-Theory does not incorporate referential facts into narrow contexts. Hence, it does not violate Combinatorial Reference. The I-Theory clearly explains reference in a non-circular way in that it straightforwardly models that the referential fact that he_1 refers to John is determined by the narrow-contextual fact that the speaker had so-and-so intention together with the semantic fact that he has the character it does.

2.6 Unwanted Intentions?

In this section I return to the issue of misfiring intentions that I left behind earlier and respond to a potential problem they raise for my proposal to let intentions figure as parameters of narrow context.

A misfiring intention is a genuine referential intention, but one which the audience is not in a position to recognize. Recall that, in accordance with the

general belief-constraint on intention-formation, it is required for a speaker to have an intention to refer that she believes that she can succeed in doing so. So a situation in which a speaker has a misfiring intention will be one in which the speaker's belief that she will succeed is false. This can happen either if the speaker is mistaken about what wide-contextual clues are available to the audience or if the speaker misjudges what the audience is able to work out from the clues that she correctly takes to be available to them. Let me illustrate these two situations with two examples.

To illustrate the first, simpler kind of situation, consider again Perry's utterance of (10). An example of the kind of situation in which the audience does not have enough information is one where Perry did not make his pointing gesture sufficiently visible, although he himself believes that he did (for example, his gesture might be vague, quick or inconspicuous). In that case, although Perry believes that the wide context contains the information that he was pointing to Kripke, it does not. The intention to refer misfires due to a mistake about what the wide context contains.

To illustrate the second, more complex kind of situation, we need a slightly more elaborate example. For instance, suppose Holmes knows that Porter is the murderer, but Watson is embarrassed to find himself clueless. Holmes and Watson have access to the same body of evidence, and Holmes charitably thinks that his friend has been clever enough to deduce who the culprit is for himself. When they see Porter standing together with McCord, both laughing at a joke that someone else just told, Holmes snorts:

(18) Look how he's smiling! Well, not for long.

Holmes's intention to refer to Porter with *he* was formed on the basis of his belief that Watson is able to ascertain that intention on the basis of the evidence which has lead Holmes himself to the conclusion that Porter is the murderer. But Watson's deductive powers are not as good as Holmes's, and the former is therefore not able to ascertain the detective's referential intention. So Holmes's intention misfires due to a misjudgment about what his audience is able to figure out based on the wide-contextual clues that he, correctly, believes to be available.

These two kinds of cases are not mutually exclusive. We can imagine – and in fact we often encounter – complicated cases, where the speaker's belief that her audience will be able to recognize what she intended is falsified by intricate relations between the audience, the speaker and the context. However, the objection I want to consider here does not require us to look into such complex cases.

The alleged problem for the I-theory emerges in the following way. Take a context in which the speaker has formed a misfiring intention. Surely, it is a fact about that context that the speaker has the misfiring intention. But then, the objection proceeds, that fact will be represented in our tuple representing the context. So, the misfiring intention *will* determine reference contrary to our intuitions. How, that is, is the I-theorist to rule out misfiring intentions becoming part of the tuples which characters operate on?

The problem with this objection is that it does not take into account that tuples represent narrow context, and narrow context comprises just those facts that determine reference. A misfiring intention does not determine reference. So it is not a narrow-contextual fact that a speaker has a misfiring intention. Hence, there will be no tuples representing misfiring intentions.

What kind of fact is it then when a speaker has a misfiring intention? Could it be a wide-contextual fact? No, because then it *would* be possible for the audience to recognize the intention in question; and so it would not misfire. Rather, it will be a fact belonging to what I called the setting of the utterance. It will be a fact on a par with our example of Perry feeling pain in his finger while making the utterance.

In other words, the Weak Intentionalist *cum* I-theorist can accept that speakers sometimes have misfiring intentions (i.e., such intentions are not impossible). She can also accept that a speaker's having such a misfiring intention is a fact. However, such a fact is neither part of wide nor of narrow context.

2.7 Semantics, Pragmatics, and Metasemantics

My primary goal in this essay has been to show that first, the direct arguments against letting intentions figure as parameters of the kind of context that characters operate on are ineffective. There were mainly two arguments, namely the Argument from Inaccessibility and the Argument from Open-Endedness. I accepted the first, but rejected the second.

Before finishing, I want to briefly return to the broader theme concerning the semantics-pragmatics distinction, mentioned at the outset. As I noted, many writers who endorse these arguments against ISS do so with a more general purpose in mind. Their chief concern is usually not the particular workings of intention-sensitive indexicals but rather a broader debate about the relation between semantics and pragmatics.

As mentioned, one of the central things at stake in this debate is a thesis of *semantic underdeterminacy*. In Carston's (2002) words,

the linguistic semantics of the utterance, that is, the meaning encoded in the linguistic expressions used, the relatively stable meanings in a linguistic system, meanings which are widely shared across a community of users of the system, underdetermines the proposition expressed (what is said). The hearer has to undertake processes of pragmatic inference in order to work out not only what the speaker is implicating but also what proposition she is directly expressing.⁴³

Theorists of this bent usually claim that the fact that most of the expressions we have looked at here are intention-sensitive provides evidence for taking their contributions to interpretation to be semantically underdeterminate. For example, as we saw, Recanati (2004) thinks that there is a stark difference between, say, *he* and *I*.⁴⁴ He accepts that *I* can be given a purely semantic treatment since its reference is determined as a function of narrow context; but on the other hand, he argues that cases like *he* do not lend themselves to the same approach. This claim figures into Recanati's overall defense of semantic underdeterminacy:

Even if we restrict our attention to expressions traditionally classified as indexicals, we see that they involve a good deal of semantic underdeterminacy. [...] We encounter the same sort of problem even with expressions like 'here' and 'now' which are traditionally considered as *pure* indexicals (rather than demonstratives). [Their interpretation] depends on what the speaker means, hence, again on wide context. [...] Again, we reach the conclusion that pragmatic interpretation has a role to play in determining the content of the utterance, in such a case.⁴⁵

With respect to this more general level of issues concerning the relation between semantics and pragmatics, my arguments support an attitude quite different from that of those who endorse semantic underdeterminacy, and more akin to the one advocated by King and Stanley (2005):

speaker intentions are relevant for fixing the referential content of a lexical item in a context only when they are determined to be so by the standing meaning of a lexical item. So, the role played by speaker intentions in semantics remains significantly constrained, even on this conception of the semantics-pragmatics distinction, by the standing meaning of the lexical items.⁴⁶

In the framework I presented in Section 4, the hallmark of intention-sensitive expressions is that their meanings (i.e., characters) operate on intention-parameters of context. Figuratively speaking, the meanings of expressions like *he*, *that*, or *now* are 'looking for' an intention which will fix their semantic contribution. Thus, in

⁴³Carston (2002, 19–20).

⁴⁴Carston (2002) goes further and argues that even though "the only strong case" for non-intention-sensitivity "is 'I' [...] nothing at all will be lost by including its reference assignment with the rest, even if pragmatic principles are seldom required for the purpose." (p. 180)

⁴⁵Recanati (2004, 57–58).

⁴⁶King and Stanley (2005, 139).

an obvious sense, they are incomplete; there is no way of reading off from their lexical entries what this contribution is (in a particular context). However, the way they depend on context for their ‘completion’ is controlled by their meanings. And it is fair to say that this kind of incompleteness is far from what is usually meant by semantic underdeterminacy.

Finally, I want to make a some related remarks about so-called *metasemantics*. According to a well known observation, one should distinguish between semantics proper and metasemantics, where the task of the former is to give a descriptive specification of the semantic values of the language and that of the latter is to pursue the question of why the terms in the language have the semantic values they do.⁴⁷ A character is an element of a theory of semantics proper in this sense. It is an answer to a question like, ‘What is the semantic value of such-and-such expression?’ In this case the answer is, ‘It is a function from a context to a content’. But such an answer is idle unless one says what one means by a context. In this essay I have argued that a context consists of (among other things) the speaker’s intention. This modeling of the speaker’s intention as part of the context is still within the remit of semantics proper.

Regarding metasemantics, one should distinguish between two kinds. First, one can be interested in issues about what makes it the case that the semantics of the language is the way it is; for instance, why does *blue* mean blue, and not red; or indeed why does *he*, *we*, or *today* have the intention-sensitive characters they do? The kind of answers that have been proposed here are of the sort, ‘Because of the way meaning supervenes on use’, or ‘Because meaning is determined by external factors’, etc. This is the sense in which Kaplan sees metasemantics as opposed to semantics proper:

“Ohsnay” means *snow* in Pig-Latin. That is a semantic fact about Pig-Latin. The *reason* why “ohsnay” means *snow* is not a semantic fact; it some kind of sociological or historical fact about Pig-Latin.⁴⁸

But secondly, when it comes to context-sensitive terms, one can be interested in the question of why what I have called the narrow-contextual facts, in a particular case, are constituted the way they are. For instance, why is the speaker’s intention so-and-so?

In this second sense, this essay has also engaged in metasemantics. The thesis of Weak Intentionalism is a metasemantic thesis. Correspondingly, the view that the descriptive meanings that are lexically associated with the terms in question do their most important work in providing clues for the audience as to the

⁴⁷See for example Kaplan (1989, 573–576), Stalnaker (1997).

⁴⁸Kaplan (1989, 573).

speaker's intentions – and thereby in constraining what the speaker could reasonably intend in the first place – is a way of answering a metasemantic question.

3 Descriptive Indexicals and Adverbs of Quantification

3.1 Introduction

In this essay I argue for two main claims. The first is that all sentences of a particular kind in which an adverb of quantification takes scope over an indexical are ambiguous between what I shall call a *singular* and a *descriptive* reading. The second claim is that this ambiguity should be analyzed as one between a referential and a so-called *e-type* use of the indexical in question.

The peculiar features of the kind of sentence we are interested in was noted by Nunberg (1992), (1993), (2004). In particular, these are cases in which indexicals seem to be interpreted not in their standard, referential way, but are instead used descriptively. Here is a suggestive sample:¹

- (1) a. *Condemned prisoner*: I am traditionally granted a last wish.
Descriptive reading: A condemned prisoner is traditionally granted a last wish.
- b. *Chess teacher giving instructions to a student who has just played 4. N × P*: According to all the textbooks, you often get in trouble with that move.
Descriptive reading: According to all the textbooks, a chess student often gets in trouble with 4. *N × P*.
- c. *Demonstrating Pope Benedict XVI*: He is usually Italian.
Descriptive reading: The Pope is usually Italian.
- d. *Noticing an off-track betting parlor in an unfamiliar neighborhood*: There is usually a cash machine around here.

¹Adapted from Nunberg (1992), (1993), (2004).

Descriptive reading: There is usually a cash machine in the area around an off-track betting parlor.

e. *Uttered in the US on July 4th 2009:* Today is always a big party day.

Descriptive reading: The 4th of July is always a big party day.

Consider for instance (1a). On the formative treatment in Kaplan (1977), *I* is an indexical whose reference in a context *c* is a parameter of the context, i.e., the speaker in *c*. But (1a) is most naturally taken to have the truth conditions of the indicated descriptive reading, i.e., it seems as if the usual referent of the pronoun is not contributed to the interpretation in this case.

Nunberg's reaction is to propose a revision of the Kaplanian semantics for indexicals. In particular, he claims that the availability of descriptive readings shows that the linguistic meaning of these expressions cannot be identified with simple functions from contexts to referents, Kaplan's *characters*. Instead, he claims that

The meanings of indexicals are composite functions that take us from an element of the context to an element of a contextually restricted domain, then drop away.²

Hence, Nunberg concludes that the Kaplanian picture of the meanings of these terms cannot be sustained in the face of descriptive readings.

Nunberg's main motivation for this is his argument that descriptive readings are obligatory. Specifically, he claims that singular readings are *incoherent* for the cases at hand. I argue in this essay that this claim is false. All the cases have singular readings, although these readings are not the ones that hearers are most likely to associate with them in the kinds of conversational settings that we usually encounter.

Consequently, rather than taking descriptive readings as evidence for a more complex semantics for the same items that appear in singular cases, I take the difference to be one of *ambiguity* at the level of LF. The difference between my view and Nunberg's is structurally analogous to a difference between a view that claims that the meaning of *bank* should be a complex function that sometimes takes us to river banks and sometimes takes us to financial institutions, and a view that posits a difference between two items that may appear at LF, each of which have distinct meanings(. In particular, I will claim that words like *I*, *you*, *he*, *today*, and *here* are ambiguous between variables that may either be free (referential) or bound, and *e-type pronouns* that have a different structure at LF. The latter will be seen to give rise to descriptive readings.³

²Nunberg (1993, 19).

³Elbourne (2008) argues that descriptive indexicals are evidence for taking pronouns to be definite descriptions. He provides a formalization of the theory in Nunberg (1993) on which

Familiarly, beginning with Evans (1977) and Cooper (1979), many authors have claimed that pronouns can be disguised definite descriptions. Such e-type pronouns were first posited in order to account for the notorious cases noted by Geach (1962) in which a pronoun appears to be neither bound nor referential, as in

- (2) If a farmer owns a donkey, he beats it.

On the relevant reading, *it* cannot be referential – which donkey does it refer to? But nor can it be bound by *a donkey* because this DP cannot be raised out of the antecedent of the conditional in order to land high enough for it to c-command the pronoun.

Nunberg's cases exhibit suggestive similarities with donkey anaphora. Most conspicuously, on their descriptive readings, the cases involving pronouns are cases in which the pronouns are neither referential nor bound. For instance, when read descriptively, *he* in (1c) does not refer to a particular pope, and at the same time there is nothing to bind it. Moreover, Nunberg's examples are, if I am right, ambiguous between referential and descriptive readings. Similarly, *it* in (2) *could* be read referentially, although that reading is far less natural than the anaphoric reading. (Imagine for instance that there is a dog, Rex, in the village and that there is a convention that donkey-owning farmers have to beat Rex once in a while.) This trait is also exhibited by Nunberg's cases, as we will see.

My discussion will not proceed against the background of Kaplanian semantics, but against the background of the more recent type of analysis according to which pronouns are variables.⁴ As such, their values are determined by an assignment function, which I take to represent the speaker's intentions. (See Essay 2.) Here the descriptive meanings undeniably associated with these terms – e.g., *I* carries roughly the descriptive meaning 'the speaker of this utterance' – is taken to be encoded in the so-called phi-features, i.e., person, gender and number.

A popular view has it that the phi-features are presupposition triggers in the sense that they are preconditions on the semantic definedness of the pronouns, and consequently of sentences in which they appear. In this essay I refrain from committing to this view. (See Essay 4.) All that is needed here is a weaker assumption, which I take to be uncontroversial: the descriptive meaning contributed by

descriptive indexicals are analyzed similarly to the e-type approach I present here. There are important differences, however. Furthermore, Elbourne's main concern is with demonstratives (bare and complex), and as such is mainly concerned with third person descriptive indexicals. In addition, Elbourne does not discuss descriptive cases that do not involve pronouns, and also resolves to abstract away from the role played by phi-features.

⁴A pioneer was Cooper (1983). Kaplan (1989) expressed sympathies for this view. See Heim and Kratzer (1998), Heim (2008) for more recent presentations.

the features guide the audience in their attempt to ascertain what the speaker intended to refer to. In fact, we will see that there are reasons to doubt the pre-suppositional analysis of the features when it comes to descriptive indexicals.

The variable theory of pronouns is unproblematically extendable to include e-type pronouns.⁵ And moreover, it is compatible with a Kaplanian notion of character. (See Essay 2.) So, in this sense, the existence of descriptive readings will be seen to be just another instance of a wider range of phenomena, namely those involving e-type pronouns. Hence, Nunberg's cases can be accounted for without the need for substantial revisions.

In Section 3.2 I demonstrate the coherence of singular readings. Section 3.3 dismisses a candidate, pragmatic approach to the descriptive readings by showing that they allow for embeddings in conditionals. Section 3.4 then sketches the e-type approach to descriptive readings, and Section 3.5 shows how it accounts for embeddings and other phenomena.

3.2 Coherence of Singular Readings

3.2.1 The Argument from Incoherence

As mentioned, Nunberg's objection to the Kaplanian view turns on his claim that singular readings are incoherent for his cases. Here is the statement of the argument from Nunberg (1993):

sentences containing descriptive uses of indexicals may be incoherent if the indexicals are interpreted as making singular reference. [...] In context, the adverbs *usually* and *always* must be understood as involving quantification over instances, but these readings are not possible if the subjects of the sentences are interpreted as referring to individuals or particular times.⁶

As we will see, the account of the cases I will give in Section 3.4 agrees partly with this suggestion although it does not agree that singular readings are incoherent and does not agree that standard semantics for the expressions in question must be abandoned.

Nunberg's conclusion is that since there is no singular reading one can associate with the examples he gives, the descriptive readings must be generated semantically. Thus, his argument is aimed at ruling out an approach that would take the descriptive readings as generated by optional pragmatic processes, e.g., as conversational implicatures.

⁵See for instance, Heim and Kratzer (1998, ch. 11).

⁶Nunberg (1993, 32). The same claim is made in Nunberg (2004, 268).

Nunberg (1993) directed this argument against the account of descriptive indexicals in Recanati (1993, ch. 16). Recanati claims that descriptive readings are generated by pragmatic processes that are pre-propositional - i.e., they help determine truth-conditional content – but optional. In the latter respect the processes he invokes are similar to implicature-generation, but since the processes are pre-propositional, Recanati is explicit that his account is not an implicature account in that it does not posit post-propositional inference processes on the part of the audiences in which conversational principles figure as premises. By contrast, Nunberg takes himself to have shown that, because descriptive readings are not optional, this kind of analysis must be rejected.

Agreeing that Nunberg's arguments show that singular readings are not available for these cases, others have used this in attempts to motivate other kinds of pragmatic accounts, thus disagreeing with Nunberg's own conclusion that descriptive readings must be seen as generated semantically. For example, Carston (1998), (2008) concludes that the descriptive readings are generated pragmatically, but by processes that are pre-propositional and non-optional. So, for Carston, the descriptive readings, and the alleged incoherence of the singular readings, are evidence for the existence of obligatory pragmatic processes that contribute to the generation of truth-conditional content.

3.2.2 Why Singular Readings are not Incoherent

The problem here is that, in suitable circumstances, singular readings *are* available for these examples. Consider again our example of (1a), repeated here.

(1a) *Condemned prisoner*: I am traditionally granted a last wish.

For ease of discussion, suppose from now on that the utterer of (1a) is Jesse James.⁷ The singular reading of (1a) will then be one on which it expresses a proposition about James. If it can be shown that there are scenarios in which this singular reading has clear intuitive truth conditions, this will be sufficient to establish that it is not incoherent.

Consider the following two scenarios:

Scenario 1

There is no general tradition that condemned prisoners have a privileged last wish. Jesse James is a notorious criminal who has been sentenced to death a large number of times, yet each time he has been

⁷The author is aware that Jesse James, the notorious outlaw who lived from 1847 to 1882, was never sentenced to death. But he begs the reader's favor in this matter.

standing at the gallows with the noose around his neck, he has been pardoned at the last moment. People irrationally romanticize James, and over the years, a tradition has evolved by which he is granted a last wish on the night before he walks to the gallows.

Scenario 2

There is a general tradition that condemned prisoners have a privileged last wish. Jesse James is a notorious criminal who has been sentenced to death a large number of times, yet each time he has been standing at the gallows with the noose around his neck, he has been pardoned at the last moment. Over the years, people have become so upset with James that they have decided that the right to a privileged last wish doesn't apply to him. He gets nothing.

There is no doubt that we have clear intuitions about the truth value of both the singular and the descriptive readings of (1a) with respect to these scenarios. The singular reading is true with respect to Scenario 1 and false with respect to Scenario 2. And conversely, the descriptive reading is false with respect to Scenario 1 and true with respect to Scenario 2.

This readily transposes to the other cases in (1). For instance, imagine that the addressee of the chess teacher's utterance in (1b) is Garry. Then a scenario for which the singular reading of this example is intuitively true is the following:⁸

Scenario 3

Garry is a brilliant young player who rarely gets in trouble with any move. Yet, mysteriously, he often gets in trouble with 4. $N \times P$. The experts are struggling to explain this fact, and all the textbooks contain sections speculating as to the reasons why Garry can't get this one right.

Perhaps the corresponding is harder to imagine for the cash machine example in (1d). However, the reason for this is merely that a context that will generate intuitions about the truth value of the singular reading of this example is more outlandish, or improbable, than the scenarios above. Call the particular betting parlor near which the utterance is made 'High Hopes'. Here is a scenario that elicits the clear intuition that the singular reading of (1d) is true:

⁸Here as below, I ignore the fact that, arguably, *that* in (1b) is also interpreted descriptively, and so should be treated along the same lines as I suggest for the general case in this essay.

Scenario 4

The cash machines of the city have wheels and can be moved around.
But for some reason, the people responsible for doing this usually
place them in the area around High Hopes.

Scenario 4 is a scenario in which an utterance of (1d) is most naturally understood as expressing the singular content about High Hopes, and in which that content is true.

So contrary to Nunberg's claims, these considerations show that *both* singular and descriptive readings are available for the cases.

3.3 The Inadequacy of the Implicature Account**3.3.1 Descriptive Readings as Implicatures**

One reaction to the failure of the argument from incoherence might be to explore a treatment on which descriptive readings are optional. I will here consider a candidate explanation in terms of conversational implicatures. Such an account can be motivated in the way that Gricean explanations are usually motivated. From a methodological point of view, the Gricean strategy can be described as follows.⁹ We have a well-attested semantic theory T (Kaplanian semantics) of a particular class of expressions E (indexicals). Then a certain phenomenon U (descriptive uses) involving E are observed, which seems to present counterexamples to T . As a consequence, a more complex alternative T' (Nunberg's richer meanings) to T is proposed. However, the proponent of T may salvage her original theory, if she can demonstrate that U is in fact *explained by T together with pragmatic principles that are independently motivated*.

To illustrate, here is a sketch of a Gricean account of (1a). First, consider the singular reading of James's utterance:

(3) Jesse James is traditionally granted a last wish.

This is the reading which, as we saw, is intuitively true with respect to Scenario 1, but false with respect to Scenario 2.

But note that in the scenario that *we* are most likely to think of the singular reading is likewise false, albeit for a different reason, namely because there is no tradition which involves only Jesse James. Rather, there is a tradition that applies to prisoners in general. If this is right, then it is natural to say that the maxim

⁹Grice famously delineated this dialectics in the 'Prolegomena' to his 'Logic and Conversation' (Grice (1989, ch. 1)).

which is being flouted in this case is Grice's *First Maxim of Quality*. In Grice's original formulation, this maxim is stated as follows:¹⁰

First Maxim of Quality (FMQ). Do not say what you believe to be false.

Accordingly, the Gricean reasoning process, which the audience might be claimed to undergo in this case, goes roughly like this:¹¹

- (i) James said that he is traditionally granted a last wish.
- (ii) There is no reason to suppose that James is not observing FMQ.
- (iii) Unless James thinks that a condemned prisoner is traditionally granted a last wish, he could not be observing FMQ.
- (iv) James knows (and knows that I know that he knows) that I can see that the supposition that he thinks that a condemned prisoner is traditionally granted a last wish is required.
- (v) James has done nothing to stop me thinking that a condemned prisoner is traditionally granted a last wish.
- (vi) James intends me, or is at least willing to allow me to think, that a condemned prisoner is traditionally granted a last wish.
- (vii) Therefore, James has implicated that a condemned prisoner is traditionally granted a last wish.

The crucial steps here are (i) and (iii). The former shows that the Gricean process we are imagining starts from the assumption that what James *said* is given by the reading on which the indexical *I* contributes its standard content, i.e., the speaker. And (iii) shows that the inference to the descriptive content turns on the assumption that James is observing the maxims. In other words, the idea is that when Jesse James utters (1a), his audience undergoes a reasoning process which starts with the singular reading according to which there is a tradition involving Jesse James himself, but upon realizing that if James were to be interpreted as intending to communicate that content, he would be violating the First Maxim of Quality, they move to the descriptive reading, which he is therefore taken to have implicated.

¹⁰See Grice (1989, 27).

¹¹This is modeled on Grice's "general pattern". See Grice (1975, 31).

A further consideration which might be taken as evidence for the implicature account is that the descriptive reading of James's utterance is *cancelable*, as witnessed by the follow-up in (4).

- (4) I am traditionally granted a last wish; but that's not true of condemned prisoners in general, though.

In a scenario like Scenario 1, this follow-up would be perfectly felicitous.

Nunberg explicitly takes the fact that, as he sees it, the descriptive readings are not cancelable as one of the main reasons against a pragmatic, Gricean approach to the examples:

it is not possible to suspend the descriptive reading of indexicals in sentences like these, which is usually taken to be a requirement for postulating a conversational implicature in the first place.¹²

However, although the felicity of the follow-up in (4) is sufficient to reject this general claim about non-cancellability, we will see (in 3.5.1) that cancellability should not be taken as evidence for the implicature account.

3.3.2 Why the Implicature Account Fails

The Gricean approach to the descriptive readings should ultimately be rejected. There are two main reasons. The first is that, for many of the cases, it is unclear how one could argue that the audience arrives at the descriptive reading via a process similar to that described in (i)–(vii) above. The second, and probably more serious, problem has to do with embeddings. I will briefly flesh out each of these objections.

First, let us return to the example of (1d), repeated here.

- (1d) *Upon noticing an off-track betting parlor in an unfamiliar neighborhood:* There is usually a cash machine around here.

To demonstrate that the singular reading of this utterance is not incoherent, we invoked Scenario 4 in which the cash machines of the city are moved around, but usually get placed near High Hopes. Intuitively, the singular reading of (1d) is true with respect to this scenario.

But it is far from obvious how the Gricean explanation of the regular unavailability of the singular reading would go in this case. One idea is the following. We are assuming that neither speaker nor hearer are familiar with the neighborhood

¹²Nunberg (2004, 268).

around High Hopes. Suppose we also assume that the singular reading, which the Gricean inference process acts on, is paraphrasable as follows:

- (5) When one is looking for a working cash machine, one usually finds one in the area around High Hopes.

