UNDERSTANDING DYNAMIC DISCOURSE

by

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Discourses are dynamic things - new information gets communicated, affecting the state of the conversation and the states of minds of the conversational participants. This work explores the question of how much of these discourse dynamics should be accounted for by semantics and how much by pragmatics. There are some philosophers and linguists who claim that the dynamic nature of discourse is good reason for abandoning traditional truth-conditional semantics and adopting instead a notion of semantics that focuses on the level of discourse, treating the semantics of sentences as their contribution to the discourse as a whole, or as their potential effect on the conversational context (dynamic semantics). I argue that such a semantic explanation is the wrong sort of explanation; we can maintain a traditional, static semantics and explain changes to the context by appealing to pragmatics - broadly speaking, by appealing to the fact that conversations are rational, co-operative activities. In chapter 1, I examine some purported differences between dynamic and static semantics, arguing that the central difference between the two views is whether (at least some) changes to the conversational context are encoded in the semantics or explained by pragmatics. In chapters 2-4, I look at an extended case study of discourses containing indefinite descriptions and cross-sentential anaphora, such as: A woman walked in. She ordered lunch. The first sentence in this sort of discourse seems to introduce a
new object under discussion that the pronoun in the second sentence picks up on. In
chapter 2, I argue that there are good reasons to think a dynamic semantic account
is not the right sort of approach, and that a pragmatic approach better explains the
data. In chapter 3, I extend my pragmatic account to cases of embedded indefinites
such as: A wolf might walk in, Mary doesn’t own a car, and If a farmer owns a don-
key, he beats it. In chapter 4, I argue against a rival approach that tries to explain
the same phenomena by appealing to the referential intentions of speakers.
Dedicated in loving memory of my grandmother, Rosa Russ.
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Introduction

This dissertation is about discourses, i.e., texts, conversations, monologues, letters etc. At least, it is about some aspect of them. A relatively recent insight in the philosophy of language is that when one is doing semantics, one should look not only at words and their contribution to sentences, but how these words and sentences act within a discourse. With this insight I whole-heartedly agree. But this has led some to adopt a new sort of semantics, one that takes the meaning of words and sentences to be their effect on the information state (or context) of the discourse. It is with this step that I disagree. The present project is an attempt to take a step back and see whether taking the dynamics of conversations seriously requires this framework, or is best treated within such a framework. I will argue that it doesn’t and it isn’t.

We can maintain a traditional notion of semantics, and better explain the effect of an expression in a discourse by appealing to pragmatics. When I say I defend a traditional semantics, I mean that I defend, roughly, the view that the semantic content of sentences are propositions, which can be more or less characterized by their truth-conditions, and that the semantic value of a sub-sentential expression is its contribution to the proposition expressed. This does not entail that particular traditional semantic treatments of certain expressions need to be defended. In fact, it is my contention that once we have the right sort of view of the pragmatics of discourse dynamics, new semantic treatments within the traditional framework are made available.
Some have also argued that the discourse approach to semantics, called *dynamic semantics*, is radically different from traditional, static semantics. I argue that it’s not, and it is seeing the similarities between the two views that makes clear the option to maintain traditional semantics and explain discourse dynamics pragmatically. Over several chapters, I examine one of the central motivating cases for dynamic semantics, cross-sentential anaphora such as: *A woman walked in. She ordered a martini.* The indefinite expression *a woman* doesn’t only contribute something to the sentence, but something to the discourse. Namely, it licenses the pronoun *she* in the subsequent sentence. The indefinite expression also appears to rely for its felicity on what came previously in the discourse: it is generally used to introduce a novel object under discussion. On many dynamic semantics views, these novelty and licensing features are encoded in the semantic value of the indefinite.

On my view, these features are explained pragmatically, by appealing to the fact that conversational participants are engaged in a co-operative, rational activity, and the speakers’ strategic plans within this activity. The important difference between the sort of of view I defend and previous static semantic accounts of cross-sentential anaphora is that I do not attempt to explain the phenomenon purely by giving an account of the semantics of pronouns. Rather, I take the notion of context change seriously, and think that the effect of sentences containing indefinites (or utterances thereof) on the context, and the effect of the context on pronouns, play a crucial role in explaining this sort of data. I aim to give an account of these discourse dynamics. Unlike dynamic semantics, however, I take the dynamics of discourse to be a matter of pragmatic rather than semantics.
Chapter 1

Static and Dynamic Semantics

[T]here seems to exist an almost universal agreement that what dy-
namic theories are about is something like an ‘information flow’ or
‘kinematics of discourse’.

–Peregrin (2003), p.7

1.1 Introduction

It is self-evident that what sentences a speaker utters over the course of a conversation affects the state of the conversation and the conversational participants. To name but a few examples, an utterance may affect the beliefs or other attitudes of the conversa-
tional participants, it may raise the conversation’s level of precision, it may provide an antecedent for an anaphoric expression, it may disambiguate a subsequent utterance. Over the last three decades, a growing number of linguists and philosophers have argued that taking the effect of sentences within discourses seriously requires aban-
doning traditional notions of meaning and adopting instead a new notion of meaning, called dynamic semantics. People on both sides of the debate have touted dynamic semantics as a radical departure from the traditional view. The literature is often unclear about the precise differences between static and dynamic semantics, making
it difficult to assess whether the challenge dynamic semantics presents is warranted by the linguistic data, and what sort of consequences adopting a dynamic semantics might have. In this chapter, I examine some alleged distinctions between dynamic and static semantics. I will argue that though the views are importantly different, they are not radically different in the way often presented. The central contention in the chapter is that the fundamental difference between static and dynamic semantics is the role of pragmatics in updating the conversational context. A static semantics is forced to separate out content from the mechanisms that guide its interaction with context, the latter of which must be explained by pragmatic principles. By contrast, a dynamic semantics accounts for both informational content and its interaction with context in its recursive compositional calculus. Understanding the commonalities and differences between the views gives us a better understanding of the right sort of arguments for the respective views, and brings into question the relevance of some of the data that sometimes motivates dynamic semantics.

The difference between the two views is, roughly, as follows. Truth-conditional, static semantics takes the content of a sentence to be its truth conditions, and the content of sub-sentential expressions to be their contributions to the truth conditions.

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1This point is not entirely unrecognized; there are some who have explicitly stated it. For example, Chierchia (1995) writes:

On the view of meaning as content, we might simply say that the utterance of a declarative sentence in a given context will naturally prompt us to enter its content into the common ground – and that is the end of the story. The second way to go is to view sentences as actually having as semantic values functions from information states into information states. On this second view, context updating would be an integral part of the compositional system of meanings... The point is simply that the view of meaning as context change claims that certain aspects of interpretation viewed so far as essentially pragmatic are best regarded as part of the calculus that builds up recursively the semantic values of expressions.(Preface p.xii-xiii)

However, Chierchia does not offer an argument for this statement. Furthermore, this type of statement is rare, and generally not reflected in discussions of dynamic semantics or the arguments for dynamic semantics. Hence, the point of the chapter is to clarify and argue for the sort of viewpoint that Chierchia expresses.
For example, if someone utters

(1) Jodie dropped ten marbles and found all of them, except for one.

then what is communicated is a condition on what a world has to be like if the sentence were true, i.e., that Jodie dropped ten marbles and found all but one.\(^2\)

Dynamic semanticists have attacked the traditional view as empirically inadequate because it fails to take into account the role of a sentence in a *discourse*.\(^3\) Consider the following example, originally due to Barbara Partee:

(2) a. Jodie dropped ten marbles and found all of them, except for one.
   b. It is probably under the couch.

(3) a. Jodie dropped ten marbles and found only nine of them.
   b. ?? It is probably under the couch.

While (2a) and (3a) are truth-conditionally equivalent, their relationship to the discourse is different. It is perfectly appropriate to follow (2a) with (2b), while it is a lot worse, if not infelicitous, to follow (3a) with (3b). I will return to a more in-depth examination of the marble example later in the paper, but the main point can be

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\(^2\)This characterization of traditional semantics is slightly misleading, for there are those who think there is more to content than mere truth conditions. Most philosophers and linguists in the truth-conditional tradition maintain that the semantic content of a sentence in a context is a *proposition*, where propositions are the bearers of truth or falsity. However, while some think of propositions as unstructured entities that merely represent truth conditions, others think of propositions as structured entities that also represent the linguistic structure of the sentence in addition to its truth conditions. On the latter view, content is slightly more complex. It should also be noted that taking the semantic content of a sentence to be a proposition is separable from taking it to be truth conditions, since one might think there are no propositions while wanting to maintain that the meaning of a sentence lies in its truth conditions. I put these issues aside, taking the traditional view to be the one in which a sentence expresses a proposition, since this is the view that comes under attack by dynamic semantics. I will also not address issues about temporalism or relativism about propositions, since this is not the present topic.

\(^3\)I take a discourse to be any sequence of sentences, written or spoken. According to this definition, not all possible discourses are coherent discourses.
understood now. Static semantics doesn’t appear to be able to explain the difference between the two discourses since there is an important difference between (the effect of) (2a) and (3a) that cannot be explained by a difference in truth conditions. (2a) provides an antecedent for the pronoun in (2b); in other terms, it introduces something that can be picked up by a singular pronoun in a subsequent sentence. (3a) provides no such antecedent for a singular pronoun (though it does do so for a plural pronoun). Furthermore, dynamic semanticists claim that the sort of anaphoric relationship (or lack thereof) present in these discourses appears to be a systematic phenomenon: it is found robustly in different contexts and across languages. Dynamic semanticists have argued that there is evidence of such systematic dynamic discourse effects in various linguistic phenomena such as anaphora, presuppositions, modals, and conditionals.

Dynamic semanticists take the semantic content of a sentence to be its context change potential (CCP), and the meaning of sub-sentential expressions to be their contribution to the context change potential. Formally, a context change potential is a function from contexts to contexts. Here, and in everything that follows, contexts should be understood as a representation of the current state of the conversation, that is, a representation of the information mutually presumed by all the conversational participants.\(^4\) The reader should not be tempted to read ‘context’ as referring to the physical environment of the conversation or something like a Kaplanian-style index. Intuitively, the semantic content of a sentence on the dynamic view is the effect it has on the information state of the conversation participants, or in other words, it is like instructions on how to update the representation of the conversation.

At first glance (and even second and third glance), it seems clear why dynamic

\(^4\)I am remaining neutral on the metaphysics of conversational contexts. They might be subjective representations in the minds of the conversational participants, or abstract, objective objects. For now, nothing rests on this distinction.
semantics has been called a radical departure from our traditional notion of meaning. Static semantics takes contents to be propositions, commonly conceived as sets of truth-supporting worlds. Dynamic contents are processes; they relate input contexts to output contexts. For example, Groenendijk et al. (1996b) write that dynamic semantics:

...embodies a radical view on the relation between context and interpretation. The meaning of a sentence is identified with its context change potential, where contexts are identified with information states. The recursive definition of semantic interpretation is stated in terms of a process of updating an information state with a sentence. Meanings of sentences, then, are update functions.5

And Groenendijk & Stokhof (1990b) write:

[T]he dynamic outlook on natural language interpretation, referred to as dynamic semantics, starts from a fundamentally different basic notion. Not the information content, but the information change potential of a sentence is regarded as constituting its meaning. Consequently, the notion of the interpretation of a sentence with respect to a model M is given by a recursive definition of the result of updating an information state with the sentence. The meaning of a sentence with respect to M can then be identified with the update function associated with the sentence in M.6

As I said above, I will argue that dynamic semantics and statics semantics plus pragmatics in fact have the same scope, and the views are not so radically different.7 The difference is where the line between semantics and pragmatics is drawn. Accordingly, I’ll begin, in the following section, with a brief discussion of what I take to be the semantics/pragmatics distinction and why it is an important distinction.

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5p.1
6p.55-56
7Recently, van Eijck & Visser (2010) have also claimed that dynamic semantics is not a radical departure from static semantics, though they have different reasons for saying so. They write: “What dynamic semantics provides is a generalization of truth conditional semantics rather than a radically different alternative”.

Without a robust semantics/pragmatics distinction, the thesis about the difference between static and dynamic semantics might seem like a deflationary one. In §1.3 I examine some common claims made about the distinguishing features of dynamic semantics, arguing that none of these really serve to distinguish it from static semantics plus pragmatics. In §1.4, I look at two case studies comparing in each a particular dynamic semantics to a particular static semantics. Finally, in §1.5, I’ll examine the differences in notions of truth and entailment in static and dynamic semantics.

I make no attempt to settle the debate or take a stand on whether semantic content is dynamic or static. In this spirit, none of the arguments should be read as claiming that static semantics can account for all the same data as dynamic semantics or vice versa. Such a claim requires extensive examination of linguistic data. Rather, I see the task of this chapter as ground-clearing work; there has been much confusion in the literature on what dynamic semantics is and what sort of arguments should motivate the view. We can’t answer the question of whether we need dynamic semantics if we don’t properly understand the scope of the view. In particular, there has been a trend to move quite quickly from the observation that there are dynamic phenomena in discourse to the conclusion that we need a dynamic semantics. I think these quick moves are wrong and in making the difference between dynamic and static semantics clearer, I aim to show why they are mistaken.

1.2 The Semantics-Pragmatics Distinction

Some readers might have the immediate worry that characterizing the difference between static and dynamic semantics in terms of the semantics-pragmatics distinction

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8 For some arguments for dynamic semantics see for example Heim (1982), Groenendijk & Stokhof (1991, 1999), Chierchia (1995) (among many others); for some arguments against dynamic semantics see Geurts (1999), Schlenker (2007).
turns the whole debate into a merely terminological one. Others might worry that it muddies the waters even more, as there are so many different conceptions of the semantics-pragmatics distinction. I don’t think either of these are a cause for concern. Semantics and pragmatics offer fundamentally different sorts of explanations, and though I won’t pretend that there aren’t a lot of problems delineating a precise line between them, I think the following rough and ready definitions are sufficient for our purposes. For the purposes of this paper, we can take semantics to be whatever gets into the recursive compositional calculus of meaning. We can take pragmatics to be a matter of what is conveyed based on reasoning from principles of conversation, generally (but not exclusively) as a result of principles that govern rational, co-operative conversation. Since this is the way in which the semantics-pragmatics distinction is sometimes characterized, I help myself to these useful terms. But the main thrust of this paper can be made without ever using the term “semantics” or “pragmatics”.

Grice (1989) famously argued that some aspects of what gets communicated in the course of a conversation can be explained by appealing to general features of conversation qua co-operative, rational activity. Among other things, this allows us to explain why utterances seem to convey something over and above their conventional meaning. In turn, without positing unnecessary ambiguity, this accounts for why similar or even identical expressions seem to convey different things in different contexts. For example, an utterance of a disjunctive sentence often conveys that the speaker does not know which one of the disjuncts is true. Suppose you want to go see the movie *Blue Valentine* tonight, and ask me where it’s playing, and I answer with:

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9Here I’m thinking of the conventional meaning of the words, the value of indexicals and other context-sensitive expressions relative to a context, and their mode of composition. The situation is actually more complicated when one considers views where pragmatic elements intrude into the compositional calculus of the meaning of the whole sentence, so a more sophisticated definition of semantics is really required.
(4) It’s playing at the Angelika or it’s at the Cobble Hill Cinema.

(4) clearly implicates that I don’t know which of the two theatres the movie is playing at. And Grice has a nice way of explaining this. Given the assumption that I’m being a co-operative conversational participant, if I had known exactly what theatre the movie was playing at I should have said so – that’s a much more informative answer to your question. (I assume these sorts of Gricean explanations are familiar to the reader, so I have given just a cursory derivation of the implicature.) Grice also has a nice explanation of why the very same sentence conveys a different implicature if details of the context are changed. Suppose we’re film buffs playing a game, and I’m testing you on your claim that you know where every independent film is currently playing in New York City. The game works like this: I give you some choices, and you tell me, of those choices, the theatre or theatres at which it is playing. Now when I utter (4), there is no implicature that I do not know which theatre the movie is at – given our conversational purposes, even if I know the stronger claim, it’s not the appropriate thing to say.

If we try to explain the difference in what’s conveyed in the two situations by appealing to semantics, things go seriously wrong. We’d first have to posit an unmotivated ambiguity in the term or, where sometimes it means ‘A or B and I don’t know which’ and sometimes it means ‘A or B and I might (do?) know which’. We will have also missed an important generalization – that there are very general features of conversation that predict when (4) is going to implicate that I know which disjunct is true and when it won’t. It would clearly be an egregious error to explain this difference as a matter of semantics.

Admittedly, this is a very simple example and many cases are not nearly as straightforward. But the point should be clear nevertheless: whether we give a semantic or pragmatic explanation for something matters. It matters if we care about giving the right sorts of explanations. It matters for making the right predictions
about the linguistic data. And it matters for capturing broad generalizations in a
principled way.

I want to adopt a broadly Gricean notion of pragmatics. I think we can accept
Grice’s basic insights that some of what gets communicated is based on the fact
that conversations are co-operative, rational activities without being committed to
any of Grice’s more specific views. In fact, I think that certain kinds of speech act
pragmatics, such as the views of Robert Stalnaker, are thoroughly Gricean in this way
and I do not distinguish them in kind from Gricean pragmatics. As we will see more
later, Stalnaker explains the effects of an assertion in a conversation by appealing
to the purpose of the conversation and principles that rational people engaged co-
operatively in an activity with that purpose would follow. While Stalnaker’s principles
are different from Grice’s maxims, and Stalnaker aims to explain the effect of the
speech act of assertion and not implicature, the explanations are fundamentally the
same. They explain important aspects of what goes on in a discourse by appealing
to communicative intentions, conversational purposes, and principles of conversation
qua co-operative, rational activity.\textsuperscript{10} With these distinctions in mind, in the next
sections I turn back to the task at hand, examining the difference between static and
dynamic semantics.

\section*{1.3 Searching for the Radical Shift}

How different is the view of meaning-as-CCP from traditional semantics? In this
section, I identify some common ways in which it has been described in the literature
as being significantly different, denying in each case that it is different in the way
described. Not everyone subscribes to all of these claims. But they are all commonly

\textsuperscript{10}Stalnaker himself often remarks that the reader should recognize the Gricean influence on his view.
associated with dynamic semantics, and examining their connection to dynamic and static semantics is worthwhile in the endeavor of figuring out the scope of the viewpoints.

1.3.1 Order Effects and the Interaction between Context and Sentence

Some claim (either explicitly or tacitly) that what is distinctive of dynamics semantics is that it captures a two-way interaction between context and sentence. For example, Hardt (1999) writes.\textsuperscript{11}

Since Montague, a primary focus of semantics has been to describe a compositional method for constructing the logical representation of a sentence meaning, and then evaluating that representation with respect to a given context. A major insight of dynamic semantics is that sentences have a systematic relation to context in two ways: not only are they evaluated with respect to the current context, but they also systematically change that context.\textsuperscript{12}

Many static and dynamic semanticists agree that sentences can be context-sensitive, that is, the interpretation of certain linguistic expressions is partly determined by the context in which they occur. The distinctive insight captured by dynamic semantics is supposed to be that sentences are also context-affecting – they change the very context in which they occur. In fact, this is the starting point for dynamic semantics. Since meanings are functions from contexts to contexts, meaning is just the way in which a particular expression is related to input and output contexts. Often arguments to the effect that a certain sort of sentence is not only context-sensitive but also context-affecting are provided as support for abandoning traditional semantics and adopting

\textsuperscript{11}See also for example von Fintel (2001), Gillies (2007), and Muskens (1991).
\textsuperscript{12}p.187
a dynamic semantics.\footnote{For example, see von Fintel (2001) and Gillies (2007).}

I think this is right, in a technical sense. On the static view, there is nothing in the semantics of sentences that encodes an instruction on how to change the context. Nor could there be, for as soon as we encode how the context is affected in the semantics, we’re going to have something that looks a lot like a CCP and therefore a dynamic semantics. But we should proceed with caution in thinking of this as a major difference between dynamic and traditional semantics. For on a traditional semantics, one can still take seriously the fact that sentences affect the context in which they are uttered. The difference is only that we must say that it is utterances of sentences, or sentence contents (propositions), or interpretations of sentences that affect the context, depending on the details of the account. Just like some say that a sentence is true at a context because the proposition it expresses relative to that context is true, we could also say that a sentence has a certain effect on the context if token utterances of that sentence type typically have that effect on the context. I will return to the relation between sentence and context after a brief digression on a related point.

Dynamic semanticists also note the order of sentences has a systematic effect on their interpretation or acceptability. Again, since dynamic meanings are CCPs, the order of sentences is clearly going to make a difference in their interpretation: later sentences are always interpreted in the output contexts of earlier sentences.\footnote{For example, Groenendijk et al. (1996a) write:}

A characteristic feature of dynamic semantics, is that it can account for the fact that order matters in discourse. (p.17.)
von Fintel (2001) argues:

There are essentially dynamic facts concerning the way the order of counterfactuals in a sequence matters to the coherence of the sequences and to the plausibility of arguments. These facts demonstrate the need for context-change in the semantics of counterfactuals.\textsuperscript{15}

By contrast, if meanings are calculated in isolation of their relationship to the context, the order of the sentences should not affect their interpretation, at least as far as semantic content is concerned. (There would, of course, be Gricean manner implicatures if all the sentences in a discourse were shuffled.)

So far, so good. But we have to be careful not to take this as a reason to think dynamic semantics is \textit{required}. The idea that these features are unique to or definitive of dynamic semantics is only true if we assume a static semantics interprets sentences in isolation of contexts. While it is certainly true that some – in fact many – static semantic theories evaluate sentences in relative isolation, it is by no means a necessary or even \textit{de facto} feature of static semantics. There is a certain group of theories that take contents to be static, but take seriously the way in which these static contents affect and are affected by the context. These sorts of theories note the same dynamic properties of discourses that the dynamic semanticists point out, but they account for them with separate, pragmatic principles. Call these theories \textit{dynamic interpretation} views.\textsuperscript{16} I will argue that dynamic interpretation views show that neither the two-way interaction between context and sentence nor systematic order effects are essentially linked to dynamic semantics.\textsuperscript{17}

\textsuperscript{15}p.7
\textsuperscript{16}I’m loosely borrowing this terminology from Roberts (2004).
\textsuperscript{17}Creswell (2002) also argues for this same point. His arguments for the point differ from mine, though I certainly agree with the spirit of them, if not the detail.
The sort of theories I have in mind are like those espoused by Stalnaker (1974, 1978, 1998), Lewis (1979), and Dekker (2004). For example, David Lewis takes the semantic content of a sentence to be a proposition. But he also takes the interaction with context seriously. At any given point in the conversation, Lewis thinks the context might (in part) determine the interpretation of an assertion, its felicity, or even its truth-value. In turn, every time something is asserted in a conversation, the context is relevantly adjusted.

Consider, for example, Lewis’ theory of definite descriptions. I do not want to endorse Lewis’ view of definite descriptions; rather, considering the example will be helpful in understanding the abstract framework alluded to in the previous paragraph, and in making my point clear. Lewis argues that the correct semantics for definite descriptions is that a description \textit{the} F denotes the most salient F in the context. An object may become salient due to the conversational participants’ physical surroundings, or things said in the conversation. Lewis asks the reader to imagine the following example. His cat, Bruce, has been dashing madly and conspicuously around the room, and then Lewis turns to you and says:

\begin{enumerate}
\item The cat is in the carton. The cat will never meet our other cat, because our other cat lives in New Zealand. Our New Zealand cat lives with the Cresswells. Our New Zealand cat will probably stay there. Miriam would be sad if the cat went away.\footnote{Slightly adapted from Lewis (1979) p.348}
\end{enumerate}

At the beginning of the conversation, the most salient cat is Bruce, for reasons that have to do with the environment, not the conversation. So in the first sentence \textit{the cat} denotes Bruce. But, Lewis argues, the more he talks about Albert, his New Zealand cat, the more salient Albert becomes, changing the salience ranking of cats

\footnote{Lewis conceives of contexts as conversational scores.}
in the context. By the final sentence of the discourse, Albert is the most salient cat, and thus *the cat* denotes Albert. Hence, Lewis posits an essential two-way interaction between context and sentence. By definition, the denotation of definite descriptions are sensitive to the context, hence the contents of the sentences in which they occur get their interpretation only relative to the context. But more importantly, Lewis also thinks utterances of sentences are context affecting. Albert the New Zealand cat rises in the salience ranking of objects in the context because sentences like “Our New Zealand cat lives with the Cresswells” are uttered in the course of the conversation. This change in context in turn affects the interpretation and acceptability of subsequent sentences in the discourse. Lewis writes:

> The ranking of comparative salience, I take it, is another component of conversational score. Denotation of definite descriptions is score-dependent. Hence so is the truth of sentences containing such descriptions, which is one aspect of the acceptability of those sentences.\(^{20}\)

Thus Lewis’ view also predicts that there will be systematic order effects when it comes to definite descriptions. If the last sentence of the above quotation came first, *the cat* in that sentence would denote Bruce and not Albert, since Bruce is the most salient cat at the beginning of the discourse. But that changes the interpretation and perhaps, then, the truth-value of that sentence. For though it may be true that Miriam would be sad if Albert went away, Miriam might not be sad at all if Bruce went away.