Then we could perhaps claim that the descriptive reading arises due to the presumption that the speaker is obeying the Second Maxim of Quality:¹³

Second Maxim of Quality. Do not say that for which you lack adequate evidence.

Given that the neighborhood is assumed to be unfamiliar to both speaker and hearer, and that each knows that the other is no more a local than herself, one might try to explain the derivation of the descriptive content by observing that the speaker does not have adequate evidence for the singular content. In a setting where it can be further assumed that the speaker does have adequate evidence for the descriptive content, this kind of explanation might seem promising.

Yet this explanation has a highly artificial flavor. And furthermore, it hardly explains why the descriptive reading would appear to arise in the broad range of cases in which all of these assumptions are not satisfied.

In any case, there is a second, more convincing reason to reject the implicature account, namely that, unlike conversational implicatures, descriptive readings arise for these examples even under embedding. To illustrate, compare the conditionals in (6).

- (6) a. If this student has good hand writing, then we shouldn't give her a scholarship.
 b. If I'm traditionally granted a last wish, then they're nice to condemned prisoners in this country.

The implicature that is well known to arise for the antecedent of (6a), when it appears free-standing, does not arise locally in the scope of the conditional, even though the consequent should be expected to facilitate it. But the same cannot be said for the descriptive reading of the antecedent of (6b), which clearly does arise locally in this case.¹⁴

Implicatures are inferred by the audience from the fact that the speaker expressed a particular truth-conditional content. So they cannot be computed lo-

¹³Cf. Grice (1989, 27).

¹⁴For discussion of embedded implicatures, see Levinson (2000), Recanati (2003), Geurts and Pouscoulous (2009).

cally, as in the antecedents of conditionals. Descriptive readings can be computed locally. Hence, they are not implicatures.

3.4 An E-Type Account of Descriptive Readings

3.4.1 Classifying the Data

We need an account, then, which allows for both singular and descriptive readings while not positing that the latter arise from pragmatic inferences. A glaring fact about the cases is the high frequency of adverbs of quantification (henceforth, QAdvs) in the examples that give rise to descriptive readings. All the examples we have looked at so far involve such an adverb: *traditionally* in (1a), *often* in (1b), *usually* in (1d), and *always* in (1e). Hence, the hypothesis that the presence of these adverbs plays an important role in the generation of the descriptive readings seems obvious.

The e-type account I will give only applies to cases that (explicitly or implicitly) involve QAdvs. This might mean that the e-type approach only covers part of the data. However, there are in fact good reasons to believe that the distinctive phenomenon that we are interested in *only* occurs with cases involving QAdvs. To explain, let us look at some of the apparent examples of descriptive readings that do not involve QAdvs. Here are two and their alleged descriptive readings:

- (7) a. *Uttered by a woman*: We are more likely to contract that disease than men.¹⁵

Descriptive reading: Women are more likely to contract that disease than men.

- b. *Upon answering the phone*: Oh, I thought you were my mother.¹⁶

Descriptive reading: Oh, I thought the person calling was my mother.

However, these cases are readily explainable without the assumption that they involve the kind of descriptive readings that the other cases clearly do involve.

First, consider *we* in (7a). *We* encodes roughly the descriptive meaning ‘plurality that includes the speaker’. That is, the plural feature of *we* carries the information that its referent is a plurality, and the 1st person feature that it includes the speaker. More precisely, a standard analysis follows Link (1983) in maintaining that plural pronouns may denote plural individuals (of type *e*), i.e., mereological sums of individuals. So, particularly, *we* (usually) denotes a plural individual of which the speaker is a part.

¹⁵Nunberg (1993, 12).

¹⁶From a 1990 talk by Nunberg, cited in Recanati (1993, 310) who makes a similar proposal about this case as I do below.

On this analysis, it is natural to take the speaker as intending to refer with *we* in the case at hand to a plurality of women, suitably constrained. (Perhaps she intends to refer to all women, or merely women in a certain work environment, etc.) The sentence then receives the relevant interpretation directly from the standard semantics for *we*. Hence, there is no motivation for classifying (7a) with the other cases we have looked at.¹⁷

Secondly, (7b) is reminiscent of familiar puzzle cases concerning the contrast between *de re* and *de dicto* readings. For instance, (8) has both a true and a false reading.

(8) Lois Lane believes Clark Kent can fly.

On the true reading, Lois Lane has a belief about a particular individual *x*, namely the belief that *x* can fly, which happens to be true. So on the true reading, (8) is equivalent to the relevant reading of (9).

(9) Lois Lane believes Superman can fly.

Lois will assent to (9) while not to (8), the reason being that she does not realize that Kent is Superman.

Yet there is (much) more to be said about Lois's mental state. A longstanding conception has it that, roughly, (8) ascribes to her a belief about *x* under a certain description, or mode of presentation, such as 'my bespectacled, nimrod colleague'. So the belief that Lois has on the false reading of (8) can be got at by the following ascription:

(10) Lois Lane believes her bespectacled, nimrod colleague can fly.

And of course Lois would not assent to (10), although she would assent to the corresponding ascription in which 'the caped rescuer' (or the like) is substituted.

The situation with (7b) is similar. Suppose the caller is Sam. Although the speaker had the belief that the caller was her mother, there is way of describing her belief on which she did not have the belief that Sam is her mother, even though the caller turned out to be identical to Sam. Yet there is nothing to indicate that the standard cases concerning descriptive indexicals in (1) involve the *de re/de dicto* contrast. Hence, there seems to be no reason to assimilate (7b) to the problem cases we are interested in here.

¹⁷Another option is to claim that (7a) expresses a generic statement, cf. Elbourne (2008, 420, n. 10) who suggests that *we* here should be interpreted as a bare plural referring to a kind in the sense of Carlson (1977). Again, if so, this is a reason to regard it as relevantly different from descriptive uses.

I suggest that all other examples of putative descriptive readings that do not involve QAdv can be explained in ways similar to what we have just illustrated, and hence should be classified differently. So it appears that at least the vast majority of descriptive readings – in the sense we are after – occur under the influence of a QAdv as in our original sample.

3.4.2 Situation Semantics for Adverbs of Quantification

To state the e-type account, we need first to introduce a rudimentary semantics for QAdv. Following Lewis (1975), it is usually assumed that the LFs of sentences with QAdv have a tripartite structure consisting of the quantifier, its restrictor and its scope. Although Lewis had originally proposed that QAdv quantify over permissible assignments to variables that he posited in the LFs of the sentences, most theorists more recently tend to adopt the view that QAdv instead quantify over situations.¹⁸ These kinds of situation semantics for QAdv are often based on the theory of situations developed by Kratzer (1989). I begin with a cursory introduction to this framework.

We avail ourselves of a set of possible situations S , a set of individuals A , and a part-of relation \leq on $S \cup A$.¹⁹ So, contrary to more traditional possible worlds semantics, the ontological primitives are no longer worlds and individuals but situations and individuals. In turn, possible worlds are constructed out of situations. A possible world is a maximal situation, i.e., a situation that is not part of any other situation. Correspondingly, a proposition is a function from situations to truth values, or equivalently a set of situations, intuitively, the situations in which it is true, and so propositions are more fine-grained than in standard possible world semantics. For example, consider the sentence

(11) Elliot snores.

The denotation of this sentence will be a proposition, i.e., a set of situations, namely the situations (including worlds) in which it is true. Briefly, this is achieved by the following lexical entries:

- (12) a. $\llbracket \text{Elliot} \rrbracket^c = \text{Elliot}$.
 b. $\llbracket \text{snores} \rrbracket^c = \lambda x. \lambda s. x \text{ snores in } s$.

In turn, by suitable compositional procedures, we derive that (11) is true in a situation s if and only if Elliot is part of s and snores in s :

¹⁸This has been proposed by Berman (1987) Heim (1990a), von Stechow (2004a), Elbourne (2005), and others. See also Portner (2009, ch. 4) for exposition.

¹⁹See Kratzer (1989, 614–615) for details.

(13) $\llbracket(11)\rrbracket^c = \lambda s. \text{Elliot} \leq s \text{ and Elliot snores in } s.$

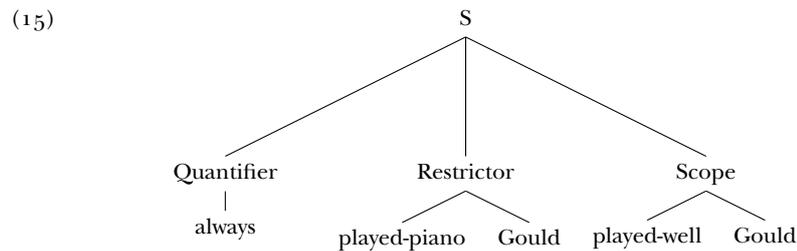
So this proposition is the set of situations of which Elliot is a part and where he snores. There are many kinds of situations contained in this proposition. For instance, there is the situation of Elliot snoring and his wife being upset, and ultimately there is the entire possible world in which this is taking place. An important kind of situation in (13) are so-called *minimal situations*, which are intuitively the smallest situations that make (11) true. Think of the minimal situations of Elliot snoring as consisting of Elliot, the property of snoring, and nothing else.²⁰ We will use this notion of minimal situations in the semantics below.

Let us now look at an easy example involving a QAdv. Consider the sentence,

(14) Gould always played well.

Suppose it is clear in the context that *Gould* refers to the pianist Glenn Gould. The claim is that *always* is a quantifier whose nuclear scope is a set of minimal situations in which Gould played well. But what is the restrictor of this quantifier? Given what is probably the intended interpretation of (14), the restriction we want is the set of minimal situations in which Gould played the piano.

This means that (14) has roughly the following LF:²¹



When it comes to the semantics, a QAdv takes two propositions – i.e., sets of situations – as argument. Following Elbourne (2005, 51), here is the clause for *always*:

(16) $\llbracket\textit{always}\rrbracket^c = \lambda p_{\langle s,t \rangle}. \lambda q_{\langle s,t \rangle}. \lambda s. \text{for every minimal situation } s' \text{ s.t. } s' \leq s$
 and $p(s') = 1$, there is a situation s'' s.t. $s'' \leq s$ and s'' is a minimal
 situation such that $s' \leq s''$ and $q(s'') = 1$.

²⁰Kratzer (1989) adopts the metaphysics of Armstrong (1978) to ground the notion of a minimal situation.

²¹I am following orthodoxy in assuming that restrictors of QAdv are explicitly represented at LF. There are important issues as to exactly how restrictors are filled in, but in general, it is assumed that the grammar computes the material in the restrictor from that in the scope. See Rooth (1985), Krifka (1992), Partee (1991) for discussion. Others, like von Stechow (2004a), Hjalmarsson (2010), argue that at LF the restrictor is a variable whose value is determined by the context. My proposal concerning descriptive readings is compatible with both these options.

Given this, and a host of other details, we will predict roughly the following truth conditions for (15):

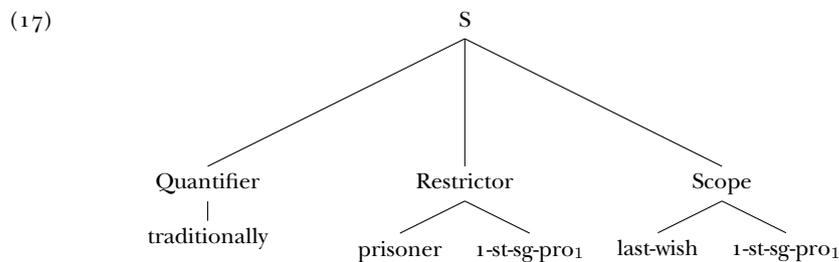
(15) is true w.r.t. s iff for all minimal situations s' s.t. $s' \leq s$ and Gould played the piano in s' , there is a minimal situation s'' s.t. $s' \leq s''$ and Gould played well in s'' .

This should make it relatively clear what kind of syntax and semantics I will be relying on in what follows. I will not give more details or clauses for other QAdv here, since I am more concerned with presenting the main strands of the kind of approach to descriptive readings I have in mind.

3.4.3 Accounting for Singular and Descriptive Readings

The basic idea of the proposal I want to make is this. In both the singular and descriptive cases, the restrictor constrains the quantification over situations to situations in which one or more individuals are said to have a certain property, such as that of being a condemned prisoner, being a pope, being a chess student that has just played a particular move, etc. The difference is that in the singular case this property is predicated of a particular individual – the referent of the pronoun – whereas in the descriptive case the restrictor involves existential quantification over individuals. In the latter cases, the pronoun in the scope of the QAdv is an e-type pronoun.

Let me illustrate this by (1a). The LF of the singular reading looks like this:



Since pro_1 is free here, its value will be settled by the context. As always, the phi-features play an important role in this process. Recall our weak assumption that the features help the audience ascertain the speaker's referential intentions, which we take to be represented by the assignment function g_c . In this case, the features are 1st person and singular, and supposing that nothing unusual is going on, the speaker's referential intention is likely to have been to refer to himself. So g_c will assign James as the referent of pro_1 .

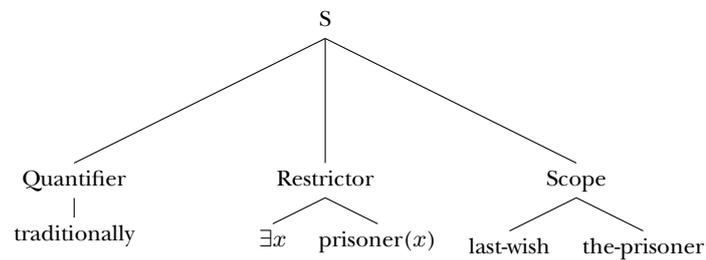
Further, let us take *traditionally* to have the quantificational force of *most*. We then derive roughly the following truth conditions for (17):

(17) is true w.r.t s iff for most minimal situations s' s.t. $s' \leq s$ and James is a condemned prisoner in s' , there is a minimal situation s'' s.t. $s' \leq s''$ and James is granted a last wish in s'' .

So the singular case is just like the Gould case, in the relevant respects.

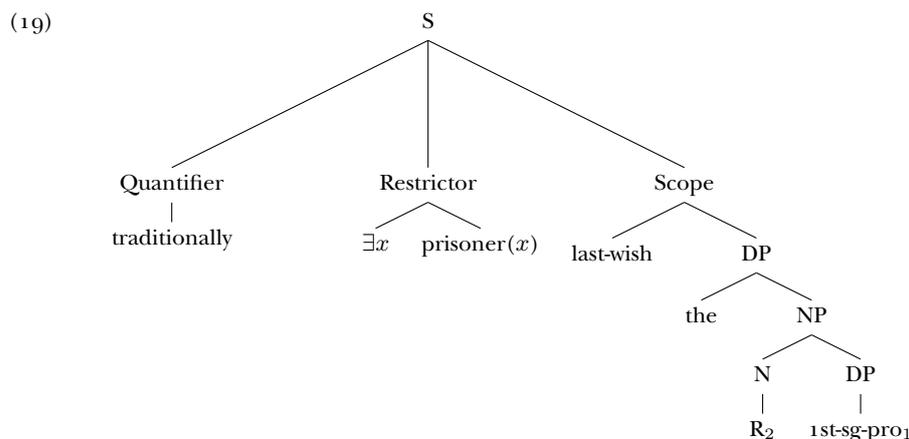
Now consider the descriptive reading of (1a). To account for this reading, we posit a different LF than the one in (17). Specifically, the pronoun in the scope of *traditionally* will be an e-type pronoun. Note first that, as with other cases where e-type pronouns have been found to make correct predictions such as donkey sentences, there is a natural way of paraphrasing the descriptive reading with a definite description:

(18)



This gets the basic intuition right. What is being claimed with the descriptive reading is that most situations s in which someone is a condemned prisoner are (or are extendable to) situations in which the prisoner in s is granted a last wish.

To make this more precise, we need to spell out the e-type pronoun in the scope. I adopt the account of e-type pronouns from Heim and Kratzer (1998, ch. 11) on which their LF representations consist of a definite article and two variables R and pro . So the LF of (1a) is the following:



Semantically, R is of type $\langle e, \langle e, t \rangle \rangle$, and pro is of type e . In other words, the context must assign an individual to pro and a relation to R . We want the DP in the scope to denote the prisoner in s . So we claim that in this case the context delivers the following assignment:

$$g_c(1) = \text{James}$$

$$g_c(2) = \lambda x. \lambda y. \lambda s. y \text{ is a prisoner in } s$$

So the DP in the scope ends up presupposing that there is a unique prisoner in s . If there is not, it is undefined. If there is, it denotes that prisoner.²² In turn, supplying the argument for *is granted a last wish*, the scope of (19) gets roughly the following denotation:²³

$$(20) \lambda s : \exists! x \text{ prisoner}(x, s). \iota y \text{ prisoner}(y, s), \text{last-wish}(y, s).$$

That is, the scope presupposes that there is a unique prisoner in s and if there is it says that the prisoner in s is granted a last wish in s . Finally, then, (19) gets roughly the following truth conditions:

$$(19) \text{ is true w.r.t. } s \text{ iff for most minimal situations } s' \text{ s.t. } s' \leq s \text{ and} \\ \text{there is a condemned prisoner in } s', \text{ there is a minimal situation } s'' \\ \text{s.t. } s' \leq s'' \text{ and the unique prisoner in } s' \text{ is granted a last wish in } s''.$$

The uniqueness presupposition is satisfied because we are limiting ourselves to minimal situations. That is each situation quantified over by *traditionally* consists

²²I am assuming the semantics for the definite article in Heim and Kratzer (1998, 75).

²³As usual ' $\exists! x \Phi$ ' abbreviates 'there is exactly one x s.t. Φ ' and ' $\iota x \Phi$ ' abbreviates 'the unique x s.t. Φ '.

of just one individual and the property of being a condemned prisoner. So this gets the intuitive truth conditions of the descriptive reading of (1a) right.

3.4.4 Salience and the Role of Phi-Features

Why does the context assign the values it does? Giving anything that resembles a final answer to this big question lies way beyond what should be expected of semanticists. However, the semantics should at least reflect some of the relevant aspects of this processes.

First, why are we sure that the context assigns James to 1? An obvious observation is that the pronoun used is *I*, and so, the features 1st person and singular play a role.²⁴ According to our relatively non-committal assumptions about this, the features help the audience determine the speaker's referential intentions. And as in the singular case, there is a strong sense in which James intended to talk about himself (or use himself in order to talk about prisoners in general) with his utterance of the e-type pronoun, although of course we cannot strictly speaking say that he intended to *refer* to himself.

There is another important point to be made concerning the phi-features in these e-type cases. Namely that feature-information has to be prevented from percolating up from the pro part of the e-type pronoun. Consider the presuppositional view of the features. Take a standard use of a referential pronoun, such as the one in (21).

(21) I am hungry.

Let us concentrate on the person feature, ignoring number. According to the presuppositional view, the 1st person feature of *I* is a precondition on the reference of *I* in the following sense (where a_c is the agent of the context, the speaker):

$$(22) \llbracket I_i \rrbracket^c = [\lambda x : x = a_c. x](g_c(i))$$

In turn, this means that if the object assigned to the index i by g_c is not the speaker, (21) as a whole is undefined, neither true nor false, representing a presupposition failure.

In the singular cases of indexicals under a QAdv, this prediction is as plausible as it is for cases like (21). So if one accepts the presuppositional view of the features, one should be content with claiming that the singular reading of James's utterance presupposes that in each of the situations quantified over by the QAdv, the prisoner we are considering is James himself.

²⁴It is a standard assumption that e-type pronouns, just like run-of-the-mill pronouns, have person, number and gender features. See Heim (1990a, 168–169).

But things are different in the case of the descriptive use. If the 1st person generates a presupposition that is allowed to percolate up in the way just described, the denotation of the scope of *traditionally* will be:

(23) $\lambda s : \exists!x \text{ prisoner}(x, s) \text{ and } x = a_c. \iota y \text{ prisoner}(y, s), \text{ last-wish}(y, s)$

That is, descriptive reading will presuppose that in all the situations s quantified over by *traditionally*, the unique prisoner in s is the speaker, James. Of course such a presupposition is unwanted, for all the descriptive cases.

As we saw, having the features on pro is necessary because they are needed in order to pick out the object assigned to pro, the choice of which is essential for making salient the relevant property which the e-type pronoun talks about. In other words, one will need some way of letting the features be interpreted on pro, but no further up. I will not make a proposal here for how to achieve this, but I note that this can be taken as a *prima facie* problem for the presuppositional view of the features itself. Once the features are allowed to be preconditions on semantic definedness, it is hard to see how the conditions they induce can be prevented from percolating up and becoming preconditions on the definedness of the clauses that embed them. (See also Essay 4.)

Secondly, consider the two-place relation assigned to R. (I ignore the relativization to situations to make the present point clear). In this case R is a function from James to one of his properties. In general, the first argument of R will always be the item assigned to pro. Let me illustrate this point with some a more familiar type of case where e-type pronouns have been posited. For example, consider the example from Heim and Kratzer (1998, 288):

(24) Every host bought just one bottle of wine and served it with dessert.

Here *it* is analyzed as an e-type pronoun that can be paraphrased as ‘the bottle of wine he had bought’. So R in this case is a relation that holds between hosts and the bottles they have bought.

The main difference involved in the descriptive reading of (1a), as represented by (19), is that the pro part of the e-type pronoun remains free, whereas in (24) and (2) it is bound by *every host*. We already gave an explanation in terms of the phi-features of why the free pro is assigned James in our own case. Furthermore, it is natural to say that because James is assigned to pro – i.e., the speaker ‘points to’ himself by his use of the 1st person singular – the property of being a condemned prisoner becomes salient in the context. (Presumably, the rest of the material in the sentence uttered (i.e., that it speaks of traditions and the granting of last wishes) also plays an important role in this.) So it is not mysterious that

the context assigns to R a relation between James and the property of being a condemned prisoner.

In conclusion, then, we seem to have arrived at a plausible analysis of both the singular and descriptive reading of (1a). I take it that it is easy to see how this analysis extends to the other cases involving pronouns in our sample, i.e., (1b–c). In each case the difference is explained in terms of a difference between an LF where the pronoun in the scope of the QAdv is referential and an LF where it is e-type. In the singular case the restrictor of the QAdv denotes a set of minimal situations in which the referent of the pronoun in the scope has the salient property. In the descriptive case the restrictor denotes a set of minimal situations in which some individual has the salient property.

The difference in LFs we have posited amounts to a systematic ambiguity. Every case in which a personal pronoun appears in the scope of a QAdv will be ambiguous between a singular and a descriptive reading explainable by the difference in LFs. (We will see in Section 3.5 that this is advantageous.)

3.4.5 *Today and Here as Variables*

We are now faced with the examples not involving pronouns, i.e., (1d–e) in which the descriptive indexicals are *here* and *today*. The immediate problem with extending our account to these cases is that there is no standard variable treatment of them that we can appeal to in order to claim that the descriptive readings are e-type readings. Kaplan treated *here* as an indexical singular term whose reference was always set as the location parameter of the context. In turn, in Kaplan's semantics, *today* is an indexical sentential operator that shifts the time parameter of his circumstances of evaluation (i.e., pairs of worlds and times). (See Essay 2.)

I outline below how one can account for descriptive readings of these terms by assuming that they are ambiguous between bare variables that can be referential or bound, and e-type constructions. If the account is successful, this will already provide some motivation for that assumption, although, to be sure, it would be far from conclusive, and more evidence would be called for.

One initial observation in this direction is that both *today* and *here* have uses on which they appear to be referential, as in the following examples:

- (25) a. Today will be rainy.
 b. Today's task is hard.
- (26) a. Rome is far from here.
 b. Here is where my home is.

A natural thought is that, in these examples, *today* and *here* are referential terms referring to the day of utterance and the location of utterance, respectively. In other words, their reference is determined by the context. So the variable view seems plausible for these uses.

In addition, although the data is admittedly less solid here, there seem to be examples of bound uses of both *today* and *here*, as in the following cases:

- (27) a. *A coach to his team at the soccer World Cup Final*: Every soccer player dreams of being here.
 b. Every President giving the inaugural address thinks today is the greatest day of his life.

In other words, it appears that there are both context-sensitive referential uses of *here* and *today* as well as bound uses, and hence it seems one can empirically motivate the hypothesis that they can be variables.

Since, of course, these words also have adverbial uses, we would be claiming a multiple ambiguity. So if this is on the right track, *today* and *here* are ambiguous between a variable use, on which they can be bound or free, an e-type use, an adverbial use, and perhaps others.

Entertaining this rough idea, then, the first thing to note is that if *today* and *here* are (sometimes) variables, they cannot *just* be variables. Just as pronouns are associated with descriptive meanings, the same will be the case for these terms. Explicitly, *here* carries the descriptive meaning ‘location of this utterance’, and *today* ‘day of this utterance’. The obvious proposal, then, is to claim that the descriptive meanings of *here* and *today* play the same role as the phi-features of pronouns, i.e., they help the audience settle their intended values.

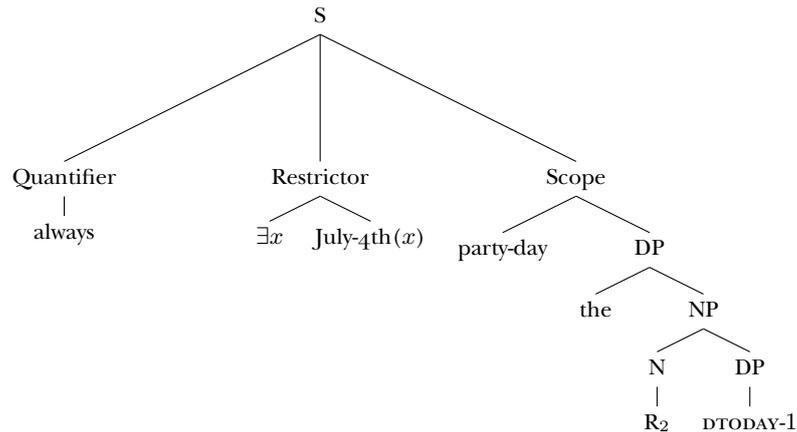
In accordance with this, we might claim that, similarly to the pronouns, these terms should be differentiated into a variable and a descriptive meaning component. Let us use the notation *DHERE* for the descriptive meaning of *here*, and *DTODAY* for that of *today*. Then the idea would be that, at LF, *here* appears as [*DHERE*-1] where 1 is a variable, and *today* as [*DTODAY*-1]. If we do this, it is natural to hypothesize that the difference between singular and descriptive readings is explainable as the same kind of difference in LF as the one we appealed to above.

More precisely, as before, the descriptive readings would be analyzed in terms of an e-type occurrence in the scope of the *QAdv* and a restrictor denoting a set of minimal situations delineated by existential quantification into the salient property in question. In (1d) this will be the property of being an area around an off-track betting parlor. In (1e) it will be the property of being July 4th (which

of course many days have, although only one day has the property of being July 4th 2009).

What we would be claiming here, then, is that not only pronouns but also other types of expressions, can have e-type readings. This seems to be a natural way of explaining Nunberg's observation of the descriptive readings of (1d–e). To make things more concrete, here is the LF we would posit for the descriptive reading of (1e):

(28)



And the values of the variables will then be as follows:

$$g_c(1) = \text{July 4th 2009}$$

$$g_c(2) = \lambda x. \lambda y. \lambda s. y \text{ is the 4th of July in } s$$

As in the cases with pronouns, the value assigned to 1 is the standard referential value of the variable, in this case the day of the utterance. And also in parallel with the earlier cases, the value assigned to R is a function from the value of 1 to a salient property of that value, in this case the property of being July 4th. Hence, we predict roughly the following truth conditions for (28):

(28) is true w.r.t. s iff for all minimal situations s' s.t. $s' \leq s$ and there is a July 4th in s' , there is a situation s'' s.t. $s' \leq s''$ and the unique July 4th in s' is a big party day in s'' .

This assumes that days are parts of situations. Perhaps we will ultimately want to avoid this.²⁵ But it is at least plausible that an analysis along these lines can be

²⁵One question concerns how to analyze sentences like

(i) Elliot always celebrates 4th of July.

One option is to claim that the restrictor denotes the set $\{s : 4/7 \leq s \wedge e \leq s\}$ and take the scope

worked out so as to allow us to account for descriptive readings in a parallel way to the cases involving pronouns.

3.4.6 Cases with Epistemic Modals

Finally, I want to turn to another class of examples of descriptive readings of indexicals, which arise in the presence of epistemic modals.²⁶ For example, imagine that the Kansas State Board of Education (KSBE) is known to change hands between creationists and evolutionists, and that after the present election all the members are creationists. Then consider:

(29) *Uttered by a member of KSBE:* We might have been evolutionists.

This case is ambiguous between a referential and a descriptive reading. So it appears to line up with the other cases we have looked at.

Rather than taking this to be evidence against our claim that descriptive readings only arise in the presence of QAdvs, the obvious route is to follow the tradition from Kratzer (1977) in assimilating epistemic modals to QAdvs in relevant ways.

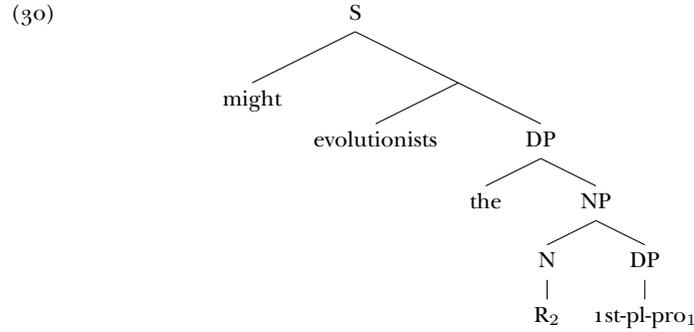
On this view *might* ϕ is true if and only if the proposition expressed by ϕ is compatible with a relevant body of information, usually the speaker's knowledge. This is analyzed in terms of possible worlds in that the speaker's knowledge is represented as a set of worlds, the worlds compatible with what she knows, and hence *might* ϕ is true if and only if at least one of these worlds is a ϕ -world. (See Essay 5.) Recall that possible worlds are just maximal situations, so there is no real departure from the semantic framework we have been assuming here, although we will talk in terms of worlds instead of situations.

The proposal I want to make is that by analyzing the pronoun as e-type, (29) can be seen as claiming that in some world w s.t. w is compatible with what the speaker knows, the members of KSBE in w are evolutionists in w . This will predict the right truth conditions for the descriptive reading.

to be $\{s : e \leq s \text{ and } e \text{ celebrates in } s\}$. Given this analysis, (i) says roughly that in all situations containing Elliot and 4/7, Elliot celebrates. We need to make the restrictor denote a set that contains Elliot since otherwise (i) will be false just because there have and will be many 4/7's when Elliot was not around. But we might be able to avoid making 4/7 part of the situations that the restrictor talks about. An idea is to make S a set, not of situations, but of situation-time pairs $\langle s, t \rangle$. A proposition will then be a set of such pairs. So the restrictor will be $\{\langle s, 4/7 \rangle : e \leq \langle s, 4/7 \rangle\}$ and the scope will be $\{\langle s, 4/7 \rangle : e \leq \langle s, 4/7 \rangle \text{ and } e \text{ celebrates in } \langle s, 4/7 \rangle\}$. These speculations, though, are better left for another occasion.

²⁶The following example is discussed by Elbourne (2008, 420). See Santorio (2010) for some related cases.

In one respect cases with epistemic modals will differ from the cases involving QAdvs in that *might* ϕ does not have the tripartite structure characteristic of sentences with QAdvs. Instead, the LF of (29) will be the following:



Here is how we will derive the right truth conditions:

First, here are the lexical entries for *might* and *evolutionists*:

- (31) a. $\llbracket \textit{might} \rrbracket^c = \lambda p_{\langle w,t \rangle} . \lambda w . \text{for some } w' \text{ s.t. } w' \in kc_c, p(w') = 1.$
 b. $\llbracket \textit{evolutionists} \rrbracket^c = \lambda x . \lambda w . x \text{ are evolutionists in } w.$

In (31a) kc_c denotes the set of worlds representing the speaker's knowledge in c . (See Essay 5.) So, *might* takes a proposition p as argument and outputs truth if and only if there is a world compatible with what the speaker knows s.t. p is true there. (31b) assumes that verbs with plural features select plural individuals of the sort mentioned earlier, which are denoted by plural pronouns.

Secondly, the contextual assignment relevant for the e-type pronoun in this case will be (where w_c is the world of the context, the world in which the utterance takes place):

$$g_c(1) = \text{the KSBE-members in } w_c$$

$$g_c(2) = \lambda x . \lambda y . \lambda w . y = \text{the KSBE-members in } w$$

Again, we take it that plural pronouns denote plural individuals of type e . In turn, R denotes a function from the plural individual accordingly assigned to pro to a property of plural individuals (i.e., that of being the members of KSBE). Hence, the e-type pronoun will presuppose that there is a unique x in w s.t. x is the KSBE-members in w , and if there is, it will denote that plural individual. So when this becomes the argument of *evolutionists* and the resulting proposition the argument of *might*, we derive that:

- (32) $\llbracket (30) \rrbracket^c = \lambda w . \text{for some } w' \text{ s.t. } w' \in kc_c \text{ and there are KSBE-members in } w', \text{ the KSBE-members in } w' \text{ are evolutionists in } w'.$

And this is just what we want.

A caveat should be mentioned, though. As (32) suggests, we predict that (29) presupposes that there are KSBE-members in at least some worlds in kc_c . That is, if the speaker's knowledge rules out that there are any KSBE-members, we predict that (29) is undefined, i.e., neither true nor false. In this case this is harmless since (presumably) the speaker would never utter (29) in the first place if her knowledge was as just described. However, in other cases, and in particular if it turns out that sometimes it is not only the speaker's own knowledge that counts, this prediction of a presupposition may have more substantial repercussions. Ultimately, then, we might want to build in a requirement that we consider only worlds compatible with the relevant knowledge state in which there are KSBE-members to begin with. But there are no obvious reasons to think that such a maneuver will not be straightforwardly implementable.

Further, note that the issue concerning how to contain the feature-information at the level of *pro* that I mentioned earlier remains. If the 1st person and plural features trigger presuppositions that are allowed to percolate up to pool with the uniqueness presupposition of the definite article, the complement to *might* will have the following denotation:

- (33) $\lambda w : \exists!x$ x is a plural individual and $x =$ the KSBE-members in w and
 $a_c \leq x$. ιy $y =$ the KSBE-members in w , y are evolutionists in w

In other words, if the combination of 1st person and plural is taken (as is usual) to induce the presupposition that the referent of *we* is a plural individual of which the speaker is a part, then we will end up presupposing that the KSBE-members in w (the world that will be bound by *might*) include the speaker. In this case this is particularly undesirable, since the whole point of the speaker's utterance is not to say that she (and the other actual members) could have held different views on the origin of species, but that the board could have consisted of different people.

On the other hand, these issues are no different from the ones that arise in the case of descriptive readings under QAdvs. So we seem to be able to handle cases with epistemic modals in parallel ways to the cases with QAdvs. In both instances, there are issues arising for how to characterize the contribution made by the features. We have seen that the presuppositional view may make wrong predictions in the absence of a blocking-mechanism to prevent percolation. This can be taken as an indication of an inadequacy of this view of feature-information, but I will not discuss it further here. (See Essay 4.)

3.5 Some Attractions of the E-Type Account

3.5.1 Ambiguity and Cancellation

I now want to expand on and discuss some aspects of the e-type account of descriptive uses of indexicals I have been sketching.

The first thing I want to touch on is the issue of cancellation that we left behind earlier. Against Nunberg's claim that descriptive readings are obligatory, we noted that they can be suspended by follow-ups, in the right circumstances. Although this might seem to motivate such an approach, we dismissed the implicature approach due to its failure to account for embeddings and due to its overall unsystematic nature. What can we say about cancellation on the e-type account?

Grice claimed that

a putative conversational implicature that *p* is explicitly cancelable if to the form of words the utterance of which putatively implicates that *p*, it is admissible to add *but not p*, or *I do not mean to imply that p* [...].²⁷

However, it is relatively easy to see that if this is what is meant by cancellability, then cancellability is not a particularly good test for implicatures, since on this notion, many other phenomena admit of cancellation.

Indeed, many have doubted cancellability as a test for implicatures. For example, Carston (2002) argues that "it is pragmatic inference quite generally that is cancellable/defeasible" and therefore concludes that as a test for implicatures, cancellability

should probably be disregarded; the most it might be expected to achieve is to distinguish encoded linguistic meaning from pragmatically inferred meaning, but even there it falls short, since, in cases of ambiguity, an encoded meaning can be cancelled without contradiction.²⁸

The latter point about ambiguity is particularly relevant here. Consider for instance:

(34) I went to the bank. But I don't mean that I went to the Thames.

Given Grice's criterion for explicit cancellation, this case counts as cancellation, although presumably no one would claim that it is an implicature of the first sentence that the speaker went to a financial institution. In this case, the speaker

²⁷Grice (1975, 44).

²⁸Carston (2002, 138). See also Sadock (1978).

uses the follow-up to indicate which disambiguation of the first sentence she intended.

According to the e-type account, sentences like our examples are ambiguous between referential (singular) and e-type (descriptive) readings. As we have just seen, cancelation is often used to disambiguate, and hence is not evidence for the presence of a conversational implicature. So we should expect that the same means for disambiguation can be used in these cases.

It should also be noted that positing ambiguity of course does not commit one to the claim that each disambiguation is available in all (or even most) contexts. In fact, there is a stronger point to be made. Consider an utterance of

(35) The bank has shares in IBM.

Bank is ambiguous between two lexical items, one meaning, among other things, ‘river bank’ (call this $BANK_1$) and one meaning, among other things, ‘financial institution’ (call this $BANK_2$). Clearly, in (35), it is $BANK_2$ that is intended as the LF item corresponding to *bank*. We are sure of this because it is a fact about the world – not about language – that river banks do not hold shares in IT corporations. But this does not mean that we cannot generate the LF in which $BANK_2$ appears. This LF will be true, roughly, if and only if the unique salient river bank has shares in IBM. But given the worldly facts, this LF is always false (presumably), at least with respect to the actual world. And this easily explains our confidence that a speaker who utters (35) intended the other disambiguation.

A similar phenomenon is involved in Nunberg’s cases. Although all the cases are in fact ambiguous between referential and e-type readings, this does not mean that both these readings are always readily available. For instance, given that cash machines do not move around, this explains why hearers are likely to be certain that an utterer of (1d) intends the e-type reading, without further prompting. And the same holds, *mutatis mutandis*, for the other cases.

3.5.2 Embeddings

The e-type account allows for the kind of embeddings the availability of which prompted the rejection of the implicature account. Our example was

(6b) If I’m traditionally granted a last wish, then they’re nice to condemned prisoners in this country.

It should be easy to see that we can claim that the antecedent of this conditional is interpreted along the lines of our e-type treatment of descriptive readings. Informally, this conditional will mean:

- (36) If in most situations s in which there is a condemned prisoner, the prisoner in s is granted a last wish, then they are nice to condemned prisoners in this country.

Since we are allowing the descriptive reading to be computed locally in the antecedent, this will account for the embedding in the way that was not open to the implicature account.

Familiarly, accounts of conditionals based on QAdvs have been proposed by Kratzer (1981), (1986), Elbourne (2005), and others. The e-type account of descriptive indexicals can be implemented into these accounts by straightforward means. For instance, suppose that, along the lines of these theories, *If* p , q is to be analysed as $[[\text{Always} [\text{If } p]] q]$, where *If* is vacuous.²⁹ Then we will analyze (6b) roughly as:

- (37) $[[\text{Always} [\text{If} [[\text{Traditionally} [\exists x \text{ prisoner}(x)]] \text{ last-wish} [\text{the} [\text{R}_2 \text{ pro}_1]]]]] \text{ nice-to-prisoners}(\text{3rd-pl-pro}_3)]$

That is, we analyze (6b) as a QAdv structure the restrictor of which is the QAdv structure we have posited for the descriptive reading of the prisoner example, and the scope of which is ‘they are nice to condemned prisoners in this country’.

3.6 Conclusion

The approach I have sketched explains why all sentences of the kind exemplified by Nunberg’s cases are ambiguous between singular and descriptive readings in a way which relies on syntactic and semantic machinery that is independently motivated by other types of data. It also handles the embedding and cancellation phenomena, which together showed the inadequacy of both the implicature account and Nunberg’s own non-ambiguity view.

To be sure, some aspects of Nunberg’s suggestions concerning descriptive readings – in particular, the basic observation that the context conspires with the pronoun to contribute a property of the object that would have been the standard reference to the interpretation – is preserved on the e-type account. But we have refrained from claiming that this must be built into the semantics for the items that also give rise to referential uses. Instead, the singular and descriptive indexicals are here seen as corresponding to different LF structures, which have different semantics.

²⁹See Elbourne (2005, 51–52) for a proposal like this.

4 Descriptive Meaning, Presupposition, and Interpretation

4.1 Introduction

Kaplan's theory in 'Demonstratives' (1977) treated pronouns as indexicals. That is, as terms whose contents are determined as a function of contextual parameters. But in various places – most notably in the 'Afterthoughts' (1989) and in the preface to 'Demonstratives' – he expressed sympathy for an alternative treatment on which they are *variables* under an *assignment*. As he says, his "conception of direct reference takes the variable under an assignment of value as its paradigm."¹

Since Kaplan, the variable approach to pronouns has been developed in great detail by semanticists working within the tradition of generative grammar.² In these frameworks, the descriptive meaning of pronouns is allocated to the so-called *phi-features* – i.e., person, gender and number. So for instance, the descriptive meaning of *she* is analyzed into three components, namely 3rd person, feminine and singular. Phi-features have been extensively studied.³ A great deal of attention has been given to their behavior under binding, and in the non-standard environments created by, for instance, attitude verbs, indirect reports and free indirect discourse.⁴ (See Essay 3 for some discussion of phi-features on

¹Kaplan (1989, 571).

²Much of this work is influenced by the authoritative treatment in Cooper (1983).

³For a sample of recent work, see the essays in Harbour, Adger, and Bejar (2008). The study of phi-features fall into three interacting fields, i.e., syntax, morphology and semantics. My interests lie solely with the latter. When I speak of a 'theory of phi-features' and related things, I mean to speak only of theorizing about the features from within semantics. I also restrict myself to phi-features in English.

⁴Relevant discussion of the phi-features of bound pronouns is found in Heim (2008); Kratzer (2008); Rullmann (2003); Sauerland (2008b). For discussion of features in attitudes, indirect

e-type pronouns.)

But none of these complex phenomena are under discussion in this essay, though. Instead, I will here be concerned almost solely with standard referential uses of pronouns. In particular, this essay discusses what becomes of the descriptive meaning that Kaplan encoded in characters on the variable-based approach to context-sensitivity.

A widespread view of the phi-features treats them as presupposition triggers, and hence the descriptive meaning of pronouns is held to be a species of presuppositional information. In this essay, I argue against this view. The main problem is that it is unable to account for the reference-fixing role of the information encoded by the features. I demonstrate that no presuppositions play a parallel role in interpretation. This makes it implausible that phi-features are presupposition triggers of either standard or non-standard kinds.

To remind us of what we mean by ‘standard’ triggers, it will be useful to keep the following examples in mind, all of which are uncontroversial cases.

- (1) a. **Aspectual verbs:** Jane stopped drinking.
Asserts: Jane stopped drinking.
Presupposes: Jane used to drink.
- b. **Clefts:** It was Brian who mowed the lawn./What Brian did was mow the lawn.
Asserts: Brian mowed the lawn.
Presupposes: Someone mowed the lawn./Brian did something.
- c. **Definites:** The UN Secretary General is Korean.
Asserts: The UN Secretary General is Korean.
Presupposes: There is a unique UN Secretary General.
- d. **Factive verbs:** Daniele doesn’t realize that Italy lost the match.
Asserts: Daniele doesn’t realize that Italy lost the match.
Presupposes: Italy lost the match.

As is easy to convince oneself of, the presuppositions in (1) satisfy the following characterization of the notion of presupposition:⁵

Semantic Presupposition

ψ is a semantic presupposition of a sentence ϕ if and only if the following holds: An utterance of ϕ in a context c is true or false only if ψ is true in c .

reports and free indirect discourse, see Schlenker (2003), (2008b); Sharvit (2004), (2008); Anand (2006).

⁵This conception of presuppositions was famously introduced by Frege (1892) and was equally famously revived by Strawson (1950).

The notion of semantic presupposition that this schema captures is complemented by a notion of pragmatic presupposition that sees presuppositions as preconditions not on definedness but on successful assertion, that is, on felicity. This is spelled out as follows:

Pragmatic Presupposition

ψ is a pragmatic presupposition of a sentence ϕ if and only if the following holds: An utterance of ϕ in a context c is felicitous only if ψ is commonly accepted among the participants of c .

Furthermore, as Stalnaker (1970, 38) observed, it is highly plausible that if ψ is a semantic presupposition of ϕ , then ψ is a pragmatic presupposition of ϕ .⁶ Utterances of the examples in (1) will in normal circumstances require that their semantic presuppositions be commonly accepted among the conversational participants; if not, the utterance will be infelicitous. So, we should expect that all semantic presuppositions are pragmatic. But, as was also observed by Stalnaker (Ibid.), the converse is not so obvious. Indeed, we will see later that it is plausible that some presuppositions are pragmatic but not semantic.

For reasons of space, I will focus almost exclusively with phi-features on pronouns and not with phi-features on other items, such as verbs, quantifier-phrases, adjectives, etc. In other words, I will have nothing to say about the important topic of *agreement*. For the record, I take my arguments to apply here as well, although I will not attempt to make a case for this claim here. I will mention one consideration, though.

One reason to distrust any kind of discussion of the content of the features, their contribution to interpretation etc. comes from an outlook which in its strongest form holds that agreement is a *purely syntactic* phenomenon. A well rehearsed example is the German *Mädchen* ('girl'), which is grammatically of neuter gender as seen from agreement with relative pronouns. In light of data like this, it might be argued that phi-features are selected on purely syntactic grounds. And it might then be claimed that the presuppositional view does not even apply here in the first place, and that phi-features should therefore be treated by an entirely different theoretical component. If so, the arguments of this essay are irrelevant.

We can note, though, that there are some reasons to reject the purely syntactic view of agreement stemming from data of the following sort:⁷

⁶Karttunen (1973) rejected this. See Atlas (2002, 34–36) for discussion.

⁷This kind of example is associated with the work on semantic transfer by Nunberg (1979), (1995). The observation that they provide data against the syntactic view of agreement was given by Pollard and Sag (1994). See Adger and Harbour (2008, 15–17) for a useful overview.

- (2) a. The hash browns at table six is/*are getting angry.
 ‘The person at table six, who ordered the hash browns, is getting angry.’
 b. The hash browns at table six wants/*want his/her/*their bill.
 ‘The man/woman at table six, who ordered the hash browns, wants
 his/her bill.’

In these examples, agreement features seem to be selected on semantic rather than syntactic grounds. Hence, they present a challenge for a purely syntactic view of agreement. I take data of this sort to motivate that there is a genuine discussion to be had about the content and role in interpretation of agreement features.

In Section 4.2 I present one version of the presuppositional view of the features, and how it departs from the indexical treatment. Section 4.3 spells out my main objections. Section 4.4 looks at a different version of the presuppositional view and argues that the objections still apply. Up to this point, my main concern will be with the claim that the features trigger semantic presuppositions. In Section 4.5 I take up the issue of pragmatic presuppositions, and also consider some non-standard varieties of presuppositions. I argue that feature information differs from these as well. I conclude with some brief remarks on the prospects of other accounts of the features.

4.2 The Presuppositional Theory

In this section I outline what I take to be the standard version of the presuppositional theory of phi-features and the way it is implemented in grammar. To this end, I will follow the sketch of such a theory in Heim and Kratzer (1998). We will look at a different version put forth by Sauerland (2004a), (2008b) later.

We should distinguish two questions:

- (Q₁) What information is encoded by phi-features?
 (Q₂) What role does the information encoded by phi-features play in interpretation?

The presuppositional theory attempts to answer (Q₂). Obviously, however, we need at least a preliminary answer to (Q₁) in order to proceed. I therefore begin by setting up a working hypothesis about the contents of the features.

4.2.1 What are the Contents of the Features?

It is evident that phi-features, in some way to be further specified, contribute information about the intended referents of the pronouns that encode them. With respect to gender, it seems fairly obvious that the masculine feature contributes the information that the referent is male, and the feminine feature that the referent is female. Similarly, pronouns with the singular feature seem to encode the information that their referents are individuals, whereas the plural feature signals that the referent is a plurality.

The person feature is perhaps more difficult to give an intuitive analysis of. A standard observation is that the person feature somehow locates the referent in a space where the addressee and the speaker are fixed points. This contrasts with a naive view according to which the 1st and 2nd person simply contribute the speaker and the addressee, respectively, to the interpretation, whereas the 3rd person indicates that the referent is the topic of speech. For instance, as reported by Jespersen (1924), the late 19th century *A New English Dictionary*, defined the persons as

denoting or indicating respectively the person speaking (*first person*), the person spoken to (*second person*), and the person or thing spoken of (*third person*).⁸

Jespersen goes on to make a crucial observation that is present in most modern day accounts of the contents of the person features:

But though the same definition is found in other good dictionaries and in most grammars, it is evidently wrong, for when I say “I am ill” or “You must go” it is undoubtedly “I” and “you” that are spoken of; the real contrast thus is between (1) the speaker, (2) spoken to, and (3) neither speaker nor spoken to. In the first person one speaks of oneself, in the second of the person to whom the speech is addressed, and in the third of neither.⁹

On this more sophisticated understanding, the persons only contribute information about whether the intended referent is the speaker or addressee; if it is neither, this is indicated, as it were, by omission.¹⁰ We will see later that the data clearly bears this out.

Against this background, the following simple picture of the content of the features emerges (where r is the intended referent of the pronoun in question):

⁸Cited in Jespersen (1924, 212).

⁹Ibid.

¹⁰This negative analysis of the 3rd person is adopted by all the accounts we shall consider below, i.e., Heim and Kratzer (1998), Heim (2008), Sauerland (2004a), (2008b), (2008a). As a further example, one could note Levinson (1983, 62), whose formulation is almost identical to this one.

- (3) a. 1st person: *r* includes the speaker.
 b. 2nd person: *r* includes the addressee.
 c. 3rd person: *r* includes neither speaker nor addressee.
 d. masculine: *r* is male.
 e. feminine: *r* is female.
 f. singular: *r* is an individual.
 g. plural: *r* is a plurality.

So, for example, according to this simple scheme, the information encoded in the phi-features of *she* is that the intended referent is a female individual distinct from speaker and addressee. Similarly, *we* encodes the information that the intended referent is a plurality that includes the speaker. The plural *you* encodes the information that the intended referent is a plurality which includes the addressee. Etc. I take this to be an intuitively satisfying answer to (Q₁), and as I said before, this judgement is quite independent of any answer one might propose for (Q₂). We now turn to the presuppositional answer to (Q₂).

4.2.2 Phi-Features as Presupposition Triggers

The presuppositional account of phi-features was first proposed by Cooper (1983) as part of a view of pronouns as variables.¹¹ On our simple analysis, it is the view that (3a–g) describe presuppositions of referential uses of the relevant pronouns. In turn, the assertive component is taken to pertain only to the referent. Here are some straightforward examples:

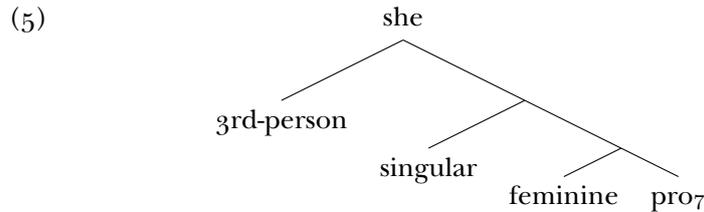
- (4) a. *Intended referent = John:*
 He walks fast.
Asserts: John walks fast.
Presupposes: John is a male individual, distinct from speaker and addressee.
- b. *Intended referent = the members of the European Parliament:*
 They talk a lot.
Asserts: The members of the EP talk a lot.
Presupposes: The members of the EP is a plurality that includes neither speaker nor addressee.
- c. *Intended referent = Mary and Paula. Speaker = Erica:*
 You are taller than me.