We can (in fact, I think we must) accept that order matters and that sentences (or utterances thereof) are both context-sensitive and context-affecting whether or not dynamic or static semantics is the right framework. The difference is that on a static view like Lewis’, the context-affecting aspect of a sentence is not a *semantic* thesis.

\(^{20}\)Lewis (1979) p.349
Whatever mechanism updates Lewis’ contexts is not part of the semantic content of an utterance. Explaining why utterances have the effect they do on the context is a matter of appealing to the way rational agents engage in discourse. For example, repeatedly mentioning something clearly makes it a topic of conversation. It is also an indication that the speaker perhaps has an intention to go on and continue saying more about that object. It is for these sorts of reasons that an object rises in salience in the context. And these are essentially pragmatic reasons. By contrast, context-affecting properties are an inseparable part of dynamic semantic contents. Dynamic semantic contents simply are context change potentials, i.e., functions from input contexts to output contexts. Taking the update to the context out of this content results in an entirely different content. This is not to say dynamic semantics has no room for pragmatics or pragmatic effects on the context. In fact, everyone agrees that pragmatics is needed for some things. Rather the claim is that when it comes to certain updates, a dynamic semantics semantically encodes the dynamic effect on the context. For the same data, a static semantics accounts for the changes to the context pragmatically. The difference between dynamic and static semantics, then, appears to be whether semantics accounts for at least some changes to the conversational context, or whether we can account for all changes pragmatically. I will return to this point in more detail in §1.4.

If the interaction with context and order effects are not unique to dynamic semantics, they are not sufficient motivation for adopting a dynamic semantics. Yet some people take them to be so. For example, von Fintel’s observation that “there are essentially dynamic facts concerning the way the order of counterfactuals in a sequence matters to the coherence of the sequences and to the plausibility of argu-

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21 Lewis himself doesn’t give an explanation of the relationship between sentences and changes to the context. Dekker (2004) and Stalnaker (1974, 1978, 1998) are much more explicit about the pragmatic motivations for updates to the context.
ments” may well be true. And if so, it calls for a serious consideration of the effect a counterfactual has on the context, and the (perhaps various) ways in which counterfactuals are sensitive to their context. This may lead to a need for a revision of the standard semantics for counterfactuals. But these points do not amount to an argument for von Fintel’s conclusion that context change is required in the semantics of counterfactuals. Such a conclusion would only be supported by a further argument that the context-changing properties of counterfactuals are semantic properties.

1.3.2 Truth-conditional Information vs. Discourse Information

Many dynamic semanticists have claimed that the difference between static and dynamic semantics does not lie merely in whether meaning is taken to be context change potential or propositional content, but rather in the type of context change a sentence induces. Thus on some views, a semantics is considered dynamic if and only if meaning is defined in terms of context change potential and context change involves something more than truth conditions. For example, Groenendijk & Stokhof (1999) claim that if dynamic interpretation is defined merely in terms of truth conditions “there would be no reason to replace the traditional notion of meaning as truth conditional content by the dynamic notion of information change potential. The latter could simply be defined on top of the former”. Moreover, Groenendijk and Stokhof and others argue that when dynamic interpretation is not defined (merely) in terms of truth conditions, there is motivation for replacing the traditional notion of meaning. The sort of information over and above truth conditions that often concerns dynamic semanticists is information about the discourse itself. Examples include standards

\[\text{22p.8}\]
of precision, the objects under discussion, the topic of discussion, and which worlds are accessible when considering modalities. Even those who do not accept the first direction of this definition of dynamic semantics – that consideration of solely truth conditions makes a semantics static – accept the latter direction – that consideration of discourse information makes a semantics dynamic.

It is true that sociologically and historically speaking, dynamic semanticists have been more concerned with discourse information than static semanticists have. However, two arguments show that there is nothing in principle or in practice that precludes a static semanticist from accounting for discourse information. First, an examination of some dynamic interpretation views shows that there are static semanticists who care about discourse information, though they may account for it pragmatically. Second, an examination of structured propositions reveals that the static semanticist has the power to semantically encode discourse information. In fact, I think it is also wrong to think that a semantics in which the CCPs are only defined in terms of truth conditions is really static, but this point will have to wait for the discussion of Heim and Stalnaker in the next section.

I will make considerably shorter work of the first point, since it has been essentially made already. The discussion in the previous subsection of Lewis’ account of definite descriptions shows that he was concerned with the ranking of salient objects in the conversational context. The ranking of salient objects, which Lewis thought explained which objects are available for anaphoric pronouns and definite descriptions, is a paradigm example of information about the state of the discourse. (At least insofar as much of the salience of the objects is influenced by what is said in the conversation. Of course objects in the environment of the conversation also contribute to the salience ranking, and this is not exactly information about the discourse.) Many of the other items Lewis suggests for the scoreboard, such as standards of precision, also represent classic discourse information. Stalnaker and Dekker also include ac-
counts of discourse information in their theories; going into the details of their views at present seems unnecessary, as the point is made. All these views are not only concerned with keeping track of discourse information in the context, but also, like the dynamic semanticist, how an utterance provides the discourse information and how the discourse information in the context in turn influences the interpretation of what is said. Of course, the dynamic semanticist may rejoin that many CCPs encode discourse information in a way that the dynamic discourse theories mentioned don’t. This is true – many dynamic semantic theories semantically encode things like information about objects under discussion or information about accessible possibilities.

I will argue, at least for the case of objects under discussion, static semantics also has the resources to encode discourse information. To illustrate this point, let’s return to the marble example from the introduction, repeated here as (6) and (7):

(6) a. Jodie dropped ten marbles and found all of them, except for one.
   b. It is probably under the couch.

(7) a. Jodie dropped ten marbles and found only nine of them.
   b. ?? It is probably under the couch.

This example has been often used to argue against static semantics and for dynamic semantics. Recall that the basic argument is that (6a) and (7a) are truth-conditionally equivalent. Assuming that the two discourses start with the same input context, updating with the truth-conditional contents of (6a) and (7a) is going to yield the same output context. Thus it is mysterious on the static view why the anaphora in (6b) is licensed while that in (7b) is not. There have been several pragmatic responses to this accusation on behalf of the static semanticist. I will not

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review them here, but the reader can perhaps by now fill in the details of how they would go. As we have seen, contexts can get updated with more than semantic content. Pragmatic responses all cite some other update that happens when the initial sentences are uttered.

However, I would like to offer a sketch of a different sort of solution, one that points to a difference in the semantics of (6a) and (7a) on a static view. Dynamic semanticists ubiquitously assume that a proposition is a set of truth-supporting worlds. However, this is not the only view of propositions on the table. Many philosophers who work in the static, truth-conditional tradition hold that propositions are structured. This is a view largely ignored in the debate between dynamic and static semantics.

There are many different views on structured propositions, but the basic idea is that structured propositions are complex entities made up of parts, and these parts reflect the semantic values of the elements of the uttered sentence. Furthermore, the constituents of a structured proposition are also generally thought to be bound together in a way that reflects the structure of the sentence. On any well-known view of structured propositions (6a) and (7a) do not express the same proposition. The proposition expressed by (6a) will contain the semantic value of ‘one’ (or, a constituent that is determined, at least in part, by the semantic value of ‘one’), while the proposition expressed by (7a) will contain the semantic value of ‘nine’ (or a constituent determined at least in part by it).

In fact, the problem raised for the possible worlds view by the marble example is not all that different from the sort of problems proponents of structured propositions have been raising against the view for decades. In general, the possible worlds view predicts that truth-conditionally equivalent sentences express the same proposition.

\[24\text{For example, King (2007), Soames (1985, 1987, 1989), Salmon (1986a,b, 1989a,b), Lewis (1972), and Creswell (1985).}\]
A common objection is that this entails that all sentences expressing necessary truths express the same proposition, which is particularly problematic when it comes to embedding these propositions under propositional attitudes. Similarly, many find it intuitive that a person can believe a proposition $P$ without believing a truth-conditionally equivalent proposition $Q$, even when we’re not dealing with necessary propositions. In the case of the marble example, a person with very poor math skills might believe (6a) without believing (7a), or vice versa. Some philosophers have taken this as evidence that a possible worlds view of propositions is inadequate. Since structured propositions reflect the linguistic structure of the sentences that express them, they individuate more finely between truth-conditionally equivalent sentences. Thus there is already a widely-accepted static account of semantic content that does not attribute the same meaning to (6a) and (7a).

Not only do (6a) and (7a) have different contents on the structured propositions view, but they are different in just the sort of way we’d expect, given the difference in anaphora licensing in the example. The structured proposition expressed by (6a) actually contains a constituent reflecting the fact that one marble was mentioned in the utterance. The structured proposition expressed by (7a) contains a constituent reflecting the fact that nine marbles were mentioned in the utterance. Thus, given some additional assumptions about the nature of contexts and how they are updated, it is unsurprising that the output context of (6a) contains some sort of representation that there is one missing marble under discussion, while the the output context of (7a) represents nine found marbles as being under discussion. After all, these are respectively represented in the semantic content of what was said. A structured proposition not only represents the way the world is, but also represents the way in

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25For example, see Soames (1987), who discusses how it is a problem for the possible worlds view that it predicts that if one believes $P$, one also believes all the necessary consequences of $P$. 
which the information was presented. It reflects the structure of the sentence, which is a fact about the discourse. In this way, structured propositions can be said to encode discourse information.

It is true that structured propositions don’t encode instructions on how to update the context with the relevant discourse information. But this just brings us back to the same difference between dynamic and static semantics suggested by the previous subsection: that updates to the context happen by separate, pragmatic mechanisms when associated with a static semantics, while they happen in one fell swoop for the dynamic semanticist.

1.3.3 Sub-sentential Updates

Finally, some people claim that a distinctive feature of dynamic semantics is its ability to handle changes to the context that occur at the sub-sentential level. Dynamic semantics doesn’t limit the occurrence of context updates to whole sentences, since the semantic values of sub-sentential expressions are also CCPs. On the other hand, Gricean tradition has it that pragmatics works off the semantic content of whole sentences (“what is said” in Gricean terminology). For example, Heim (1982) seems to make this assumption when she writes:

What is particular to the file change model... is that accommodation can apply at any point during the evaluation of a complex logical form and can thereby affect the outcome of the next interpretation rule that applies. For instance, we saw in section 5.2 how a definite description in the scope of a quantifier may trigger accommodation during the construction of an auxiliary file, and how the interpretation of the quantified structure will then be based on the accommodated auxiliary file, leading in effect to substantially different truth-conditions than would have resulted without accommodation. This would not have been possible in a theory where truth-conditions, rather than context-change potentials, were assigned directly by the recursive interpretation rules. We have derived considerable benefit from permitting accommodation to be “interspersed” with interpretation in this way... (p.401)
If this is true, then there cannot be pragmatic sub-sentential updates and this indeed would be a distinctive feature of dynamic semantics. Furthermore, if dynamic semanticists are right in pointing out that discourse dynamics occurs at the sub-sentential level (as they claim it does in examples like (8) and (9) below), then this would be a good argument for a dynamic semantics indeed.

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

(9) A woman is in the seminar room and she is wearing a blue sweater.

In each of these cases, the interpretation of an earlier part of a sentence affects the interpretation of a later part of the sentence. In (8) the indefinites in the antecedent introduce something that can be picked up by the anaphoric pronouns in the consequent; similar is true of the indefinite in the first conjunct and the pronoun of the second conjunct in (9).  

So the question at hand is whether the ability to deal with context change everywhere is a unique feature of dynamic semantics. As you might imagine, I am going to argue that it is not. As I mentioned in §1.2, we can accept a broadly Gricean pragmatics – that certain aspects of communication are explained by appealing to features of conversations qua co-operative, rational activity – without committing oneself to the letter of every Gricean doctrine. In fact, the idea that whole sentences must be fed to pragmatics seems like one of the least important aspects of his central insight. In any case, among those who are committed to a static view of semantics, there is certainly a wide range of views on the role of pragmatics, including many who think pragmatics acts at the sub-sentential level. For example, Levinson (2000), Taylor (2001), and Simons (2010) all argue, for different reasons, that a broadly Gricean

\[26\] Whether these examples are actually examples of essentially dynamic sub-sentential updates is debatable in itself. There are static semantic accounts of this sort of phenomena, for example, e-type views of anaphoric pronouns. But I want to bracket that debate here.
conception of pragmatics applies at the sub-sentential level. There is also a family of views in philosophy that takes things a step further, arguing pragmatics “freely enriches” almost everywhere. Philosophers who hold this sort of view include Francois Recanati (e.g. Recanati (2010)), and relevance theorists like Dan Sperber, Deirdre Wilson (e.g. Sperber & Wilson (1986)), and Robyn Carston (e.g. Carston (1991)), to name but a few. This is not to argue that the only alternative to a dynamic semantics is a view in which pragmatics intrudes freely in the domain of semantics. In fact, in chapter 3 I will argue, following Simons and Taylor, that quite modest adjustments to Grice’s views are sufficient for motivating a constrained role for pragmatics at the sub-sentential level. But arguing for which view of pragmatics is correct is beyond the scope of the present chapter. The point is, the difference between static and dynamic semantics cannot depend on whether there are updates to the context at the sub-sentential level without the further, highly debatable assumption that pragmatics only acts on whole sentences. Given the considerable history in philosophy of positing pragmatics as acting at the sub-sentential level, someone who wanted to give a pragmatic account of context change has a wide range of views available.

1.4 Locating the Difference: Two Case Studies

I have been arguing that dynamic and static semantics are not radically different kinds of theories. Furthermore, our investigations thus far have suggested that the central difference between the two views is a difference in the role of pragmatic principles in interactions with context. In this section, I want to look at two case studies of what can be thought of as minimal pairs of dynamic and static semantics. Each case reveals that the dynamic and static views have very similar notions of content and context. However, the static view postulates separate mechanisms which relate content and context to explain the ways in which sentences behave dynamically in a
discourse, while the dynamic view takes these mechanisms to be (part of) the content. The mechanisms themselves – update operations on the context – do not even look terribly different on the views compared, but on the static view they are motivated by pragmatic principles, while on the dynamic view they neither have nor require a pragmatic motivation.

1.4.1 Heim vs. Stalnaker

The view proposed in Heim (1983) is so similar in many respects to that found in Stalnaker (1974, 1978, 1998) that they are widely considered to be notational variants of each other. I will argue that they are not in fact notational variants, and understanding why not is informative to the present project.

Stalnaker, as I have already mentioned, espouses a dynamic interpretation view – a static theory of content with an emphasis on its interaction with the context. For Stalnaker, contents are sets of truth-supporting worlds. Contexts are also sets of worlds, the worlds that are compatible with the mutual presuppositions of the conversational participants. In other terms, contexts represent the open epistemic possibilities for the sake of the conversation. Stalnaker proposes that in general, the purpose of a conversation is to gain information about the world, and the purpose of an assertion to aid in that endeavour, i.e. to provide novel information. An informative assertion will eliminate some of the open epistemic possibilities. Thus when a speaker makes an assertion, if it is accepted by the conversational participants its content is intersected with the context, thereby eliminating all the worlds which are incompatible with the content. This intersection of the content with the context is the sort of pragmatic update mechanism I alluded to at the beginning of this section. These sorts of update operations are not mysterious, technical constructs. Eliminating possibilities that conflict with the truth of a speaker's (accepted) assertion is simply what good conversational participants actually do in real-life conversations.
Rational people don’t keep around possibilities that conflict with information they’ve accepted. If we are interested in formally modeling what goes on in conversations, set intersection is a good way to model this phenomenon, given Stalnaker’s notion of contents and contexts. Intersection is an operation that relates contents and contexts, an operation that results in eliminating the conflicting worlds in the context and thus yields an accurate representation of the state of the conversational context after an assertion is uttered and accepted. When I talk about update operations or update mechanisms, I mean to talk about just these sorts of things – operations that formally model how the context in a conversation changes given an utterance.

In her 1983 view, Heim also takes contexts to be sets of epistemically open possible worlds. However, rather than defining the content of a sentence as a set of worlds, she defines the semantic content of a sentence as a function from sets of worlds to sets of worlds, i.e., a context change potential. This function takes a set of worlds and returns the maximal subset compatible with the truth-conditional content of the sentence in question.

Stalnaker and Heim’s views can be illustrated as follows. Where S is an arbitrary sentence and P the proposition it expresses:

**Stalnaker:**

\[ \lbrack S \rbrack = P \]

Input context \( \cap P \) = Output context

**Heim:**

\[ \lbrack S \rbrack = \text{Input context} \cap P \]

\[ ^{27}\text{Though she does first propose this simpler system, Heim’s full system actually takes contexts (and thus context change potentials) to be defined over slightly more complex structures than sets of worlds; she takes them to be sets of pairs of worlds and sequences (which are functions from indices to individuals in the domain). This extra complication is not relevant to the present discussion.} \]
It is clear that for any input context and assertion, Heim and Stalnaker’s theories will predict the same output context. Their views, however, are not merely notational variants of each other. Crucially, on Stalnaker’s view, the fact that the update to the context is the intersection of context and content is *pragmatically* motivated. Updating the context is a matter of conversational participants reasoning about speech acts. Since one of the main conversational purposes is to gain information, and conversational participants assume they are following a maxim of informativity, it is only rational to eliminate those possibilities that have been closed off by the content of the assertion proffered. But this is a matter of rationality, and not a matter of natural language. Furthermore, the fact that context change occurs based on general principles of reasoning is an important feature of Stalnaker’s theory; he argues that his view “motivate[s] some principles that are useful for explaining regularities of linguistic usage”. These principles are essentially pragmatic, as Stalnaker claims, “they are proposed as principles that can be defended as essential conditions of rational communication, as principles to which any rational agent would conform if he were engaged in a practice that fits the kind of very abstract and schematic sketch of communication that I have given”.

Heim, by contrast, makes a claim about the *semantics* of sentences. The intersectional update is encoded in the meaning of a sentence. For Heim, updating the context is a fact about natural language and not necessarily about rational communication (and it is superfluous in terms of an explanatory role in her theory if it is). Moreover, the phenomenon that she primarily aims to account for is presupposition projection. Taking meaning as context change potential is her solution to the projection problem. Since Heim takes presupposition to be a semantic phenomenon, it is crucial to

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28 Stalnaker(1978) p.88
29 *ibid.*
30 Presupposition projection is the problem of accounting for when the presuppositions of sentences
her theory that context update is a semantic and not pragmatic phenomenon; presupposition projections are not calculated based on broadly rational principles. As Beaver (2001) points out, “Heim provides a method of stating semantics... in such a way that admittance conditions\(^{31}\) can be read off from the semantic definitions without having to be stipulated separately.”\(^{32}\) Taking the context change potential out of the semantics would rob Heim’s system of its ability to account for the very thing for which it aims to account.\(^{33}\)

The two notions of meaning presented are quite similar. They are both based on sets of truth-supporting worlds. But Stalnaker takes meanings to be sets of worlds, while he posits distinct update operations that explain their interaction with the context. Heim also thinks of meanings in terms of sets of worlds, but she takes them to be functions relating the sets of worlds in the input and output contexts, without positing separate mechanisms that act on contents and contexts to explain their interaction.\(^{34}\)

1.4.2 DPL vs. PL\(_{+D}\)

It doesn’t help clarify matters in the least that dynamic and static semantics usually take very different approaches to accounting for the same sort of linguistic data. For example, in the case of indefinites and pronominal anaphora, dynamic semantic approaches generally explain the phenomenon in terms of the effect of an indefinite on the context and the anaphoric pronoun’s sensitivity to the context. By contrast,

\(^{31}\)A formula is admitted in a context iff the context satisfies the presuppositions of the formula.

\(^{32}\)p. 85

\(^{33}\)The interested reader should see Appendix A for a formal discussion of this.

\(^{34}\)Now we are also in a position to see why defining CCPs over merely truth conditions, as Heim does, does not entail Heim’s view is equivalent to a static one, as many want to claim.
most static approaches focus on giving a context-sensitive semantics for the pronoun that captures the same data. So whereas the dynamic theory exemplifies the picture of information flow throughout the discourse (the indefinite introduces a discourse referent that can later be picked up on), the static picture fails to do so. But I have been arguing that this is an artifact of the static views that are out there. We can embrace the picture of ‘information flow’ without thinking it needs to be represented semantically.

The previous case was informative, but some might think it’s a special case, since the views discussed deal only with truth conditional information and intersective updates. So I want to turn to a comparison of two theories that deal with discourse information (anaphora, in particular): Dynamic Predicate Logic and my own toy theory, Predicate Logic plus Dynamics. I will argue that they are similar and different in precisely the same ways as Heim’s and Stalnaker’s views.

Dynamic Predicate Logic (DPL) is a first-order extensional system, with the syntax of ordinary predicate logic, developed by Groenendijk and Stokhof (1991). DPL was motivated primarily by cross-sentential pronominal anaphora, as in (10), as well as by what is called donkey anaphora, as in (11). As such, the system is designed to account for data involving pronominal anaphora.

(10) a. A woman walked in.
    b. She ordered lunch.

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

In standard predicate logic (PL), (10) is represented as follows:

(12) a. $\exists x (\text{woman}(x) \land \text{walked.in}(x))$

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35 For the sake of brevity, I put the case of donkey anaphora aside for now, but will return to it in chapter 3.
b. $\text{ordered.lunch}(x)$

Though as speakers of English, we realize that $\text{she}$ in (10b) gets its denotation from $\text{a woman}$ in (10a), in the PL representation of (12b), $x$ is a free variable, and thus is not bound by the existential in (12a). The only way to get the right reading in PL is to represent the discourse (10) as one sentence, where the variable representing the pronoun is bound by the relevant existential as in (13).

$$(13) \quad \exists x (\text{woman}(x) \land \text{walked.in}(x) \land \text{ordered.lunch}(x))$$

But, as Groenendijk and Stokhof point out, this seems to be an ad hoc way of characterizing the English discourse, since it places $\text{she ordered lunch}$ in the syntactic scope of the quantifier, when it is clearly not so in the English.

Furthermore, although Groenendijk and Stokhof do not discuss this point, representing (10) as (13) is not only ad hoc but plainly delivers the wrong truth conditions when one considers some quantifiers aside from the indefinite. Take (14) for example:

$$(14) \quad \begin{align*}
\text{a.} & \quad \text{Exactly one woman walked in.} \\
\text{b.} & \quad \text{She ordered lunch.}
\end{align*}$$

Representing (14) analogously to (13) (with a ‘$\exists$’ replacing the first existential) gives us something that is true in a world (or model) in which there is exactly one woman who both came in and ordered lunch. But this is compatible with a world in which many women came in but only one of whom ordered lunch. Intuitively, however, these are not the conditions under which discourse (14) is true. (14) is true in a world in which exactly one woman came in, and that woman ordered lunch.\footnote{This point was originally raised by Evans (1977) p.493.}

The problem in each of these cases, donkey anaphora included, is that the pronoun seems to get its value from an existential quantifier despite the fact that it is not
within the syntactic scope of that quantifier. Taking meaning to be context change potential resolves this sort of problem. Groenendijk and Stokhof argue that we should look not just at the truth conditions of (10a) and (10b) alone, but at how they change the context. Existential sentences like (10a) don’t only inform conversational participants about the world (i.e. that there is some woman or other who came into the contextually salient place), but informs them that some new woman or other is under discussion. The CCP of an existential sentence therefore adds a new woman under discussion to the context. Sentences with pronominal anaphora as in (10b) are sensitive to the things under discussion.