¹¹In the bound case, the features are usually taken to restrict the range of possible antecedents. I am not concerned with bound uses of pronouns in this essay though. See Heim (2008) for discussion.

Asserts: Mary and Paula are taller than Erica.

Presupposes: Mary and Paula is a plurality that includes the addressee.
Erica is an individual which includes the speaker, i.e., is the speaker.

Given that phi-features are syntactically realized, a very rough analysis of a free occurrence of *she* with, say, the index 7 can be given as follows:¹²



Semantically, the features are taken to denote *partial identity functions*. The way they are defined makes reference to parameters of c , which we will take to be a Kaplanian context consisting of (at least) a speaker parameter a_c , the assignment function g_c , and a parameter h_c for the addressee in c . Using a standard notation, the features in (5) are then interpreted as follows:

- (6)
- a. $\llbracket \text{feminine} \rrbracket^c = \lambda x : x \text{ is female. } x$
 - b. $\llbracket \text{3rd person} \rrbracket^c = \lambda x : x \text{ includes neither } a_c \text{ nor } h_c. x$
 - c. $\llbracket \text{singular} \rrbracket^c = \lambda x : x \text{ is an individual. } x$

So each feature denotes a function which maps any entity to itself unless it fails to satisfy the information encoded by that particular feature, in which case the function is undefined. In turn, the denotation of an occurrence of *she* is given as follows:

- (7) $\llbracket she_i \rrbracket^c = [\lambda x : x \text{ is a female individual distinct from } a_c \text{ and } h_c. x](g_c(i)).$

This means that she_i denotes $g_c(i)$ if $g_c(i)$ is a female individual distinct from speaker and addressee; and if $g_c(i)$ fails to meet at least one of these criteria, she_i is undefined. The account will follow the same pattern for the rest of the features matching the construal of their contents in (3).

In other words, this theory treats phi-features as triggering semantic presuppositions, that is, preconditions on definedness. It has the consequence that if the object assigned to the index of a particular pronoun does not have the property specified by one or more of its phi-features, the DP corresponding to the

¹²See Adger and Harbour (2008) for an overview of the history of research on the syntax of the features in the tradition of generative grammar.

pronoun will be undefined, and so will the whole clause of which this DP is a constituent, i.e., it will fail to determine a truth value when evaluated at a particular world (or circumstance of evaluation).

Before I go on, in the next section, to make my case against this picture, I want to highlight some further factors of it, some of which I take to be advantages over the traditional, indexical view of pronouns.

4.2.3 Indexicality Abandoned: Context and Assignment

How does this treatment depart from the more traditional indexical theory of pronouns? Heim (2008) remarks:

[N]otwithstanding the prevailing tradition in philosophy to analyze first person pronouns as indexicals rather than variables [...] [w]e can treat all pronouns, regardless of person and number, as variables [...]. Person features happen to be indexicals, that is, they denote functions defined with reference to an utterance context that determines participant roles such as speaker and addressee.¹³

In other words, indexicality – dependency on contextual parameters – is relegated to the person features while the pronouns themselves are viewed as bare variables. But it is important to note that, as is obvious, making the person features indexical in this sense does not mean that they will play the reference-fixing role of characters.

So what does play the reference-fixing role in this theory? In terms of the framework, the question condenses to the question of what determines the assignment function. In semantics of this sort, the assignment function is taken to be determined by the context of utterance. So we can ask, how does a context determine an assignment? Theorists whose main interest is in developing semantics for natural languages typically tend to defer this question. For instance, Heim and Kratzer simply take it for granted that

The physical and psychological circumstances that prevail when an LF is processed will (if the utterance is felicitous) determine an assignment to all the free variables occurring in this LF.¹⁴

Heim (2008) ventures slightly more detail:

For free pronouns, the relevant assignment is given by the utterance context and represents the speaker's referential intentions.¹⁵

¹³Heim (2008, 36–37).

¹⁴Heim and Kratzer (1998, 243).

¹⁵Heim (2008, 35f).

I agree that identifying the speaker's intentions as what is represented by the assignment function is correct. (See Essay 2.) As I mentioned, that this framework is able to accommodate the fact that the reference of pronouns (perhaps with the exception of *I*) is a matter of intentions is a major advantage. But I also take it to be undeniable, regardless of what one thinks of this issue, that the information encoded by the phi-features – i.e., the descriptive meaning of pronouns – is a factor in this contextual determination. If one thinks (as I do) that it is necessary for reference that the speaker have an appropriate intention and that the audience be in a position to recognize this intention, then it is natural to say that the audience will use the features to ascertain the speaker's intention. If one thinks that reference-determination has nothing to do with intentions, then one will most likely hold that the reference of a pronoun is determined directly by the descriptive meaning encoded in the features.

Finally, let us provide a little more detail to how Heim and Kratzer see the role played by the features in the semantic evaluation *per se*. Even though they remain non-committal on *how* the assignment function gets determined in context, the fact that the context has to be in good standing plays an essential role in Heim and Kratzer's theory. They distinguish between *truth conditions* and *appropriateness conditions* as follows:¹⁶

Appropriateness Condition

A context c is a *appropriate* for an LF Φ only if c determines a variable assignment g_c whose domain includes every index which has a free occurrence in Φ .

Truth and Falsity Conditions for Utterances

If Φ is uttered in c and c is appropriate for Φ , then the utterance of Φ in c is *true* if $\llbracket \Phi \rrbracket^c = 1$ and *false* if $\llbracket \Phi \rrbracket^c = 0$.

This means that sentences with referential pronouns are only evaluable for truth and falsity in contexts that determine an assignment function that assigns a value to every such pronoun occurring in the sentence in question.

So how do the features enter the picture? Take the example in (8).

(8) She₁ is tall.

Heim and Kratzer allow that a context may be such that it determines an assignment that assigns a male, say Boris, to 1. So this context is appropriate for (8).

¹⁶Cf. Heim and Kratzer (1998, 243). I have assumed, as elsewhere, that g is included in c .

However, as seen from the LF in (5), given the feminine gender of *she*, Boris will be ‘thrown out’ along the way and ultimately the DP corresponding to the pronoun will be undefined, and hence by the truth conditions above, (8) will be neither true nor false.

Further, Heim and Kratzer write:

On this account of gender features, it is not strictly speaking impossible to use a feminine pronoun to refer to a man. But if one does so, one thereby expresses the presupposition that this man is female. This is intuitively right. If the discourse participants mistakenly believe a male to be female, or if they are willing to pretend that they do, then indeed an occurrence of *she* can refer to a man, without any violation of principles of grammar.¹⁷

I take this as indicating that Heim and Kratzer accept that feature information plays a reference-fixing role by allowing that a context can assign to the index of a pronoun an entity that violates its features. The reason that *she* in (8) is allowed to refer to Boris in the sense of Boris being assigned to its index, in this case, is that the participants are willing to at least accept that Boris is female. So we can imagine that upon observing that the speaker used *she* they will look around for possible referents that they are at least willing to accept are female. (We will see in Section 4.5 that this does not mean that feature information is to be likened to pragmatic presuppositions, though the two share some similarities.)

This points to another aspect that I take to be a major advantage of the variable treatment of pronouns, namely the possibility of assigning feature-violating entities to indices. But, as I will argue in the next section, I take it to be wrong to also claim that the features *qua* semantic presuppositions discard these assignments further down the line resulting in undefinedness for the DP corresponding to the pronoun and in turn the whole clause in which it occurs.

4.3 Phi-Features and Reference

In this section I present what I take to be the two main problems for the view of the features as triggering semantic presuppositions. The problems are related. The first has to do with the role played by the information encoded in the features – i.e., descriptive meaning – in interpretation. These considerations will reappear in Section 4.5 as the main objection to the corresponding view of the features as triggering pragmatic presuppositions. The second problem concerns the specific semantic presuppositions assigned by the account. I begin with the first problem.

¹⁷Heim and Kratzer (1998, 245).

4.3.1 Feature Information as Pre-Assertoric

I take it as a *datum* to be accommodated by any theory that the information contributed by phi-features serves as a crucial aid for the audience in their attempt to recover what the speaker intended to refer to with a particular use of a pronoun. Consequently, feature information helps the audience establish the assertoric, or truth-conditional, content of the utterance.

This already points to a significant difference from the triggers in (1). In none of these cases does the presupposed information help fix the assertoric content of the presuppositional sentence. For instance, the information that Jane used to drink, which is presupposed by an utterance of (1a), does not play a role in helping the audience fix the assertoric content of (1a). Rather, the information that Jane used to drink is given by the very information that she stopped. We just do not know what it would be for someone to stop doing something they have never been doing.

This is precisely the motivation for the claim that such presuppositions are semantic presuppositions. And so, for example, we might propose the following lexical entry for *stop*.¹⁸

(g) $\llbracket stop \rrbracket = \lambda F \lambda x : x \text{ used to } F. x \text{ is no longer } F\text{'ing.}$

Taking this route will have the consequence that, for instance, if Jane should turn out never to have been drinking, then (1a) will be neither true nor false. And this is intuitively right.

The relationship between the asserted information and the backgrounded information in these standard cases, then, seems to be the opposite of what it appears to be with respect to the phi-features. In the latter case, the backgrounded information, the information encoded by the features, is something the audience must exploit in order to recover the information the speaker intends to foreground with the utterance. Feature-information, therefore, is *pre-assertoric*. (In the terminology of Essay 2, it belongs to wide context.) Conversely, in cases of standard presuppositions, what information the speaker intends to background is inferred from the information that she is immediately recognized as having foregrounded.

Let us try to be a bit more specific about how audiences use feature information in uncovering referential intentions. Faced with an utterance involving a referential use of a pronoun an audience will use a host of clues in uncovering

¹⁸After Sauerland (2008a).

what the speaker intended to refer to.¹⁹ Examples include gestures the speaker might have made, salience resulting from either contextual conspicuousness or previous discourse introduction, facts about the utterance situation, etc.

In fact, audiences also sometimes resort to the presuppositions of other phrases in the clause. Here is an example of an situation where this happens:

Reception

Tom is talking to an acquaintance, Jerry, at a reception when two of their mutual friends, Jane and Sarah, approach them. They both know that Jane has been a heavy drinker for years, and that Sarah has never touched alcohol. Jerry turns to Tom and says, without any gesturing, pointing or the like:

(10) She stopped drinking.

Clearly, Tom will be able to quickly realize that Jerry intends to refer to Jane, and not to Sarah, with *she*. Since Tom needs to know to whom Jerry intends to refer with the pronoun in order to settle the assertoric content of his utterance, this helps to clarify the observation that standard presuppositions are not used for this purpose.

The point is not that standard presuppositions never play a role in settling assertoric content; the point is rather that standard presuppositions do not play a role in settling the content *of their triggers*. The pronoun *she* needs to have its reference settled before the intended assertoric content of Jerry's utterance can emerge. In this case, the phi-feature information underdetermines the referent of the pronoun, since there are two candidate referents that equally satisfy the features, i.e., that are both female individuals distinct from speaker and addressee. Had there been no other way of ascertaining what Jerry intended to refer to, his utterance would have been infelicitous. But he knows that he and Tom share the information that Jane has long been drinking, and so he relies on the presupposition of *stop* to help Tom fix the referent of *she*. This precisely shows that the presupposition that Jane used to drink does *not* play a role in settling the content of *stop*. Had it not been the case that Tom can infer *just* from Jerry's use of *stop*,

¹⁹I am assuming that audiences can determine when an occurrence of a pronoun is referential independently of determining what it refers to. This will be done by recognition of syntactic structure in most cases. In cases of structural ambiguity like *Every string player overestimates his potential*, context will first be used to disambiguate whether the pronoun is intended as co-indexed with the quantificational DP; if not, the occurrence of *his* is referential, and the usual strategies for uncovering to whom the speaker intended to refer will apply. Compare the three-fold distinction between different uses of context in Stanley and Szabó (2000). See also Fiengo and May (1996) for relevant discussion.

that he takes it for granted that the referent of *she*, whoever it is, used to drink, his utterance would have failed.

Very often, however, the phi-features themselves will suffice for solving the interpretative task of identifying the intended referent. Being used to occupying the audience role themselves, speakers know this. Given that their aim is to communicate, they endeavor to make things as easy as possible for their interlocutors. So, among other ways of doing so, they choose pronouns with phi-features accordingly. Roughly, if you want to tell me something about a particular object x you will choose a pronoun *pro* to refer to x such that it seems reasonable to you that I shall be able to use the information that the phi-features of *pro* encode to figure out that it was x you wanted to talk about. And not uncommonly, this will be enough – I will indeed be able to uncover your intention just by noticing the phi-features you chose.

For example, consider the following straightforward situation:

Lunch

Saul, Ruth and David are having lunch, and are about to order their food. Having looked over the menu, Saul ventures the prediction:

(11) He's going to order the duck.

The way Saul will be interpreted by Ruth and David depends crucially on the fact that he chose to use *he* in realizing his intention to refer to David. In particular, it depends on the 3rd person and masculine features of *he*. Had Saul used *she*, he would have been interpreted as trying to predict what Ruth was going to order. And similarly, had he used *I*, he would have been taken as intending to refer to himself.

According to (3), *he* contributes the information that its referent is a male individual distinct from both speaker and addressee. So, when Ruth and David hear Saul's utterance, they will know that he is intending to refer to a male who is neither himself nor whoever he takes himself to be addressing. Given that they are the only two people he could reasonably take himself to be addressing, and given their common knowledge about Ruth's gender, they then take her to be the addressee and David to be the referent.

This is far from a complete description of how audiences use phi-features in ascertaining intentions, even in a simple situation like this. However, we already have enough to note that, given this role played by phi-features, they must be seen to differ significantly from the standard presupposition triggers in (1), where the presupposed information is not used by audiences in order to arrive at the right

interpretation of the assertoric content. (We will return to these points in Section 4.5 when discussing pragmatic presuppositions.)

4.3.2 Reference and Feature-Information

In the rest of this section, I want to detail what I think is problematic about the specifically semantic presuppositions assigned to the features by the theory we are currently examining.

Consider the question of what one can refer to with a particular pronoun on a given occasion. In relation to the phi-features, two possible answers present themselves:

(R1) By uttering a pronoun *pro* referentially on a particular occasion, a speaker can refer to an object x only if x satisfies the phi-features of *pro* on that occasion.

(R2) It is not the case that (R1).

That is, one may hold either that referents have to satisfy the features or that they do not. This of course is an empirical decision, and I will argue below that while (R1) is right for some features, (R2) is right for others. But the point I want to make here is that *either way*, taking the features as triggering semantic presuppositions is undesirable.

First, if (R1) is found to be right, then associating semantic presuppositions with the features is undesirable because, in that case, there is no motivation for doing so. The motivation for positing a semantic presupposition ψ for a particular expression or construction α must come from data to the effect that if ψ is false, then the question of the truth or falsity of clauses involving α ‘does not arise’, as the phrase goes.²⁰ That kind of data is the reason we associate semantic presuppositions with the triggers in (1). Consequently, it makes little sense to assign a semantic presupposition ψ to an expression or construction α , if ψ cannot fail. But this is exactly what will be the case for the putative semantic presuppositions triggered by the features, given (R1).

Let us be clear about what exactly is meant by this. Of course, there are many cases of *necessarily true* semantic presuppositions. Consider for instance (12).

(12) The smallest even number is prime.

This sentence semantically presupposes that there is a unique smallest even number, and since this is true necessarily, (12) is an example of a sentence with a

²⁰See Strawson (1950, 330).

necessarily true semantic presupposition. But the proposal presently under consideration is of a fundamentally different nature. In general, a construction of the form *The F is G* triggers the semantic presupposition that there is a unique *F*. (12) is an instance of this form for which the presupposition triggered happens to be necessarily true. Other instances have contingent semantic presuppositions. But the present proposal wants to claim that, for example, every utterance of *I* is one on which the presupposition – that the intended referent is the speaker – is true, although contingently so (the speaker could have intended to refer to something else). That is not parallel to the case of (12), and clearly there is no point in assigning a semantic presupposition that can never fail in this sense, and which would therefore be idle wheels.

Secondly, if (R2) turns out to be correct, then the semantic presuppositions obviously make the wrong predictions. That is, the theory will predict reference-failure – and derivatively a truth value gap – for any case in which the intended referent does not satisfy the features of the pronoun the speaker chose.

This should already be enough to doubt the theory. However, I want bring out how (R1) and (R2) fit the data. As I demonstrate below, our intuitions clearly show that while (R1) correctly describes the 1st and 2nd person pronouns, (R2) is adequate for the rest. I then argue that this result is unsurprising given the pre-assertoric nature of feature information described earlier.

I begin by going through a selection of examples involving each feature and along the way highlight what seem to be the intuitive judgements about them. I then go on to sketch an explanation of the data.

Starting with the 3rd person, here is a classic example from Kaplan (1977):

His Pants I

David is looking at a shop window. He sees someone reflected in the glass, and suddenly he realizes that the person's pants are on fire.

With alarm, he exclaims:

(13) His pants are on fire!

A few moments later, he realizes that it was in fact himself he saw reflected, and that it is his own pants that are on fire.

Kaplan's own verdict on the case – that it succeeds in expressing a singular proposition about David – seems right.²¹ Intuitively, we have no hesitation in judging

²¹Kaplan (1977, 537, n. 64). To be sure, Kaplan was, in this footnote and elsewhere, discussing the familiar puzzle cases in which a rational subject holds beliefs with contradictory truth conditions, and was advocating the likewise familiar solution that the object both beliefs are about is

the utterance true, and so it would seem that the pronoun successfully refers to the speaker in this case.

Correspondingly, consider the following situation:

His Pants II

David and Saul are looking at a shop window. David sees someone reflected in the glass, and suddenly he realizes that the person's pants are on fire. Since the person appears to be closer to Saul, he gets Saul's attention and warns him,

(14) His pants are on fire!

A few moments later, they both realize that it was in fact Saul that David saw reflected, and that it is Saul's pants that are on fire.

Here again it seems clear that intuitively we take the utterance to be true and thus that we take *his* as referring to Saul, the addressee of David's utterance.

The data strongly suggest, then, that one can refer successfully to both speakers and addressees with the 3rd person.

Turning to the 1st person, the contention that one can only refer to oneself with the 1st person is age-old. A well known example is the following:²²

Mad Napoleon

André has gone mad and thinks he is Napoleon. When the doctors try to calm him down, he retorts:

(15) I won the Battle of Austerlitz!

The standardly reported intuition is that *I* in this case does not refer to Napoleon, even if we imagine that he and André are contemporaries. Rather, the pronoun refers to André, the speaker, as attested by the clear intuition that what André said is false.

We might also consider the following variant of Kaplan's case:

My Pants

David is looking at a shop window. On the other side of the glass, there is a man who looks just like him, and David therefore mistakes

thought of under two different characters, which for Kaplan were thus fit to play the role of what is often called *modes of presentation*. I allow myself to adopt Kaplan's case for my purposes. (Schiffer (1978) argued that a mode of presentation is whatever is required to avoid ascribing contradictory beliefs to the subject in this kind of case. See also Perry (1977), (1979) for classic discussion.)

²²Adapted from Barwise and Perry (1983, 148).

the window for a mirror. Suddenly, he notices that the person's pants are on fire and exclaims:

(16) My pants are on fire!

Admittedly, our intuitions are not as stable as with Mad Napoleon. In the right circumstances, some might judge the utterance true. Yet it is likely that most people will judge the utterance false. It seems that *my* is most naturally read as referring to David, which implies that hearers naturally force the pronoun away from violating the 1st person feature.

Similarly, the data seem to show that one can only refer to one's addressee with the 2nd person. To be sure, it is obvious that one can refer to oneself with *you*, for instance while pointing at oneself in a mirror. But, of course, it is equally obvious that in such a case the speaker is also the addressee. Nevertheless, the same would seem to hold even in a case where the speaker does not realize that she herself fulfills both roles. For instance, consider the following case:

Your Pants I

David is looking at a shop window. He sees someone reflected in the glass, and suddenly he realizes that the person's pants are on fire. Concerned, he tries to warn the unfortunate:

(17) Your pants are on fire!

A few moments later, he realizes that it was in fact himself he saw reflected, and that it is his own pants that are on fire.

The sense that *your* refers to David in this case is quite strong. This is important, because it shows that even when the speaker has a false belief about the identity of the addressee of his utterance, the 2nd person nevertheless refers to the addressee. To ratify this intuition, consider finally the following more complex story:

Your Pants II

Saul and David are sitting on a sofa. In front of the sofa is a glass pane. Opposite is another sofa. The sofas look exactly the same and two men dressed like David and Saul are sitting in the seats opposite to them. So, from where David and Saul are sitting, the pane looks like a mirror. Suddenly, David realizes that the pants of the person sitting opposite Saul are on fire. So he turns to Saul and warns him:

(18) Your pants are on fire!

It is likely that most people will deem David's utterance false, indicating that they find it most natural to take the 2nd person as referring to the addressee, Saul, whose pants are not on fire.

We have so far only looked at the person feature. But before I attempt any conclusions, let us first consider the two other kinds of features. We begin with gender.

First, consider the following example:

Spy

In order to conceal his identity, the spy Paul has been posing as a woman among a group of female smugglers. His deceit has been successful and they all believe that he is a woman like them. On the final day, knowing that backup is on the way, Paul, still disguised, pulls out a gun and commands the others to put their hands up. Completely taken by surprise, one of the smugglers stammers:

(19) Careful! She's got a gun.

Most likely, many will judge this utterance true indicating that *she* is being taken to refer to Paul, although its gender feature is thereby violated. It is easy to imagine parallel cases where the pronoun used is masculine.

Finally, here is a scenario to illustrate that one can use a singular pronoun to refer to more than one person:

Twins

Shelia and Chantal are two beautiful identical twins. In a store one day Charlie sees two mirrors, one reflecting Shelia and the other Chantal. Charlie, who does not realize that he is seeing two different people, comments:

(20) She's really beautiful.

It seems that our intuitions tend towards taking Charlie's utterance of *she* as referring to both Shelia and Chantal in this case. It should be relatively straightforward to construct corresponding examples where plural pronouns are used to refer to a singular referent.

4.3.3 Consequences

I take this to strongly suggest that (R1) is right for 1st and 2nd person pronouns, while (R2) is right for the rest. As we saw, both of these results make a presuppositional treatment implausible. In other words, the case for conceiving the features

as triggering semantic presuppositions seems thin. I anticipate two potential worries about this conclusion, which I will now briefly address.

First, it is possible that some will have intuitions of reference failure with respect to the cases involving gender and number above. Is this evidence for the claim that gender and number act as preconditions on reference, and hence on definedness? There is at least one reason to think not. If (R₂) is true, then it is to be expected that pronouns will either be taken to refer to the intended referent, despite potential feature violation, or will be taken to refer to some salient object which does satisfy the features. Hence, (R₂) is consistent with there being cases where the pronoun does not refer because there is no salient candidate referent apart from the one the speaker intended. If one feels compelled to judge the cases involving gender and number as cases of reference-failure, then the reason is most likely not that the intended referent violates the features, but rather that there is no alternative which does not. It is easy to verify that if we set up the cases such that there is a salient feature-satisfying candidate, then those that do not feel compelled to take the referent to be the intended feature-violating one, will settle for the salient feature-satisfying one instead.

Relatedly, both (R_{1–2}) are of course consistent with there being cases of reference failure due to some fault in the speaker's intentions. There are two broad kinds of cases to consider, namely the intention might be either *void* or *unrecognizable*. Let me explain what I mean by each. First, a speaker's intention is void in this sense if the object she intends to refer to does not exist. Even if both you and I believe that there is a man in the corner, no one wants to claim that you can succeed in referring with *he* (or any other pronoun for that matter), if it is actually just a shadow that we are seeing. Secondly, one might want to sort cases in which the speaker's intention is unrecognizable as cases of reference failure. In my view this is the correct analysis. (See Essay 2.) But no doubt some will hold that as long as the speaker had an intention to refer, this should be enough, even though she failed to make it publicly accessible. (This is what I called Strong Intentionalism in Essay 2.) We do not need to take a stand on this issue here though. For note that (R_{1–2}) are consistent with reference failing for either of these reasons.

4.3.4 Towards an Explanation of the Data

A natural question now becomes, is there a cogent way of explaining the data given the general observation of the pre-assertoric nature of the features brought out earlier?

It is an empirically attested fact that all known natural languages incorporate

person systems that define different persons in terms of the two roles of speaker and addressee.²³ It appears, then, that utterances are universally conceived of as having a speaker and an addressee. That is, we conceptualize utterances as performed by someone and directed at someone. And the reason for this is immediate: Utterances *do* have both speakers and addressees universally – even soliloquy is addressed to someone (oneself, or some, perhaps absent, or pretended to be absent, audience, etc.).

The data concerning the persons that we have looked at is to be explained with reference to this fact about the structure of utterance situations. The natural suggestion is that since there is always a fact of the matter about who the speaker and addressee are, the 1st and 2nd persons are intuitively taken to refer in accordance with these facts, regardless of any false beliefs the speaker might have. By contrast, since there is no corresponding robust fact to be consulted in this case, the 3rd person is intuitively taken to refer in accordance with what the speaker believes, even if these beliefs are known to be false.

It is a separate question how audiences go about *ascertaining* the speaker's intention in a particular case. With respect to the 1st and 2nd persons, the vast majority of situations are such that it is immediately clear to everyone who the speaker and addressees are, and clear to everyone that this is clear to everyone, etc. Hence, although this is not always the case, the feature information is usually enough to recover the intention.

Yet, with respect to the 3rd person, the feature information is rarely enough, and hence the speaker is required to provide more clues such as a demonstration or, as in the case of Reception, something more subtle. Cases in which the feature information is enough are usually cases in which the other features, i.e., gender and number, conspire with the 3rd person to make the intention recognizable. This was the case in Lunch. Indeed, it is hardly an accident that 3rd person pronouns (in English) are the only ones that also encode gender information; that extra is simply not needed in the case of the 1st and 2nd persons.