More formally, a DPL model consists of a structure \( \langle D, F \rangle \) where \( D \) is the domain of individuals and \( F \) is an interpretation function which assigns individuals to constant expressions and sets of \( n \)-tuples of individuals to \( n \)-place predicates. DPL contexts are sets of assignment functions, which are total functions from the set of variables to the domain of objects. Since pronouns are represented as free variables, and the value of free variables (as in many standard logics) is determined by an assignment function, keeping track of (potential) anaphoric relationships between quantifiers and pronouns is a matter of keeping track of assignment functions. Accordingly, the context change potential of a DPL formula is a function from sets of assignment functions to sets of assignment functions.\(^{37}\) There are two kinds of functions; for lack of better terminology, let’s call them *updates* and *tests*.\(^{38}\) Updates change the input context by adding assignment functions and/or changing the existing assignment functions. Tests don’t add or change assignment functions; they only have the power

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\(^{37}\) In the most famous paper on DPL (Groenendijk & Stokhof (1991)), DPL is formulated in terms of *relations* between pairs of assignment functions. This is equivalent to the formulation in terms of functions from sets of assignment functions to sets of assignment functions, as Groenendijk & Stokhof (1990b) prove. I follow the formulation of DPL from the 1990 paper here.

\(^{38}\) 'Test' is actually the standard term for the kind of function I describe. ‘Update’ is the one for which I lack a better term.
to eliminate the assignment functions that don’t have whatever feature(s) they are testing for.

The value of an existential determiner is an update: $∃x$ takes all the assignments in the input context and essentially makes them “forget” what they assign to $x$. In other terms, it takes each assignment function in the input context and outputs all those assignment functions that differ from it at most in what it assigns to $x$, the output context being the collection of all such assignment functions. The value of an atomic formula is a test. It tests all the assignment functions in the input context, letting only those through to the output that do in fact assign any relevant variables to the interpretation of the predicate in the formula. An existentially quantified formula $∃xPx$ sequences these two functions, first making the assignment functions in the context forget what they assign to $x$, and then filtering the output state for those assignment functions that assign $x$ to something in the interpretation of $P$.\[39\]

Sentences and sub-sentential parts of DPL are always interpreted in the order in which they appear; both conjunction and the sequencing of sentences is not commutative (the sequencing of sentences, in fact, is treated as though it were the conjunction of those sentences).

We are now in a position to see how DPL treats (12). The existential in (12a) takes all the assignment functions in the input, making them forget what they assign to $x$. $Woman(x)$ tests this output, allowing through only those assignment functions that assign $x$ to something in the interpretation of woman (i.e. that assign $x$ to a woman), and $walked.in(x)$ then does the same thing, filtering the output further for those assignment functions that assign $x$ to something that walked in. Together this represents the idea that the context now reflects that some woman or other who

\[39\] For the general case $∃xϕ$ the existential update is sequenced with whatever function is the value of $ϕ$. 
walked in is under discussion and available for pronominal anaphora. (12b) then further filters the context for those assignment functions that assign $x$ to something in the interpretation of *ordered.lunch*. The final context contains all and only the possible assignment functions (given the original input context) that assign $x$ to a woman who walked in and ordered lunch.

In this way, DPL existential determiners have the power to *semantically* bind variables that are beyond their syntactic scope. The free variable in the final sentence of the discourse gets its value from the existential at the beginning of the discourse, without the pitfalls of interpreting it as falling within the syntactic scope of the quantifier.

The contrasting (toy) system, called Predicate Logic plus Dynamics ($\text{PL}+\text{D}$), is a static semantics accompanied by pragmatic update operations that relate contents to the context.\(^{40}\) Since arguments for pragmatically motivating the update operations cannot be given quickly, only the briefest motivation will be offered here.\(^{41}\) But even without an adequate defense of the pragmatic motivations, the point stands. The question is not whether $\text{PL}+\text{D}$ is the right view, but whether it is technically feasible. $\text{PL}+\text{D}$ shows that the sort of dynamic discourse information that DPL is concerned with can be accounted for in a framework with a static semantics. $\text{PL}+\text{D}$, like DPL, has the syntax of ordinary predicate logic; in fact, in terms of its syntax and semantics, it is just ordinary predicate logic. Following the ordinary Tarskian interpretation of predicate logic, the semantic value of formulas in $\text{PL}+\text{D}$ are sets of truth-making assignment functions. A formula is true (relative to a model) iff its

\(^{40}\)Dekker (2004) presents a static predicate logic augmented by pragmatic principles, called Predicate Logic with Anaphora, to account for anaphora data. His system is different from the one presented here, but in many ways similar in spirit. I address some of the differences between Dekker’s pragmatics and mine in chapter 4.

\(^{41}\)I will argue extensively for the pragmatic motivations of update operations like the one presented below in chapter 2.
denotation is not empty. PL+D aims to account for the same fragment of English as DPL. As such, contexts are also defined as sets of assignment functions. A PL+D model is just a standard model of predicate logic, defined in precisely the same way as DPL models.

The semantic value of an existentially quantified formula $\exists x \phi$ relative to a model is the following set of assignment functions: $\{g \mid \exists h : h[x]g \& h \in [\phi]\}$.\(^{42}\) The value of an atomic formula $P \times$ is the set of assignment functions such that each one assigns $x$ to an object in the interpretation of $P$. Notice that although the semantic definition of an existential formula is static, the qualification on the assignments in its value reveals that the existential is an assignment *shifter*. The assignment functions in its denotation do not have to make the formula in its scope true. Rather, there has to be some $x$-*variant* of each assignment function (i.e. an assignment function that differs at most in what it assigns to $x$) in its value that makes the formula in its scope true.

PL+D has two pragmatically driven update operations that mediate between content and context. One is *set intersection*, which acts like a test, and the other is an update. Tests are the default effect an utterance has on the context; they are carried out by intersecting the input state with the semantic content of the sentence and apply to all formulas. The intersective update can be easily motivated pragmatically for Stalnakerian considerations. The semantic values of sentences are just their truth-conditional content. Cooperative conversational participants are making informative assertions; therefore, there is motivation to eliminate the assignment functions in the input context that conflict with the content of what was asserted. In addition to the normal intersective update, an existentially quantified formula $\exists x \phi$ pragmatically triggers an update which takes each assignment in the input context and returns all the $x$-variants that are in the interpretation of $\phi$.

\(^{42}\) $h[x]g$ is read as $h$ differs at most from $g$ in what it assigns to $x$. 
Although, as I said, I will not provide a full pragmatic story here, I want to make this update seem plausible. As with intersection on Stalnaker’s view, the update is supposed to formally model something that actually goes on in conversation. Let’s make the reasonable assumption that conversational participants keep track of the objects under discussion, partly with a view towards being able to understand anaphoric pronouns. Roughly, if someone utters (10a), the other conversational participants track that a woman is now under discussion. When (10b) is uttered, the conversational participants are in a position to understand that she denotes the same woman, in other words, they track that the speaker is still talking about the same woman. Here we are formally modeling anaphoric relationships as the relationship between an assignment function and a variable. The way to model what I have just described, then, is that conversational participants are tracking assignment functions. If we can pragmatically explain why the utterance of (10a) introduces a woman into the discussion, then we can explain why the assignment functions in the context are shifted accordingly.

Let’s see how PL_{D} handles (12). (12a) is an existentially quantified sentence, and so it pragmatically triggers both the intersective test and the update. The content of (12a) is the set of assignment functions such that for each assignment function, there exists at least one x-variant that assigns x to a woman who walked in. If there is such an object in the model, this will amount to the denotation being the set of all assignment functions. The intersective update, therefore, has no effect on the input context. (This is a result of the system being extensional. In an intensional system, which would work with world-assignment function pairs, updating the context with the informational content of an existential would yield an informative update.) Then, the update takes the input context and returns all the x-variants of each assignment function that assign x to a woman who walked in. So after semantically and pragmatically processing (12a), the context is in the same state as after the
semantic processing of the same sentence according to DPL. (12b) will trigger the normal intersective update. Its content is the set of assignment functions that assign $x$ to something that ordered lunch. Since all the the assignment functions in its input context assign $x$ to a woman who walked in, the resulting output context will include only assignments that assign $x$ to a woman who walked in and ordered lunch. The final output context is therefore the same one DPL predicts, and intuitively the correct one; the assignment functions record the information that there is at least one object that is a woman, and walked in, and ordered lunch.43

In this way, existentials in PL$_{+D}$ have the power to *pragmatically* bind variables beyond their syntactic scope. That is to say, existentials have a lasting effect on the context by shifting assignment functions to match the variable they bind with the right sort of object. Since free variables are sensitive to the assignment functions, they can pick up values introduced by an existential, even when they are not in the syntactic scope of that existential.

The views presented are similar and different in precisely the same way as Heim’s and Stalnaker’s views. DPL and PL$_{+D}$ both define meanings based on sets of assignment functions. In PL$_{+D}$, meanings just are these sets, and their interaction with the context is accounted for by pragmatically motivated update operations that mediate

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43I have been glossing over one complication of PL$_{+D}$. The problem with treating pronouns as straightforward free variables in a static semantics is that formulas containing free variables do not get the truth conditions we really want. The set of assignment functions (12b) determines, for instance, is the set of all assignment functions that assign $x$ to an object that ordered lunch, and so the sentence would be true so long as something in the model ordered lunch. This may or may not be a bad consequence, depending on one’s take of the data. This may just be the correct way of modeling the truth conditions of a pronominal sentence out of context. But within a context, we want a sentence containing a pronoun to pick out a subset of these assignment functions. In (12), this is the set of assignment functions that assign $x$ to a woman who walked in and ordered lunch. This is easily fixed, however, by making the semantic clause for pronouns sensitive to the assignment functions in the input context. This is an intuitive way to model the fact that pronouns are anaphoric – they must look to something prior for their value. Moreover, dynamic and static semanticists alike agree that it is perfectly acceptable to have context-sensitive expressions in a static semantics. It is the context-*affecting* nature of certain expressions that make some people think we need a dynamic semantics.
between them. In DPL, meanings are CCPs, and so they are defined directly in terms of the relationship between the sets of assignment functions that make up input and output contexts. These two ways of viewing meaning, as was the case with Heim and Stalnaker, do not seem significantly different in the notions they employ. It does not make a difference whether we introduce discourse information or more complicated updates to the context. The sole distinction, again, is a matter of separating out the update mechanisms from the semantic contents or not.\footnote{For a more formal comparison between DPL and PL$^{+ \! D}$, see Appendix B.}

The investigations in the foregoing sections also speak against another (almost universally) accepted formal definition of dynamic semantics: a semantics is dynamic just in case its updates are non-distributive or non-eliminative, otherwise it is static.\footnote{This is extensively argued for in Groenendijk and Stokhof (1990). See also van Bethem (1986), Muskens et al. (1997), von Fintel and Gillies (2006), among others.}

The definitions of eliminativity and distributivity are as follows:

\textbf{Definition 1: Eliminativity}

An update $\tau$ is eliminative iff for every context $c$: $\tau(c) \subseteq c$ (An update is eliminative if and only if an updated context contains at least as much information as the original context.)

\textbf{Definition 2: Distributivity}

An update $\tau$ is distributive iff for every context $c$ and for every element $i$ in $c$, $\tau(c) = \bigcup_{i \in c} \tau(\{i\})$ (An update is distributive if and only if the result of applying the update to the context globally is equivalent to applying the update ‘pointwise’ to each member of the context and taking the resulting set.)

Groenendijk and Stokhof and others argue that if an update function is both
eliminative and distributive, context change collapses into truth-conditional content, and thus an eliminative and distributive dynamic system is not really dynamic at all. Conversely, if a system is either non-distributive or non-eliminative, then it is dynamic. But as we saw in the comparison of Heim and Stalnaker, the updates in both their views were eliminative and distributive, since the only update is intersection. Yet, I argued it would be wrong to conflate the two views. Conversely, the update that shifts the assignment functions in $PL_{+D}$ is non-eliminative, since it adds new assignment functions to the context, but the semantics in the system is still the ordinary semantics of predicate logic.

1.5 Truth and Entailment

As the reader might expect, taking semantic contents to be CCPs leads to different definitions of truth and entailment. The purpose of this section is to examine just how different they are and in what ways. Truth in dynamic semantics is generally defined as successful update. An update $\phi$ is successful in a context $c$ iff updating $c$ with $\phi$ does not result in the absurd state (the empty context). In other words, an update is successful in a certain context just in case there is some possible way of carrying out that update. Truth in a world (or with respect to whatever sort of indices one wants) can then be defined in terms of success:

A CCP $\phi$ is true in index $i$ iff $\phi$ is successful in $\{i\}$

We can then derive an ordinary notion of truth if we imagine the index in question to be the actual world.\footnote{Or an index that includes the actual world in the relevant way, such as a world/assignment pair.} Moreover, from this we can derive the truth-conditional
content of a CCP $\phi$ as the set of indices in which $\phi$ is true.

It is a deep question, which I will not attempt to answer, whether dynamic truth is conceptually equivalent to our ordinary notion of truth. (This is a difficult question in no small part because there isn’t a consensus on what the ordinary conception of truth is.)\footnote{Although one might wonder whether the conception of successful update should be explanatorily prior to truth or vice versa. One might think that the reason a realistic context (a context containing the actual world) can be successfully updated with the content of an utterance is because that utterance is true, and not vice versa.} But this definition of truth does generally match the ordinary one in empirical predictions. For example, one can’t successfully update $\{@\}$ with a CCP containing information that conflicts with it (because then the actual world will be eliminated, resulting in the empty or absurd state), and so anything that isn’t true\textsubscript{static} in the actual world won’t yield successful update and vice versa.

Different dynamic views emphasize the connection between classical notions of truth and the dynamic notion more or less, often depending on the focus of the view. Though it is universally agreed among dynamic semanticists that truth is not the central notion for meaning, views like that in Heim (1983) and Dynamic Predicate Logic often emphasize that the truth conditions can be read off the CCPs. By contrast, when Groenendijk et al. (1994), for instance, describe dynamic semantics they describe it as a view in which “the notion of truth, which relates language to the world, loses its key role. Central notions are consistency and support, which relate language, not to the world, but to the information language users have about it”\footnote{Groenendijk et al. (1994), p.2}. It is no coincidence that one of the main focuses of the paper is epistemic might. In fact, typical dynamic semantic analyses of epistemic might are one area in which an ordinary notion of truth might not be recoverable from dynamic meaning. Frank Veltman’s semantics for epistemic might treats the CCP of might $P$ as a non-
distributive test on the context for P-worlds.\textsuperscript{49} If there is at least one P-world in the context, the output is the entire context, if there are no P worlds, the update fails and we end up in the absurd state. Of course, if we try updating a context containing only the actual world with \textit{might} $P$, on this view, it will amount to updating with $P$ simpliciter. This is the right result as far as the dynamic meaning of \textit{might} $P$ goes: if the only world left in the context is the actual world, then testing for whether there’s a P-world in the context is equivalent to testing for whether the actual world is a P-world. And this is the intuitively right result if we are thinking of the context as the set of epistemically open possible worlds – if someone has narrowed down the set of open possibilities to just one world, then this is the only world that matters for epistemic modals. Rather, the point is, if we wanted to derive some notion of what makes \textit{might} $P$ true relative to a not-P-world (say one that has epistemically accessible P-worlds), there’s no way to derive it from the non-distributive CCP and the definition of truth in a world in terms of successful update. Now, one might think this is no flaw at all in the dynamic perspective – perhaps there is no truth-conditional content at all to the epistemic modal, and the dynamic semantic perspective has it right. The point is only that we can’t have it both ways – we can’t both maintain that \textit{might} acts as a non-distributive update on the context and that \textit{might} contributes to the truth-conditional content of \textit{might} $P$, where truth is defined in terms of successful update.\textsuperscript{50}

There is no single agreed upon notion of dynamic entailment, and none are easily defined in terms of the classic notion of entailment. As Muskens et al. (2011) point

\textsuperscript{49}See Veltman (1996), Groenendijk et al. (1996a), and Van Der Does et al. (1997) for details of the view.

\textsuperscript{50}Groenendijk & Stokhof (1990b) write that “It is only consistency with information, and not truth that makes sense for modal notions interpreted along these lines”.(p.63) On the other hand van Eijck & de Vries (1995) argue that static contents can be given for this sort of update semantics if we take the static contents to be the weakest precondition for successfully processing the update. They relate Veltman’s update semantics to classic S5 modal logic using this concept.
out, it is not self-evident what it means to say, in a dynamic system, that the con-
clusion is true under every interpretation in which the premises are true, and though
“there are plausible options... no single candidate has won universal favor so far”.51
Exposition on this matter is further complicated by the fact that it’s difficult to write
down a formal definition of entailment without looking at a particular system. I will
attempt here to explain the dynamic notions of entailment as generally and neutrally
as possible; the reader should keep in mind that there are notational variations in
the definitions which are (in theory) equivalent. I will discuss 4 prominent dynamic
notions of entailment; the reader should be aware that there are others. I borrow
heavily from Muskens et al. (2011)52 in the following definitions, though my exact
wording differs from theirs.

**Dynamic definitions of entailment**

\[ \phi_1...\phi_n \models \psi \text{ iff} \]

1. For all models M, for each state in which \([\phi_1] M \ldots [\phi_n] M\) effect no change from
   input to output state, \([\psi] M\) effects no change.53

2. For all models M, each input-output state for the sequential composition of
   \([\phi_1] M \ldots [\phi_n] M\) is an input-output state for \([\psi] M\).54

3. For all models M, each state reached after successfully processing \([\phi_1] M \ldots [\phi_n] M\)
   is a state on which \([\psi] M\) effects no change (a fixed point for \([\psi] M\)).55

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51 p.642
52 See p.643.
53 This is sometimes called test-test consequence. Another way of putting this is that for all models,
a fixed point for the premises is also a fixed point for the conclusion.
54 Sometimes called update-update consequence.
55 Sometimes called update-test consequence.
4. For all models $M$, in each state that is reached after successfully processing $[\phi_1]^M ... [\phi_n]^M$, successfully processing $[\psi]^M$ is possible.$^{56}$

These definitions have something in common, in that they all attempt to cash out what it could mean for the meaning of one sentence to be contained in others when meaning is conceived as context change potential. All of the above definitions represent reasonable candidates, and are generally used in different systems to capture different intuitive entailments.

It is perhaps clearest when it comes to entailment that the differences between static and dynamic semantics are substantive. At least on some dynamic definitions of entailment, it is not at all easy to see how they relate to the idea that underlies the classical notion of entailment, that is, truth ensures truth in all models. The logical properties of entailment also differ. With the exception of the first definition above, dynamic entailment is generally non-monotonic, since some updates cause a loss of information.$^{57}$ Unsurprisingly, the two views differ in which entailments are predicted. Dynamic notions of entailment capture relations that rely on the order of the premises and changes in context between the premises and conclusion.$^{58}$ This brings out the fact that our central argument so far – that static and dynamic semantics differ on whether updates to the context are accounted for by pragmatics or semantics – is not a merely terminological debate. Entailment (at least, semantic entailment) is a semantic notion, and so putting more into the semantics has an effect on what entailments there are. What entailments hold and the logical properties of an

$^{56}$This is DPL’s notion of entailment.

$^{57}$For a discussion of the logical properties of the various entailment relations see Muskens et al. (2011) and Veltman (1996).

$^{58}$Of course, which entailments are predicted differ among the various particular systems. To some extent, the same holds true for static semantics. The static semanticist is not bound to a single definition of entailment. For example, one might adopt the notions of entailment in non-monotonic logic, relevance logic, paraconsistent logic, etc.
entailment relation are substantive philosophical and empirical questions, questions
that static and dynamic semantics give different answers for. Thus though they are
not radically different views, sometimes small difference in semantic treatment can
lead to big differences in the logic (like a lack of monotonicity).

The difference can be illustrated by an example from one of our case studies, DPL
and PL_{+D}. Groenendijk & Stokhof (1991), among others, claim there are entailment
relations that involve anaphoric pronouns, e.g. (15a) entails (15b):

(15) a. A man walked in.
    b. He walked in.\(^{59}\)

Their notion of entailment (#4 above) reflects this (in fact, (3) would be sufficient,
but Groenendijk and Stokhof need (4) to capture other entailments). Recall that in
DPL \( \exists x (\text{man}(x) \land \text{walked.in}(x)) \) takes all the existing input assignment functions
and yields all the \( x \)-variants that assign \( x \) to a man who walked in. In any state or
model in which this can be successfully accomplished, we will be able to update with
\( \text{walked.in}(x) \) (in fact, the update will idle because all the assignment functions in the
input will already assign \( x \) to something that walked in). On the other hand, there’s
no obvious way in which PL_{+D} can predict this (alleged) entailment.\(^{60}\) This is because
on this view there is a **pragmatic** context change that occurs between (15a) and (15b).
And it is simply not clear how to square a change in context with the classic notion
of entailment. Recall that the LF of (15b) appeals to the (local) context, but there’s
nothing in the semantics of (15a) or the classical notion of entailment that guarantees

\(^{59}\)My own intuitions on these cases are admittedly fuzzy and I’m unclear whether this is an example
of a genuine entailment that should be captured by the semantics.

\(^{60}\)This is not to say that no static account could get this entailment relation. For example, on King
(1994, 2004)’s Context Dependent Quantifier account of pronoun anaphora, the LF of a sentence
like *He walked in* when it is anaphoric on *A man walked in* is *A man walked in*. Thus the entailment
relation, classically construed, obviously holds here.
the way that context parameter is filled in will yield the truth of (15b) any time (15a) is true, even if we allow some sort of context change to occur across the turnstile. Of course, some sort of pragmatic notion of reasonable inference can be defined. For example, in every coherent, co-operative discourse situation in which (15a) is true, the context will be updated in a way that makes (15b) true.

1.6 Conclusion

I have argued that dynamic semantics does not represent a radical shift in our conception of meaning. In many ways, it is a natural extension of traditional truth-conditional semantics. The main difference between the two views is not the notions they employ or the features they take as relevant, but whether the mechanisms involved in the interaction between content and context consist in separate pragmatic mechanisms or are part of a single compositional calculus.

Having said that, I think there is a place where we can, historically speaking, mark a (relatively) radical departure from our traditional notion of meaning, and that’s the recognition that the dynamics of discourse is relevant to doing semantics. But this departure was performed by philosophers who clearly took content to be static; philosophers like Lewis and Stalnaker. The radical departure is not including the dynamics of discourse in semantic contents, but considering it at all.

We’re now in a position to begin answering some of the interesting questions the debate between static and dynamic semantics raises, such as whether we need dynamic semantics and what would be the consequences of adopting a dynamic semantics. Full answers to these questions are beyond the scope of the present work, but I will sketch some answers to the latter question here. The answer to the first question will occupy much of the remaining chapters.

Debates in a range of areas in philosophy rely on the meaning of certain claims. For
example, some debates in epistemology rely on the meaning of knowledge ascriptions, some debates in the philosophy of physics rely on the meaning of counterfactual conditionals, some debates in ethics rely on the meaning of moral claims. In general, the right semantic and pragmatic account of these claims is crucial to the debate in question. However, I think the arguments in this paper reveal that the static/dynamic semantics debate does not carry much weight here. This is because, if I am right, the difference between static and dynamic semantics comes down to the role of pragmatics in updating the context, and none of these debates (as far as I can see) turn on whether updates to the context are semantic or pragmatic. This is not to say that philosophers in other areas can ignore discourse dynamics in general. Quite the contrary – if any of these claims are context-sensitive or context-affecting, their interaction with the context is going to be crucial for having the right semantics, and that is going to make a big difference to the debate. But whether the interaction with context is accounted for semantically or pragmatically is more of an issue in the philosophy of language than relevant to these other debates.