So, feature information is used by audiences to ascertain intentions. But only in the case of the 1st and 2nd persons is there an additional fact of the matter about who the referent is, since the role of speaker and addressee are hard-wired into any utterance situation. I do not mean this talk of a fact of the matter to be understood in some metaphysical sense. I am not claiming that there is a fact of the matter about what *I* and *you* refer to independently of what interpreters

²³See Noyer (1992, ch. 2). Noyer adopts a tradition according to which "The primary distinction is between participants in the speech-act and nonparticipants [...]." (p. 146). But since a participant is defined as either the speaker or the addressee, and a nonparticipant as neither speaker nor addressee, the system clearly takes these roles as the primitive ones.

take them to refer to. Rather, I am claiming that because it is, with very rare exceptions, clear who the speaker and addressee are, this creates a sort of practice of always taking the 1st and 2nd persons to refer in accordance with the actual facts about who is occupying each role. In turn, this is made possible because there always *are* such facts. The speaker is simply expected to be aware of these facts; what she refers to will be what these facts dictate with no quarter given.

I take this to at least hint at the direction in which the data can be explained by reference to the pre-assertoric nature of feature information. As we saw, this role of feature information already suggested a clear difference from semantic presuppositions. In turn, we have also seen that whether or not one takes feature information to constrain what one can refer to, this makes an account in terms of semantic presuppositions implausible.

4.4 The Scalar Theory

In this section I will look at Sauerland's (2004a), (2008b) version of the presuppositional account of the features.²⁴ We will see that the concerns raised above transpose to this theory, although it has some initial advantages over the proposal by Heim and Kratzer. In discussing Sauerland's theory, I will focus on the persons. The treatments of gender and number follow the same pattern, and I take it as clear how my considerations generalize to these cases.

4.4.1 The Semantics and its Motivations

In the notation we used above, Sauerland's semantics for the persons is given as follows:

- (21) a. $\llbracket \text{1st person} \rrbracket^c = \lambda x : x \text{ includes the } a_c. x$
 b. $\llbracket \text{2nd person} \rrbracket^c = \lambda x : x \text{ includes either } a_c \text{ or } h_c. x$
 c. $\llbracket \text{3rd person} \rrbracket^c = \lambda x. x$

This departs from our intuitive analysis of the content of the person features from (3a–c) in two important respects. First, the 2nd person is associated with a disjunctive presupposition. Secondly, the 3rd person is analyzed as non-presuppositional as reflected by the fact that it denotes the non-partial identity function. What are the motivations for this? I begin with the entry for the 3rd person.

Notice first that the non-presuppositional entry is a welcome result from our point of view since, as His Pants I and II showed, one can succeed in referring to both speakers and addressees with the 3rd person. That is, considered as a

²⁴This version is also explicitly endorsed by Heim (2008).

semantic presupposition, the proposal that the 3rd person requires that the referent be neither the speaker nor the addressee is incorrect.

Sauerland's own motivations for this weak semantics are similar. They come from two sources. The first observation pertains to agreement with quantificational DPs and focuses on examples like (22).²⁵

(22) Everyone of us_[plur, 1st] is_[sing, 3rd] responsible.

If the 3rd person triggered the presupposition 'includes neither speaker nor addressee', then this presupposition would be required to hold of each individual in the domain quantified over.²⁶ But given that the domain contains the speaker, and perhaps²⁷ the addressee, this would predict that the clause should be infelicitous.

The second observation motivating the non-presuppositional entry for the 3rd person is analogous to the one we have been considering in that it points to cases where the 3rd person is used to refer to the addressee, as is common in the politeness forms involving the plural found in many languages (traditionally referred to as *pluralis reverentiae*). Sauerland (2008b, 70) cites the German *Sie*, exemplified by (23).

(23) Könnten Sie bitte etwas rücken.
 could-3RD, PLUR they-3RD, PLUR please something move
 'Could you please move a little.'

The pronoun *Sie* is 3rd person and plural, but is here used to refer reverentially to a single addressee. Again, if the 3rd person generated the presupposition 'includes neither speaker nor addressee', then this should exhibit presupposition failure. But instead the 3rd person pronoun refers to the addressee of the utterance. (This also motivates a null analysis of the plural feature.)

It would seem, then, that analyzing the 3rd person as non-presuppositional, i.e., as not imposing restrictions on its possible referents, is advantageous with respect to both agreement data from bound uses of pronouns and from the fact that 3rd person pronouns can refer to both speakers and addressees.

²⁵Cited in both Sauerland (2004a), (2008b).

²⁶Thus we are assuming that Cooper (1983), Heim (1983), and many others, are right in maintaining that, as Percus (2006, 3) puts it, "If for all individual denoting expressions X, [X P] presupposes that $\llbracket X \rrbracket$ has the property Q, then $\llbracket [\text{Every A}] P \rrbracket$ presupposes that every individual with the A-property has property Q." In other words, the presuppositions of the predicate in the nuclear scope of *every* project to all the individuals that are being taken to satisfy the restrictor. Heim's (1983) well known example was *Every nation cherishes its king*, which she noted projects the presupposition that every nation has a king.

²⁷English does not distinguish between inclusive and exclusive 1st person, so there is no way to tell.

The second departure from the simpler analysis was the disjunctive entry for the 2nd person in (21b). As Sauerland (2004a) admits, there is a problem with this entry in that it incorrectly predicts that (24) should be grammatical.

(24) *Speaking of me and you*: *Each of us_[plur, 1st] are_[sing, 2nd] responsible.

Given the disjunctive entry for the 2nd person the presupposition we predict is that each individual quantified over either is the speaker or is the addressee. Since that is so, (24) should be grammatical; yet clearly it is not.

A possible reply is given to the effect that the prior availability of (25) might block (24), even though the latter is strictly speaking grammatical.

(25) Both you and me are responsible.

I will not go into this here.²⁸ We can note, however, that there is some initial pressure to avoid the disjunctive entry for the 2nd person from this direction. Furthermore, we noted that one can only refer to the speaker with the 2nd person when the speaker is (perhaps unknowingly) also the addressee of the utterance, and hence, the disjunctive entry is not needed to accommodate these cases. We will see below that Sauerland's motivation for positing it in the first place has some weaknesses. To understand this motivation, we need to look at the pragmatic component of Sauerland's theory, which I now go on to review.

4.4.2 Implicated Presuppositions

Given the weak semantic presuppositions posited for the 2nd and 3rd persons, the question becomes: What about the obvious points that on the one hand we ordinarily infer from a use of the 2nd person that the intended referent includes the addressee and not the speaker, and on the other hand, we ordinarily infer from a use of the 3rd person that the intended referent includes neither speaker nor addressee? After all, this was the reason for our intuitive analysis of the content of the features in (3). The pragmatic component of Sauerland's theory is designed to explain these facts.

The central claim of Sauerland's pragmatics for the phi-features is that they generate presuppositions of a special kind, called *implicated presuppositions*. This kind of presupposition is highly comparable to the more familiar *scalar implicatures*, which have received wide attention in the literature, the main difference

²⁸Heim (2005) considers some ways of amending the scalar semantics, none of which are entirely without problems. In addition, they are open to criticism raised in this essay simply by virtue of construing the features as triggering semantic presuppositions.

having to do with their epistemic standing, which I will not go into here.²⁹ Yet, since the comparison with scalar implicatures is explanatory, I briefly sketch some main points.

Notice that on the analysis in (21), the person features are linearly ordered on a scale of asymmetric entailment. That is, 1st person entails 2nd person and 2nd person entails 3rd person; but 3rd does not entail 2nd, and 2nd does not entail 1st.³⁰ The person features thus form a scale comparable to the well known examples in (26).

- (26) a. $\langle all, some \rangle$
 b. $\langle and, or \rangle$

Typically, a use of one of the elements on these scales will implicate the negation of (all or some of) the more informative alternatives, as in (27).³¹

- (27) a. Ellen ate some of the cake.
Scalar Implicature: Ellen didn't eat all of the cake.
 b. Rudolf or Agnes went to the beach.
Scalar Implicature: Rudolf and Agnes didn't both go to the beach.

Traditionally, one explains these implicatures by pointing to some version of Grice's First Maxim of Quantity:³²

First Maxim of Quantity (FMQ)

Make your contribution as informative as is required (for the current purposes of the exchange).

The scalar implicatures in (27) are then derived in the familiar way. That is, briefly, they are said to arise from the fact that the implicated content is required to make the speaker's expressing the literal content consistent with the presumption that she is observing FMQ.

²⁹This kind of presupposition is also referred to in the literature as *antipresuppositions*. I stick to the terminology of 'implicated presuppositions' to avoid confusion. For relevant discussion of this notion and its relation to scalar implicatures, see Chemla (2008), Percus (2006), Sauerland (2004b), (2008a), Schlenker (2006).

³⁰Although used in this debate in this way, 'entail' is perhaps not the right term here. At any rate what is meant here is that a feature α entails another β iff the domain of α is a subset of the domain of β . For instance, the domain of the 1st person, the set of objects for which the function is defined, is a subset of the domain of the 2nd person.

³¹This simplifies matters in that, as was observed already by Gazdar (1979), these implicatures usually have an epistemic component. Since this has no bearing on our topic, I leave this out for simplicity.

³²Grice (1989, 26).

As first proposed by Heim (1991) in relation to issues surrounding the contrast between the definite and indefinite articles, a similar phenomenon is claimed to be found in the domain of presuppositions. As a consequence, a special class of presuppositions, the implicated presuppositions, is posited to handle the data. In particular, implicated presuppositions are said to arise from inference processes involving a pragmatic principle corresponding to FMQ:³³

Maximize Presuppositions (MP)

Among a set of alternatives, use the felicitous sentence with the strongest possible presupposition.

Roughly, MP predicts that uttering an expression from a group of alternatives is felicitous only if there is no stronger expression which could have been felicitously uttered. We can formulate this as follows:

Maximize Presuppositions – Felicity Version (MPF)

For any sentence pair $\langle \phi, \phi' \rangle$ s.t. ϕ' is an alternative to ϕ that asserts what ϕ asserts but additionally presupposes ψ , an utterance of ϕ is felicitous iff

(MPF₁) The presuppositions of ϕ are satisfied.

(MPF₂) It is not the case that the presuppositions of ϕ' would have been satisfied.

Given this, we predict that, for example, a use of the 3rd person will trigger the inferences corresponding to (MPF₁) and (MPF₂), as in (28).

- (28) a. The presuppositions of the 3rd person are satisfied.
 b. It is not the case that the presuppositions of the 2nd person would have been satisfied.

Since the 3rd person, on this semantics, is non-presuppositional, (28a) is always vacuously satisfied. And so, from a use of the 3rd person, we predict the presupposition that it is not the case that intended referent is either the speaker or the addressee. This is what we wanted, as reflected in the intuitive analysis of the content of the features in (3).

Similarly, we predict from a use of the 2nd person that

³³Here I follow the way this is formulated by Chemla (2008). This version is preferable to the one used by Sauerland (2008a) which does not restrict its application to expressions that are members of appropriate alternative-sets; hence, read literally, it over-generates vastly.

- (29) a. The presuppositions of the 2nd person are satisfied.
 b. It is not the case that the presuppositions of the 1st person would have been satisfied.

By (29a), it is presupposed that the intended referent is either the speaker or the addressee. By (29b), it is not presupposed that the intended referent is the speaker. Hence, we predict that it is presupposed that the intended referent is the addressee. Again, this corresponds to what we took to be the content of the 2nd person on the simple analysis.

4.4.3 Inherited Problems

Note that the implicated presuppositions that this account predicts are pragmatic, and not semantic, presuppositions. Using our previous notation, we can lay out the divergence between the two kinds of presuppositions generated by Sauerland's theory as follows:

Table 1	1st person	2nd person	3rd person
Semantic ps	$r = a_c$	$r = h_c \vee r = a_c$	\emptyset
Implicated ps	$r = a_c$	$r = h_c$	$r \neq a_c \wedge r \neq h_c$

How do we know that the implicated presuppositions are not preconditions on definedness? For several reasons. A first indication is their genealogy. As illustrated by (28) and (29), the implicated presuppositions are derived via the pragmatic principle MP from the assertoric content and its semantic presuppositions.

But moreover, in the case of the 2nd and 3rd persons, the implicated presuppositions predicted by Sauerland's account simply *cannot* be preconditions on definedness on pain of contradiction. Given the semantics for the 2nd person, the 2nd person is defined for the speaker. But if the implicated presupposition associated with the 2nd person were a precondition on definedness, the 2nd person would not be defined for the speaker. Similarly, given the vacuous lexicalized presupposition for the 3rd person, the 3rd person is defined for an argument which is either the speaker or the addressee. But if the implicated presuppositions triggered by a use of the 3rd person were a precondition on definedness, the 3rd person would not be defined for an argument of this kind.

Hence, the implicated presuppositions predicted by Sauerland's account cannot have the status of preconditions on definedness alongside those lexicalized by the semantics in (21). They must therefore be pragmatic presuppositions, i.e., preconditions on felicity. Consequently, this is an account on which it is not the case that a semantic presupposition associated with an expression automatically becomes a pragmatic presupposition of a speaker who uses that expression.

This in itself might be taken as a potential problem. However, I will ignore this. Instead, I will focus on the fact that the pragmatic presuppositions this account invokes to explain the intuitive inferences associated with the persons – and which motivated the simple analysis in (3) – are what I shall call *purely pragmatic presuppositions*, i.e., they are pragmatic and not semantic. Again, I relegate discussion of pragmatic presuppositions to the next section. But first I want to comment on the semantic presuppositions assigned by Sauerland’s scalar semantics.

Since this account, like the that of Heim and Kratzer, posits semantic presuppositions for some of the features, it comes with its own version of the set of problems brought out in Section 4.3. The predictions made by Sauerland’s semantics is given as follows:

Table 2	1st person	2nd person	3rd person
$r = a_c$	r	r	r
$r = h_c$	#	r	r
$r \neq h_c \wedge r \neq a_c$	#	#	r

This set of predictions is more desirable than the ones made by the non-scalar account. In particular, as mentioned, it allows the 3rd person to be used to refer to both speakers and addressees. It thereby refrains from predicting reference failure in His Pants I and II. This is an intuitively welcome result, which is achieved by not associating any semantic presupposition with the 3rd person.

The account nevertheless associates semantic presuppositions with the 1st and 2nd persons. In the former case, it therefore inherits the motivational problem brought out in relation to (R1) from 4.3.2. In the case of the 2nd person, there are several problems. First, it predicts, wrongly, that one can refer to the speaker with the 2nd person; as we saw, one can only do so as long as the speaker is also the addressee of the utterance. Secondly, the disjunctive entry makes wrong predictions in cases like (24). Thirdly, the purpose of it is to generate the implicated presuppositions; but as I will argue in the next section, these are undesirable independently.

The same is true, *mutatis mutandis*, of this theory’s account of gender and number, which also take a scalar form. In particular, the masculine gender and the plural number are associated with null presuppositions like the 3rd person, and the intuitive inferences associated with their uses are explained along the same lines as above. Yet, the female and the singular are assigned semantic presuppositions, and hence the account incorrectly predicts reference failure in cases like Spy and Twins.

I conclude, therefore, that the semantic presuppositions posited by Sauerland’s account inherit the problems described earlier. These semantic presuppo-

sitions figure essentially in the derivation of the (pragmatic) implicated presuppositions that are invoked to explain the inferences associated with the features. So if the semantic presuppositions must be eliminated from the account, there will no longer be any basis for deriving the desired implicated presuppositions.

4.5 Phi-Features and Accommodation

Even if features do not trigger semantic presuppositions, then perhaps they simply trigger pragmatic presuppositions and nothing else. In particular, we can imagine an account according to which the features trigger purely pragmatic presuppositions the contents of which correspond directly to the intuitive analysis of the content of the features in (3), and which are not derived – like Sauerland’s implicated presuppositions – from lexicalized preconditions on definedness. As I explain below, the features would not be alone in triggering purely pragmatic presuppositions. But, as we will see, the pre-assertoric role of the phi-features still differentiates them from other examples of purely pragmatic presuppositions to a degree that gives sufficient reason to reject regarding them as triggering presuppositions of this kind in the first place.

4.5.1 Accommodation and Pragmatic Presuppositions

I will approach the topic of pragmatic presuppositions through the notion of *accommodation*. In the broadest terms, accommodation can be described as a mechanism by which a missing presupposition is supplied by the hearer in order to avoid infelicity. Examples will be familiar. Perhaps less familiarly, I suggest below that accommodation behavior is a hallmark particularly of pragmatic presuppositions. The point is in fact relatively obvious, namely that accommodation has no effect on semantic definedness.

Minimally, a case in which accommodation can take place is a case in which the speaker’s and the hearers’ beliefs regarding the presupposition diverge. The speaker will believe that the presupposition is true, since otherwise she would not have made the utterance in the first place.³⁴ So, minimally a case in which accommodation can take place is one in which the speaker believes that the presupposition is true while the audience either does not have any beliefs about the presupposition or believes it is false. If accommodation does take place, this means that upon hearing the utterance – and thereby realizing that the speaker

³⁴Stalnaker (2002) points out that requiring that a speaker *believe* her presuppositions is too strong and that the attitude involved should instead be characterized as, what he calls, ‘acceptance’. I agree, but ignore this complication here. (See Essay 5.)

is presupposing something they do not themselves believe – the audience adjusts this divergence so that the result is that they also believe the presupposition (or at least pretend to do so). If accommodation takes place, the speaker's utterance is not infelicitous.

Yet, none of this has any effect on whether or not the utterance is defined in the semantic sense. If it has a false presupposition, the utterance is neither true nor false, no matter what anyone believes or pretends to believe. For instance, even if everyone feels absolutely confident that the lawn has been mowed, (1b) is nevertheless neither true nor false if it has not been.

(1b) It was Brian who mowed the lawn.

Hence, accommodation is a notion that essentially pertains to pragmatic presuppositions. It is a mechanism by which communicative failure is avoided by the cooperation of the audience. Since the proposal regarding phi-features we are left with at this point is that they trigger purely pragmatic presuppositions, I want to examine this proposal by considering accommodation in relation to feature information. I begin by arguing that the ordinary notion of accommodation is not applicable to feature information. I then move on to a comparison with more non-standard purely pragmatic presuppositions.

4.5.2 Does Feature Information Accommodate?

There are two types of cases to consider, namely on the one hand, cases in which the feature information is used to recover the speaker's intention, and on the other hand, cases in which it is not. With respect to the latter, we will screen off cases in which there are *no* means of recovering the speaker's intention, since these are not interesting for present purposes. So, the second type of case will be ones in which, although the feature information does not suffice, there are other means of settling the referent of the pronouns in question.

First, consider situations in which the audience uses the features of the pronoun chosen by the speaker in order to grasp her referential intention. Is this process a species of accommodation? It is crucial to avoid a potential source of misunderstanding from the outset. I have been emphasizing that the chief difference between (standard) presuppositions and feature information is that the latter plays a role in determining assertoric contents, whereas the former does not. However, feature information and presuppositions do share certain aspects of pre-assertoricity, which for the latter is the main reason that accommodation is possible. Yet, as we will see, this does not mean that feature information accommodates.

Here is a familiar observation from within the Stalnakerian tradition:

an utterance will affect the common ground in two steps: (i) first, the fact that the utterance was made becomes common ground (and the participants may immediately draw inferences based on that fact, and perhaps adjust the common ground accordingly), (ii) then, assuming that the proper (implicit) negotiation has occurred, the asserted proposition is added to the common ground.³⁵

An equally familiar observation in the same tradition is that,

Presupposition accommodation occurs in step (i) and is thus similar to the kind of common ground adjustment based on manifestly obvious facts that everyone in the conversation observes [...].³⁶

There are good reasons to claim that feature information also does its work here in this pre-assertoric stage of interpretation. Indeed, Stalnaker (1998) says,

If certain information is necessary to *determine the content of* some speech act, then appropriate speech requires that the information be shared information at the time at which that speech act is to be interpreted.³⁷

And as I have been arguing in this essay, it is the chief role of feature information to help settle the content (i.e., reference) of pronouns. So it is not surprising to find Stalnaker using the following example:

Suppose Phoebe says “I saw an interesting movie last night.” To determine the content of her remark, one needs to know who is speaking, and so Phoebe, if she is speaking appropriately, must be presuming that the information that she is speaking is available to her audience – that is shared information. But she need not presume that this information was available before she began to speak. The prior context that is relevant to the interpretation of a speech act is the context as it is changed by the fact that the speech act was made, but prior to the acceptance or rejection of the speech act.³⁸

Not all information that has a pre-assertoric role is created equal, though. Stalnaker is careful to make it clear that by choosing the above example, he is not thereby putting the information that so-and-so is speaking on a par with presuppositions:

We add to the context, not only the information that Phoebe uttered certain sounds, but also that she uttered an English sentence, and that she is saying something to us. And [...] we can also infer that she is making whatever presuppositions are required to make her utterance intelligible and appropriate.³⁹

³⁵von Stechow (2008, 143).

³⁶Ibid.

³⁷Stalnaker (1998, 101) – my emphasis.

³⁸Stalnaker (1998, 101).

³⁹Stalnaker (1998, 102).

In other words, the mere fact that both feature information and presuppositions do their work in the pre-assertoric context does not warrant equating them. In fact, the work they do is very different, although it takes place at the same stage of interpretation. Feature information is required in the pre-assertoric context in order to determine the referent of the pronoun. By contrast, presuppositions are needed in the pre-assertoric context in order to secure the felicity of the presuppositional utterance; not in order to determine its content.

So consider Lunch where Ruth draws on the fact that Saul used the 3rd person, masculine and singular features in order to infer that he intends to refer to David. We can give a toy sketch of the reasoning that takes place in the pre-assertoric context as follows:

- (i) Saul used the 3rd person, male and singular features. (Observable fact)
- (ii) Therefore, Saul believes that his intended referent is a male individual distinct from speaker and addressee. (Feature information)
- (iii) Ruth and David are the only two reasonable candidate addressees for Saul's utterance. (Assumption)
- (iv) Therefore, Saul either intended to refer to David or intends to refer to Ruth. (From (ii) and (iii))
- (v) Ruth is female. David is male. (Observable facts)
- (vi) Therefore, Saul intended to refer to David. (From (ii), (iv) and (v))

Although this whole process takes place pre-assertorically, nothing in this process looks like accommodation.

Let us therefore instead turn to cases in which the speaker's referential intentions are recognizable independently of the feature information. For convenience we can stick with His Pants I, Kaplan's original example.

Consider a hearer of David's utterance who is not under the same illusion as David, i.e., she knows that David is seeing himself in the window, and hence she knows that it is David's own pants that are on fire. Plausibly, such an informed audience will be able to learn from David's utterance that *he* does not realize this. She will recognize that the reason David chose the 3rd person was that he does not realize that it is his own pants that are on fire; because if he had realized this he would have used the 1st person. Things get more complicated due to the fact that, of course, the hearer will also realize that she might be wrong, i.e., her epistemic position is not strong enough to *rule out* that David knows that it

is his own pants that are on fire but refrained from choosing the 1st person for different reasons. But let us ignore this here.

The question here is whether the mechanism just described – the fact that the hearer will learn that David at least accepts that the person whose pants are on fire is not himself – should be counted as presupposition accommodation. I think the answer is ‘no’. The reason for accommodating is to render felicitous an utterance, which would, in the absence of accommodation, be pragmatically defect. The hearer of David’s utterance recognizes independently of the feature information that David intends to refer to the person reflected in the glass, which she knows is himself, whereas David believes it is someone else. Hence, she does not need to take on board the (false) information that that person is neither David nor whoever he is addressing in order to make sure his utterance is felicitous. The pronoun refers independently of the phi-features in this case. And so, the second, assertoric step of interpretation can easily take place without the need for anything analogous to accommodation.

Consequently, neither cases in which feature information is used in fixing referents, nor cases in which it is not, but gives additional information, deserve to be described as cases of accommodation. However, before we are warranted in making conclusions concerning the proposal to regard feature information as (purely) pragmatic presuppositions, there are a few more things to look at.

4.5.3 Resilient Purely Pragmatic Presuppositions

The triggers on our initial list in (1) are not only standard because they trigger both semantic and pragmatic presuppositions. They are also standard because the pragmatic presuppositions they trigger accommodate with a relative *smoothness*. In the often repeated words of Lewis (1979b), they “spring into existence” when needed, making it “not as easy as you might think to say something that will be unacceptable for lack of required presuppositions.”⁴⁰ On the other hand, there are presuppositions that exhibit a certain kind of *resilience* to accommodation, and which I will therefore call *resilient*.⁴¹ So, we now have two ways in which a presupposition can be non-standard. It can be purely pragmatic; and it can be resilient.

Some presuppositions are both purely pragmatic and resilient. Examples include those triggered by the particles *too*, *as well* and *even*. Since we have seen that feature information does not accommodate, we need now to compare this kind

⁴⁰Lewis (1979b, 416). Lewis introduced, in this essay, the terminology of accommodation. See Beaver and Zeevat (2006) for extensive discussion. See also Atlas (2002, 34–36).

⁴¹For some discussion of resilient presuppositions, see Beaver and Zeevat (2006), von Stechow (2008).

of information with these resilient, purely pragmatic presuppositions. I focus on the case of *too*.

Consider the famous example from Kripke (2009):

(30) Sam is having dinner in New York, too.

Kripke's point was that it is not sufficient to say that for an utterance of (30) to be felicitous, there has to be an individual x other than Sam who is having dinner in New York, since that is almost trivially satisfied in any context. Attention must be paid to the particular role played by the context of utterance in that it is also required that x be *contextually active*, to paraphrase Kripke's terminology. So imagine the following scenario:

Hi-Fi Store

David and Ruth pass by a hi-fi store in London. In the window, TV screens are showing pictures of Magic Johnson sitting down to eat dinner at a fancy New York restaurant. Noticing this, Ruth remembers that their friend Sam is in New York this evening and utters (30).

Given this set-up, David will be able to recover from the context the presupposition in (31).

(31) Magic Johnson is having dinner in New York.