However, there are other aspects of adopting a dynamic semantics that might have wider relevance to issues outside the philosophy of language. For example, a static semantic theory offers a simpler picture of the relationship between mind and language. Static semantics allows us to adopt the straightforward picture that sentences in the language of thought map directly onto those in spoken language. On the other hand, it is much harder to defend a picture in which the correct semantics for the language of thought is a dynamic one, where our thoughts are updating conversational information states. So the simple mapping picture will probably have to be given up if one adopts a dynamic semantics, unless a dynamic view of the language of thought can be defended. I am not offering this as an argument for or against either view, but as an interesting consequence that deserves further consideration.

Another potential consequence that deserves further consideration is the role of
propositions in a dynamic semantics. Many dynamic semanticists speak of propositions as *derivable* from the CCPs of sentences, which is true, in the sense that one can always derive the truth-conditional content of a sentence from its CCP. But propositions play many philosophical roles, and being equivalent with truth-conditional content is not even necessarily one of them. Propositions are (variably) thought to be the bearers of truth and falsity, the objects of attitudes, the referents of that-clauses, and the meanings of sentences. Arguably, CCPs can play all these roles. This could lead one to the view that in a dynamic semantics, CCPs just are propositions. I imagine it would be interesting to further investigate what this amounts to.

An answer to the first question is even more complicated than the second, but what I hope the arguments in the present chapter have made clear is how the debate should proceed. Making observations that there are dynamic properties of discourse – that the order of sentences makes a difference for interpretation and acceptability, that sentences have a two-way relationship with the context, that there are sub-sentential updates, that we track discourse information as well as truth-conditional information – are not sufficient for motivating a dynamic semantics. They equally motivate a dynamic interpretation view. Examining linguistic data does not merely require looking at the dynamic features it possesses, but on whether those features appear to be derived from pragmatic or semantic mechanisms. Or in other terms, it requires us to conjecture about whether they are most appropriately explained by diverse mechanisms or a single mechanism. Deciding on whether a theory like DPL or PL\textsuperscript{+D} is the right theory is a matter of determining whether update operations on the context can and should be pragmatically motivated. Is such an operation something that comes from the meaning of the existential quantifier or is it something explained by general features of conversation? One of the challenges in the debate is that a pragmatic motivation for these sorts of updates may not be as obvious as that for,
say, intersection. But the fact that it is not obvious should not be considered a point in favor of the dynamic semanticist. Perhaps, for example, it was not obvious that the exclusive reading of or could be pragmatically explained before Grice pointed it out. Since the case of cross-sentential anaphora is a central one in motivating dynamic semantics, the remainder of the dissertation will examine it as a case study. I will defend a dynamic interpretation view, arguing that the data in question does not in fact demand a dynamic semantics. Though this doesn’t conclusively settle the debate – that would require an extensive examination of all the relevant linguistic data – the arguments in favor of a dynamic interpretation view of indefinites and cross-sentential anaphora, and the style of view defended, give us good reason to think the question can and should be settled in favor of static semantics.
Chapter 2

Discourse Dynamics, Pragmatics, and Indefinites

2.1 Introduction

Everyone agrees that conversations take place in a context. This is not to merely point out that conversations occur at a time and a place, or that there are particular speakers and hearers, though this is all of course true. Conversations take place against a background of mutually recognized facts: facts about the beliefs and presumptions of the participants, facts about the information conveyed thus far, facts about what’s under discussion, and so on. Although there is some disagreement as to the exact nature of conversational contexts, it is generally agreed that they record these sorts of facts.

As Stalnaker (1978) and Lewis (1979) first pointed out, the context both affects and is affected by the utterances in a conversation. Consider a conversation in which I ask (1) and another one in which I ask (2):

(1) Do you know of a nice, flat road for bike riding?

(2) I need a large, flat surface for a physics experiment. Do you know of any?
In the first case it is perfectly acceptable to assert \((3)\) in reply, but in the second case it is unacceptable:

\[(3) \quad 4\text{th Avenue is flat.}\]

Uttering \((1)\) or \((2)\) affects (among other things) the standards of precision in the conversational context. What counts as flat for bike-riding is a lot more forgiving than what counts as flat for a physics experiment. In turn, the standards of precision in the context affect the acceptability of \((3)\).\(^1\)

In this way, discourses are *dynamic* things.\(^2\) An utterance affects the context in various ways. For example, the context might be updated with the information conveyed, a new topic of discussion, an increase in the standards of precision, or the fact that the particular utterance occurred. In turn, the context constrains whether an utterance is acceptable or even true.

As we saw in chapter one, over the last thirty years, the dynamic nature of discourse has thrown into question whether traditional truth-conditional semantics is the right approach to a theory of meaning. A number of philosophers and linguists have argued that we should abandon the traditional notion of content and adopt a dynamic one that acts directly on contexts. Recall that dynamic semantics takes the semantic value of sentences to be their *context change potentials* (CCPs) and sub-sentential expressions their contribution to the CCP of the whole. Technically, a CCP is a function from contexts to contexts. Intuitively, it is like an instruction or a recipe for updating the context. By contrast, traditional *static* semantics generally takes

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\(^1\)Whether the change in context affects the truth or merely the acceptability of \((3)\) depends one one’s view of predicates like *flat*.

\(^2\)It’s a little weird to think of untokened discourses as dynamic; it is likely more precise to think of tokened discourses as dynamic and untokened discourses as things that would be dynamic if they were tokened.
the semantic content of a sentence to be its truth conditions, and the sub-sentential expressions their contribution to the truth conditions of the whole.\(^3\)

In chapter one, I argued that the central difference between static and dynamic semantics comes down to whether certain changes to the conversational context are (at least in part) dictated by the semantics, or whether they are explained by pragmatics. Dynamic contents encode (some of) the effects of an utterance on an arbitrary input context. By contrast, static contents do not encode any updates to the context. On a static view, the effect(s) of content on the context has to be explained pragmatically. These are fundamentally different sorts of explanations. Semantics describes facts about natural language. Pragmatics, on the other hand, describes facts about rational agents who engage in co-operative activities.

The sort of updates to the context that are central to the dynamic view are systematic or robust ones: updates that are observed across contexts and languages. Dynamic semanticists claim that we need a semantic theory to adequately account for these sorts of updates, particularly in cases in which the updates are not merely a matter of recording the truth-conditional information conveyed by an utterance. As just stated, the context records not only the information conveyed by utterances in the conversation, but information about the conversation itself: what topic is under discussion, etc. Call this discourse information. Dynamic semantics generally holds that pragmatic accounts cannot capture updates regarding discourse information. I take the reasoning behind this to be something like the following. If static contents of utterances are truth conditions, and pragmatics standardly acts on contents, then it seems all we can ever yield is updates about truth conditions, and not about other facts such as discourse information. In chapter one, I argued that this, in principle,

\(^3\)This is not an entirely accurate characterization of static semantics, since static semantics includes views in which contents encode more than merely truth conditions, such as structured views of content. The point is that static contents are not things that act directly on contexts.
was not an inherent limitation of an account that maintains a traditional semantics. The view defended in this chapter shows these claims about the limits of pragmatic explanations to be false in practice. I will examine the case of indefinite expressions – expressions of the form $a(n) \ x$ or $\text{some} \ x$ – which historically played a central role in motivating the move to dynamic semantics. In looking at this case, I will show that pragmatics not only does have the power to explain systematic, robust updates involving discourse information, but that a pragmatic explanation is the right sort of explanation of the phenomena in question. The important result is that we are able to maintain a traditional static notion of content and account for the relevant updates to the context by appealing to pragmatics. This also opens up new strategies for accounting for a variety of linguistic data. The present chapter concentrates on the basic, unembedded cases of indefinites; in the following chapter, I extend my account to cases of indefinites embedded under operators and quantifiers.

As I’ve said before, the argument is not intended to be the final word on the debate between static and dynamic semantics (since such an adjudication can only happen by examining all the relevant linguistic data), but it does undermine some important arguments for dynamic semantics. Specifically, it has become a trend in the recent literature to move directly from the observation that a certain linguistic construction has a systematic interaction with the conversational context (which we will see shortly in the case of indefinites) to the claim that we need to adopt a dynamic semantics to capture the data. I will argue that in the case of indefinites, a pragmatic view not only can account for the data, but in several important instances accounts for it better than dynamic semantic accounts. This suggests that the quick move from the linguistic data to a dynamic semantics is not warranted, and that other arguments for dynamic semantics (evidence from conditionals, modals, presuppositions, and so on) should be similarly re-examined.

In §2.2, I identify two features associated with indefinites in discourse, *novelty* and
licensing. I briefly review one family of dynamic views that semantically encodes these discourse properties. These views are particularly attractive because the CCP (i.e. the dynamic semantic value) of the indefinite simultaneously accounts for novelty and licensing. I then argue that these accounts cannot be right, because novelty is not a semantic feature of indefinites. In §2.3 I motivate a neo-Gricean pragmatic picture in which updating the conversational context is a matter of recognizing speakers’ plans for the discourse. I maintain a static, truth-conditional notion of content and the standard semantics for indefinite expressions, and argue that novelty and licensing are uniformly explained by this pragmatic view involving planning. §2.4 discusses some further merits of my pragmatic account over an account that semantically encodes the discourse properties of indefinites. Those readers who are interested in some formal comparisons between dynamic semantics and the sort of account I propose should consult appendix B.

2.2 Novelty and Licensing

The received tradition is to treat the indefinite as a classical existential quantifier. However, uttering a sentence containing an indefinite in a discourse generally has a greater effect than that of making a mere existential claim. For example, consider the following short discourse:

(4) a. A woman walked in.
    b. She ordered lunch.

Many people have noted that when a speaker utters something like (4a), it is understood that she is using a woman to talk about something new according to the

\footnote{This is not to argue that no dynamic semantic account can be right, but that this family of accounts cannot be right.}
conversation. Call this feature of indefinites novelty. This contrasts with definite expressions like the woman and she, which are generally thought to continue discussing something familiar to the conversation. It is important to note that novelty is not a matter of reference or denotation; no one claims that the object in the world that actually satisfies the indefinite description has to be new to the conversation. Novelty is the claim that, roughly, a speaker is talking about something that is novel for the purposes of the conversation. Novelty is unexplained by traditional semantics, since there is nothing in the semantic value of an existential quantifier that encodes whether it describes something novel or familiar to the conversation.

Secondly, (4a) introduces a woman under discussion that can be picked up by future anaphoric expressions, like she. Call this feature licensing. It is not at all obvious how to explain in what way a woman licenses the anaphora in (4b). Since a woman is not a referring expression, we cannot simply say that a woman and she refer to the same object in the world. (As, for example, we might be tempted to say if we replaced a woman in (4a) with a proper name like Michelle Obama.) Neither can we say that a woman binds the pronoun, since the pronoun lies outside of its syntactic scope.

### 2.2.1 Dynamic Semantic Accounts

As previously noted, one reaction to the discourse properties possessed by indefinites (i.e. novelty and licensing) has been to develop a semantics that encodes these properties. This is the strategy of many dynamic semanticists, such as Kamp (1981), Heim (1982), Groenendijk & Stokhof (1991), Kamp & Reyle (1993), Muskens (1996), and Asher & Lascarides (2003). On these views, the CCP of an indefinite description dictates that a novel representation of an object under discussion should be added to the context. This representation then provides a value for subsequent anaphoric
pronouns.\textsuperscript{5}

Objects under discussion are represented in the context by discourse-level entities, i.e. representations that are neither linguistic expressions nor objects in the world (or in a model). I adopt Heim’s notion of a \textit{file card} when describing the object that plays this role.\textsuperscript{6} A conversational participant has to keep track of the information conveyed about the objects under discussion, making sure to bundle together bits of information thought to be about the same object. But this bundling of information doesn't commit the conversational participants to talking about a \textit{particular} object in the world. For example, the fact that (4) is about a woman who ordered lunch doesn’t commit the conversation to being about a particular woman who ordered lunch. In some cases, there may even be no fact of the matter which woman discourse (4) is about. But it is clear that according to the conversation, the properties of being a woman, walking in, and ordering lunch should be bundled together. The discourse does not accurately represent the world if there turns out not to be a single object that shares these properties. And the conversational participants are not accurately tracking the conversation if they think that there are two distinct things under discussion, say, a woman who walked in and another individual that ordered lunch. Thus the metaphor of a file card is useful. File cards record information that is presumed to be about a single object for the purposes of the conversation. They can be satisfied by objects in the world (or individuals in the model), but aren't required to be associated with any object in particular. Though talk of file cards

\textsuperscript{5}This description glosses over considerable formal differences between the views. These differences are not relevant for the present project.

\textsuperscript{6}I take file cards to be equivalent to other concepts that do the same work, such as discourse referents or discourse entities. I prefer the file card metaphor because the terminology involves no temptation to confuse file cards with real objects in the world, contrary to the unfortunate term \textit{discourse referent}. Anyone who prefers working in a discourse referent framework should feel free to substitute \textit{discourse referent} for \textit{file card} throughout. By adopting Heim’s metaphor of a file card, I do not intend to take on any of the details of file change semantics.
is clearly metaphorical, the file card picture can be formally implemented in various ways, using familiar tools such as assignment functions.\footnote{One standard example of such a view is Dynamic Predicate Logic (Groenendijk & Stokhof (1991)). The interested reader is encouraged to look at appendix B for a formal comparison between DPL and an implementation of the view I present informally in §2.3.}

In the family of dynamic semantic views alluded to above, (4a) encodes an instruction to add a file card to the context, give it a label that has not yet been used, such as $x$, and then record on it $x$ is a woman and $x$ walked in. (4b), on the other hand, encodes an instruction to update the file card labeled $x$, adding to it the information $x$ ordered lunch.\footnote{In general, sentences with pronouns encode an instruction to update a particular file card; just which file card depends on the association of a pronoun with a particular antecedent, which is determined before the semantic machinery does its thing. How this association takes place is itself an interesting topic, but is beyond the scope of the present work.} By using the notion of a context change potential, the semantics accounts for both novelty and licensing with a single explanation. An indefinite semantically encodes an instruction to introduce a new file card. This is what accounts for novelty. The introduction of this new file card also provides something for the sentence containing the pronoun to update. This accounts for licensing. Though the pronoun is not syntactically bound by the indefinite, the semantics of the indefinite bridges the gap between the indefinite and pronoun; the indefinite introduces something that the pronoun can pick up on.\footnote{On certain formal implementations, this amounts to the indefinite semantically binding the pronoun. See appendix B for more details.} Without the new file card introduced by (4a), the instruction encoded by (4b) – to update the file card labeled $x$ – could not be carried out.

The dynamic picture described also accounts for some other cases in which indefinites license anaphoric pronouns beyond their syntactic scope, as in donkey sentences:

\begin{equation}
(5) \quad \text{If a farmer owns a donkey, he beats it.}
\end{equation}

I am putting donkey sentences and other cases of indefinites embedded under quan-
tififers and operators aside for the present chapter. I return to them in chapter 3.

2.2.2 Against Semantic Accounts

The dynamic view just described offers an elegant account of indefinites in discourse. But if novelty is encoded in the semantic value of an indefinite, as such accounts claim, we should expect it to always be present. However, examining a wider variety of examples reveals that indefinite descriptions are not always associated with a new object under discussion. On the contrary, there are many felicitous uses of indefinites that do not describe a novel object under discussion at all. Consider the following discourses:

(6)  
   a. A student walked into Sue’s office and asked her about his exam.  
   b. Finally, a student needed her help!

(7)  
   a. I went to see *Star Trek* on Sunday.  
   b. That’s pretty much all I did all weekend: I saw a movie.

(8)  
   a. We have this nail here.  
   b. Unfortunately, now we have a nail and no hammer.

(9)  
   a. I went out to dinner with the woman from the bar last night.  
   b. Can you believe it – a woman went out to dinner with me!

These are not just cases in which an indefinite fails to introduce a novel file card. Rather, the second sentence in each discourse contains an indefinite that intuitively continues talking about an object already under discussion. Let’s call these *summary uses* of indefinites. This contrasts with the other main use of indefinites, *introductory uses*, as illustrated by (4). Unlike the typical cases in which novelty (and licensing) is cancelled because of the interaction between the indefinite and an operator or
quantifier (such as negation), summary uses do not require the presence of a particular operator that takes scope over the indefinite. Summary uses are also not special cases constrained by how the object under discussion is previously introduced or described. In the examples, the familiar object is previously talked about using an indefinite description (in (6)), proper name (in (7)), demonstrative (in (8)), or definite description (in (9)). Furthermore, summary uses of indefinites can occur in subject or object position.

In each of (6), (7), (8), and (9), it would be a mistake to interpret the indefinites in the latter sentences as talking about a novel object under discussion. The most salient interpretation (if not the only interpretation) of (6) is that one and the same student walked into Sue’s office and needed her help. The use of the indefinite expression in (6b) does nothing to hinder this interpretation, despite the fact that we all know many students might visit a professor’s office. In (7), it is clearly understood that all the speaker did all weekend is see *Star Trek*, as evidenced by the fact that it would be infelicitous for an interlocutor to ask “What movie did you see?” after (7b). The same goes for the other summary cases. Pre-theoretically, if one was to ask someone how many nails are under discussion in (8) or how many women went out to dinner with A according to (9), the answers would be one nail and one woman, respectively.10

If a semantic account of novelty is right, the natural interpretation of these discourses should *conflict* with the meaning of the indefinites, and these examples should sound really bad. But they don’t; in fact, they sound perfectly ordinary. The intro-

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10 After formulating these examples, I was pleased to discover that Szabo (2000) also notes an example of this kind:

(10) The detective ordered a Martini. As soon as the waiter left he knew that something was wrong. Then he realized what it was. He had just ordered a Martini from a waiter who looked exactly like the murderer he was after. (p.37)

Szabo also uses this as evidence that novelty is pragmatic, but offers neither further argument for this fact, nor a pragmatic derivation of novelty.
ductory use of indefinites obeys novelty. Summary uses do not. Novelty therefore only applies to some uses of indefinites. I take this to be a decisive reason against a semantic account of novelty.\textsuperscript{11}

It is also worth noting that without a clear indication of a summary use (such as the word \textit{finally}), the correct interpretation of a discourse like (6) is unclear. Consider:

\begin{enumerate}
\item A student walked into Sue’s office and asked her about his exam.
\item A student needed her help.
\end{enumerate}

It is simply unclear whether there are one or two students under discussion in (11). This is unexpected on a semantic view of novelty. On a semantic account, the natural reading of (11b) should be that another student needed Sue’s help.

Some other cases of non-novel uses of indefinites have been raised against the semantic views of novelty in the past. These cases involve embedded indefinites. For example, von Fintel (1994) discusses the following example in a footnote:

\begin{footnotesize}
\begin{itemize}
\item One thing the proponent of novelty might say in these cases is that they involve the \textit{merging} of file cards. Multiple file cards can be merged into one during the course of a conversation if it is revealed that what were being treated as distinct objects under discussion are actually satisfied by one and the same object in the world. For example, suppose we are discussing Mark Twain and Samuel Clemens, unaware that they are in fact the same individual. If at some point someone informs the conversational participants that they are one and the same person, the file card for Mark Twain and the one for Samuel Clemens are merged into one. So someone might suggest that what is going on in the summary uses is that a new file card for the indefinite description is in fact being introduced, but then immediately merged with the relevant old one. I think this explanation of the summary cases fails for several reasons. There is nothing jarring about the cases. Unlike the case in which it is explicitly conveyed in the conversation that we have been mistakenly treating one object as two, there is nothing here to provoke a pragmatic repair of the context. Furthermore, a merging solution seems to be an \textit{ad hoc} treatment of the intuitive data. Phenomenologically speaking, there is nothing in the summary cases that feels like the paradigmatic cases of merging file cards (as in the Mark Twain/Samuel Clemens case). Merging saves a technical notion of novelty by sacrificing the file card picture’s ability to capture what is intuitively going with the objects under discussion (i.e. that there is one object under discussion in the summary cases, not two). An account of discourse dynamics that captures what ordinary people take to be going on in conversations is preferable to an account that makes technical distinctions that don’t intuitively connect to what is going on in real life conversations.
\end{itemize}
\end{footnotesize}
(12) Show me a man who plays hard and I show you a man who deserves a beer.\textsuperscript{12}

The most salient reading of (12) is the one in which for each hard-playing man shown to the speaker, it is that same man who deserves a beer. Intuitively the speaker is not proposing a game in which the interlocutor shows him a hard-playing man and the speaker shows him a different man who deserves a beer.\textsuperscript{13}

One reaction to the cases of non-novel indefinites is to drop novelty as a semantic feature, but retain treating semantic values as CCPs to account for licensing.\textsuperscript{14} On this approach, the fact that novelty is associated with indefinites in many contexts must still be accounted for. In the following section, I argue that novelty is best explained as a matter of pragmatics – an implicature of uttering sentences with indefinites in these contexts. To maintain a dynamic semantics, then, there must be two distinct explanations of the discourse properties of indefinites: a pragmatic one for novelty, and a semantic one for licensing. Given this, we lose the elegant simplicity with which the original versions of dynamic semantics accounted for all the discourse properties of indefinites. By contrast, I argue that we can maintain a traditional, truth-conditional semantics and give a uniform pragmatic explanation for novelty and licensing. Once the pragmatic account of novelty is developed, an account of licensing emerges naturally, making a semantic account of licensing superfluous.

\textsuperscript{12}p.65 fn. 59. Though clearly a case of non-novelty, this doesn’t seem like the same sort of example as the summary cases. Introductory and summary uses of indefinites are not intended to exhaustively cover all possible uses of indefinites.

\textsuperscript{13}Another case of non-novelty for indefinites, called the requantification problem, occurs when giving a focus sensitive or presupposition sensitive semantics for adverbs of quantification. These semantics require that some indefinites pick up old file cards. For more discussion see Rooth (1995), Krifka (2001), and von Fintel (1994).

\textsuperscript{14}E.g., this is the approach of Krifka (2001) and Farkas (2002).
2.2.3 Towards a Pragmatic Account

In the previous subsection I argued that novelty is not semantic, which is one reason to think it is a pragmatic phenomenon. But there are also positive reasons for thinking it is pragmatic. One of the marks of a pragmatic phenomenon is cancellability — something conveyed via pragmatics can be cancelled whereas something conveyed via semantics cannot (or it is at least much more difficult to find a situation in which conventional aspects of language are cancelled). If I am right, and novelty is an implicature of utterances containing indefinites, then it is what Grice called a generalized conversational implicature, since this is the sort of implicature that is normally associated with a sentence containing a particular lexical item or phrase across different contexts. A generalized conversational implicature can be cancelled in two ways.\footnote{See Grice (1989) pgs. 39, 44. It seems that Grice himself actually misspeaks when he writes about generalized conversational implicatures. While generalized implicatures are supposed to work just like particularized ones in that they are derived from the content of an utterance, Grice writes that they are associated with “a certain form of words in an utterance” (p. 37). He must mean, rather, that the implicature is normally associated with the content of utterances containing a certain form of words.}

It might be contextually cancelled, in that it is used in a context which makes it clear that the implicature is not present, or it might be explicitly cancelled. Novelty bears both these features. We already saw that novelty is contextually cancelled in summary uses. But consider also the following example of explicit cancellation.

Suppose Ann has been telling Beth about a student of hers, Jane. After some discussion of Jane, the following dialogue occurs:

(13) Beth: I have to go, are we still meeting later for coffee?

    Ann: I can’t – I have a meeting with a student. In fact, it’s Jane I’m meeting with.

Though the utterance containing a student at first seems to indicate that a novel
student is being spoken about, this is immediately cancelled by the explicit statement that the student with whom Ann has the meeting is in fact the very same student they had been discussing. On the other hand, conventional or semantic phenomena, such as the contrastive feature of but, are not so easily cancelled. While (13) does not seem odd at all, (14) certainly does:

(14) Jane is short but nice – not that I generally think short people are not nice.

Though cancellability is not a decisive test for whether a phenomenon is pragmatic, it is strong evidence on the side of the pragmatic story, especially in this case. There are some cases in which cancellability can be an indication of something else. For example, Crimmins (1992) argues that the default interpretation of underarticulated expressions can be cancelled.\textsuperscript{16} In general, default semantic interpretations can be cancelled when there’s another semantic interpretation available. For example, the default interpretation of “I swam to the bank” is that I swam to the river bank, but I can correct that by explaining that I swam to a financial institution. But there’s no evidence that novelty falls into any of these categories. There’s no reason to think that novelty is the result of some sort of underarticulation. And if indefinites were ambiguous between a novel and non-novel reading, we would expect some language to have two different lexical items to encode those meanings. But to my knowledge, there is no such language reported in the literature. So an ambiguity thesis is unmotivated. In general, ordinary, non-ambiguous conventional meanings are difficult to cancel – especially when we’re talking about meaning at the level of character rather than content. So while cancellability may not be a knock-down test, it is excellent prima facie evidence for exploring a pragmatic explanation. Furthermore, regardless

\textsuperscript{16}For example, suppose I am on the phone with you and I am in New York City and you are in Florida. If I say “it’s raining”, the default interpretation is that it’s raining in New York City. But I can cancel that interpretation by explaining that I was watching TV and saw that it is raining where you are in Florida, which is what I meant to express.
of whether one considers the summary uses cases of contextual cancellation, I have already established them as a class in which indefinites are not associated with so much as a hint of novelty. Taking this into consideration along with the fact that the phenomenon is explicitly cancellable, there is overwhelming evidence that the novelty condition should be accounted for pragmatically.

2.3 The Pragmatics of Indefinites in Discourse

2.3.1 Framework

Philosophers and linguists alike have criticized Gricean pragmatics for not being rigorous enough.17 As mentioned before, many dynamic semanticists argue that a pragmatic theory of discourse phenomena is inadequate precisely because of the lax nature of pragmatic explanations. However, just because Gricean derivations are generally unsatisfactory, it does not follow that pragmatics lacks the explanatory power of semantics. The difference between semantics and pragmatics is not in the rigor of the explanations they offer, but in the type of explanation. We can accept Grice’s claims about the nature of pragmatics – that it is based in principles of rational, co-operative activity – without endorsing any of his particular views.

Thomason (1990) suggests that if Grice is right about the nature of pragmatic phenomena then “it should be possible to single out certain important types of reasoning mechanisms and data structures that figure in communication among intelligent agents, and that work together to make implicature possible. These features should be independently motivated by linguistic and philosophical considerations, and should be theoretically central”.18 I agree with Thomason in thinking that the applicable

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17See for example Thomason (1990), Levinson (1983), Leech (1983), Harnish (1976), and Davis (1998) for some criticisms of Gricean derivations of implicature.

18p.330
reasoning mechanism is plan recognition, and the data structure is the conversational context. In this subsection, I will lay out the necessary details of each of these elements in turn. In §2.3.2, they will come together in the explanation of the discourse properties of indefinites.

I have already talked considerably about the role of the context in a conversation, so it should be evident that it is an important, independently motivated data structure. Though there is some disagreement about the nature, structure, and precise content of contexts, it is a plausible principle that the elements included in the context are just those that the conversational participants must track for the conversation to run smoothly. These must include the objects under discussion, since in any discourse, there are things under discussion. In most normal discourses, the participants continue to talk about the objects under discussion over the course of multiple utterances. To be able to follow a conversation, then, participants must keep track of the objects under discussion.\(^{19}\)

We can adopt the same representation of objects under discussion as discussed in the previous section, namely, file cards. Recall that file cards record information about objects under discussion, and can be satisfied by objects in the world (or model), but are not themselves concrete objects in the world (or model). Since file cards are the only element of the context with which I am concerned in this paper, I adopt the simplified view that the context is a set of file cards. For now, we can think of this as an unstructured set, to which file cards get added but not removed.

\(^{19}\)It should be noted that some people disagree with this assessment, and think the only element that needs to be represented in the context is the common ground, i.e. the set of propositions mutually presumed by the conversational participants. Since the common ground represents everything that is presumed by the conversational participants, it will include information about the conversation itself, such as which objects are under discussion. Therefore, in principle, there should be some way to translate what I say here into an account that has only the common ground in the context. However, I do not think it is a fruitful way of thinking of things and so will not pursue it further here.
Nothing hangs on this simplifying assumption, which is dropped in the next chapter.

Planning and plan recognition are also independently motivated, as important parts of co-operative activities among rational agents. Plans have long been posited by philosophers and computer scientists to play crucial roles in activities such taking a trip, cooking, playing sports, fixing a car and so on. A well-run conversation is just like any of these other co-operative, rational activities. Take planning a trip with friends for instance. Achieving the goal of a successful trip is not a matter of performing random, disconnected actions. Rather, it requires having a coherent series of plans. Not only does one have to make plans such as where to go, how to get there, and what hotel to book, but they have to cohere in a way such that, for example, the hotel is booked in the very same place one chose to travel to. Likewise, participants in a conversation do not make random, disconnected utterances. A successful conversation also requires a coherent series of plans: not just what to talk about or how to answer a question under discussion, but also how an object under discussion relates to a question under discussion, for example.20

Of course, a complete plan for a typical conversation is not decided upon beforehand, but the sort of plans we will be concerned with are speakers’ short-term plans, which we can call local plans.21 Even in the most casual of conversations, speakers have at least basic, limited plans that drive what they say next, such as a plan to answer a question under discussion or a plan to introduce a new topic of conversation.

20Discourse plans are distinct from domain plans in that the latter is a plan regarding a task aside from the conversation, while the former is a plan for the conversation itself. The two can of course be related – my plan for the conversation might be intricately involved with achieving my domain plan – but they are nevertheless distinct. For example, suppose we are having a conversation about going to see a movie together tonight. I might have a domain plan to go see an action film; I might have a discourse plan (part of which is) to enter the topic of action films onto the conversational context. Clearly the discourse plan here is aimed to play a part in achieving my domain plan, but they are not the same plan. See Grosz & Sidner (1990) and Litman & Allen (1990) for further discussion on discourse vs. domain plans.

21Local plans might also be thought of as subplans, or elements of an overall plan. I am remaining neutral for now on the nature of plans.
For example, a speaker might mention the Bahamas in order to make the Bahamas the current topic of conversation. This is no different from planning a trip: for instance, we may begin by researching desirable destinations, and which destination is chosen in part determines how the rest of the planning goes.

The sort of plans one makes in co-operative rational activities like conversing and trip-planning must be recognizable to the other participants in the activity. For example, I should make it clear if I plan to book a hotel room, or else we might end up with several hotels booked for the same night. Not making one’s plans recognizable will likely result in a disastrous trip. Similarly, if a speaker wants to introduce the topic of going to the Bahamas into the context, the hearers must be able to recognize this plan in order to properly track the conversation. Not doing so will likely result in a disastrous conversation. On my view, therefore, tracking the conversation – i.e. updating the conversational context – is a pragmatic process involving plan recognition.

Plan recognition aids in co-operation in large part because, as Bratman (1990) argues, recognizing plans helps support expectations. Expectations, in turn, enable agents to make further plans based on them. For example, recognizing my plan to go to the departmental colloquium tomorrow supports your expectation that I’ll be there, thus enabling you to plan on that assumption. It also supports my own expectation that I’ll be there, allowing me to plan on the same assumption. The same holds true for discourse plans. For example, my plan to introduce the topic of the departmental colloquium supports both of our expectations that it’s now (one

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22 A speaker might have a weaker sort of plan, one that constrains the possible plans for the conversation rather than determining one particular future course, even in the short term. For example, a speaker might mention several places and continue to talk about one of them depending on what her interlocutor replies.

23 At least in part – I leave it open that there are other ways in which the conversational context is updated; for example, updating with the fact that a goat just walked into the room is not a matter of recognizing anybody’s plans. I will not be concerned with these other ways in the present paper.
of) the topic(s) of conversation, allowing us to both make further discourse plans accordingly.

We can think of plan recognition as compatible with Gricean pragmatics.\textsuperscript{24} Grice thought that pragmatic derivations were about recognizing speakers’ intentions. Plan recognition, unlike intention recognition, not only emphasizes what a speaker wants the interlocutors to believe (or understand, or presume) but how the speaker wants to fit her contribution into the overall conversation.

2.3.2 The Account

Now that the pragmatic framework is in place, let’s turn to the specific explanation of the discourse properties of indefinites. I will argue that uttering a sentence containing an indefinite in typical introductory contexts implicates that a novel file card is being talked about. I will then argue that the pragmatic derivation of the novelty implicature also explains licensing.

First it will be useful to review an often overlooked aspect of Gricean pragmatics. Grice thought there was a close connection between the maxim of relation and the maxim of manner (in particular, the supermaxim “be perspicuous”). Relevance and perspicuity go hand in hand because making relevant utterances is in part a matter of being perspicuous about the connection between the utterance and the rest of the conversation. Grice offers several examples in which an implicature is generated so that conversational participants can continue to assume that the speaker is obeying both relevance and perspicuity. That is to say, the implicature jointly appeals to relevance and perspicuity.\textsuperscript{25}

\textsuperscript{24} Thomason argues that plan recognition should replace Grice’s conversational maxims, but I think it is better seen as compatible with Grice’s project.

\textsuperscript{25} See Grice (1989) p.31-32. Grice’s two examples are each in their own way relevantly analogous and disanalogous to the derivation I give below. The reader should not take any details of these specific derivations as features of my view. The point is only that Grice seemed to think relevance
The plan recognition framework further explains the intuitive connection between relevance and perspicuity. As mentioned above, local discourse plans that drive particular utterances are the sorts of plans that should be recognizable. Part of making a plan recognizable is a matter of being perspicuous in how it connects to the conversation as a whole, and thereby the conversational context that represents the state of the conversation. But this means that being clear about how one’s local discourse plans relate to the overall plan for the discourse is part of making them recognizable, i.e. recognizable, perspicuous plans go hand in hand with relevant utterances. It is important to note that being perspicuous about the connection between an utterance and the conversation is both a matter of the content of the utterance and the manner in which the utterance is worded.

Recall typical introductory cases look like (4), repeated here as (15):

(15) a. A woman walked in.
    b. She ordered lunch.

As previously mentioned, I am maintaining the traditional semantics of indefinites as run-of-the-mill existential quantifiers, and the semantic content of sentences as truth-conditions. Furthermore, while I remain neutral on the semantics of definite descriptions, pronouns, and names, I take it as a brute fact that whatever their semantics, they have the ability to pick out a particular object already under discussion, i.e. a file card already in the context. This is not to say that these definite constructions are conventionally associated with familiarity, but merely that they clearly have the ability to pick out particular objects, including particular objects that are familiar. I remain neutral on whether this is a semantic or pragmatic aspect of these definite expressions.

and perspicuity often join together in generating implicatures.
By assumption, the semantic value of an indefinite does not pick out a particular file card (or object in the world). Neither does it encode anything about novelty or familiarity. A sentence containing an indefinite simply makes a general, existential claim about the world. We are assuming that speakers are being co-operative and thereby making relevant contributions to the conversation, so the existential claim must in some way relate to the conversational context and the ongoing discourse plan. Furthermore, there are many ways in which to express the same content as an existential claim (for instance, with an equivalent existentially entailing claim), but the speaker chose to use an explicit device of existential quantification (i.e. the indefinite).

Let’s work through (15) to see how the derivation works. Suppose a speaker utters (15a) at some point during the course of a conversation. There are two relevant facts about the utterance. First, the content of (15a) is that there is at least one woman who has the property of walking in. Second, the speaker explicitly used the indefinite expression *a woman*. A good conversational participant will be as co-operative as possible in achieving the conversational goals. This involves letting one’s discourse plans be as transparent as possible. Explicitly using the expression *a woman* is a fairly perspicuous way of revealing a plan to talk about a woman. Co-operative conversational participants, in an effort to track the conversation, may ask themselves how this relates to the conversational context. Does the speaker want to convey information about a woman already under discussion, or is this woman novel to the

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26 Of course, the most perspicuous way to reveal one’s plans would be to constantly spell them out in detail. However, there are brevity constraints in discourse; utterances should be as transparent as possible while at the same time not being excessively long or verbose. This is a practical constraint of agents with limited resources, like time and patience. Levinson (2000) writes that “human speech encoding is relatively very slow: the actual process of phonetic articulation is a bottleneck in a system that can otherwise run about four times faster” (p.6). If Levinson is right, a speaker really has to balance being transparent with being brief. Using a particular term to indicate a plan to talk about some object of that kind seems to be about as close to an optimal solution to that tension as we can get.
discussion? If the speaker had wanted to pick out a particular woman already under discussion, she had a much better way to do so, one far less prone to interpretive error: she could have used a pronoun, definite description, demonstrative, or name. But the speaker didn’t do so. So unless there is some other clear reason for the speaker making an existential claim rather than one containing a definite expression, (15a) is indicative of a plan to convey information about a new woman under discussion. Talking about a novel woman is often indicative of a plan to go on and say something more about that woman. So co-operative interlocutors who want to responsibly track the conversation, upon recognizing the speaker’s plan to talk about a new woman, will add a novel file card with the information \( x \) is a woman and \( x \) walked in (where \( x \) is a previously unused symbol). The addition of the appropriate file card connects the existential claim to the set of file cards, making it relevant to the conversation in general. But this very same act explains why the subsequent anaphoric pronoun in (15b) is licensed – there is now an appropriate file card in the context which it can pick up on.\(^{28}\)

The notion of introducing a novel object as indicative of a discourse plan to say something further about it needs to be clarified at once. Of course, there are plenty of reasons why a speaker might bring up an object that she won’t mention again. There is no requirement on co-operative discourse that every object mentioned play an extended role in the conversation. However, if speakers are not making a series of disconnected claims, many of the objects mentioned will play an extended role in the conversation. Just imagine a conversation in which no objects (or the majority of objects) mentioned were ever picked up on again, as in (16):

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\(^{27}\)Recall that I am not assuming that these expressions are conventionally associated with familiarity, but merely that they have the ability to pick out familiar objects.

\(^{28}\)On the static view, how the pronoun gets its value from the file card is a matter of the semantics of the pronoun. The present account is compatible with various views on the subject. I explore one formal account – treating the pronoun as a free variable – in appendix B.

The discourse begins to sound ridiculous, like a laundry list of statements about the world rather than a proper conversation (or like a literary description of a scene, but literary devices often work precisely because they subvert linguistic expectations). In an ordinary conversation, one’s gut reaction to something like (16) is to ask, “why are you telling me this?” Such an interlocutor is not making relevant contributions to the conversation. So while mentioning a novel object does not require a speaker to go on and talk about it, it does raise the conversational participants’ credence that she will go on and talk about it. So mentioning something novel is really indicative of a plan to potentially go on and talk about it. Such a discourse plan effectively eliminates all the potential ways the discourse could go in which the object in question is definitely not an object under discussion. Recognizing a plan to potentially go on and talk about something based on the reasoning outlined above is reason to add the appropriate file card to the context, since participants don’t know which of the objects mentioned will be picked up on again. In fact, even the speaker need not have a firm intention on whether she plans to go on to talk about an object. Perhaps, for example, she is waiting to see what her interlocutor replies before deciding what to say.29

The present explanation predicts the same output contexts for (15a) and (15b) as the dynamic accounts described in §2.2. Recall that they were able to account for novelty and licensing by encoding the instruction to add a new file card in the semantics of the indefinite. By contrast, I have just argued that there are pragmatic reasons for updating the context with a new file card when a sentence containing an indefinite is uttered (on an introductory use). This replicates the elegant results of the dynamic semantic accounts without making the mistake of semantically encoding

29Planning to talk about an object under discussion is not the only area in which speakers may have a range of plans rather than a specific plan in mind. Other examples include specificity resolution for questions and the interpretation of epistemic modals. (See von Fintel & Gillies (2008)).
novelty and without abandoning traditional treatments of semantic content.

The pragmatic account just given also correctly predicts that existentially entail-
ingen sentences like (17) don’t introduce a new file card:

(17) It’s not the case that every woman didn’t walk in.

While on the truth-conditional account of content we’ve been assuming, (17) has the
same content as (15a), it does not explicitly contain a device of existential quantifi-
cation. (17) would be a bad choice for a speaker who wanted to make a plan to talk
about a woman recognizable. In general, the account predicts that, absent a special
context, a file card gets added for only the descriptive content of the indefinite used.
So, in general, file cards are introduced based on an explicit linguistic act.

In the same way, the account explains the difference in anaphoric potential be-
tween other truth-conditionally equivalent sentences like (18) and (19):

(18) David is married.

(19) David has a spouse.

According to the view just defended, (18) does not introduce a file card for David’s
spouse, whereas (19) does. This gives the intuitively right result, since in the general
case (18) does not license pronominal anaphora on David’s spouse, whereas (19) does.
It is worth emphasizing that this is a quite natural result of the plan recognition

On some views of structured propositions such as that of King (2007), (17) and (15a) do not have
the same content. On such a view, existential sentences are only those that explicitly contain an
existential term like some or a. On this view, the novelty implicature runs entirely off content,
though the explanation is otherwise the same.

This is not to preclude the possibility of adding new file cards based on the perceptual environ-
ment or by accommodation. Under certain circumstances, I do think file cards can be added by
accommodation. I will turn to some such cases shortly. File cards are also added for things salient in
the perceptual environment of a conversation. For example, to borrow a well-known example from
Stalnaker, if a goat walks into the room during our conversation, we all note that a goat walked into
the room and record that fact. In our current terminology that amounts to adding a file card for
the goat that walked in.
model. As I have repeatedly said, a good conversational participant makes her plans recognizable, and it is intuitive to think that not only the content of what she says but also the manner in which she expresses it are indicative of her discourse plans. In this case, the fact that the term *a spouse* was or was not explicitly used lets the conversational participants know about the speaker’s local plans to (potentially) go on and talk about David’s spouse. Recall that it has been these local plans that have been our focus all along. Of course a speaker can utter (18) with a discourse plan of saying something about David’s spouse (e.g. “David is married. His wife is smart.”), but she has done nothing to indicate a local plan to make David’s spouse an object of discussion.

The account also predicts that only one file card gets added for each indefinite. For example, (15a) results in the introduction of a file card for only a woman, not any of the objects normally associated with a woman or entailed by the existence of a woman, like hands or a heart. Some people have argued that file cards are entered into the context for every object whose existence is entailed by the state of the conversation. If this was the case, upon making an utterance using an indefinite, a file card would get entered for every object whose existence it entailed. Furthermore, file cards would get added after processing existentially entailing sentences like (17) and (18). I disagree. If we are to take contexts seriously in pragmatic explanations, they have to be manageable. If the conversational context is going to be a tractable reconstruction of the information exchanged during a conversation, and something that has a key

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32 For example see Roberts (2003). This sort of position is generally motivated by a desire to account for the familiarity requirement on definites in the face of data that demonstrates that definite descriptions can be used without explicitly introduced antecedents. The position is also not entirely fruitful, since there are just as many examples of definite descriptions felicitously used where the existence of the object in question is not entailed by the context. For example, while the position on file cards may solve the problem for cases like “I went out for dinner last night. The waiter was rude.”, it doesn’t solve the problem for cases like “I went out for dinner last night. The salmon was divine.”. Restaurants almost always have waiters, but they do not almost always have salmon.
role in things like deriving implicatures and predicting felicitous anaphora, it must be a cognizable construct of reasonable size. Adding file cards willy-nilly for every object associated with an uttered indefinite description will soon result in an unruly jungle of a conversational context, one that seems an unlikely candidate for a psychologically real representation of a conversation. Thus I take it to be the correct result that the present explanation predicts only the addition of a single file card of the appropriate sort for each indefinite.

Some might object that the novelty implicature does not seem like an ordinary Gricean implicature, especially since it conveys information about the discourse itself rather than other information about the world. There are several reasons why this objection isn’t particularly worrisome. First, pragmatics has not been typically occupied with accounting for discourse information, and so there is little precedence for this sort of implicature. The important result in this paper thus far is that the same pragmatic principles that explain ordinary implicatures can also explain the communication of discourse information. That this is not exactly the ordinary sort of implicature is exactly the point. Nevertheless, one might still object that speakers don’t have these sort of meta-intentions to communicate propositions about the discourse itself. I do think it is a difficult (and indeed perhaps unanswerable) question whether a speaker genuinely has an intention to communicate a complete proposition like *I am speaking about a new woman under discussion now.* However, speakers certainly have intentions about whether they want to continue talking about an old object or introduce a new one. I am open to the idea that what gets implicated is not propositional and so not a traditional Gricean implicature in this sense. Finally, there is some precedent among traditional implicatures for implicatures about the discourse

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33In Roberts (ms), she argues that the file cards that are actually tracked by the conversational participants are just a limited subset of all the file cards available in the context, the file cards that are relevant to the current question(s) under discussion.
itself. For example, a speaker might implicate that something his interlocutor just said was rude or irrelevant.

The novelty implicature also bears other markings of a traditional implicature, e.g., it is non-detachable in just the way we’d expect given that it is generated by relevance and manner. That an implicature is non-detachable means that there is no semantically equivalent utterance that lacks the implicature in question. Grice believed this feature to hold of all implicatures except those derived from the maxim of manner, since those are also based on the words used. Since the novelty implicature works off the presence of an explicit device of existential quantification, it is present when \( a \) is replaced by another term with the same content such as \( \text{at least one} \) and \( \text{some} \). That is, the implicature is non-detachable so long as there is an explicit device of existential quantification. But when there is no such device, no implicature is generated and so it is absent from utterances like (17) and (18) though they may have the same content as (15a) and (19).

Someone might object that these indefinites that all supposedly have the classic semantics of the existential quantifier do not in fact license anaphora in the same way. For example, while in the majority of contexts discourses like (15) are felicitous, the felicity of discourses like (20) below varies somewhat relative to different contexts.

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34 The implicature appears to be detachable in the case of \textit{one or more}, but I take this to be mere appearance. Utterances containing the locution \textit{one or more} do not appear to license singular anaphora, despite the fact that they are truth-conditionally equivalent to claims containing indefinites. One would expect given my account that they do introduce a new file card and license subsequent anaphora. However, it seems that the lack of felicitous singular anaphora is a grammatical constraint quite independent from anything discussed here. Utterances containing \textit{one or more} do in fact introduce a new file card, but it’s one that licenses plural anaphora. (A complete account of anaphora involves positing something like plural file cards anyway.) While “One or more women walked in. \#She sat down.” is bad, “One or more women walked in. They sat down.” is fine, despite the first sentence’s non-committance as to whether there is one or multiple women. Even if one takes \textit{one or more} to have the same semantic value as \( a \), \textit{some}, and \textit{at least one}, it is undeniable that the former takes a plural noun and requires plural agreement on the verb, while the latter take singular nouns and require singular agreement. Thus it should come as no surprise that the former takes a plural pronoun while the latter take singular ones.
a. At least one woman walked in.

b. She ordered lunch.

It is beyond the scope of the present paper to examine all the differences between indefinite expressions. Intuitively, however, a pragmatic story should be able to accommodate the difference between the two discourses just mentioned, since one uses a phrase that makes the possibility of more than one woman walking in explicit, whereas the other leaves it implicit. However, there is data, due to Farkas (2002), that strongly suggests a difference in the semantics between a and some, because of a difference in their embedding behaviour. For example, (21) has a (very salient) generic reading, whereas (22) does not:

(21) A man always buys the first round of beer.

(22) Some man always buys the first round of beer.

This data doesn’t require adopting a dynamic semantics, but it does suggest that there is some semantic difference between a and some (as well as the other indefinites). I leave this as an open question for further examination.

### 2.3.3 Summary Uses

The explanation of the novelty condition is based on the idea that asserting the existence of some thing(s) will not be relevant, that is, it will not meet the conversational participants’ discourse expectations that it connects to the set of file cards, unless it is construed as indicative of a plan to introduce something new. This is because there are other linguistic expressions available that do have the ability to pick out particular existing file cards, and do so in a clearer, more effective way, such that they’d be preferred by co-operative speakers. Failing to have used such a perfectly good locution generally indicates that the speaker did not have a plan to update an
old file card. If the speaker had such a plan, making an existential claim would be needlessly general. It would be powerful confirmation for this view if when there was a reason to assert the existence of something regardless of the speaker’s plan in terms of the set of file cards, novelty was not implicated. This is just what we see in summary uses of indefinites, as in (6) and (9) from §2.2, repeated here as (23) and (24):

(23)  
(a) A student walked into Sue’s office and asked her about his exam.
(b) Finally, a student needed her help!