Why is this presupposition purely pragmatic? Imagine that Ruth and David are mistaken about what they see on the screens. For instance, suppose that the restaurant they see is in fact not in New York but in Paris. In that case (31) is false, and this gives the utterance a flavor of infelicity (although of course it will be accepted by David if he shares the false belief). But our intuition is quite clear that this does not affect the definedness of (30). We still take it to be true or false depending on whether Sam is having dinner in New York or not. Hence, (31) is not a semantic presupposition.

Why is this presupposition resilient? Imagine that David and Ruth were not conveniently passing by a TV showing pictures of some easily recognizable individual having dinner in some easily identifiable city. In fact, they have not even been talking about restaurants, who is having dinner at the moment, or the like. Clearly, in that case, it would be impossible for David to do what he will do in the analogous situation involving a standard presupposition – that is, accommodate. In the normal case, it is easy to see what the speaker thinks is an unproblematic presupposition, and therefore easy to take it on board, in the absence of independent problems with it. But in this case, David simply has no way of figuring out

that Ruth is presupposing that Magic Johnson is having dinner in New York. And so, there is no way he can simply adjust the context to include the presupposition, because there is no way he can tell what to adjust with. Here is how von Fintel (2008) puts the point:

there cannot be accommodation with presuppositions that do not just target what is in the common ground but concern facts in the world that no manner of mental adjustment can bring into being. A particular case of that is the actual history of the conversation (the conversational record) [...]. Whether or not the conversation has made someone salient who is having dinner in New York tonight is part of the common ground. If the conversation hasn't made such a person salient, then it is common ground that there is no such person. And so, accommodation cannot help.⁴²

In other words, *too* is special in that its presuppositional component requires the active participation of the context of utterance. In particular, the context is needed to determine the content of the presupposition.

By contrast, this is not so for standard triggers. And significantly, this is not so for them *even qua* triggering pragmatic presuppositions. Consider for instance the pragmatic presupposition triggered by the factive verb *realize* in (1d), repeated here.

(1d) Daniele doesn't realize that Italy lost the match.

For an utterance of this sentence to be felicitous in a given context it must be the case that the participants commonly accept that Italy lost the match. That is, it is a pragmatic presupposition of (1d) that Italy lost the match. (Of course, this is also a semantic presupposition of this sentence.) Importantly, we do not need the help of the context of utterance in settling the content of the presupposition. We 'see', without any help from context, that (1d) presupposes that Italy lost the match. And similarly for the other triggers in (1).

4.5.4 Is Feature Information Resilient?

Finally, we may now ask whether feature information is a species of resilient, purely pragmatic presuppositions, that is, a pragmatic presupposition that does not accommodate. To claim that a particular type of information or inference is of this kind of course only makes sense given that one has a reason to think that it is a (purely) pragmatic presupposition in the first place. In the case of *too*, there is a good reason to think so. For clearly, the presupposition triggered by *too* acts as a precondition on felicity. For instance, in Hi-Fi Store, for Ruth's utterance

⁴²von Fintel (2008, 154). An analogous proposal is found in Beaver and Zeevat (2006, 32).

to be felicitous, the presupposition that Magic Johnson is having dinner in New York is required. (As we saw it is not needed for definedness; and hence *too* does not trigger semantic presuppositions.) Given this reason to take *too* as triggering purely pragmatic presuppositions, it was now observed that this presupposition is resilient in the sense that the context was needed to determine its content.

By contrast, feature information differs from this on both counts. First, there is no independent reason to treat it as a precondition on felicity. To be sure, it might be suggested that feature information plays a role in avoiding infelicity by helping the audience ascertain the speaker's intentions. After all, if the audience has no means of recovering the speaker's referential intentions, the utterance will surely be infelicitous. But although this is of course undeniable, it is crucial to note that this is only so because the audience needs to ascertain the speaker's intentions in order to recover the assertoric content of her utterance. The infelicity that will prevail in a case of insufficient feature information does not result from this insufficiency itself, but from the fact that, in such a case, the very assertoric content of the utterance is imperceptible. This has no parallel with *too*.

Secondly, if feature information were presuppositional, it would share with *too* the characteristic that the context would be needed to settle its content. However, even so, there would be a crucial difference, namely that settling the content of this alleged presupposition would *constitute* settling the assertoric content of the utterance. Again, nothing like this is going on with the pragmatic presupposition triggered by *too*.

What seems to be right in the case of the features is something like what we sketched for Ruth's interpretation of David's utterance in Lunch, and what was also implied by Stalnaker. That is, certain information concerning the speaker's beliefs about the intended referent becomes available to the hearer simply from the observation that the speaker chose a particular feature combination. She then uses this information together with other types of information about the context – e.g., who are candidate addressees, the gender of the candidate referents, etc. – in order to ascertain the speaker's intention. What is not right is a picture according to which she first finds out to whom the speaker intended to refer, then realizes that therefore the speaker must believe that that person satisfies the features of the pronoun chosen. This simply puts the cart before the horse.

To sum up, then, since it is inappropriate to speak of either accommodation or resilience with respect to feature information, the case for regarding it as a species of pragmatic presuppositions remains doubtful.

4.6 Prospects

If the foregoing is on the right track, we are warranted in concluding that feature information diverges radically from presuppositional information of both standard and non-standard kinds. I argued that the features do not act as pre-conditions on definedness (reference) and hence that they cannot be seen as triggering semantic presuppositions, and further that the information they contribute is not to be likened to that played by purely pragmatic presuppositions, even the special breed of resilient ones.

As such the burden of this essay has been negative. To be sure, the critique of the presuppositional theory that I have presented rests on a number of positive observations, such as the fact that feature information is used in reference-determination, that one can refer to speakers and addressees with the 3rd person, to males with the female gender and *vice versa*, etc. But the residue question, of course, remains: If feature information is not to be classified as presuppositional, then how *should* this kind of information be classified? Below, I offer some brief remarks on the prospects for answering that question.

Frege (1892) originally posited the notion of a semantic presupposition as a way of accounting for information intuitively associated with certain constructions – in his case definite descriptions – but which could not be regarded as entailments due to the now well known fact that it projects out of standard negation. Later still, Grice (1989) contributed a major advance in classifying and accounting for more types of such additional information. His general strategy was aimed at preserving as much as possible of standard semantics while explaining instances of surplus information by appealing to general principles governing rational communication. He thereby invented modern pragmatics and in the process instigated an ongoing debate over its relation to semantics. Stalnaker's (1970) seminal introduction of the notion of pragmatic presuppositions was an instance of the same strategy.

In a more contemporary setting, the standard conception conceives of presuppositions in opposition to another category of surplus information, namely that of *conventional implicatures*.⁴³ On Grice's original account, the latter were distinguished from the familiar *conversational implicatures* by being directly encoded by the grammar, that is, they constituted a part of meaning, separate from truth conditional content. Hence, in contrast to their conversational counter-

⁴³Thus, famously, Heim (1983), following in part Gazdar (1979), objected to Karttunen and Peters (1979) conventional implicature treatment of presuppositions on number of now widely accepted points of criticism. More recently, Potts (2003), (2007) has forcefully argued for the existence of conventional implicatures.

parts, conventional implicatures were not triggered by inference-processes on the part of the audience involving general principles of rational communicative behavior.

Furthermore, conventional implicatures, if they exist, do not act as preconditions on definedness. To take a haggard example, on this picture, (32) is thought to conventionally implicate a contrast between being poor and being honest.

(32) She is poor but honest.

But surely, the fact that there is no such contrast does not render (32) undefined in the sense that our examples in (1) are undefined if their presuppositions are false. Rather, even though there is no contrast between poverty and honesty, (32) is true or false depending on whether or not the person referred to by the pronoun has both the properties the sentence ascribes to her.

Both of these traits – non-cancelability and semantic inertia – seem highly comparable to the characteristics of feature information. Investigating the hypothesis that feature information is a species of conventional implicature is therefore likely to prove fruitful. However, this is far from saying that there are no obstacles to the view that features encode conventional implicatures. One obvious problem is that conventional implicatures do not, at least not usually, play a role in content-determination in the way that I have been stressing the features do. Conventional implicatures are not pre-assertoric in the sense I have been using this term. The information that there is a contrast between poverty and honesty, which is undeniably associated with (32), plays no role in settling the assertoric content of that sentence.

In light of this, one might begin to feel that feature information is not akin to any of these types of surplus information associated with particular constructions or lexical items. And so it might be suggested that, rather, feature information is to be grouped with general information about the discourse situation, such as that the speaker has demonstrated a particular object. Both this and feature information seem to be ways of making manifest referential intentions. And, as we saw, Stalnaker (1998) comes very close to describing feature information as akin to the kind of information that becomes available as a matter of observable fact just because the utterance is made in the way it was. Yet, it is still an open question what kind of information this is.

5 How to Fuse Contexts

5.1 Introduction

Presuppositions are preconditions on things going well with an utterance. In all the following cases, the presupposed material is required for the utterance as a whole to be successful:

- (1) a. **Aspectual verbs:** Katie has started swimming.
Asserts: Katie has started swimming.
Presupposes: Katie has not already been swimming.
- b. **Clefts:** It was Enrico who pole vaulted./What Enrico did was pole vault.
Asserts: Enrico pole vaulted.
Presupposes: Someone pole vaulted./Enrico did something.
- c. **Definites:** The chairman of the board reads the Times every morning.
Asserts: The chairman of the board reads the Times every morning.
Presupposes: There is a unique chairman of the board.
- d. **Factive verbs:** Susan doesn't regret getting a raccoon.
Asserts: Susan doesn't regret getting a raccoon.
Presupposes: Susan got a raccoon.

There are two broad ways of fleshing out this intuitive picture of presuppositions as preconditions on utterance success.

According to the historically oldest of these, presuppositions are preconditions on a sentence *having a truth value*. So one will hold that in order for a presuppositional sentence to be either true or false, all of its presuppositions must be true. This conception, which was introduced by Frege (1892), and was revived by Strawson (1950), is often referred to under the heading of *semantic presuppositions*.

A more recent way of understanding presuppositionality sees presuppositions as preconditions on *felicity*. By this it is meant that the satisfaction of presuppositions is a necessary condition for communication to proceed smoothly. This way of thinking about presuppositions is associated with Stalnaker (1970), (1974), (1978), (1998), (2002) who introduced the term *pragmatic presupposition* for this notion.

This conception is linked to a familiar picture according to which communication proceeds against a background of constantly evolving shared information called the *common ground*. The common ground is roughly describable as the pragmatic presuppositions mutually accepted by the participants, the observation being that when a pragmatic presupposition is not mutually accepted by the participants of a conversation, uttering a sentence which presupposes it will result in a conversational breakdown. Such breakdowns are usually easy to fix up by the process known as accommodation; but sometimes they are not, and the common ground has to be repaired by more cumbersome conversational moves such as requests for making the presuppositions explicit by asking questions, or the like.

Let us sum up these two ways of thinking about presuppositions as follows:

Semantic Presupposition

ψ is a semantic presupposition of a sentence ϕ if and only if the following holds: An utterance of ϕ in a context c is true or false if and only if ψ is true in c .

Pragmatic Presupposition

ψ is a pragmatic presupposition of a sentence ϕ if and only if the following holds: An utterance of ϕ in a context c is felicitous if and only if ψ is commonly accepted among the participants of c .

A key point to note here is that whereas semantic presuppositions are required to be *in fact true*, pragmatic presuppositions are merely required to be accepted in the common ground.

All the presuppositions in (1) are both semantic and pragmatic, as is intuitively clear. There are reasons for holding that although all semantic presuppositions are also pragmatic, the converse is not true in that, arguably, some presuppositions function only as preconditions on felicity and have no influence on definedness. In this essay I am only concerned with presuppositions that satisfy both of the notions above. (See Essay 4.)

This essay discusses the influential treatment of presuppositions developed within the *dynamic semantics* in the tradition from Heim (1982), (1983).¹ The goal of this enterprise is to provide an explicitly semantic treatment of various discourse effects including, most notoriously, cross-sentential anaphora. With respect to presuppositionality, the main aim has been to give a satisfactory solution to the problem of presupposition projection – the challenge of predicting the presuppositions of compound sentences from those of their parts.

For this purpose, dynamic semantics proposes a reversal of the traditional approach to semantics where the fundamental semantic category is taken to be contributions to truth conditions. In the dynamic systems, instead of assigning truth-conditional semantic values, the recursive interpretation mechanism of the grammar assigns *context change potentials* (CCPs). In turn, since truth can no longer be defined in terms of satisfaction, as in the foregone semantic frameworks, dynamic semantics proposes to define truth in terms of CCPs.

This maneuver has consequences for the way presuppositionality is perceived by the dynamic theories. In particular, standard dynamic semantics engenders what can be described as a semantic conception of pragmatic presuppositions. That is, dynamic semantics adopts the strategy of lexically encoding preconditions on felicity.

After briefly reviewing the dynamic treatment of presuppositionality in Section 5.2, I demonstrate, in Section 5.3, that this treatment of presuppositions is in tension with the project of deriving truth conditions from CCPs. The problem is that given the way this is standardly done, conversational infelicity becomes *sufficient* for gappiness, lacking a truth value. I diagnose this situation by showing that the incorrect predictions arise due to a failure to separate common ground information from the information relevant for evaluating for truth and falsity.

I describe a solution to the problem that involves completely ignoring common ground information for the purpose of evaluation for truth. However, I show in Section 5.4 that this strong proposal makes the wrong predictions for expressions that depend on contextual factors in other ways than presuppositional expressions. My example is *epistemic modals*. I illustrate a basic problem with providing a definition of truth based on CCPs that gives satisfactory results for both presuppositions and epistemic modals.

Finally, in Section 5.5, I outline a unified semantics that solves these problems. This involves seeing CCPs as operating on what I call *fusion contexts*. Fusion contexts contain more information than the kinds of contexts standardly em-

¹This type of semantics is similar in important respects to the frameworks of Groenendijk and Stokhof (1991) and Veltman (1996). A sophisticated version of the latter, with explicit Heimian components, is presented in Beaver (2001).

ployed in dynamic semantics. I demonstrate that defining CCPs as operating on fusion contexts allows one to give a CCP-based definition of truth that unifies the dynamics of epistemic modals and presuppositions while treating the latter as both semantic and pragmatic. At the same time, we will see that achieving fusion comes at costs that some might want to regard as too high.

5.2 The Dynamic view of Presuppositions

5.2.1 Context Change and Common Ground

Dynamic semantics is based on a view of meaning according to which the meaning of a sentence is a potential to affect context, a CCP. A context is thought of as a collection of information. Dynamic semantics of the sort under discussion here follows a long tradition of modeling information as sets of possible worlds, the fundamental idea being that a piece of information, chiefly, a proposition, places a constraint on how the world could be. (See the Introduction to this thesis.) The proposition that elephants have trunks, for instance, is modeled as the set of worlds in which elephants have trunks, and hence this proposition is true at the actual world, if and only if the actual world is a member of that set.

A context, then, is a set of worlds called the *context set*, representing the relevant body of information. In turn, CCPs are modeled as functions from context sets to context sets. The basic idea is that a sentence changes the context set by discarding from it all worlds incompatible with the proposition it expresses in that context. As we will see, though, this simple conception only applies to a limited class of sentences. This class includes simple (presumably) non-context-sensitive sentences like *Elephants have trunks* but also sentences with indexicals like *I am hungry*. It is highly non-trivial to delineate this class of sentences, but for ease of reference let us call them *bland*.

I will illustrate the basics of the kind of dynamic semantics we will be working with by taking indexical sentences as my example. We begin with the familiar concept of a denotation function $\llbracket \cdot \rrbracket$ relativized to a context k and a world w . The context k is here thought of along the lines of Kaplan (1977), that is, as a tuple of parameters relevant for assigning contents to indexical expressions. Further, I assume that this tuple includes an assignment function determining values for variables. I will call such contexts *Kaplan contexts*. So a Kaplan context looks like this (later we will add more parameters):

$$k = \langle a_k, t_k, l_k, w_k, g_k \rangle$$

Here a_k is the speaker in k , t_k the time, l_k the location and w_k the world of the utterance. And g_k is the assignment function.²

For exposition, let us assume that I always refers to the speaker, we specify the following clause:

$$(2) \quad \llbracket I \rrbracket^{k,w} = a_k$$

In turn, we will set up the system so that we can compute things like the following:

$$(3) \quad \llbracket I \text{ am hungry} \rrbracket^{k,w} = 1 \text{ iff } a_k \text{ is hungry in } w.$$

And so on for the rest of the class of bland sentences.

With this in the background, we can now define CCPs. We use $[]$ to notate CCPs, letting $[\phi]$ denote the CCP of ϕ and $c[\phi]$ the result of applying it to c . In the bland cases, CCPs are defined as follows:

Bland CCP

If ϕ is bland, then

$$c[\phi] = \{w \in c : \llbracket \phi \rrbracket^{k,w} = 1\}$$

So for instance, the CCP of *I am hungry* will eliminate from c all the worlds in which the speaker in k is not hungry. Here we have not said anything about the relation between c and k . This will be a major theme in what follows. But for now, we can assume that c and k are both determined by the conversational situation. So think of a conversational situation as determining both a Kaplan context and a context set, which is a body of information.

What kind of information? Let us begin by focusing on a notion of context usually referred to as *common ground*. The common ground is the information that the participants mutually *accept* for the purpose of the exchange. Acceptance is a non-factive propositional attitude, weaker than both knowledge and belief. That a subject s accepts p does not entail that s knows p , nor that s believes p , and does not entail that p is true.³

We spell out this conception of common ground information as follows:⁴

Common Ground. A common ground is a set of worlds $cg = \{w :$
for all ϕ s.t. the participants mutually accept ϕ as true, $\llbracket \phi \rrbracket^{k,w} = 1\}$.

²We may also want a parameter for the addressee in order to handle 2nd person pronouns. (See Essay 4.) But this will not play a role in the present discussion.

³See Stalnaker (2002) for details.

⁴Here, as in what follows, I allow myself to speak as if the objects of propositional attitudes are sentences. It should be obvious that a more precise definition can be given. In particular, let $\llbracket \phi \rrbracket^k$ denote the set $\{w : \llbracket \phi \rrbracket^{k,w} = 1\}$. Then $cg = \{w : \text{for all } \llbracket \phi \rrbracket^k \text{ s.t. the participants mutually accept } \llbracket \phi \rrbracket^k, \llbracket \phi \rrbracket^{k,w} = 1\}$. I leave this complication out because its absence does no harm.

Note that due to the non-factivity of acceptance, there is no entailment from the common ground including a particular proposition to that proposition being actually true. In terms of worlds, it is not the case that the actual world is always a member of the common ground.

5.2.2 Felicity and Presuppositionality

To provide an account of the felicity conditions of presuppositional sentences, the context sets that serve as arguments for their CCPs must be thought of as what we just called common grounds. It is easy to see why. As Stalnaker has continuously emphasized, it is undeniable that a speaker can felicitously utter a presuppositional sentence in a situation where her interlocutors (or even the speaker herself) merely accept the presuppositions of her utterance, while not believing or remaining agnostic about them. Here is a recent statement of the observation:

Successful communication is compatible with presuppositions that are recognized to be false, but the information that they are being presupposed must be actually available, and not just assumed or pretended to be available.⁵

For example, for my utterance of *Katie has started swimming* to be felicitous, it is sufficient that you are willing to accept for the purpose of the current exchange that she has not already been swimming, and you may well at the same time believe or even know that this is in fact false. Of course, very often, if you have such knowledge or belief, you will not be willing to accept my presupposition, but the important point is that you are not forced into non-acceptance.

We therefore define the CCPs of presuppositional sentences as follows (using the device of notating presuppositions by subscripts):

- (4) a. $cg[\phi_\psi] = \#$ iff for some $w \in cg$, $\llbracket \psi \rrbracket^{k,w} = 0$.
 b. If $cg[\phi_\psi] \neq \#$, then $cg[\phi_\psi] = \{w \in cg : \llbracket \phi \rrbracket^{k,w} = 1\}$.

⁵Stalnaker (2002, 716). The proviso that common ground information need not be true information has been present in Stalnaker's writing from the very inception of the notion of common ground. Thus Stalnaker (1974) wrote, "Communication [...] normally takes places against a background of beliefs or assumptions which are shared by the speaker and his audience [...]" (Stalnaker (1974, 48) – my emphasis). Similarly, only a few paragraphs later we are presented with the full-fledged common belief definition of the common ground incorporating the same qualification: "A proposition P is a pragmatic presupposition of a speaker in a given context just in case the speaker assumes or believes that P , and assumes or believes that his addressee assumes or believes that P , and assumes or believes that his addressee recognizes that he is making these assumptions, or has these beliefs. (Ibid., 49) In Stalnaker (1998) the same qualification is made: "I propose to identify the context (at a particular point in a discourse) with the body of information that is *presumed*, at that point, to be common to the participants in the discourse" (p. 98 – my emphasis) For a general criticism of this qualification, see Gauker (1998).

For example, here is the CCP of (1a):

- (5) a. $cg[Katie\ has\ started\ swimming] = \#$ iff for some $w \in cg$,
 $\llbracket Katie\ has\ not\ been\ swimming \rrbracket^{k,w} = 0$.
 b. If $cg[Katie\ has\ started\ swimming] \neq \#$, then
 $cg[Katie\ has\ started\ swimming] = \{w \in cg : \llbracket Katie\ is\ swimming \rrbracket^{k,w} = 1\}$.

We have now left the realm of bland sentences. The CCP of (1a) is a partial function: it only applies to context sets for which all worlds are such that Katie has not been swimming. Since the context set is the common ground, this reflects the requirement that for the assertion of a presuppositional sentence to be felicitous, its presuppositions must be mutually accepted by the participants. If the function applies, it returns the context set it took in but where all worlds in which Katie is not swimming have been eliminated. If the common ground does not contain the information that she has not been swimming, i.e., if the participants do not mutually accept this, the update is undefined, representing a conversational infelicity.

5.3 The Problem of Common Ground Distortion

5.3.1 Infelicity and Gaps

The theory sketched above arose from the attempt to provide a solution to the projection problem. Briefly, provided a suitable assignment of CCPs to sentence-forming operators and functors, the partiality of sentential CCPs will be transmitted to those of compound sentences in a way which predicts the desired projection facts.⁶ This requires one to view CCPs as the basic, recursively assigned, semantic values.⁷ Hence, truth conditions must be defined in terms of CCPs. Many dynamic systems therefore include attempts to define truth in terms of context change.

Let me begin by spelling out a constraint that any assignment of truth conditions (dynamic or not) to presuppositional sentences has to obey:

Gap Constraint. ϕ_ψ is true or false if and only if ψ is true.

This is of course just another way of stating that ψ is a semantic presupposition of ϕ_ψ . So, we are after a definition of truth that obeys the Gap Constraint.

⁶The origin of this solution is Heim (1982), (1983). See Stokke (2010) for some discussion.

⁷See in particular Heim (1982, 325–326).

Here is the definition of truth in terms of CCPs that Heim (1982), (1983) originally proposed, in our notation:

- (6) a. ϕ is true w.r.t. w and c iff $w \in c[\phi]$.
 b. ϕ is false w.r.t. w and c iff $w \notin c[\phi]$.

This definition relativizes truth to both a context and a world. Usually, this is done because we have things like indexicals in the language. We used the notion of a Kaplan context to handle indexicality. So, following standard practice, we would want to relativize truth to a Kaplan context and a world. But in the definition of truth above, truth is being relativized to the kind of context that CCPs operate on, which we are assuming are distinct from Kaplan contexts (although both may be thought of as determined by the utterance situation).

Doing things this way is only acceptable if we can take c as settling the content of indexicals. Given that we are thinking of c as a common ground, it is relatively clear that taking c in this way will give some wrong results.⁸ For instance, assume that I have a twin, Martin, and that I am suffering from the delusion that I am Martin. Further, suppose that I am in a conversational setting where my audience shares this false belief (or, if you like, that they just accept it). Then if I say *I am hungry*, and if common ground settles the content of indexicals, we will predict that my utterance is true if and only if Martin is hungry, which is clearly incorrect.

To avoid confusions of this kind, then, we will relativize truth to Kaplan contexts and worlds. But the goal is still to define truth in terms of CCPs, so we simply restate the Heimian proposal as follows:

- (7) a. ϕ is true w.r.t. w and k iff $w \in c[\phi]$.
 b. ϕ is false w.r.t. w and k iff $w \notin c[\phi]$.

To see if a sentence ϕ (relative to k) is true at a world w , we look at whether w survives the update with ϕ .

Let us call the world w at which we are evaluating for truth or falsity the *world of evaluation*. Most often, we are interested in the actual world @, and so we are interested in the special case of (7) where $w = @$. But it is useful to have a definition of truth at an arbitrary world, which is what we have with (7). (I sometimes talk of the world of evaluation as the actual world in what follows.) Further, let us call the context c that (7) makes reference to the *context of evaluation*. Note that the context of evaluation is *not* the context k to which truth is relativized, but the context which we use to define truth in terms of CCPs.

Here is how Heim motivated her proposal:

⁸Stalnaker (1998) thinks otherwise.

Now given that we think of files [i.e., contexts] as recording what has been said in a discourse, we ought to assume that saying something false produces a false file, and saying something true produces (*ceteris paribus*) a true file. Indeed, we might try to use this relationship between the truth of an utterance and the truth of a resulting file to define the former in terms of the latter.⁹

What does the notion of the truth and falsity of a context amount to? The intuitive idea is simple. At any point in a conversation, we can ask whether the information in the common ground correctly describes a particular possible world. And given how contexts record information, it is trivial to see that

(8) A context c is true at a world w iff $w \in c$.

In other words, the idea behind Heim's definition of truth is, as her slogan proclaims, that "To be a true sentence is to keep the context true."¹⁰

We saw that the notion of common ground information required for predicting felicity and infelicity of presuppositional sentences was defined in terms of the non-factive attitude of acceptance. That is, for a proposition to be included in the common ground, it is neither necessary nor sufficient that it be true at the world of evaluation. As we will see next, this means that the context of evaluation in Heim's definition of truth cannot be thought of in common ground terms.

Given the definition of truth above, a truth value gap is predicted in two kinds of situations. In particular, we derive the following from (7):

(9) ϕ is neither true nor false w.r.t. w and k iff either
 a. $c[\phi] = \#$, or
 b. $w \notin c$.