(24)  
(a) I went out to dinner with the woman from the bar last night.
(b) Can you believe it – a woman went out to dinner with me!

In the summary uses the existential, general meaning of the indefinite is emphasized. (23b) is appropriate to utter in a context in which Sue had been waiting and hoping for some student or other to need her help – she isn’t happy or relieved because that particular student came to her office in need of help, but that some student at all needed her help. The speaker has a special reason to use an existential claim, since it expresses something a definite expression cannot. If we replaced a with the in the summary uses, they would each convey something different, if they made sense at all. Since there is this special reason to use an indefinite and only an indefinite, we have reason to believe novelty won’t be implicated. And this is exactly what we see. Part of what cancels the implicature that the indefinite is being used to introduce something new is the explicit marking with some sort of term of summary – the examples of the kind I have given are much worse if they are not accompanied by terms like finally, can you believe it, or at least a special intonation. Since novelty is a generalized implicature, some sort of explicit indication to show that it is cancelled is just what one would expect.
Summary uses of indefinites are almost purely existential: they convey information about an object of a certain kind, but which particular object of that kind is irrelevant for the purposes of the conversation. Of course, the conversational participants understand, in (23) for example, that the student who needs Sue’s help is in fact the student introduced in the first sentence. A competent conversational participant will update the file cards accordingly. It is in this sense that the indefinite picks up on something old. It is also in this sense that the existential claim is relevant – it meets the conversational participants discourse expectations that it connects to the file cards. Unlike the introductory uses, which implicate that something new is being talked about, revealing the speaker’s intention to discuss a new object, the summary uses implicate that something old is being talked about, revealing the speaker’s intention to add information about an old object (as in (23b)) or comment on an old object (as in (24b)).

2.4 Applications and Advantages

We are now in a position to explain the infamous marble problem:

(25) a. Jodie dropped ten marbles and found all but one.
   b. It’s probably under the couch.

(26) a. Jodie dropped ten marbles and found nine of them.

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35 In some of the summary uses, such as (24b), the sentence doesn’t add any information, but rather registers the speaker’s surprise. While it is not straightforwardly an informational update, it still intuitively clear how such a statement is relevant to the set of file cards, since it comments on an existing card in the set. Such cases are probably more acceptable if repeating the known information helps to answer a question under discussion. The connection between objects under discussion and questions under discussion is an interesting one, but pursuing it is beyond the scope of the present work.

36 The example is originally due to Barbara Partee, and discussed in Heim (1982), Kamp (1988), and Groenendijk & Stokhof (1999), among others.
This pair of examples is typically thought to pose serious problems for traditional semantics. Since (25a) and (26a) are truth-conditionally equivalent, dynamic semanticists have argued that traditional semantics lacks the resources to predict why anaphora is licensed in the first case but not in the second.\textsuperscript{37} The present account makes precisely the correct prediction. In (25a), the fact that the speaker mentions the one missing marble is indicative of a plan to continue talking about the missing marble. Thus a file card for the one missing marble is added to the conversational context. When we get to (25b), then, there’s an appropriate antecedent for the pronoun – the file card for the one missing marble. (26a) does not mention the missing marble, but merely entails its existence. Since I have argued that the context is built based on recognizing speakers’ strategic discourse plans, the lack of mentioning the missing marble in (26a) reflects a lack of a local plan to go on to talk about it. Thus when the conversation reaches (26b), there is no file card for the missing marble and thus no antecedent for the pronoun. And so the anaphora is correctly predicted to be infelicitous.

Furthermore, the present explanation has a significant advantage over the dynamic semantic accounts from §2.2. It has been noted by many that the anaphora in (26b) significantly improves after a noticeable pause between (26a) and (26b). There is no natural explanation for this phenomenon on the type of dynamic semantic accounts described in §2.2.\textsuperscript{38} However, the present account offers a natural explanation of the

\textsuperscript{37}There are other replies to this example on behalf of traditional semantics. For example, Stalnaker (1998) argues that one can account for the difference based on the referential intentions of the speakers. See chapter 4 for arguments against a referential intentions account of anaphora on indefinites.

\textsuperscript{38}This is not to say that a dynamic semanticist could not offer an explanation, but to claim that there is no explanation that stems naturally from the family of dynamic semantic views considered in §2.2.
phenomenon. An extended pause in speech is usually an indication that the speaker is thinking. Thinking is part of planning, and when a speaker pauses to think, one significant possibility is that she is thinking about what to say or what to do next. Therefore, conversational participants are more likely to accept a change in plans, since something has occurred that often indicates a change in plans.

In this case, a file card for the missing marble is added to the context by accommodation. Accommodation (introduced by Lewis (1979)) is the idea that the conversational context can be adjusted to make an utterance acceptable or true if the context would otherwise cause the utterance to be unacceptable or obviously false. Unrestricted, accommodation vastly overgenerates and sometimes seems ad hoc: it has the power to make almost anything an acceptable utterance. But it is commonly agreed that accommodation is a real phenomenon, albeit constrained by certain conditions. Recognition of a change in plans seems to be a paradigmatic case in which conversational participants should be ready and willing to accommodate.

The result is that the felicity of (26b) is going to vary depending on how salient it is that plans are being changed. This correlation of change in felicity with change in plans is further supported by other examples in which anaphora goes from bad to good with factors that indicate a change in plans. For example, it is generally accepted, and the present theory predicts, that the following discourses are infelicitous.

(27)  a. Jodie is married.
     b. #He is nice.

(28)  a. John is a bicycle-owner.
     b. #It is nice.39

39These examples are from Heim (1982).
But there are certain circumstances in which these cases sound better, or even perfectly felicitous. For example, here again, (27) and (28) improve a lot if the speaker pauses for a significant period in between the two sentences.

Let’s consider a more fleshed out instance of the phenomenon so we can see more possible factors that play into it. There’s a scene in the movie *When Harry Met Sally* in which Harry and Sally are making small talk on an airplane, and the following discourse takes place.

(29)  


b. Sally: You are? (Long pause in which Harry says “mmhmm”...) You are.  

(Another pause.) Who is she?

I think there are at least two factors that improve this example. Aside from the pauses, which I’ve already discussed extensively, there is no confusion as to Sally’s possible discourse plans here. Sally knows her discourse plans will be made clear even without the explicit introduction of a file card for Harry’s fiancé. Second, because there are two different speakers in the conversation, the first speaker’s intentions haven’t been violated. Marriage is already a topic of conversation at this point in the conversation (Sally has just said that she is not interested in marrying anyone right now), and so the most obvious reason for Harry saying what he does is to convey that he, unlike Sally, is interested in marriage. But Sally, who finds Harry extremely annoying, is surprised that anyone would want to marry him, and so has her reasons for changing the focus of the conversation to Harry’s fiancé. If Harry had simply said all in one breath, “I am getting married and she is a lawyer”, it wouldn’t sound nearly as good as (29). This result is also predicted by the planning account, as conversational participants should be more willing to accept a discrepancy in plans interpersonally than intrapersonally, since people tend to fail to comply with other people’s plans more often than they fail to comply with their own.
Dynamic semantics treats the relationship between indefinite and pronouns as extremely systematic; the relationship is a matter of semantics. By contrast, on my account, the relationship is motivated by recognizing speakers’ discourse plans in using indefinites. While appealing to accommodation to explain these cases on the dynamic semantic view seems ad hoc, accommodation is a natural part of my view: under appropriate circumstances, interlocutors are primed to recognize that discourse plans have changed and adjust the set of file cards accordingly. The notion of plan recognition and speakers’ intentions predicts the variance in acceptability of such discourses; dynamic semantics fails to predict the same variance.

2.5 Conclusion

I have argued that the discourse properties of indefinites are best accounted for pragmatically, as an implicature derived from recognizing the discourse plans of the speaker. A significant advantage of the present account is that the phenomena are accounted for without complicating the semantics or the pragmatics. The general picture of pragmatics adopted in this paper is one dynamic semantics needs anyway, for things like deriving implicatures or ambiguity resolution. Dynamic semanticists do not deny the need for a pragmatics on top of their semantics. So my pragmatic view is no more complicated than one a dynamic semanticist need adopt anyway. But my semantics is considerably simpler. The dynamic semantic theories considered in §2.2 build updates with both truth conditions and discourse information into the semantics. By contrast, I take semantic contents to be truth conditions alone.

The pragmatic account of indefinites in discourse is not intended to be a full-fledged theory of cross-sentential anaphora. Such a theory requires making a commitment on the semantics of pronouns, and the present account is compatible with various views on the topic. In appendix B, I examine one particular formal treatment,
but this is meant to be illustrative of the sort of formal accounts that the present view makes possible rather than a commitment on the semantics of pronouns.

The pragmatic account opens a whole new type of strategy for explaining cross-sentential anaphora. Previous static strategies for cross-sentential anaphora largely focus on the semantics of pronouns (namely e-type, d-type, and context dependent quantifier accounts\(^\text{40}\)). Other strategies that have aimed to replicate the dynamic-style accounts have focused on the referential intentions of speakers when using indefinites. I argue against such accounts in chapter 4, but, in brief, they fail because not all indefinites that license anaphora are used with referential intentions. In contrast to standard static accounts, the dynamic semantic accounts described in §2.2 have a powerful and elegant explanation of the data: an indefinite introduces a file card that provides a value for the pronoun. But these accounts mistakenly semantically encode a pragmatic phenomenon. They also require abandoning the traditional notion of semantic content, replacing it with context change potentials. The present pragmatic account allows static views to explain cross-sentential anaphora via the introduction of a file card which provides a value for the pronoun. Such strategies can be fruitful because they maintain the elegance with which certain dynamic accounts explain the discourse properties of indefinites both without abandoning traditional notions of content and without semantically encoding properties that are in fact pragmatic.

\(^{40}\)See for example Evans (1977), Neale (1990) and King (1994), among others.
Chapter 3

The Pragmatics of Indefinites in Embedded Contexts

3.1 Introduction

Many people have tried to account for cross-sentential anaphora by giving a d-type or e-type analysis of pronouns. I think these approaches are problematic, but such discussion is beyond the scope of the present work. Rather than go through the details of these accounts, I want to say that these accounts are wrong-headed. Like the dynamic semanticist, I think cross-sentential anaphora is but one example of a much more general phenomenon: information flows through a discourse. The explanation of cross-sentential anaphora can then be assimilated to the general explanation of how information flows, i.e. how the context gets updated and in turn affects content. Unlike the dynamic semanticist, I think this explanation should be a primarily pragmatic, rather than semantic, one.

In chapter 2, I argued that the discourse properties of indefinites are best accounted for pragmatically. Showing that a pragmatic account of the discourse properties of indefinites was not only possible but preferable was intended to undermine
the position of the dynamic semanticist, who claims that we need to appeal to semantics to explain these sorts of dynamic features of discourse. But the account in chapter 2 only discussed basic, unembedded cases of indefinites. For the pragmatic account to do the work it is supposed to do, it has to be applicable to cases of indefinites embedded under various constructions, such as negation, modal operators, conditionals, universal quantifiers, and others. Some might worry that the sort of pragmatic account I defended cannot be extended to the embedded cases. The potential objections fall roughly into two categories. The first is predicting when anaphora on indefinites in embedded contexts is blocked and when it is licensed. For example, anaphora on the indefinite is blocked in the first of these two discourses, but licensed in the second:

(1)  
   a. Bryan did not get a bottle of wine.  
   b. # It is a barolo.

(2)  
   a. Bryan might get a bottle of wine.  
   b. It might be a barolo.

The second is accounting for unbound anaphora on indefinites within a single sentence, such as in cases of donkey anaphora, as in (3) and (4):

(3)  If a farmer owns a donkey, he deducts it from his taxes.

(4)  Every farmer who owns a donkey deducts it from his taxes.

Of course, in these cases the indefinite(s) in question also occur under the scope of other operators or quantifiers, so this a form of the first problem compounded by a second one.

After a brief discussion of how dynamic semantics generally deals with these embedded cases, I will take each of the problems in turn, focusing in the first half of
the paper on the anaphoric potential of indefinites in a range of embedded cases, and in the second half on the case of mid-sentence updates and donkey anaphora. I will argue that account I have given along with independently motivated assumptions about the nature of pragmatics accounts for the full range of data at least as well as or better than dynamic semantics.

3.2 The Myth of the Dynamic Account

Of course there is not a single dynamic semantic position on embedded indefinites. Dynamic semantics theories vary on their treatment of indefinites and other quantifiers and operators, and so it only makes sense that they also vary in explaining the interaction of the two. But there is considerable popularity to the thought that a dynamic semantics can do what a pragmatic view can’t, that is, have the power to predict the range of data surrounding cases of embedded indefinites. For example, Asher & Lascarides (2003) claim that a pragmatic theory can’t account for the interaction of indefinites with words that like if, not, and every, which, as I mentioned before, block certain anaphoric links.\footnote{Asher & Lascarides (2003) p. 40-41} The sort of data that Asher as well as other dynamic semanticists\footnote{For example, Groenendijk & Stokhof (1991) give exactly the same example to illustrate the same point.} cite is the following:

(5) a. Every farmer who owns a donkey is cruel.

b. ??It lives in a stable.

Asher claims that “dynamic semantics gives a systematic analysis of these anaphoric dependencies”.\footnote{p.41} That is, according to most standard dynamic semantics, words like
every, if, and not, as well as modal operators, block the cross-sentential anaphoric potential of indefinites within their scope. That is to say, while indefinites can introduce a file card that is picked up by a pronoun within the scope of the embedding quantifier or operator, the file card does not survive beyond that scope, and therefore cannot be picked up by pronouns in subsequent sentences.

However, as many have already noted, there are examples of embedded indefinites that do in fact license cross-sentential anaphoric pronouns. For example, there are cases in which pronouns can be anaphoric on indefinites embedded under universal quantifiers. While these sorts of anaphoric dependencies are not always licensed, they are also by no means rare. Consider:

(6) a. Every professor has a computer.
    b. It is used for research and administrative work.\(^4\)

(7) a. Every chess set comes with a spare pawn.
    b. It is taped to the top of the box.\(^5\)

(8) a. Every rice-grower in Korea owns a wooden cart.
    b. Usually he gets it from his father.\(^6\)

Even (5a), which Asher & Lascarides (2003) and Groenendijk & Stokhof (1991) use to motivate their view, can license anaphora beyond the scope of the universal. If the anaphoric pronoun itself occurs within a relative clause, the anaphora is perfectly felicitous. If the anaphoric pronoun occurs in the object position, the sentence is much improved over one in which the pronoun occurs in subject position. For example:

\(^4\)King (1994)
\(^5\)Sells (1985)
\(^6\)ibid.
(9)  a. Every farmer who owns a donkey is cruel.
    b. But those who keep it in a cage are crueler than those who keep it in a stable.

(10)  a. Every farmer who owns a donkey is cruel.
      b. They tend to treat it quite poorly.

This suggests that the problem with (5) is not so much about the universal quantifier but rather about having a subject-position pronoun anaphoric on an indefinite occurring inside a relative clause. This is further supported by the fact that (11) below does not sound very good either, even though some is never treated as blocking the anaphoric potential of indefinites within its scope:

(11)  a. Some farmer who owns a donkey is cruel.
      b. ??It lives in a stable.\(^7\)

Cases like (6) through (10) in general indicate that whether or not a pronoun can be felicitously anaphoric on an indefinite embedded under a universal quantifier has little to do with the so-called “blocking powers” of the universal quantifier.

The same is true of modal cases, conditionals, and negation. While (12) is bad, discourses like (13) are perfectly fine. The same goes for (14) and (15), and (16) and (17).

(12)  a. A wolf might walk in.
      b. # It is grey.

\(^7\)This is not to say we can never have subject position anaphora on indefinite antecedents that occur in relative clauses. I think there are some examples that sound ok. But the fact that many sound degraded still supports the hypothesis that there’s something odd about it that does not have to do specifically with universal quantifiers.
(13) a. A wolf might walk in.
    b. It would eat you first.\(^8\)

(14) a. If a farmer owns a donkey, he beats it.
    b. \# He is rich.

(15) a. If a farmer owns a donkey, he beats it.
    b. But if he is rich, he feeds it well.

(16) a. There was no thief.
    b. \#He was sneaky.

(17) a. There was no thief.
    b. He would have had to have been magical (to break in without a trace).

There seem to be just as many cases in which anaphora is licensed as those in which it is blocked. Treating the semantic value of quantifiers and operators as CCPs does little to help predict the range of cases. Views that treat quantifiers as blocking the licensing power of indefinites within their scope (i.e. treat them as externally static) fail to predict the felicitous cases (for example, Dynamic Predicate Logic). By contrast, views that treat quantifiers as allowing the licensing power of indefinites within their scope (i.e. treat them as externally dynamic) fail to predict the infelicitous cases (for example, Dynamic Montague Grammar).

Poesio & Zucchi (1992) and Roberts (1995, 1996) suggest treating the quantifiers as externally static and give pragmatic accounts for the felicitous cases. These accounts have been criticized as \textit{ad hoc} (by, for example, Brasoveanu (2007, 2006) and van Rooy (2005)). Groenendijk & Stokhof (1990a) conclude that the quantifiers

\(^8\)Roberts (1987)
and operators are sometimes externally static and sometimes externally dynamic. Even if an account could be worked out that predicts under what conditions they are dynamic and what conditions they are static, this lack of parsimony in positing a pervasive ambiguity is quite severe. Unless some cross-linguistic evidence is found in support of such an ambiguity, it seems like an entirely undesirable (and indeed wrong) move. To my knowledge, no such evidence exists. Chierchia (1995) argues for a mixed approach of anaphora, in which the felicitous sorts of examples are treated as d-type anaphora, whereas the others are treated as dynamically bound variables. Elbourne (2005) persuasively argues that Chierchia’s arguments for this view (as well as those of Kurafuji (1998, 1999) for the same view) don’t work. Brasoveanu (2007) seems to offer a more promising dynamic semantic account, though it is not the semantics alone that explains the data. One of the crucial explanatory aspects lies at the semantics-pragmatics interface, with the pragmatics licensing certain covert operators. The cases of operators is not as problematic for dynamic semantics in general, since it is relatively more straightforward how to build in the felicitous vs. infelicitous cases into the meaning of the modal expressions (though it is certainly problematic for some dynamic views in particular, and negation in general is a lot more difficult than modality).

There’s a deceptive simplicity and elegance to the early (and often taken as standard) dynamic semantic theories. Looking at those, one is tempted to think that if only we adopted a view in which meanings are CCPs, we would have a simple, straightforward way of accounting for a lot of puzzling data. But as with most views, its shortcomings emerged over time, and examples like the ones I cited above show that the issues are not so simply solved. More contemporary dynamic semantics, like that of Brasoveanu (2006, 2007) might capture more of the data than, say DPL, but rely on a highly complex semantics and a semantics-pragmatics interface, and still fail to capture the entire range of data. This is not to insinuate that I don’t think highly
of a lot of the work being done by contemporary dynamic semantics. Nor is it to say that it is in principle impossible to come up with an adequate dynamic account. Rather, the point is that the notion that adopting a dynamic semantics straightforwardly and simply yields the results we desire is nothing more than a myth. *There is no systematic analysis of indefinites in embedded contexts that falls out of adopting the view that meanings are CCPs*. Dynamic semantic views not only disagree in their predictions, but to my knowledge no single theory accounts for even the bulk of the data. The recalcitrance of the data to submit to a semantic explanation suggests that perhaps it’s time to look elsewhere for an explanation of the licensing facts. I will argue that, contrary to what Asher & Lascarides (2003) claim, a pragmatic theory can account for much of the data. After a brief interlude about contexts, I will turn to each of the embedded cases in turn.

### 3.3 Extension to Embedded Cases

#### 3.3.1 Contexts

Recall that we are thinking of contexts as information states, i.e., states that reflect the body of facts against which a conversation takes place. For the sake of simplicity, when I gave the treatment of unembedded indefinites I treated a context as an unstructured set of file cards. This was because we only needed to focus on the aspect of the context that keeps track of the objects under discussion, and any structure on those objects was irrelevant to the simple case. We now have to drop the simplifying assumption that contexts are unstructured sets of file cards. Instead, let’s think of a context as containing (minimally) an *ordered* set of file cards and a *common ground*. The ordering on the file cards corresponds to a salience ranking based on how recently a file card was introduced or updated. That is, the most salient file cards, those at the “top” of the context, are those that were just recently introduced or updated.
There are at least two ways that file cards can be lowered in the salience ranking (i.e. become backgrounded): either gradually, by more and more file cards being added on top of them, or suddenly, a move that intuitively corresponds to the conversational participants recognizing that a particular object is no longer under discussion. For our purposes up until this point, we have also assumed that once a file card gets added, it stays in the context forever. We will now drop this assumption as well. File cards can be added temporarily to the context and removed when it is clear that they are no longer appropriate objects under discussion. A common ground, following Stalnaker (1974, 1978, 1998), is the set of mutual presumptions of the conversational participants at any point during the conversation. Also following Stalnaker, I will model this in terms of a context set, which is the set of worlds that are epistemically open given the mutual presumptions.

3.3.2 Modal Subordination

As examples (12) and (13) above show, modal operators tend to block the anaphoric potential of indefinites when the subsequent pronoun occurs in a factual mood, but license pronominal anaphora when it also occurs under the scope of a modal. Roberts (1987) called the latter phenomenon modal subordination: subsequent sentences in a string of modal statements are interpreted as subordinate to each other. As mentioned in the previous section, the early, standard dynamic semantic accounts treated modal operators as blocking the anaphoric potential of indefinites within their scope. These sorts of accounts have to come up with an explanation as to why anaphora in modal subordination is felicitous. For example, Roberts (1987) attributes it to a pragmatic mechanism in which appropriate antecedents are accommodated. Of

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9This approach has been criticized as *ad hoc* by van Rooy (2005), Brasoveanu (2006, 2007), Geurts (1999).
course, those who do not treat the blocking powers as part of the semantics of the modal have to explain why anaphora is sometimes blocked. A good account of indefinites embedded under modals should be able to explain both the felicitous and infelicitous cases. The present pragmatic view does just this.

Suppose someone utters something of the form $\diamond \exists x Fx$. In this case, the speaker has asserted a possibility. This focuses the attention of the conversational participants to that possibility. The speaker has also asserted the existence of something within that possibility. The same pragmatic account that applied in the basic case applies here, within the possibility just introduced. The conversational participants might ask themselves in what way the existential claim is relevant to the context, i.e., in what way it meets discourse expectations or furthers the plans for the discourse. Cooperative speakers don’t make disconnected remarks. If a speaker asserts the existence of an object, there is a general discourse expectation that it somehow relates to the file cards in the context. But if the speaker had wanted to pick up on a file card already in the context, she had a perfectly good way of doing so, one that would be a lot less likely to lead to mistaken interpretation, i.e., a definite, demonstrative, pronoun, or name. The fact that she didn’t implicates that she intends to talk about something new to the discourse. This in turn gives rise to the discourse expectation that the speaker has a plan to potentially go on and talk about the object alluded to. So the cooperative interlocutor adds the appropriate file cards to the context accordingly. This accounts for the felicity of discourses like (13). Like the account of unembedded cases, the implicature works off the content of the modal claim and the fact that an explicit device of existential quantification was used.

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10 For one such dynamic semantic account, see van Rooy (2005).

11 This accounts for differences between sentences like *Someone might have murdered Sue* and *Sue might have been murdered*. In chapter 2 I argued that the former indicates a clear plan to potentially say something more about Sue’s murderer whereas the latter indicates no such plan (rather it indicates a plan to go on and talk about Sue’s having been murdered).
Unlike the unembedded cases, however, the file card introduced in the context of a possibility only survives so long as the possibility is being entertained. A straightforward way to think of this is in terms of the context set, i.e. the set of worlds in the context that represent the open possibilities compatible with the mutual presumptions of the conversational participants at any given point during the conversation. In the normal case, when a file card is added to the context it is presumed to be satisfied in every world in the context set. This is just what it means for the worlds to be in the context set – if they don’t satisfy the file cards then they are not compatible with the current presumptions of the conversation. For example, if there is a file card for a woman who walked in and ordered an avocado sandwich, every world in the context set must contain a woman who walked in and ordered an avocado sandwich. Worlds in which there are no such women are not compatible with the presumptions of the conversation. When a speaker makes a modal claim, the conversation is then focused on a set of possibilities that is distinct from the context set. This set of worlds might be a subset of the context set (if the modal is epistemic), or a completely different set (if the claim is counterfactual). The file card introduced within the possibility must be satisfied in every world in this temporary context set, but clearly need not be satisfied in every world in the original context set. So long as the conversational participants are focused on the context set representing the possibility under discussion, the file card can survive. But as soon as the hypothetical talk stops, the focus returns to the normal context set. The file card is not satisfied in every world in this context set, and so it cannot survive and is no longer available to license anaphora. This explains the contrast between examples like (12) and (13). In (12b), the lack of modal expression in the sentence indicates that the speaker has left the hypothetical and returned to the main context set. Thus the anaphoric pronoun to a file card not satisfied in all the worlds in the main context set is infelicitous. By contrast, in (12b), the use of a modal indicates the continued consideration of the possibility introduced,
and so the file card is still available. Thus the anaphora is predicted to be felicitous, which it is.

This account is further confirmed by the fact that it isn’t the presence of a modal operator that blocks anaphora in a subsequent sentence in a factual mood, but the hypothetical nature of the initial utterance. Consider the following minimal pairs:

(18) It is possible that a god exists. #He initiated the big bang./ He might have initiated the big bang.

(19) It is necessary that a god exists. He initiated the big bang.

Upon hearing the sound of horses hooves and a beating drum:

(20) A messenger might be coming. #He has a drum./ He might have a drum.

(21) A messenger must be coming. He has a drum.

These examples show that if according to the content of the initial utterance, the indefinite is satisfied in every world in the context set, any kind of subsequent anaphora is felicitous, even if the indefinite was under the scope of a modal operator, as in (19) and (21). It is only when the content of the initial utterance doesn’t commit the conversational participants to the satisfaction of the indefinite in every world in the context set that anaphora is restricted to within hypothetical statements, as in (18) and (20). These last examples don’t provide evidence against dynamic semantic views in general, but do pose problems for those standard accounts that attribute the blocking of anaphoric licensing to the presence of a modal operator, such as Asher & Lascarides (2003) and Roberts (1987).

3.3.3 Negation

In general negation blocks the anaphoric potential of indefinites, as in (22) and (23):
(22)  
   a. There wasn’t a thief.
   b. # He was sneaky.

(23)  
   a. Mary doesn’t own a car.
   b. # It is blue.

Most dynamic semantic accounts explain this in terms of the semantics of negation, defending a view in which it blocks the cross-sentential anaphoric potential of indefinites within its scope. But examples like (22) and (23) are also easily explained on the present pragmatic view. On the salient reading, where the indefinite takes narrow scope with respect to the negation, the utterance does not give rise to a discourse expectation that the speaker has a potential plan to go on and talk about a thief or car, since the speaker is asserting that there are no such objects. One is unlikely to have a plan to go on and talk about a non-existent thief or car. And if for whatever reason one did have such a plan, this would be a fairly poor reason of so indicating, since the proposition expressed explicitly asserts that there is no object at all–actual or merely possible–to talk about. Recall that in order for conversational participants to entertain a file card, it is generally presupposed for the purposes of the conversation that it is satisfied in some relevant set of worlds (even if those worlds are counterfactual). For the normal case, this was all the worlds in the context set. For modal cases, this was a derived set of worlds. But in the case of negation, accepting the utterance eliminates all worlds where Mary has a car or where there was a thief in the relevant time and place from the context set. Therefore there are no worlds in which a file card for a car that Mary owns or a thief can be satisfied. Thus no file card is added for a thief or a car, and the subsequent anaphora is not licensed.

Nevertheless, there are exceptions to the above generalization about negation; there are certain cases in which anaphoric pronouns do pick up on indefinites under the scope of negation, as in (24) and (25):
(24)  a. There wasn’t a thief.

        b. He would have had to have been magical (to break in without leaving a trace).

(25)  a. Mary doesn’t own a car.

        b. So she doesn’t have to park it.

In these cases, the anaphoric pronoun must occur under the scope of a modal or negation. At first, such data might suggest that we should treat negation as a modal. Then the explanation could be assimilated to the explanation of modal subordination, whether that amounts to a dynamic semantic explanation of modal subordination or not. For example, at a glance it might seem like the negated sentence introduces a context set of negated worlds in which the file card is satisfied. However, such an explanation is not so simple to work out, and to my knowledge, no one has yet worked out a successful view along these lines.\textsuperscript{12} Such a proposal is unlikely to be the right one in any case. The negation data differs importantly from the modal subordination data (in a way I’ll describe momentarily), and so it seems that there shouldn’t be a uniform explanation for the two.

In chapter 2, I argued that the pragmatic explanation of introducing a file card in terms of recognizing a speaker’s plans also gave a nice explanation of why some cases of anaphora that would normally be infelicitous were sometimes felicitous. Recall that I was thinking about cases like the following example from the movie \textit{When Harry Met Sally}:

\textsuperscript{12} In an unpublished draft of the paper, van Rooy (2005) mentions that he had given precisely such a proposal in an earlier draft of the work, but a reviewer made him see that the proposed solution was more problematic than he realized. (p.16) Whatever the problem, it was so severe that van Rooy did not amend the proposal, but removed it completely and argued for something quite different, something along the lines of what I will argue. In the published version of the work, his earlier proposal is given no mention and he simply suggests there is no good reason to pursue an analogy between negation and modals. (p.298)

b. Sally: You are? (Long pause in which Harry says “mmhmm”...) You are.

(Another pause.) Who is she?

I argued that although Sally’s use of the anaphoric pronoun she to talk about Harry’s fiancé would normally be infelicitous, there are certain factors that make what goes on in this discourse more reasonable, and as a result it is natural add a file card for Harry’s fiancé to the context by accommodation. Accommodation is a mechanism by which the conversational context is adjusted to make an utterance felicitous that would otherwise be infelicitous. Left unconstrained, accommodation yields gross overgeneralization. But within reasonable constraints, accommodation seems to be capture a real phenomenon that goes on in conversations. For this particular example I argued that the change in speaker and the long pause contributed to the interlocutors’ readiness to accept the change in discourse plans – while Harry may have wanted to talk about the fact that he was getting married, Sally clearly wants to refocus the discussion on his future wife. I think that a similar thing is going on in these felicitous negation cases. That is to say, they should be explained by accommodation.

There are two things that make these cases so ripe for an explanation by accommodation. First, the cases in which anaphora on indefinites embedded under negation is felicitous are special cases limited to certain conditions. Second, there are specific relevant facts about the sorts of contexts in which it is appropriate to use a negated sentence. Not only do both these factors constrain the use of accommodation, but further discussion will show that they are factors which lend themselves to an explanation by accommodation.

In the case of modal subordination, there are few restrictions on what can be felicitously uttered using a pronoun anaphoric on an indefinite (beyond general conversational restrictions on what is felicitous), as long as the pronoun is also under the scope of a modal. By contrast, the negation cases are generally felicitous only
when the anaphoric sentence either provides a reason as to why (the speaker thinks that) there is no object of the kind in question (e.g. why there wasn’t a thief) or when they directly answer a question already under discussion. In both these cases, the anaphoric sentence is one that explains why the speaker made the negative claim. Earlier I argued that speakers are unlikely to have a plan to go on and talk about something that they claim doesn’t exist. One situation in which interlocutors are likely to accept such a plan post hoc is if the speaker is explaining why she claimed there is no object of the relevant kind in the first place.

For example, suppose we’re discussing what Mary will do with a large sum of money she just inherited. Almost any string of modal claims is felicitous (though of course some might seem more inappropriate or far-fetched than others, the anaphora is still felicitous). For example, a speaker might utter (27):

\[(27)\]
\[\begin{align*} a. & \text{ Mary might buy a car. } \\ b. & \text{ It would be red. } \end{align*}\]

But in the analogous scenario in which we’re discussing whether Mary bought a car with her large sum of money after we know she spent it, the following is infelicitous:

\[(28)\]
\[\begin{align*} a. & \text{ Mary didn’t buy a car. } \\ b. & \text{ ?? It would be/have been red. } \end{align*}\]

(28) can be made felicitous (or at least judged significantly better) if the scenario is changed so that the colour of the car becomes relevant to the explanation of why she didn’t buy one. Consider the same scenario, but with the added salient conversational presumption that Mary only likes red cars.

\[(29)\]
\[\begin{align*} a. & \text{ Mary didn’t buy a car. } \\ b. & \text{ It would have been red and the insurance on red cars is too expensive. } \end{align*}\]
Similarly, if we are discussing whether Mary bought a car with her inheritance, the following discourse is infelicitous:

(30)  a. Mary didn’t buy a car.

       b. ?? So she doesn’t have to park it.

On the other hand, if Mary is late to meet us and someone wonders aloud whether it’s because Mary is having trouble finding a parking spot, it is perfectly felicitous to utter (31):

(31)  a. Mary doesn’t have a car.

       b. So she doesn’t have to park it.

So a sentence containing an indefinite that takes narrow scope with respect to a negation does not unrestrictedly license anaphoric pronouns under the scope of negations or modals. Again, this differs significantly from the case of modal subordination, in which an indefinite that takes narrow scope with respect to a modal does unrestrictedly license anaphora as long as it is under the scope of a modal.

The second important factor is the context in which it is appropriate to utter a negative sentence. Negative utterances are not made out of the blue. Generally the question of whether or not the object in question exists (or a closely related question) is under discussion, or a question that presupposes the positive counterpart to the negative sentence is under discussion. For example, it would be extremely weird to utter “Mary doesn’t have a car” discourse initially. It is appropriate to utter it in a context in which the participants are discussing whether Mary has a car, or something that presupposes that she has a car, such as whether she is having trouble parking. Horn (1989) cites several philosophers and linguists who argue in favour of this point, including some experimental psycholinguistics that shows that processing times for
negative sentences are longer than for positive sentences unless a proper context of denial is set up.\textsuperscript{13} Givon (1978, 1979) remarks that (32) is odd discourse initially:

(32) Oh, my wife’s not pregnant.

unless it is in a context in which the hearer can be expected to assume “that there was some likelihood that my wife was pregnant, that the subject has been under discussion, that it had been considered as a probability”.\textsuperscript{14} The oddness of (32) when this sort of context is lacking is further supported by the fact that the following sorts of replies are likely:

(33) Wait a minute – was she supposed to be pregnant?

Hold it – I didn’t know she was supposed to be pregnant.

The same does not hold for the positive counterpart of (32). “Oh, my wife is pregnant” is perfectly appropriate discourse initially without any particular expectations required.\textsuperscript{15} Strawson (1952) also supports this point, claiming that “the standard and primary use of ‘not’ is specifically to contradict or correct; to cancel a suggestion of one’s own or another’s”.\textsuperscript{16}

Although the contexts in which it is appropriate to utter, say (31a), aren’t ones that explicitly introduce a file card for Mary’s car, they are all contexts which make a car that Mary (potentially) owns salient. These are exactly the same sort of contexts in which accommodation is allowed in the unembedded case, such as (26) above. Making something salient certainly isn’t sufficient to license anaphora, but it does help in cases of accommodation. The sorts of factors I’ve argued facilitate accommodation

\textsuperscript{13}See Wason (1972), Greene (1970), and Cornish & Wason (1970).
\textsuperscript{14}Givon (1979) p.104
\textsuperscript{15}Horn (1989) also cites Ducrot (1973) as making the same point with a different example.
\textsuperscript{16}p.8
would hardly help if the sort of file card to be accommodated was not salient at all. In
the same way, the negation cases are ripe for accommodation because there is already
an appropriate sort of object made salient. Without further constraints, this would
lead to an overgeneralization of felicitous cases, but as I argued before, the negation
cases are felicitous only when the speaker is explaining *why* she made the negative
utterance. Thus accommodation seems like a natural explanation here.

3.3.4 Universal Quantifiers

Recall that the standard dynamic semantic accounts treat universal quantifiers as
externally static, that is, they block the licensing power of indefinites within their
scope. Other versions of dynamic semantics treat universal quantifiers as externally
dynamic, predicting that indefinites within their scope should always have licensing
power that reaches beyond it. Neither of these positions on its own can capture all the
data, since there are many cases in which it appears that indefinites within the scope
of a universal quantifier do license anaphora beyond their scope, as in (6), repeated
here as (34), while there are other cases in which they do not, as in (35):\(^{17}\)

(34)  a. Every professor has a computer.
      b. It is used for research and administrative work.\(^ {18}\)

(35)  a. Everybody on this block has a dog.
      b. ??It is brown.

\(^{17}\)Some dynamic semantic accounts, such as that of Brasoveanu (2007) appeal to the interaction
between semantics and pragmatics to explain the full range of cases. Brasoveanu’s semantics alone
predicts that singular anaphora on indefinites under the scope of a universal quantifier should never
be felicitous, but he posits that certain contexts license covert operators, which when present license
the anaphora. Pragmatic factors determine what contexts license the covert operator.

\(^{18}\)King (1994)
The present account predicts that a universal quantifier does not block the licensing power of an indefinite, which explains the felicity of (34) but not the infelicity of (35). Unlike the case of negation, in which a speaker is unlikely to have a plan to go on and discuss an object that she has asserted doesn’t exist, there’s nothing about making a universal claim that indicates that speaker has no intention of going on to talk about an object mentioned within that claim. In fact, for the same reasons an unembedded indefinite incites the conversational participants to add a new file card, an indefinite scoped under a universal should as well. The only difference in the file card(s) added is that they should represented as subordinate to a universal in the context. That is to say, in (34) for example, it is clear that for each professor, there is some computer that they have, so a file card for each of those computers is added to the context. In a more fleshed out version of this proposal, this will likely require a more complex representation of file cards in the context (this is probably needed to account for plural anaphora anyway). The file cards for the computers are subordinate to those of the professors, which explains why any anaphoric continuation to (34) is interpreted as applying to all the computers, and not as picking out one in particular.

The reader might note that there is a significant contrast between the explanation of the felicitous anaphora cases when it comes to negation and when it comes to universals. Negation generally blocked anaphora, and the felicitous cases were explained by appeal to accommodation. On the other hand, in the case of universals, anaphora is generally predicted to be felicitous and the cases in which it is infelicitous have to be explained some other way. I think the data warrants this contrast. In the case of negation, the situations in which we found felicitous cross-sentential anaphora were carefully circumscribed: they were just those cases in which the utterance explained why the negative claim had been made. Furthermore, I argued that negative claims are generally made in contexts in which the object that the pronoun picks up on has
already been made salient prior to the negative claim. As I argued earlier, both of these factors lend themselves to an explanation by accommodation. By contrast, the cases in which we find felicitous cross-sentential anaphora on indefinites scoped under universals are much more plentiful and much more varied. Some factors that facilitate anaphora in these cases have been discussed in the literature, but they are often vague. For example, one insight stemming from Fodor & Sag (1982) is that there has to be some narrative continuity between the utterances in the discourse. However, it’s not entirely clear what narrative continuity amounts to or whether there is a deeper pragmatic or semantic explanation that underlies this observation. Finally, the universal claims do not have to be made in a context that makes the relevant object salient. Thus we shouldn’t expect an explanation by accommodation.

The present account alone cannot predict precisely when anaphora is licensed in these cases and when it is not. Further investigation of the data and how the notion of narrative continuity should be fleshed out is required to see whether the explanation meshes well with the pragmatic account. There appear to be a lot of factors and to my knowledge, no existing view dynamic or static, can predict the full range of data. The point here is that claims like those of Asher & Lascarides (2003) and Groenendijk & Stokhof (1991) that a pragmatic account would fail to predict the blocking power of universals is no flaw of a pragmatic account. Since universals seem to somewhat equally block and license anaphora, neither prediction should be a deciding factor between the two views.

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19 See Poesio & Zucchi (1992) and Wang et al. (2006) for some discussion.

20 The remarks in this section apply to other generalized quantifiers as well. For example, (36) and (37) are both felicitous:

(36) Most professors have a computer. It is used for research and administrative work.

(37) Few farmers own a donkey. It does the farm work less efficiently than a tractor.
3.4 Donkey Anaphora

I said in the introduction that there are two main categories of potential objections to the pragmatic account. In the previous sections, I dealt with the first such objection: extending the account to indefinites embedded under operators and quantifiers. While I have not dealt with every single operator or quantifier, I hope that the reader can see how the explanation would go for those not discussed. Though the pragmatic account alone could not account for every bit of data, in each case, it accounted for the same amount of data or more than existing dynamic semantic accounts. Now we turn to the second sort of objection, cases in which indefinites license syntactically unbound anaphora within a single sentence. For example:

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

(39) Every farmer who owns a donkey beats it.

According to widely accepted syntactic theories, a donkey does not bind it in either (38) or (39). But much like in the case of indefinites in multi-sentence discourse, the indefinite licenses the pronominal anaphora on it. It appears, in fact, to be the same sort of phenomenon: an indefinite acts as though it binds something beyond its syntactic scope. Thus it would be a serious point against the present theory if it could not account for these types of sentences. One potential objection to a pragmatic account is that pragmatics is traditionally thought to act on the contents of whole sentences, whereas the dynamic effects of the indefinite in donkey anaphora occurs mid-sentence. On this conception of pragmatics, there is just no way a pragmatic account could apply to these cases. By contrast, dynamic semantics has no conceptual challenges in dealing with mid-sentence updates to the context. Since sub-sentential expressions are themselves CCPs, dynamic semantics can give much the same explanation for donkey anaphora as for discourse anaphora. This is not
to say, of course, that particular dynamic semantic accounts of donkey anaphora are unproblematic. Quite the opposite is true. But dynamic semantics has no in principle problem with donkey sentences, like some people think a pragmatic account does. Though it is a common (but far from ubiquitous) assumption, I do not think pragmatics is limited to working off of propositional contents. Since it is important to establish this fact before explaining how the present view accounts for donkey anaphora, I turn to the topic of sub-sentential pragmatics presently. Following the discussion of sub-sentential pragmatics, I will examine each kind of donkey anaphora (conditional and relative clause) in turn.

3.4.1 Sub-sentential Pragmatics

It is a common assumption of the Gricean tradition that the input to pragmatic calculations is the semantic content of a sentence relative to a context (or the semantic content of an utterance). Historically speaking, this stems from Grice’s “Logic and Conversation” in which he describes “what is said” as the input to pragmatic calculations. Though Grice is not entirely clear on what exactly it is, “what is said” is generally taken to be the semantic content of a complete sentence (i.e. the proposition expressed).

Grice sketches the derivation of an implicature as follows:

He said that \( p \); there is no reason to suppose that he is not observing the maxims, or at least the Cooperative Principle; he could not be doing this unless he thought that \( q \); he knows (and knows that I know that he knows) that I can see that the supposition that he thinks that \( q \) is required; he has done nothing to stop me thinking that \( q \); he intends me to think, or is at least willing to allow me to think, that \( q \); and so he has implicated that \( q \).\textsuperscript{21}

\textsuperscript{21}Grice (1989) p.31
In the calculation, the proposition expressed comes first, and the implicature is derived from it. As mentioned above, this assumption poses particular problems for the present topic, since the dynamic properties of the indefinite in donkey anaphora seem to have their effect mid-sentence. If we are to give a pragmatic account of the relationship between indefinite and pronoun, then, we must give up the assumption that pragmatics only acts on the contents of whole sentences. Happily, this assumption has been challenged before for a variety of reasons, most of which are unrelated to the present topic. Rather than a problem for a pragmatic account of donkey anaphora, the need for mid-sentence updates is one more reason to give up this assumption about pragmatics.

One question to ask when it comes to sub-sentential pragmatics is: do sub-sentential expressions have illocutionary force? That is, can the utterance of sub-sentential expression constitute a speech act? If the answer to this question is “yes”, then an argument for sub-sentential pragmatics seems fairly easy. If speakers are doing sub-sententially similar or analogous things to what they are doing sententially – i.e. asserting, questioning, commanding, etc. – then sub-sentential expressions have as much status as inputs to pragmatics as sentences do. If there were sub-sentential speech acts, an interlocutor could equally ask about the content of a sentence or a sub-sentential expression: why did the speaker assert/ask/command that? But I will put aside the question of whether there is something like sub-sentential speech acts. I think that whether an illocutionary act is performed in the utterance of a sub-sentential expression is not nearly as important as the question of whether sub-sentential expressions have a conversational purpose. Are they the sorts of things interlocutors can grasp and reason about? I think the answer to this latter question is “yes” and that this gives us good reason to think that pragmatic effects occur based on sub-sentential expressions. Expressions that have a conversational purpose, or ones that interlocutors can grasp or reason about must be, in whatever sense one
wants to cash it out, contributions to the conversation, and thus the cooperative principle applies.

I present two distinct but related arguments for this claim in this section, both drawing heavily from arguments in the literature. First I will examine Simons (2010)’s argument that unasserted sub-sentential clauses have conversational purposes and thus can and do act as the input to pragmatic implicatures. Then I will turn to arguments that show that general pragmatic considerations often determine the content of context-sensitive expressions, and therefore act before sentential content has even been determined. Taken together, there is really no reason left to think that sentential contents must be the input to pragmatic calculations.