In either situation, the system will refrain from assigning a truth value. Hence, the system predicts a truth value gap for a sentence if either its CCP is undefined for the context of evaluation, or the context of evaluation is false at the world of evaluation (or both).

The problem is that because the context of evaluation is the common ground, then (9a) has the highly undesirable consequence that a conversational infelicity will be *sufficient* for a truth value gap.¹¹

⁹Heim (1982, 330).

¹⁰Heim (1983, 253).

¹¹Heim (1982, 337–341) discussed a similar problem, namely that her system predicts that *any* falsity in the context of evaluation is sufficient for a truth value gap. As a solution to this problem, both she and Bonomi (2005) propose to define truth w.r.t. a context of evaluation that contains no false information. The proposal I discuss below is a cleaner version of this idea, and hence also solves these further problems.

Assuming that the context of evaluation is the common ground, whether or not the update is defined or not is a matter of whether or not the presuppositions are accepted among the participants. There are four kinds of cases given the two parameters of acceptance/non-acceptance and truth/falsity of the presupposition at the world of evaluation. Table 1 shows what status is predicted for an utterance of ϕ_ψ for each type of case:

Table 1	ψ accepted	ψ not accepted
ψ false	gap, felicitous	gap, infelicitous
ψ true	true/false, felicitous	gap, infelicitous

As illustrated by Table 1, the Gap Constraint is violated by the system we have so far. We fail to make the truth of ψ both necessary and sufficient for the definedness of ϕ_ψ . Let me comment on these four cases in turn.

For the first type of situation, in which the presuppositions are accepted among the participants but nevertheless false, the system fails to assign a truth value. The reason is that in such a case the world of evaluation will not be included in the context of evaluation. This is intuitively right and illustrates the familiar Strawsonian situation in which the question of truth and falsity ‘does not arise’.¹² So this is a welcome consequence of the requirement that the context of evaluation be true at the world of evaluation.

The second kind of situation, in which the presupposition is both true and accepted, is probably the most common one. People make utterances that have certain presuppositions, and by and large, they take care to make sure that their presuppositions are true, and that they only make presuppositional utterances when they are fairly sure that their audience also accepts their presuppositions, or will at least accommodate them. In these cases, we want to say that the truth value of the utterance as a whole depends on whether or not the world of evaluation is the way the assertive component of the utterance represents things as being. And the system predicts this.

In the third type of situation, where the presupposition is both not accepted and false, the prediction of a gap is likewise intuitively compelling. Here we have both a conversational infelicity and a Strawsonian failure. The utterance is thus doubly defective.

Finally, consider the fourth type of situation in which the presupposition is not accepted but nevertheless true. The system will fail to assign truth or falsity to the utterance, due to the update-crash that results from the presupposition not being included in the context of evaluation.

¹²Cf. Strawson (1950, 330).

As long as the context of evaluation is the common ground, however, this consequence is clearly incorrect. It is easy to think of examples that provide evidence against this prediction. Here is a description of one kind of situation that will provide counterexamples to the prediction under discussion:

- (i) The presupposition is true, and the speaker knows this.
- (ii) The audience believes that the presupposition is false.
- (iii) The speaker believes that the audience believes that the presupposition is true.

The speaker confidently utters the sentence, due to (iii). But the system will not assign a truth value to the speaker's utterance, due to the infelicity induced by (ii). Nevertheless, it is intuitively clear that the utterance should be considered true or false depending on whether or not the asserted proposition correctly represents the facts at the world of evaluation.

To illustrate with just one example, consider the case of definite descriptions:

Coffe Room

Patrick and Sven are two new employees of The Firm. In order to keep them in line, they have been told that The Firm is run by a single all-powerful CEO and no board. Nevertheless, this is in fact false. The Firm is run by a board. One day, Patrick, Sven and a more senior employee, Stella, who is initiated into the actual workings of The Firm, are discussing the merits of different newspapers in the coffee room. During their conversation, Stella declares, 'The chairman of the board reads the Times every morning.'

In this situation, Stella's utterance will be infelicitous, since its presupposition is not mutually accepted between herself and her interlocutors. That is, an update crash will result from the presupposition being false at some of the worlds in the context of evaluation, i.e., the common ground. And the system therefore fails to assign a truth value to Stella's utterance. Nevertheless, our intuition is clear that her utterance should be considered true or false depending on the facts about the reading habits of the chairman.

5.3.2 Diagnosis: Common Ground Distortion

The problem is, then, that the dynamic system we have so far predicts that infelicity is sufficient for a truth value gap. This is intuitively too strong. Infelicity is not sufficient for a truth value gap. Nor is infelicity necessary for a gap, as is

obvious from the fact that we can speak felicitously when everyone accepts our presuppositions even though they are in fact false, and hence the utterance is intuitively neither true nor false.

In other words, conversational felicity and infelicity are wholly independent of semantic definedness, which depend only on the factual truth or falsity of the presuppositions. Consequently, what we would like to predict is laid out by Table 2.

Table 2	ψ accepted	ψ not accepted
ψ false	gap, felicitous	gap, infelicitous
ψ true	true/false, felicitous	true/false, infelicitous

What, more precisely, is the source of the discrepancy between these desiderata and the predictions in Table 1?

It is clear that the source has to be found in the assumption that the appropriate context of evaluation is the common ground. The common ground information, so to speak, *distorts* the evaluation. The common ground is by definition a collection of information towards which the participants bear the non-factive attitude of acceptance. Hence which worlds are in the context of evaluation is not determined by the facts, and therefore whether or not an update will crash or not is not determined by the facts but by what the participants accept. Hence, if the context of evaluation is the common ground, the Gap Constraint is violated.

5.3.3 No Assistance from Accommodation

I should address what might be felt to be an immediate response to the points just raised. The fact that a presupposition is not accepted prior to the utterance usually does not cause a conversational infelicity. What usually happens – thankfully – is that the hearers simply adjust the common ground to accord with the information that the speaker is perceived to be taking for granted. Lewis (1979b) coined the term *accommodation* for this process.

The situation we used as an example above involving a definite description is obviously one in which accommodation is very likely to take place. Stella's authority is likely to be accepted by her interlocutors who are therefore likely to go along with her presupposition. And of course, if accommodation does take place, the undesirable prediction of a gap is avoided.

However, this is in fact a *weakness* of the system. The reason for this is fairly obvious. It would surely be an unwelcome feature of a theory if it had the consequence that whether or not an utterance is assigned a truth value or a gap depended on whether or not accommodation takes place. The fact that a particular

presupposition is accommodated is irrelevant for whether one wants to assign a truth value to a sentence that presupposes it. But this is exactly what the present theory does predict.

Further, it is undeniable that accommodation does not always take place – sometimes the fact that the audience does not accept a presupposition simply leads to infelicity. Typically, the audience will ask a question concerning the presupposition that the speaker is representing herself as making by uttering the sentence she did. This results in the speaker making the presupposition explicit, and it can then be debated. For example, in the case above, Patrick and Sven might be so astonished at having been deceived that they would interrupt Stella to verify that there really is a chairman. So given that accommodation sometimes occurs and sometimes does not, the system predicts that gappiness varies with accommodation, and it does so with respect to the *same* world of evaluation. Clearly, this is a further implausible consequence.

5.3.4 One World

The original definition in (7) conceived of the context of evaluation as directly determined by the common ground. We found that this made incorrect predictions for presuppositional utterances. While discussing the dynamic solution to the projection problem, Schlenker (2008c) mentions in passing that

we can take a non-presuppositional sentence H to be true at a world w just in case w ‘survives’ the update with H [...].¹³

Taking up this idea, and broadening its scope to include presuppositional sentences, here is a proposal which will solve our present difficulties:

- (10) a. ϕ is true w.r.t. w and k iff $w \in \{w\}[\phi]$.
 b. ϕ is false w.r.t. w and k iff $w \notin \{w\}[\phi]$.

In other words, we consider a *minimal* context of evaluation, namely the one which consists only of the world of evaluation. So the proposal is that when we want to evaluate a sentence ϕ for truth and falsity at a world w , we check whether w is eliminated by ϕ , and hence the evaluation for truth and falsity takes place in complete isolation from contextual information. All we are looking at are the *facts* at the world of evaluation.

Notice that (10) has the consequence there are *no* false contexts of evaluation – by definition, any context of evaluation correctly represents the facts at the world of evaluation. But does that mean that we lose the correct prediction of a

¹³Schlenker (2008c, 5).

truth value gap in the cases where the presuppositions are false at the world of evaluation? We do not. Since the context of evaluation is simply the world of evaluation, the update crashes only when a presupposition is false at that world. Contrastingly, if all the presuppositions are true at the world of evaluation, $\{w\}[\phi]$ is defined, and whether or not the world of evaluation survives the update depends solely on whether or not the asserted proposition correctly represents the facts there.

Hence, this proposal solves the problem of infelicity being sufficient for a gap. How is this solution achieved? The evaluation for truth is envisioned as proceeding against an ‘objective’ context of evaluation from which falsities from the common ground have been rooted out, and so they cannot distort the process. To make predictions about felicity, we think of the CCPs as operating on common grounds. But what we have seen is that, to get a correct definition of truth in terms of context change, we have to refer to a different notion of context.

5.4 Fusion Failed

In this section I turn my attention to a different category of expressions, that of *epistemic modals*. I argue that although the proposal above is right for presuppositional sentences, it gets important facts about epistemic modals wrong. And moreover, what is needed to handle modals gets important facts about presuppositionality wrong.

5.4.1 Epistemic Modals

Epistemic modals are operators such as *might* as it appears in (11).

(11) We might be out of butter.

According to the standard analysis of such expressions, (11) makes the claim that the possibility of being out of butter is compatible with a relevant body of information. Put differently, (11) claims that the relevant body of information is not strong enough to rule out the possibility that the group of people referred to by *we* is out of butter. In turn, *must* is taken to be the dual of *might* in that *must* ϕ is equivalent to \neg *might* $\neg\phi$.

I will assume here that the notion of contextual information relevant for the felicity of epistemic modals is that of common ground.¹⁴ Further, in mainstream

¹⁴There are some reasons to doubt this assumption. In particular, it is not implausible that ultimately the proper notion is one on which the relevant information is what the participants *take to be known*. For some discussion, see Veltman (1996, 260, n. 3), Portner (2009, 87–91).

dynamic semantics, epistemic modals are treated by means of CCPs that are procedural in the sense that they serve not so much to change the context as to check whether the contextual information is of a certain kind. Here is the standard definition of the CCP for *might* ϕ :¹⁵

$$(12) \quad cg[\textit{might } \phi] = \{w \in cg : cg[\phi] \neq \emptyset\}.$$

As von Fintel and Gillies (2007) explain, the clause says that *might* ϕ

will take the information state [...] and either return all of it or none of it, depending on whether or not the condition is satisfied. The condition is that the information that ϕ carries be compatible with [the information state].¹⁶

As they indicate, this means that an equivalent rendition of the proposed CCP for *might* is the following:

- (13) a. If $cg[\phi] = \emptyset$, then $cg[\textit{might } \phi] = \emptyset$.
 b. If $cg[\phi] \neq \emptyset$, then $cg[\textit{might } \phi] = cg$.

What does it mean to ask whether ϕ is compatible with *cg*? According to the proposal, ϕ is compatible with *cg* if the result of applying its CCP to *cg* is non-empty. The output of a CCP is non-empty if there is at least one world at which the proposition expressed is true. This means that ϕ is compatible with the common ground when the common ground does not rule ϕ out.

So for example, consider an utterance of (11). Two things will occur. First, the Kaplan context will determine a propositional content for what plays the role of ϕ (known as the *prejacent* to the modal). In this case, the prejacent is paraphrasable as ‘We are out of butter’. This means that the context must determine an extension for *we* – roughly, a set of individuals that includes the speaker.¹⁷ Suppose that the proposition assigned to the prejacent is that Albert and Victoria are out of butter. Secondly, the CCP of *might* now comes into play. Applying the CCP of (11), we check whether the common ground is compatible with Victoria and Albert being out of butter. If it is – that is, if it is not ruled out that

The question boils down to whether we want to predict that *might* ϕ is felicitous in a situation in which ϕ is compatible with what the participants accept, although incompatible with what they take themselves to know. I think intuitions are unclear here, and it is therefore relatively harmless to make the simpler assumption, which means we can avoid having to introduce another notion of contextual information. But if the assumption turns out to be wrong, this further complexity can easily be incorporated.

¹⁵I rely on von Fintel and Gillies (2007). They acknowledge (p. 53, n. 24) Veltman (1996), van der Does, Groenenveld, and Veltman (1997), Beaver (2001, ch. 5), Gillies (2001). See also Groenendijk, Stokhof, and Veltman (1997).

¹⁶von Fintel and Gillies (2007, 53–54).

¹⁷Ultimately, we will most likely want to say that plural pronouns (usually) refer to plural individuals since these can be claimed to be of type *e*. I ignore this here, though. (See Essay 3.)

they are out of butter – then nothing happens, the context is left untouched. If the common ground rules out that they are out of butter – then it is rendered absurd.

How does this explain felicity conditions? As Groenendijk et al. (1997) put it,

No hearer will be prepared to update his information state with a sentence if the result would be the absurd state.¹⁸

The idea is, then, that we are entitled to assume that participants will try to avoid the situation where the common ground is empty. They will therefore either reject a statement threatening to produce that result or revise the common ground so as to avoid the absurdity. The former case is a case of infelicity, the latter case is one closely resembling presupposition accommodation.

This treatment is in the business of predicting how *might*-sentences function in conversations. The non-factive notion of common ground is suitable for this purpose because whether an utterance of a *might*-sentence proceeds smoothly depends not on what is known but on what is taken to be known.

5.4.2 Collapse

What does our proposal for defining truth predict in the case of modals, given the semantics just outlined? From the definition of the CCP for *might* ϕ and the definition of truth in (10), we derive:

$$(14) \text{ might } \phi \text{ is true w.r.t. } w \text{ iff } w \in \{w\}[\text{might } \phi] \text{ iff } \{w\}[\phi] \neq \emptyset \text{ iff } \llbracket \phi \rrbracket^{k,w} = 1.$$

This is clearly unsatisfactory in that it *equates* the truth conditions of *might* ϕ with those of the prejacent. It thus predicts that Victoria's utterance of (11) is true just in case Albert and herself are in fact out of butter.

This problem can be stated by noting that the present definition of truth violates what is usually taken to be a truism about epistemic modality. The principle is sometimes called 'Non-Collapse':¹⁹

Non-Collapse. What is epistemically possible is sometimes not merely what is actually true.

This means that the context of evaluation is at least sometimes not so specific as to rule out every world but the actual world. (Indeed, it is hard to think of situations where this is not the case!) So, in our framework,

¹⁸Groenendijk et al. (1997, 192). See also Portner (2009, 94).

¹⁹This is the terminology of Yalcin (2007a).

For some contexts of evaluation c and worlds of evaluation w , $\{w\} \neq c$.

Intuitively, “with respect to some contexts, what is possible is not, or not merely, what is actual.”²⁰

Imposing Non-Collapse avoids collapsing the truth conditions of the *might*-sentence into those of the prejacent. But Non-Collapse just rules out (10) as a definition of truth by fiat. In fact, with Non-Collapse in place, we *cannot* give the right truth conditions for presuppositional sentences with our present resources. The reason is that with more than one world in play, the CCP of ϕ_ψ can become undefined even when ψ is true at the actual world, and hence the Gap Constraint will fail.

One possible reaction to this is to question the idea of giving truth conditions for modal sentences in the first place. Many dynamic semanticists remain skeptical about assigning truth conditions in general. For instance, Groenendijk et al. say,

Truth and falsity concern the relation between language and the world. In dynamic semantics it is information about the world rather than the world itself that language is related to. Hence, the notions of truth and falsity cannot be expected to occupy the same central position as they do in standard semantics.²¹

One view, then, is that *might*-sentences do not serve to say something about the world but rather to say something about the context, i.e., the collection of information about the world that is evolving through discourse. And for this reason we should forego the project of assigning truth conditions to sentences of this type.

A possible confusion arises from the fact that some dynamic semanticists agree with this fundamental attitude towards modals but still allow themselves to speak of truth and falsity. For instance, von Fintel and Gillies maintain that

although it can make perfect sense to assign *truth-conditions* to modal expressions [...] those truth-conditions are not about whether a proposition expressed by the sentence is true. So there is room to allow that epistemic modals have and contribute truth-conditions, without requiring them to traffic in and express propositional contents. This is yet another way of exploring the idea that epistemic modals involve a kind of comment about the information carried by their prejacent.²²

The important point, though, is not whether we elect to speak in terms of truth or falsity but rather how these notions are conceived of by the system. In particular,

²⁰Yalcin (2007a, 1002).

²¹Groenendijk et al. (1997, 192).

²²von Fintel and Gillies (2007, 55).

what matters is whether the relevant notions are defined relative to a world, as we have done above, or not.

To be sure, a notion of truth that is not relativized to worlds may be suited for many purposes such as characterizing contrariness, consistency, entailment, etc.²³ However, my interest here is in the project of giving a *general* definition of truth derived from CCPs. By this I mean a definition of the form

Truth Schema. ϕ is true w.r.t. X iff Y .

To achieve the derivation, a CCP has to figure in Y in a non-trivial way.²⁴ To achieve generality, one should be able plug in any sentence for ϕ and get the right result. Since at least some classes of sentences (e.g., bland and presuppositional sentences) depend on the facts for their truth, we want to make reference to a world, or something else robust enough to play the role of the facts, in X .

I want to suggest that the dynamic semantics for modals introduced above is compatible with thinking of them as having truth conditions of this robust kind.

5.4.3 Truth Conditions for Modals: A first Proposal

Let us first look at the truth conditions that von Fintel and Gillies adopt:

(15) ϕ is true w.r.t. c iff $c[\phi] = c$.

As they say, this means that “A sentence is true in a state iff the information it carries is already present in that state.”²⁵

An immediate question here is how to think of c . Since we are focusing on modals at the moment, let us for the time being think of it as a common ground. So, in the case of *might*-sentences, (15) predicts that

(16) *might* ϕ is true w.r.t. cg iff $\exists w \in cg : \llbracket \phi \rrbracket^{k,w} = 1$.

So we predict that *might* ϕ is true relative to a common ground cg if and only if the propositional content assigned to its prejacent is compatible with the information in cg .

The problem with this suggestion, from our point of view, is that it does not relativize truth to a world. Truth is here defined relative to a common ground.

²³See Veltman (1996), Groenendijk et al. (1997), von Fintel and Gillies (2007).

²⁴I deliberately avoid commitment to the claim that the CCP that appears on the right hand side must be the CCP of ϕ , since it may be that, in some case, we shall have to define truth conditions by referring to the CCPs of other sentences. Even so, there is no immediate threat to the project of deriving truth conditions from CCPs.

²⁵von Fintel and Gillies (2007, 50).

The concept of truth that it engenders is therefore of the lightweight kind that von Fintel and Gillies had in mind in the passage quoted above. My plan is to use the basic idea of this to arrive at a notion that is suitably relativized.

The first thing to note is that when we are interested in defining truth for epistemic modals, common ground is no longer the relevant kind of contextual information. This is seen already from another intuitive principle about epistemic modality:

Reflexivity. What is actually true is epistemically possible.

If Reflexivity holds, then

- (17) a. If ϕ is true, then *might* ϕ is true.
 b. If *must* ϕ is true, then ϕ is true.

Given that Reflexivity has to be validated, the context of evaluation to serve in the truth conditions for modals must consist of propositions that are known, and not merely accepted.²⁶

In particular, the relevant context of evaluation will be defined as follows:

Knowledge Context. A knowledge context is a set of worlds

$$kc = \{w : \text{for all } \phi \text{ s.t. the participants mutually know } \phi, \llbracket \phi \rrbracket^{k,w} = 1\}.$$

So the aim is to give a definition of truth in terms of their dynamic CCPs and relative to a world and a knowledge context.

To do so, I will appeal to a modified Kaplan context. A Kaplan context is a representation of a concrete situation. The proposal is to add to the tuples we already have a parameter representing the knowledge context of that situation. So a Kaplan context k will now be a tuple

$$k = \langle a_k, t_k, l_k, w_k, g_k, kc_k \rangle$$

So kc_k is the knowledge context in play in the situation in which the utterance takes place. We then reshape the CCP-based definition of truth currently on the table so it becomes relative to Kaplan contexts:

- (18) ϕ is true w.r.t. k iff $kc_k[\phi] = kc_k$.

²⁶It might be thought that Reflexivity follows from the fixed-point definition of truth in (16). For given that $cg[\phi] = cg$ iff for all $w \in cg : \llbracket \phi \rrbracket^{k,w} = 1$, it is clear that if ϕ is true in the fixed-point sense, then *might* ϕ is true in that sense; and if *must* ϕ is true in the fixed-point sense, then ϕ is true in that sense. But notice that Reflexivity speaks of *actual* truth. And since it may be that $@ \notin cg$, $cg[\phi] = cg$ does not entail that $\llbracket \phi \rrbracket^{k,@} = 1$.

Why is there no world mentioned on the left-hand-side in this definition? We are here mimicking the notion of *truth-in-a-context* from Kaplan (1977, 547). For Kaplan, this notion was defined so that a sentence is true-in-a-context k if and only if it is true relative to k and the circumstance of evaluation you get by plugging in the time and world of k . But since I am here thinking of circumstances as just worlds, it is defined as follows:

Truth in a Context

ϕ is true in k iff $\llbracket \phi \rrbracket^{k, w_k} = 1$.

So when we talk of truth relative to, or with respect to a Kaplan context, we have this notion in mind.

If we substitute *might* ϕ for ϕ in (18), we predict that *might* ϕ is true with respect to a Kaplan context k if and only if its prejacent is compatible with the knowledge context in k . Put differently, a *might*-sentence is true if and only if the propositional content assigned to the prejacent relative to the context of utterance is compatible with what is known in that context.²⁷ And the dynamic CCP for the modal is preserved.

5.4.4 Demanding Completeness

We now have a proposal that assigns CCP-based truth conditions to modal sentences while respecting both the idea that truth should be relativized to the facts and that the truth of a modal claim depends on the knowledge context in play. How will this fare with presuppositional sentences?

Plugging ϕ_ψ into (18), we get:

$$(19) \quad \phi_\psi \text{ is true w.r.t. } k \text{ iff } kc_k[\phi_\psi] = kc_k \text{ iff } \forall w \in kc_k : \llbracket \psi \rrbracket^{k, w} = 1 \text{ and } \llbracket \phi \rrbracket^{k, w} = 1.$$

²⁷There are parallels between this proposal and the ‘Diagonal’ view of Yalcin (2007a), which he ultimately rejects. See in particular Yalcin (2007a, 1009). Note also that the definition in (18) can be used to define contents of either a standard or centered kind represented by the contrast between

Standard Content of ϕ relative to k . $\lambda w. \phi$ is true w.r.t. $\langle w, kc_k \rangle$.

Centered Content of ϕ . $\lambda k. \phi$ is true w.r.t. k .

This fact can be taken as evidence against the widespread conception that sentences with CCPs of the kind in (12), which are therefore genuinely dynamic in the sense of van Benthem (1986), cannot be associated with propositional contents. There are some reasons to think that this variety of Centered Contents can provide a treatment of the embedding data identified by Yalcin (2007a), sometimes taken as a stumbling-block to a dynamic treatment of epistemic modals (see Portner (2009, 97)). Stephenson (2007) handles this data with centered contents, although of a different kind.

In other words, the truth conditions of ϕ_ψ will come out as follows:

- (20) a. ϕ_ψ is neither true nor false w.r.t. k iff $\exists w \in kc_k$ s.t. $\llbracket \psi \rrbracket^{k,w} = 0$.
 b. ϕ_ψ is true w.r.t. k iff $\forall w \in kc_k : \llbracket \psi \rrbracket^{k,w} = 1$ and $\llbracket \phi \rrbracket^{k,w} = 1$.
 c. ϕ_ψ is false w.r.t. k iff $\forall w \in kc_k : \llbracket \psi \rrbracket^{k,w} = 1$ and $\llbracket \phi \rrbracket^{k,w} = 0$.

Looking at (20a), we satisfy the left-to-right direction of the Gap Constraint. That is, we have that

Partial Gap Constraint. If ψ is false, then ϕ_ψ is neither true nor false.

In terms of worlds, Reflexivity states that the actual world is always included in the knowledge context. So (20a) predicts that if the actual world is a $\neg\psi$ -world, then ϕ_ψ is neither true nor false.

But we fail to derive that if ψ is true, then ϕ_ψ is either true or false depending on whether ϕ represents the facts at the actual world correctly. The reason is that all that is required for ϕ_ψ to be neither true nor false is that there is *some* world in kc_k where ψ is false, but of course this could be so even if ψ is actually true. More concretely, we predict that if the knowledge context is compatible with both ψ and $\neg\psi$, then ϕ_ψ will be neither true nor false even if ψ is true at the actual world.

Is this acceptable? That is, can we learn to live with the Partial Gap Constraint? I think we cannot; we should stand firm on our demand for the full blooded Gap Constraint. If we settle for the Partial Gap Constraint, we would have to live with predicting truth value gaps in situations like the following:

Elevator

Katie has long been an enthusiastic cyclist. In fact, until recently she never indulged in any other form of exercise. But when she started a new job in a different part of the city a few months ago, she took up swimming in a nearby pool. One day, two of Katie's new colleagues, Enrico and Susan, are chatting in the elevator. Neither of them know Katie well enough to know what kind of sports she likes. But because Enrico likes Susan, he is trying to get her to agree to go swimming once a week. So he tells her, 'Lots of people are swimming nowadays. For instance, Katie has started swimming.'

The intuition is clear that what Enrico said is true. His utterance presupposes that Katie has not already been swimming and it asserts that she is, both of which are in fact the case. However, given the system we have at the moment, we predict that what he said is neither true nor false, simply because the knowledge context does not rule out that she has been swimming before.

I think this kind of consideration is sufficient to demand more than the Partial Gap Constraint. The reason we originally accepted the Gap Constraint was that it is simply another way of spelling out the notion of a semantic presupposition. A semantics which aims to treat presuppositions as both semantic and pragmatic must respect the Gap Constraint.

5.5 Fusion Achieved

In this section I propose a unified framework that allows deriving truth conditions from CCPs in a way that satisfies our desiderata. The definition I propose respects the demands we noted in relation to the Truth Schema, and it makes the right predictions for both presuppositional and modal sentences.

5.5.1 Fusion Contexts

Why have things gone wrong so far? We have been thinking of CCPs as operating on contexts that are just sets of worlds, collections of a particular kind of information. But we can see the problems with reaching a unified definition of truth, derived from CCPs, as caused by the limitations of this simplistic picture. Instead, the proposal below constitutes a unified system. The main device is to make CCPs operate on richer entities. In particular, they will be operating on contexts that have more structure than the sets of worlds traditionally encountered in dynamic semantics. I call such contexts *fusion contexts*.

A fusion context is a representation of many different aspects of an utterance situation at the same time: The world in which it takes place, and several types of information in play. As such, fusion contexts provide a more realistic representation of a conversational setting than one that just consists of one kind of information, such as common ground.

It is very natural to think of conversations as evolving against the background of different types of shared information. Speakers can say things that are contradictory to what they think they know; they can go along with presuppositions that they know, or think they know, to be false; whole conversations can take things for granted that everyone knows to be false. But likewise, in many situations, we are not so lax, and we only say things that conform to what we take to be genuine knowledge. Yet we may be wrong, and this will affect the truth of what we say, although not its felicity.

At the same time, we will view conversations as taking place in contexts of the Kaplanian sort, that is, we will take CCPs to act on features of concrete utterance situations, relative to which truth is to be defined. The aim is, then, to outline a

semantics, which allows one to incorporate a host of different kinds of conversational backgrounds, while keeping its judgements of felicity and truth completely separate.

So a fusion context is an extension of the notion of a Kaplan context. In addition to incorporating both the knowledge context and the common ground into Kaplan contexts, we will include a variable n ranging over a set of values $\{1, 0, \star\}$. The \star can be thought of as a new truth value, the value neither true nor false, but we do not have to think of it this way. Just like we do not have to think of 1 and 0 as the values True and False, they are just model-theoretic devices *in terms of which* truth and falsity are defined. So a fusion context is a tuple:

$$u = \langle a_u, l_u, t_u, w_u, g_u, cg_u, kc_u, n_u \rangle$$

A word about n_u : If one is married to the idea that every element of the tuples we use to represent utterance situations must correspond to a tangible feature of the reality of such situations, how should one think of this element? n_u will be used to keep track of truth-relevant information. Hence one can think of n_u 's having a certain value roughly as corresponding to the 'fact' about the utterance situation that a particular sentence is true, false, or gappy. n_u is thus a sort of record of truth values throughout discourse.

Notice that our previous notion of a Kaplan context is subsumed by fusion contexts. So we can conveniently use fusion contexts as the kind of context to which $\llbracket \]$ is relativized. I do this from now on.

5.5.2 Sketching the System

The first thing to do is to introduce two new denotational clauses, one for presuppositional sentences, and one for epistemic modals. At this point we need to be strict in distinguishing between atomic and non-atomic sentences. We continue to use ϕ, ψ , etc. for the non-atomic case, as we have done above, and we use p, q , etc. for atomics. The two new denotation clauses we need are for atomics:

- (21) a. $\llbracket p_q \rrbracket^{u,w} = \#$ iff $\llbracket q \rrbracket^{u,w} = 0$.
 b. $\llbracket p_q \rrbracket^{u,w} = 1$ iff $\llbracket q \rrbracket^{u,w} = 1$ and $\llbracket p \rrbracket^{u,w} = 1$.
 c. $\llbracket p_q \rrbracket^{u,w} = 0$ iff $\llbracket q \rrbracket^{u,w} = 1$ and $\llbracket p \rrbracket^{u,w} = 0$.
- (22) a. $\llbracket \text{might } p \rrbracket^{u,w} = 1$ iff $\exists w \in kc_u : \llbracket p \rrbracket^{u,w} = 1$.
 b. $\llbracket \text{might } p \rrbracket^{u,w} = 0$ iff $\forall w \in kc_u : \llbracket p \rrbracket^{u,w} = 0$.

We return to some discussion of these clauses later.

The plan now is this. First we define updates for individual parameters of fusion contexts, and then we define an update of a fusion context as the result

of updating each of its parameters. We only need to define updates for n_u and cg_u , since they are the only ones that will change from context to context.²⁸ If one wants, one can define updates for the rest, which leave them the same in all cases. Here are the relevant definitions:

- (23) a. $cg_u[\phi_\psi] = \emptyset$ iff $\exists w \in cg_u : \llbracket \psi \rrbracket^{u,w} = 0$.
 b. If $cg_u[\phi_\psi] \neq \emptyset$, then $cg_u[\phi_\psi] = \{w \in cg_u : \llbracket \phi \rrbracket^{u,w} = 1\}$.
- (24) $n_u[\phi_\psi] =$
 a. \star iff $\llbracket \psi \rrbracket^{u,w_u} = 0$.
 b. 1 iff $\llbracket \psi \rrbracket^{u,w_u} = 1$ and $\llbracket \phi \rrbracket^{u,w_u} = 1$.
 c. 0 iff $\llbracket \psi \rrbracket^{u,w_u} = 1$ and $\llbracket \phi \rrbracket^{u,w_u} = 0$.
- (25) $cg_u[\text{might } \phi] = \{w \in cg_u : cg_u[\phi] \neq \emptyset\}$.
- (26) $n_u[\text{might } \phi] =$
 a. 1 iff $\exists w \in kc_u : \llbracket \phi \rrbracket^{u,w} = 1$.
 b. 0 iff $\forall w \in kc_u : \llbracket \phi \rrbracket^{u,w} = 0$.

There is no great change from what we have seen earlier. The only change is in the presuppositional case, where we are now modeling infelicity as the common ground being reduced to absurdity, rather than by means of partiality. Conceptually, this is an innocuous change. The reason for it will become clear below.

Given this setup, the definition of CCPs, i.e., of updates of a fusion context, is simply the following:

$$(27) \quad u[\phi] = \langle \dots, w_u, n_u[\phi], cg_u[\phi], kc_u \rangle.$$

The next step is to define truth as follows:

- (28) a. ϕ is true w.r.t. u iff $u[\phi] = \langle \dots, w_u, n_u[\phi], cg_u[\phi], kc_u \rangle$ s.t. $n_u[\phi] = 1$.
 b. ϕ is false w.r.t. u iff $u[\phi] = \langle \dots, w_u, n_u[\phi], cg_u[\phi], kc_u \rangle$ s.t. $n_u[\phi] = 0$.
 c. ϕ is neither true nor false w.r.t. u iff $u[\phi] = \langle \dots, w_u, n_u[\phi], cg_u[\phi], kc_u \rangle$ s.t. $n_u[\phi] = \star$.

Finally, we give a definition of felicity as follows:

- (29) a. ϕ is felicitous w.r.t. u iff $u[\phi] = \langle \dots, w_u, n_u[\phi], cg_u[\phi], kc_u \rangle$ s.t. $cg_u[\phi] \neq \emptyset$.

²⁸Here as above I am ignoring the obvious fact that the knowledge context very often changes during conversation. One obvious reason is that knowledge may be gained via testimony. Interesting questions arise concerning the relation between common ground change and knowledge context change. But they lie beyond the scope of the present discussion.

- b. ϕ is infelicitous w.r.t. u iff $u[\phi] = \langle \dots, w_u, n_u[\phi], cg_u[\phi], kc_u \rangle$ s.t. $cg_u[\phi] = \emptyset$.

Let me now illustrate some of the predictions of this system.

5.5.3 Predictions

First, what are the predictions for presuppositional sentences? ϕ_ψ takes a fusion context and returns another. Two things happen. First, the value of n_u is set. The important thing to note is that n_u is set to \star if and only if there are presuppositions that are false at the world of evaluation w_u . Secondly, the common ground changes. If the presuppositions are satisfied by the common ground information, we proceed as usual by eliminating all the worlds in which the asserted proposition is false.

Given the definitions of truth and felicity, we predict the desiderata from Table 2 (repeated here):

Table 2	ψ accepted	ψ not accepted
ψ false	gap, felicitous	gap, infelicitous
ψ true	true/false, felicitous	true/false, infelicitous

Notice in particular, that the Gap Constraint is satisfied: ϕ_ψ receives a gap if and only if ψ is false at the world of evaluation. So we treat ψ as a semantic presupposition. But we have merged this with a treatment of ψ as a pragmatic presupposition. We treat ϕ_ψ as felicitous if and only if ψ is accepted in the common ground (regardless of its actual truth value).

Moving on to modals, *might* ϕ takes a fusion context and returns another. Again, two things will occur. First, the value of n_u is set. It is set to 1 if and only if ϕ is compatible with the knowledge context, and to 0 if it is not. Secondly, *might* acts on the common ground. It checks whether ϕ is compatible with the common ground and returns the emptyset if it is not, and otherwise leaves it undisturbed.

We thus make the following predictions for *might* ϕ :

Table 3	ϕ compatible with cg_u		ϕ incompatible with cg_u	
	ϕ comp. with kc_u	ϕ incomp. with kc_u	ϕ comp. with kc_u	ϕ incomp. with kc_u
ϕ false	true, felicitous	false, felicitous	true, infelicitous	false, infelicitous
ϕ true	true, felicitous		true, infelicitous	

Looking at Table 3, we notice that the results accord with the following two intuitive ideas:

Modal Truth. *might* ϕ is true w.r.t. u iff ϕ is compatible with what is known in u .

Modal Felicity. *might* ϕ is felicitous w.r.t u iff ϕ is compatible with the common ground in u .

This means that there is no relation between felicity conditions and truth conditions. Hence, *might* ϕ , on this account, can be false but felicitous and true but infelicitous.

The first of these situations is one in which the participants are willing to go along with things they in fact know to be false. We need not assume that they realize that they have this knowledge. The intuition is that it can be felicitous to utter a *might*-sentence in a context where what is mutually accepted for the purpose of the exchange is compatible with ϕ , even though the genuine knowledge the participants have is in fact strong enough to rule ϕ out, and hence the utterance is false.

The second situation is one in which the participants are not willing to go along with something that they in fact (perhaps without realizing this) know to be true. That is, it can be infelicitous to utter *might* ϕ if ϕ is incompatible with the common ground information; yet if what is known is in fact strong enough to rule out $\neg\phi$, then this utterance will be judged as true.

Finally, notice that both the truth conditions and the felicity conditions of *might*-sentences, on this picture, are independent of the actual truth or falsity of the prejacent. In other words, the system satisfies Non-Collapse, the assumption that kc_u sometimes contains more worlds than just the actual world. And it satisfies Reflexivity, which rules out as non-existent cases in which the prejacent is true but *might* ϕ is false. These are represented by blanks in Table 3. So the actual truth of ϕ is sufficient (although not necessary) for the truth of *might* ϕ .

5.5.4 Embeddings

Another feature of the account above is that it handles embeddings. That is, the CCPs defined for presuppositional sentences and epistemic modals, and the definitions of truth and felicity, are intended to apply not just to atomic cases. Let me illustrate this.

There are two kinds of embedding cases to consider. The first is one where an epistemic modal scopes over a presupposition trigger. Let us limit ourselves to considering embeddings of atomic presuppositional sentences. So we are considering sentences of the form *might* p_q . Here is an example:

(30) Katie might have started swimming.

What do we predict for this case? That is, how is *might* p_q predicted to update n_u and cg_u ? Plugging *might* p_q into our clauses, we get:

- (31) $n_u[\textit{might } p_q] =$
 a. 1 iff $\exists w \in kc_u : \llbracket p_q \rrbracket^{u,w} = 1$.
 b. 0 iff $\forall w \in kc_u : \llbracket p_q \rrbracket^{u,w} = 0$.

- (32) $cg_u[\textit{might } p_q] = \{w \in cg_u : cg_u[p_q] \neq \emptyset\}$.

This explains the reason for reshaping the way presuppositional sentences affect common ground, and for adding the denotational clauses for atomic presuppositional sentences. If we had not done that, the two instances above would have been meaningless. But because we made that preparation, we now derive results. And they turn out to be correct.

I will describe the predictions we make in an informal way, rather than trekking through the details of the derivations. Given the definitions of truth and felicity, we derive that

- (33) a. *might* p_q is true w.r.t. u iff it is compatible with kc_u that q and that p .
 b. *might* p_q is false w.r.t. u iff it is incompatible with kc_u that $\neg q$ and that p .
 c. *might* p_q is neither true nor false w.r.t. u iff it is incompatible with kc_u that q .
 d. *might* p_q is felicitous w.r.t. u iff q is accepted in cg_u .

With respect to our example, this means that

- (34) a. (30) is true w.r.t. u iff it is compatible with what is known in u that Katie has not been swimming before and that she is swimming now.
 b. (30) is false w.r.t. u iff it is incompatible with what is known in u that Katie has been swimming before and that she is swimming now.
 c. (30) is neither true nor false w.r.t. u iff it is incompatible with what is known in u that Katie has not been swimming before.
 d. (30) is felicitous w.r.t. u iff it is accepted in the common ground in u that Katie has not been swimming before.

These results show that we predict that *might* p_q semantically presupposes *might* q . For note that if no world in kc_u is a q -world, then neither (31a) nor (31b) applies in that the truth of p_q requires at least one q -world, while falsity requires that all worlds are q -worlds. So *might* p_q is neither true nor false if q is incompatible with what is known. Further, we predict that *might* p_q pragmatically presupposes that q in that *might* p_q will be infelicitous if it is not accepted among the participants that q . So (30) projects the semantic presupposition that Katie might not have

been swimming before, and the pragmatic presupposition that she has not been swimming before. I take these results to be at least *prima facie* intuitively plausible.

Now consider the reverse kind of situation where a presupposition trigger scopes over an epistemic modal. Again we limit ourselves to embeddings of atomics. The case we are after is of the form $p_{\text{might } q}$. Here is an example:

(35) John realizes that it might be raining.

Again, we plug our embedding case into the clauses defined earlier:

(36) $n_u[p_{\text{might } q}] =$
 a. \star iff $\llbracket \text{might } q \rrbracket^{u, w_u} = 0$.
 b. 1 iff $\llbracket \text{might } q \rrbracket^{u, w_u} = 1$ and $\llbracket p \rrbracket^{u, w_u} = 1$.
 c. 0 iff $\llbracket \text{might } q \rrbracket^{u, w_u} = 1$ and $\llbracket p \rrbracket^{u, w_u} = 0$.

(37) a. $cg_u[p_{\text{might } q}] = \emptyset$ iff $\exists w \in cg_u : \llbracket \text{might } q \rrbracket^{u, w} = 0$.
 b. If $cg_u[p_{\text{might } q}] \neq \emptyset$, then $cg_u[p_{\text{might } q}] = \{w \in cg_u : \llbracket p \rrbracket^{u, w} = 1\}$.

As before, we make predictions here because of the additional denotational clauses. In particular, because we have defined denotational clauses for *might p*, the system will know how to set the value of n_u .

Given the definitions of truth and felicity, we derive that

(38) a. $p_{\text{might } q}$ is true w.r.t. u iff q is compatible with kc_u and p is true at w_u .
 b. $p_{\text{might } q}$ is false w.r.t. u iff q is compatible with kc_u and p is false at w_u .
 c. $p_{\text{might } q}$ is neither true nor false w.r.t. u iff q is incompatible with kc_u .
 d. $p_{\text{might } q}$ is felicitous w.r.t. u iff *might q* is accepted in cg_u .

In terms of the example in (35), this means that

(39) a. (35) is true w.r.t. u iff it is compatible with what is known in u that it is raining and John realizes this.
 b. (35) is false w.r.t. u iff it is compatible with what is known in u that it is raining and John does not realize this.
 c. (35) is neither true nor false w.r.t. u iff it is incompatible with what is known in u that it is raining.
 d. (35) is felicitous w.r.t. u iff it is common in u ground that it might be raining.

As seen from this, the prediction is that $p_{\text{might } q}$ is true or false only if *might q* is true. So the latter is a semantic presupposition of $p_{\text{might } q}$. And further, $p_{\text{might } q}$ is felicitous only if *might q* is common ground. So *might q* is a pragmatic presupposition of $p_{\text{might } q}$. In terms of our example, we predict that (35) projects both

the semantic and pragmatic presupposition that it might be raining. As before, these results at least initially seem intuitively acceptable.

So it appears that our system makes tolerable predictions with respect to embeddings. Before closing, I remark briefly on some further issues.

5.5.5 Adding Connectives

One thing that has so far been glossed over is the following question: Given that we define CCPs in terms of a prior definition of $\llbracket \cdot \rrbracket$ – that is, in terms of a prior definition of what we can plausibly call *satisfaction* conditions – then why insist on defining truth in terms of CCPs? The reason is that, although compositional, $\llbracket \cdot \rrbracket$ is defined only up to the level of *atomic* sentences. But a central part of the motivation for dynamics from the origin was that, even so, CCPs should be the notion that is *recursively* defined. That is, the notion that is defined for the connectives. The reason for this was the desire to predict facts about presupposition projection in compound sentences.

This involved defining CCPs for the connectives that was meant to allow one to derive both the right truth conditions and the right projection facts. I will confine myself here to conjunction, and will give no more than an outline of how this can be incorporated into the system above.

We want to predict the right projection facts both for semantic and pragmatic presuppositions. We thus need to incorporate both a way of updating the common ground such that we will predict the right felicity facts, and a way of setting the value of n_u so that we will predict the right truth conditions. With respect to the latter, it will not do to set things up such that conjunctions are true if and only if both their conjuncts are true. For one thing, we need to say something about how truth value gaps percolate up, so to speak. But at the same time we want to predict the well known asymmetric projection facts about conjunctions with presuppositional conjuncts.

One way of doing so is to follow Peters (1979) and adopt the following variant of the truth tables for conjunction and the conditional from the ‘strong’ logic of Kleene (1952):²⁹

\wedge	1	o	#
1	1	o	#
o	o	o	o
#	#	#	#

²⁹Sophisticated versions of this approach to presupposition projection has been developed by Beaver and Krahmer (2001), George (2008). See also Fox (2008), Beaver (2001, ch. 2).

According to this truth table, conjunction is asymmetric in the sense that $0 \wedge \#$ receives the value 0 whereas $\# \wedge 0$ receives $\#$. This accords with the often observed projection fact associated with conjunction in English, namely that whereas $\phi_\psi \wedge \gamma$ presupposes ψ , $\psi \wedge \phi_\psi$ presupposes nothing.

This was noted by Stalnaker (1974) who diagnosed the phenomenon by positing that when one asserts that ϕ and ψ one first asserts that ϕ and then asserts that ψ . Hence any presuppositions of ψ that are entailed by the assertive component of ϕ will trivially be satisfied by the common ground once the assertion of the second conjunct is made. This analysis was encoded in the CCP for conjunction that Heim (1983) proposed, where

$$(40) \quad c[\phi \wedge \psi] = c[\phi][\psi]$$

I take it that it is obvious that this can be incorporated into the fusion system as follows. A conjunction $\phi \wedge \psi$ will set n_u in accordance with the Peters truth table above. And furthermore, it will affect the common ground such that $cg_u[\phi \wedge \psi] = cg_u[\phi][\psi]$. And hence we will predict the right projection facts in accordance with the definitions of truth and felicity in terms of fusion CCPs.

5.5.6 Byproducts

Fusion was achieved at several cost. One cost comes from the additional denotational clauses (21)–(22) we had to avail ourselves of in order to handle embeddings. As mentioned above, the original dynamic thought was to only define denotational clauses up to atomic sentences and let recursion be handled by CCPs in order to predict projection facts.

Defining the denotation of p_q is arguably not in violation of this idea. Briefly, we can assume that presuppositional expressions like *start*, *the*, *realize* etc. are associated with partial denotations, and that this partiality composes up to the level of atomic presuppositional sentences.

However, far less plausibly, we are required to regard *might p* as atomic. If *might p* is not atomic, then by allowing it into the domain of the denotation function, we have allowed for denotations to be recursively defined. If so, then why not give recursive clauses for the connectives?

One answer might be that the reason is that this will not give the right projection results. But there is an obvious problem with this answer. Namely, since to hold that some strategy along the lines sketched above involving clauses akin to the Peters connectives is ultimately feasible is at least as plausible as to hold that the dynamic strategy can in the end be worked out, it is simply not safe to assume

that allowing recursion inside the denotation function will necessarily give the wrong results in terms of projection of semantic presuppositions.

What should we make of these issues? If what I have argued is on the right track, then it appears that the only way of successfully deriving truth conditions for both presuppositional sentences and modals from their CCPs, handling both embeddings and projection, is to fuse things in the way sketched. By adding the device of keeping track of denotational values through discourse, we have in effect alloyed a denotational and a dynamic semantics. Sparks have flown in the form of the costs adduced. If one is sufficiently troubled by these costs, then one can view the above as a *reductio* of the project of unification. But if one can live with them, then one can declare unification achieved, although by hard labor.

Some are likely to be content with the *reductio*. In particular, for the theorists who believe that the project of assigning truth conditions to epistemic modals is misguided from the outset, fusion can be avoided in favor of the definition of truth discussed in 5.3.4 on which the context of evaluation is the singleton of the world of evaluation. This route is one that involves regarding *might*-statements as not truth-apt in the way associated with *expressivist* stances on other areas of language such as moral and aesthetic claims, or indicative conditionals.³⁰

I will end by a very brief comment about this in relation to the topics we have been discussing. Take the expressivist about moral claims. One at least *prima facie* plausible claim is that, although sentences expressing moral claims, are not truth apt, they nevertheless affect discourse, and most likely they have felicity conditions. To incorporate the former part of this position, one idea is to maintain that moral predicates are not in the domain of the denotation function. In turn, one could then try to claim that, even so, moral sentences are associated with CCPs.

However, given that CCPs are defined in terms of denotations, this is either not feasible for the theorist we are envisioning, or she will need another way of defining CCPs. There are reasons for being pessimistic about the latter horn of this dilemma. How is one to think of CCPs acting on sets of worlds if not in terms of, at some level, relations holding between sentences and worlds? And what else could such relations be but relations which, however weakly, are conceptualized in terms of notions inimical to expressivism such as representation, satisfaction, if not truth?³¹

³⁰Yalcin (2007b) argues for this position.

³¹A relevant comparison is Veltman (1996) who proposes to interpret worlds not as ontological primitives but as sets of formulas and hence the interpretation function of this system maps formulas onto sets of worlds, that is, onto the sets of formulas of which they are members. One can note that although it might seem that this avoids the commitment to something that looks very much

5.6 Conclusion

I described the original dynamic treatment of presuppositions as a semantic conception of pragmatic presuppositions. Since CCPs are the values recursively assigned by the system, and since – pre-fusion – CCPs only encoded preconditions on felicity by determining how sentences affect common ground, this meant that deriving satisfactory truth conditions was in danger of making conversational infelicity sufficient for gappiness. The remedy we looked at was to define truth in terms of CCPs acting on an artificial context of evaluation, intuitively, the information state which rules out all worlds but the world of evaluation. In effect this maneuver was a way of neutralizing the pragmatic presuppositions encoded by CCPs for the purpose of evaluating for truth.

Epistemic modals presented a problem for this definition of truth. Acting as tests on common grounds, rather than updates, their truth conditions make reference to more realistic information states than the minimal one just mentioned. Faced with the tension arising from presuppositional sentences wanting to shrink the context of evaluation and modals wanting to enlarge it, unification was achieved by fusion.

But fusion blew sparks that pose questions about the project of unification itself. Felicity conditions and truth conditions can cohabit; but only in makeshift quarters.

like taking satisfaction conditions as basic, it is far from clear that this is really the case. Indeed, Beaver suggests as much: “To see how a set of atomic formulae can be identified with a possible world think of the atomic formulae in the set as those which are true at that world, and those not in the set as false in that world”. (Beaver (2001, 150)).

6 Conclusion

In the introduction to this thesis, I described how semantic research has developed in an increasing attempt to capture aspects of natural languages beyond truth-conditional information, the cardinal examples being indexicality and presupposition. In the essays that followed, challenges to this project have been encountered – some have been answered and some have been left open.

Essay 2 aimed at showing how to accommodate a fact about interpretation – the prominence of speaker’s intentions in the content-determination of indexicals – which to some have spelled misfortune for the semantic account of indexicality. Significantly, this involved abandoning the original Kaplanian picture of indexicality in favor of the variable-based approach on which the speaker’s intentions are directly represented by the assignment of values.

In Essay 3 I dealt with the challenge arising from a particular phenomenon involving the descriptive meanings that for Kaplan were encoded in characters, namely that of descriptive uses of indexicals. Again, the variable view was seen to be able to accommodate what at first appeared to be recalcitrant data. In particular, by noting that, on the one hand, the variable picture is straightforwardly extendable to incorporate e-type uses, and on the other hand, that descriptive meanings play a role in settling the values of e-type uses, the claim that descriptive readings call for a revision of the semantics was rejected.

The variable-based view of pronouns relegates their descriptive meanings to the phi-features. But a question remains about how to analyze the information contributed by the features. In Essay 4 I discussed a standard proposal according to which the features are presupposition triggers. The main issue was what kind of presuppositional information feature-information might be. I distinguished several kinds of combinations of the main notions of semantic and pragmatic presuppositions. But none seemed fit to cover feature-information. The question still stands, then, of how to analyze feature-information and its contribution to interpretation, although its fundamental role of guiding audiences’ attempts at

ascertaining speakers' intentions remains clear.

Essay 5 turned to the nature of presuppositionality, and in particular, to the dynamic project of blending semantic and pragmatic conceptions of presuppositions. We saw that major problems arose for the project of deriving truth-conditional content from dynamic content while respecting the idiosyncrasies of both presuppositionality and epistemic modals. The solution that was needed turned out to involve a fusion of the picture of contexts originally invoked in attempts to account for indexicality and those countenanced by dynamic systems in theorizing about presuppositionality and epistemic modality, and an integrated system was presented in which indexicality, presuppositionality and epistemic modality were all treated in terms of context change.

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