I am not the first to note that endorsing Grice’s notion of pragmatics does not require endorsing every particular aspect of Grice’s own story, but it is nevertheless worth emphasizing here. Grice’s central insight is that certain aspects of what is communicated in a conversation are best explained by appealing to general principles of conversation viewed as a co-operative activity of rational agents. We can easily accept this central insight without accepting, say, Grice’s view on the nature of what is said or his pragmatic explanation of metaphor. A number of people have already argued that Grice’s maxims can and do apply to embedded clauses, and I want to briefly review their positions and add further support to their claims here. For example, Walker (1975) argues:

[Grice’s Conversational Hypothesis] holds that by a particular utterance on a particular occasion the speaker can convey more than his utterance strictly means through relying on a general recognition of Grice’s Cooperative Principle. It is therefore concerned with utterances, whether they constitute self-standing speech acts or not; an utterance of a subordinate clause, as in the antecedent of a conditional, is still an utterance, and therefore may convey conversationally more than it literally means. It may convey, for example, a further condition
on which the consequent is taken to depend.\footnote{p.151, also cited by Simons (2010).}

The sorts of examples that generally motivate this point of view, as previously mentioned, have little to do with donkey anaphora:

\begin{enumerate}
\item[(40)] If the old king had died of a heart attack and a republic has been declared, then Tom will be quite content.
\item[(41)] Bill believes that some of his students are waiting for him.
\item[(42)] Either Kai ate the broccoli or he ate some of the peas.\footnote{(40) is from Cohen (1971). (41) from Chierchia (2004), (42) from Sauerland (2004), and all are also cited in Simons (2010).}
\end{enumerate}

In (40), the implicature that the king first died, and the republic was declared afterwards (and perhaps because of it) stems from the antecedent of the conditional, not the entire conditional. In fact, as many have pointed out, Tom might not be happy at all if things occurred the other way around. In (41) and (42), the scalar implicatures are implicatures of non-asserted clauses and not the whole sentence. The implicature some but not all his students are waiting for Bill is embedded under the attitude of belief, and the implicature that Kai ate some but not all of the peas is an implicature of just one of the disjuncts and not the whole disjunction.\footnote{\textit{Not everyone agrees that the temporal/causal implicature of and or scalar implicatures are actually implicatures. See for example King \& Stanley (2005) for an argument against treating examples like (40) as a matter of conversational implicature and Chierchia (2004) for an argument that scalar implicatures are semantic. Simons (2010) claims that we can find more uncontroversial implicatures – namely relevance implicatures – in the same sort of subordinated circumstances. For example, consider:}

\begin{enumerate}
\item[(43)] \textit{A}: How will you get to the party?
\item[(40)] \textit{B}: Either I’ll borrow a car or I’ll take the bus and walk from the bus station.
\item[(41)] \textit{B’}: If I can’t borrow a car, I’ll take the bus and walk from the bus station. (p.36)
\end{enumerate}

As Simons points out, the first disjunct of \textit{B}’s utterance or the antecedent of \textit{B’}’s utterance is only relevant if the hearer assumes the speaker will use the car she borrows to get to the party. This is akin to the relevance implicature in Grice’s famous petrol example.
As Simons (2010) points out, there are actually two distinct issues to be addressed when dealing with pragmatics at the sub-sentential level. The first is what she calls the *calculation* problem. According to the standard Gricean picture, as described above, in the calculation of an implicature, the propositional content comes first, implicature second. The calculation problem is the problem of how the calculation of an implicature gets off the ground if we’re starting not with a proposition but with the content of a sub-sentential expression. The second problem is what she calls the *compositionality* problem. The compositionality problem, roughly, is the problem of implicatures intruding in the content of the sentence. Normally, the semantic content of a sentence is thought to be compositional, that is, determined by the conventional content of the parts (with ambiguity and reference resolved) and their mode of composition. If the content of a sentence contains pragmatic implicatures as well, then we are forced to give up this picture of the pure compositionality of semantic content.\(^{25}\)

For those who want to maintain something along the traditional lines between semantics and pragmatics, the compositionality problem is a significantly harder problem. The compositionality problem involves allowing pragmatic content to enter into the truth conditions of a sentence relative to a context. But the challenge of donkey anaphora (and mid-sentence update more generally) is the challenge of the calculation problem, not the compositionality problem. On the pragmatic view of donkey anaphora, the antecedent of the conditional or the relative clause introduces a file card (or file cards) of the appropriate kind, for much the same reasons they do in the unembedded cases (but more on that later). This has an effect on the context, but does not intrude on the truth conditions of the sentence as a whole, except that

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\(^{25}\)Simons actually divides the compositionality problem into two distinct but related problems. I don’t think this is necessary, but for her description of the issues, see Simons (2010) p.7-8
the updated context plays a role in providing a value for the appropriate pronoun(s). But this phenomenon is just an ordinary instance of context-sensitivity, and not a special problem for the present view. So what we need to turn to now is the calculation problem, and show that this presents no particular problem at all. I’ll restrict the discussion to clauses rather than all sub-sentential expressions, as extending a Gricean notion of pragmatics to embedded clauses is arguably less problematic than extending it to words or phrases. The issues with donkey anaphora only deal with clauses so we need not pursue the more complicated issues here.26

Simons argues that subordinate clauses have a conversational purpose beyond contributing to the propositional content of the entire utterance. Given that they have their own conversational purposes, the Principle of Cooperativity and all its associated maxims apply equally to them, and they are just as available as whole sentences for reasoning about the communicative intentions of a speaker. In fact, she argues that subordinate clauses sometimes express an utterance’s main conversational point. For example, consider the following question and variety of possible answers:

(44) a. Where did Jane go last week?
    b. Henry believes she was interviewing for a job at Princeton.
    c. Henry thinks she was interviewing for a job at Princeton.
    d. Henry said she was interviewing for a job at Princeton.
    e. Henry hinted she was interviewing for a job at Princeton.27

It is the content of the subordinate clause, and not the propositions expressed by (44b-e) that answer the question asked.

26It is my suspicion that a broadly Gricean pragmatics can apply to the content of a variety of sub-sentential expressions, not just those that are clauses. However, this is not the forum for pursuing this suspicion, since we need only adopt the more conservative position that pragmatics applies to sub-sentential clauses for our present purposes.

27p.12
Even when not the main point of an utterance, subordinate clauses seem to be conversationally accessible in a natural way. One can smoothly take up the content of the antecedent of a conditional (even if one does not want to deny the truth of the conditional itself). Consider:

(45) A: If Jane comes later, we can fill her in.

B: She won’t be coming.\(^{28}\)

In this case, B responds to the content of the antecedent of the conditional, not to the content of the entire assertion. If conversational participants can and do engage with subordinate clauses and not just the contents of entire assertions, then it should be expected that principles of conversation (qua cooperative, rational activity) should apply to them.

In fact, it seems like little more than an historical accident to think that pragmatics could only act on the contents of whole sentences. Grice’s seminal paper made this assumption, and it was widely adopted in work in pragmatics ever since. But had Grice not initially made that assumption, I wager that few people would have thought, at least not this widely and for this long, that pragmatics is something that acts on sentential contents and sentential contents only. It is a deep insight that agents engaged in acts of communication will communicate some things based not only on what they literally say, but on the fact that they said what they did while engaged in a rational, communicative action. But what person who is not familiar with the Gricean tradition would think that we couldn’t look at sub-sentential contents to figure out the communicative intentions of our interlocutors?

Some philosophers have argued that the very same pragmatic reasoning that explains the derivation of implicatures helps determine the content of context-sensitive

\(^{28}\)Also Simons’ example, p.13.
expressions, resolve ambiguity, and determine the content of underspecified expressions. If these mechanisms help determine the propositional content of a sentence, they cannot require the input of a proposition to get going. As a matter of fact, it appears even Grice himself thought so. In “Meaning”, Grice writes that relevance is of consideration in disambiguating the reference of particular terms or phrases:

In cases where there is doubt, say, about which of two or more things an utterer intends to convey, we tend to refer to the context (linguistic or otherwise) of the utterance and ask which of the alternatives would be relevant to other things he is saying or doing, or which intention in a particular situation would fit in with some purpose he obviously has (e.g. a man who calls for a “pump” at a fire would not want a bicycle pump).

In this case, Grice appeals to the same sort of general conversational considerations that determine implicatures – namely relevance – to explain disambiguation. But disambiguation occurs prior to determining propositional content, and so figuring out what the speaker intends to communicate in this example does not begin by appealing to a proposition. And, as I’ve been arguing, this seems entirely reasonable.

These sorts of examples aren’t only limited to cases of disambiguation. Ken Taylor (2001) argues that the same sort of considerations that drive implicature generation drive the determination of the value of many context-sensitive expressions, thus helping in determining what proposition is expressed by a speaker in a given context. Taylor (2001) invites us to consider the following two questions:

(46) Have you had breakfast?

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31These are what King & Stanley (2005) call weak pragmatic effects. If Taylor is right, weak pragmatic effects are not different in their derivation from strong pragmatic effects (i.e. implicatures). The only difference between the two is that weak pragmatic effects are more constrained by the semantics. Taylor’s argument also speaks against Bach (1999)’s distinction between wide and and narrow context, where narrow context is thought to determine the values of context-sensitive expressions and wide context to be involved in implicature generation.
(47) Have you had sex?

As he points out, in ordinary contexts, in our culture, (46) is an inquiry as to whether the hearer has had breakfast yet today, while (47) is generally an inquiry as to whether the hearer has had sex ever. Furthermore, (46) often implies an invitation to have breakfast with the speaker, whereas (47) has no such similar implication. The time span that the question concerns is a matter of completing the determinate communicated content of the questions. On the other hand, the implications they carry are a matter of more traditional post-propositional pragmatic implicatures. But as Taylor argues, both the pre-propositional completion of the questions’ content and the post-propositional implicatures are determined by the same sorts of factors. And these factors are classic pragmatic considerations.

Both the difference in the time span the questions concern and their accompanying implications seem to be a matter of the speaker and hearers’ mutual knowledge of their culture and context of the conversation (particularly cultural habits of breakfast eating and sex having), and the ability of the hearer(s) to recognize the intentions of the speaker based on this knowledge. The fact that (46) is a today (or this morning) question has to do with our (more or less) shared practice of eating breakfast daily, and the speaker and hearer’s mutual knowledge of this fact. Likewise, the fact that (47) is an ever question has to do with our (more or less) shared practice of not having sex daily. As Taylor demonstrates, this is further confirmed by the fact that when the details of the context or culture are changed, both the question expressed as well as its accompanying implications change as well. For example, suppose we lived in a culture in which everyone eats only one meal a day. Some people eat their meal in the morning, some at noon-time, and some in the evening. Essentially, this is a culture divided into breakfast-eaters, lunch-eaters, and dinner-eaters. Suppose a breakfast-eater and a dinner-eater are engaged in a conversation about whose eating habits are superior, and the breakfast-eater utters (46) to the dinner-eater. Clearly the question
asked is an *ever* question and not a *today* question – the breakfast-eater knows the dinner-eater hasn’t eaten breakfast today! Furthermore, it’s not an invitation to breakfast; rather, the breakfast-eater wants to establish whether the dinner-eater has ever had a meal in the morning time or tasted breakfast food. Similarly, we can imagine a situation in which (47) asks a *today* question. Suppose some people are at a special sort of party (perhaps from the decade of free love), where everyone at the party is supposed to (consentually) hook up with another guest at the party exactly once. One guest sees another guest whom he finds attractive across the room and asks (47). Clearly here the question is as to whether the addressee has had sex *yet today at this party*, and not *ever*. Furthermore, it is most definitely accompanied by a strongly implied invitation to engage in the act.

The point is, these sorts of undeniably pragmatic considerations – a matter of considering the relevance and informativeness of the question given the mutual knowledge of the world, the culture, and particular facts about the circumstances of the conversation to recognize the speaker’s likely intentions – are at work both at the level of completing the determinate content of the question as well as the post-propositional implications. The only difference between the pre-propositional pragmatics and the post-propositional pragmatics is that the pre-propositional pragmatics is closely constrained by the semantics, in this case the tense and aspect.\(^{32}\) Determining the content in these cases requires using some pre- or sub-propositional content of the sentence in question as input to the pragmatic calculations. Indeed, the lesson is that we can acknowledge that pragmatics happens in lots of places without aban-

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\(^{32}\) As Taylor points out, each question is appropriately answered in the positive if an event of the relevant sort (breakfast eating or sex having) occurs during an evaluation span of time that is in the past (but not wholly so) with respect to the reference span of the question. The difference between the completion of the two questions is the location of the early temporal border of the evaluation span (the beginning of the day vs. the beginning of life, in this case). It is only this early temporal border that is determined by the pragmatics.
doning Grice’s central insights and without adopting a view where pragmatics runs amok. Moreover, given the sorts of examples that Simons and Taylor cite, it seems this is precisely the view of pragmatics we should adopt.

Finally, for those who think adopting a view in which pragmatics takes place at a sub-sentential level is a significant disadvantage, it is important to note that in the debate with dynamic semantics, abandoning the traditional semantic/pragmatic lines is something both sides of the debate must do. On a dynamic semantics, semantics, which is traditionally relegated to the sentence, extends beyond the syntactic bounds of a sentence and to the discourse. On the present picture, pragmatics reaches within the sentence, acting on sub-sentential expressions. Given that there is good evidence that context updates happen both mid-sentence and between sentences, it is unclear how any theory that takes the interaction between linguistic expressions and context seriously is going to maintain the traditional semantic/pragmatic boundaries. With this notion of pragmatics under our belts, let’s turn back to the issue at hand: donkey anaphora.

### 3.4.2 Conditional Donkey Anaphora

It is not my intention here to give a full-fledged theory of conditional donkey anaphora. Such a theory requires making firm commitments on the semantics of pronouns and the semantics of conditionals, both of which deserve much greater space than I can give them here. I will, however, show that the present pragmatic account of the discourse properties of indefinites presents no conceptual problem for donkey anaphora. Adopting the pragmatic account does not rule out any of the main existing formal strategies for treating donkey anaphora.

Conditional donkey sentences are like (38), repeated here:

(48) If a farmer owns a donkey, he beats it.
There are two things that need to be explained, and correspondingly, there are two parts to the explanation. First, we have to explain how the unbound pronouns in the consequent of the conditional get their values from the indefinites in the antecedent. The second is how the sentence gets its universal force – why it conveys that every farmer beats every donkey he owns. The first will be explained in the same way I’ve been explaining cross-sentential anaphora. The only difference is that the update to the context with the new file card takes place mid-sentence, instead of after the content of the entire sentence has been processed. The second will be explained by appealing to the interaction between the semantics of the conditional and the indefinite. The reader should note that the same is true of dynamic semantic accounts. No dynamic semantic account of donkey anaphora relies on the semantics of the indefinite or the pronoun alone, but also on their interaction with the semantics of the conditional. The same is also generally true of static semantic accounts that treat pronouns as d-type or e-type (as going proxy for definite descriptions or getting their values from definite descriptions). One exception is Neale (1990), who gives a static d-type account in which the universal force is explained in terms of the semantics of the pronoun, but any such account is bound to fail. King (2004) argues decisively against this view, and I will not rehearse his arguments in detail here. Suffice it to note, as he does, the difference between (48) and the following discourse:

(49) a. A farmer owns a donkey.

  b. He beats it.

Any theory that explains the universal nature of the donkey sentence in terms of the pronominal semantics is going to have trouble explaining why discourse (49) has no reading upon which it means that every farmer who owns a donkey beats all the donkeys he owns.
Giving a theory of conditional donkey anaphora notably encounters some further challenges that are useful to keep in mind. I will briefly sketch each of them here so that I can easily refer back to them when applicable:

**Weak vs. strong readings:** Though people generally judge (48) to be true if and only if every farmer beats *every* donkey he owns, people tend to judge analogous sentences differently. For example, consider:

(50) If a man has a credit card, he uses it to pay for dinner.

People do not judge the truth of (50) to require every man to use *every* credit card he has to pay for dinner, but judge it to have the weaker truth conditions that every man uses *some* credit card of his to pay for dinner.

**The problem of indistinguishable participants:** This is traditionally a problem for e-type or d-type theories of donkey anaphora. E-type functions or d-type descriptions generally presuppose a unique antecedent. As we will see below, this uniqueness is satisfied in a theory of conditional donkey anaphora by appealing to minimal situations that satisfy the antecedent. But in a case of indistinguishable participants, like (51) below, even a minimal situation cannot satisfy the uniqueness requirement.

(51) If a bishop meets a bishop, he blesses him.

In any minimal situation that satisfies the antecedent (on a straightforward implementation), there will be two distinct bishops.

**The formal link:** Much like in cross-sentential anaphora, (52) is felicitous, whereas (53) is not:

(52) If a man has a wife, he is sitting next to her.
(53) *If a man is married, he is sitting next to her.33

Making wives salient is not sufficient for licensing anaphoric pronouns. Some e-type and d-type analyses that rely on salient functions to determine the values of pronouns therefore have difficulty explaining the contrast between (52) and (53).

The proportion problem: Any account, dynamic or static, that treats (48) as quantifying over farmer-donkey pairs will fail to predict the right truth conditions for sentences like (54):

(54) If a farmer owns a donkey, he usually beats it.

Intuitively, (54) is false in the following scenario. Suppose there are 10 donkey-owning farmers, 9 of whom own one donkey each, and the other one owns 100 donkeys. The farmer who owns 100 donkeys beats all the donkeys he owns, but none of the other farmers beat their donkeys. However, any analysis that blindly quantifies over farmer-donkey pairs is going to come to the conclusion that there are more farmer-donkey pairs where the former beats the latter than not, and predict (54) to be true.

3.4.2.1 The Pragmatics of Indefinites in Conditionals

As I said in the previous section, the first part of the account of donkey anaphora is how the pronouns in the consequent get their value from the indefinites in the antecedent. I have just argued that general considerations of conversations as co-operative, rational activities motivate pragmatics at the sub-sentential level just as at the sentential level. I furthermore agreed with Simons (2010)’s argument to the effect that the utterance of a sub-sentential clause can have a conversational purpose,

33 Examples are from Heim (1990).
and thus it is no surprise that a (broadly) Gricean theory of implicature derivation is applicable to them.

Of course there are many different conversational purposes for different utterances, but sometimes there are also general purposes are explanatorily fruitful. One such purpose is (arguably) to have one’s assertion accepted, or at least entered on the conversational record. Stalnaker (1978) has pointed out that this plays a key role in giving a pragmatic explanation for one kind of update to the context. Namely, when engaged in a conversation, an assertion results in the elimination of all the conflicting possibilities that were previously open in the conversational context. And so Stalnaker uses this very general conversational purpose of an assertion to give a pragmatic explanation of why the context gets updated in the way it does. Similar considerations apply to the antecedents of conditionals, and I will argue that they also explain why the context gets updated in the way it does.

The antecedent of a conditional has a rather straightforward conversational purpose: it requires interlocutors to suppose that something is the case. We saw this in Simons’ example in (45) above. A nice explanation of why the hearer can respond with Jane isn’t coming, is that there is no point (in this context) in supposing that Jane is coming if the hearer knows that Jane isn’t. In the case of donkey anaphora, the interlocutors may ask themselves: why did the speaker invite me to suppose that a farmer owns a donkey? If the speaker had wanted to invite me to suppose something about a particular farmer or a particular donkey, she had the devices to do so – she could have used a definite description, demonstrative, name, or pronoun as appropriate. But she did not. In the unembedded case, I argued that this sort of reasoning – absent a clear motive for using an existential despite an existing file card – led to the conclusion that the speaker’s action could only be explained by attributing an intention to the speaker to talk about something novel. The story applies in much the same way here. If the speaker wanted her interlocutors to consider someone or some
objects in particular she would have said so. And so co-operative interlocutors, keeping track of objects under discussion, will add the appropriate file card(s) to the context.

So this provides a nice, intuitive story for what’s going on with the pragmatics of the antecedents of donkey conditionals. Furthermore, the story I just told correctly predicts when cross-sentential anaphora on indefinites under the scope of conditionals is felicitous and when it is infelicitous. If it is conversationally clear that the supposition remains under consideration, the farmer and donkey file cards remain available, but once the supposition is understood to have conversationally expired, they expire as well. As such, we can understand why (55) and (56) are felicitous discourses but (57) is not:

(55) If a farmer owns a donkey, he beats it. But if he is rich, he feeds it well.

(56) If a farmer owns a donkey, he beats it. It always howls and disturbs the neighbors.

(57) If a farmer owns a donkey, he beats it. # It is grey.

34 Of course, the speaker may have mentioned some farmers and donkeys already in the discourse. In fact, she may have mentioned all the farmers and donkeys in the relevant domain. But by using an existential, she picks out none of them in particular. The whole conditional may have a summary sort of flavor to it – suppose the speaker as just named every farmer and every donkey in the relevant domain, asserting of each that they stand in the beating relation as well as the owning one, and then follows it up by concluding “So, if a farmer owns a donkey, he beats it”. But there is still a sense under the supposition of the antecedent that we are considering an arbitrary farmer and arbitrary donkey. We’re in quite a different situation from the summary uses, where there is only one object of the relevant kind under discussion and there’s an obvious reason for using an existential to continue the discussion about it.

35 This is infelicitous on the most salient reading, in which a donkey being grey has nothing to do with the supposition that a farmer owns a donkey. However, if we create a rich enough context in which it is conversationally understood that the color of the donkey is relevant to whether or not a farmer owns it, or whether or not a farmer beats it, this example can sound a lot better. For example, suppose we both know that donkeys come in various colors: grey, brown, purple. And I am informing you of what kind of person owns what color donkey and how he treats it: If a farmer owns a donkey, he beats it. It is grey. If a banker owns a donkey, he ignores it. It is purple.
The second part of the account of donkey anaphora, as I said above, is explaining the universal reading. This part relies on the interaction of the semantics (and pragmatics) of indefinites and pronouns with that of the conditional. As I said before, I am not going to give an account of donkey anaphora, but show that the pragmatic account is compatible with existing approaches. In the following sections I look at two major approaches: dynamic predicate logic and situation semantics.

### 3.4.2.2 Predicate Logic plus Dynamics

In chapter 1, I described a toy system, called Predicate Logic plus Dynamics (PL\(_+_D\)), which I argued could account for cross-sentential anaphora in a similar way to Dynamic Predicate Logic (DPL), but with the updates to the context and the resulting relationship between indefinite and unbound pronoun explained pragmatically. The semantics of PL\(_+_D\) is just the ordinary semantics of predicate logic, and all the dynamic aspects of interpretation are accounted for by the pragmatics. In that discussion, I did not extend the analysis to donkey anaphora. The DPL treatment of conditional donkey anaphora is simple and elegant. Can PL\(_+_D\) similarly account for donkey anaphora?

The semantic clause for conditionals in predicate logic is as follows (with reference to the model suppressed):

\[
[\phi \rightarrow \psi] = \{ g \mid g \in [\phi] \Rightarrow g \in [\psi] \}
\]

Unlike the fragment of PL\(_+_D\) presented in chapter 1, in which the standard semantics for predicate logic was left untouched, the extension of PL\(_+_D\) to account for conditional donkey sentences cannot use the standard PL semantics for conditionals. This should come as no surprise. I have just argued that conditionals with existential antecedents pragmatically induce an update to the context after the antecedent
and before the consequent, and that this updated context is picked up on by the consequent. Thus there is context-sensitivity in the consequent of conditionals that ordinary predicate logic is not equipped to handle. The semantics for conditionals must reflect this context-sensitivity. Luckily, one straightforward change in the PL semantics for the conditional – an appeal to the context in the consequent – will account for donkey conditionals in PL+D.

**PL+D** semantic clause for conditionals (where ‘C’ is the context):

\[
\text{\([\phi \rightarrow \psi] = \{g \mid g \in [\phi] \Rightarrow (g \in C \Rightarrow g \in [\psi])\}\)}
\]

As a refresher, here are the rest of the relevant PL/PL+D semantic clauses as well as PL+D’s two pragmatic update rules:

**PL+D Semantics (relevant clauses)**

1. \([t]_g = g(t)\) if \(t\) is a variable
   \n   \[= F(t)\] if \(t\) is a constant

2. \([Rt_1...t_n] = \{g \mid \langle[t_1]_g...[t_n]_g\rangle \in F(R)\}\}

3. \([\phi \land \psi] = \{g \mid g \in [\phi] \land g \in [\psi]\}\}

4. \([\exists x\phi] = \{g \mid \exists k : k[x]g \land k \in [\phi]\}\}

**PL+D Pragmatic updates**

Where C is the input context, P is the content of an arbitrary assertion, and H is an arbitrary predicate, the 2 pragmatic updates are:

1. \(C[P] = C \cap P\) (Truth-conditional update)
2. \( C[\exists x H x]^{36} = \bigcup_{g \in C} \{ h \mid h[x]g \& h(x) \in F(H) \} \) (New file card update)

The semantic clause for the conditional stated that all the assignment functions in the denotation of the antecedent that were also in the local context are in the denotation of the consequent. Let’s work through (38) to show that this yields the right truth conditions. The logical form of (38) (as DPL has it) is as follows:

\[(58) \ \exists x(\text{Farmer}(x) \land \exists y(\text{Donkey}(y) \land \text{Owns}(xy))) \rightarrow \text{Beats}(xy)\]

As the reader can plainly see, the antecedent and consequent are translated into predicate logic the way they would be if they were found unembedded, and the existentials in the antecedent do not bind the variables in the consequent. If the antecedent is false, then the set of assignment functions it denotes is the empty set, and the conditional is vacuously true (the truth conditions are those of the material conditional). The interesting case is when the existential antecedent is true, i.e. there is at least one donkey-owning farmer. In this case, the denotation of the antecedent includes all the assignment functions for which there exists at least one \( x \)-and-\( y \)-variant\(^{37} \) that assigns \( x \) to a farmer and \( y \) to a donkey that stand in the owning relation. Among these will surely be included all those assignment functions that already assign \( x \) to a farmer and \( y \) to a donkey that stand in the owning relation. This is important because it’s these assignments that all need to be included in the denotation of the consequent to get the right truth conditions for the conditional (we don’t care about the assignment functions that don’t assign \( x \) to a farmer and \( y \) to a donkey).

After the semantic processing of the antecedent, the context is updated for the pragmatic reasons defended above. (Note that no reference to updating is made in

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\(^{36}\)I present the rule based on the simple case for purposes of perspicuity. The general rule for \( \exists x \phi \) is a little more complicated to define.

\(^{37}\)An \( x \)-variant is an assignment function that differs at most from another in what it assigns to \( x \).
the semantics of the conditional, lest anyone think I’ve snuck some dynamics into the semantics). Accordingly, the context is updated with a file card for a donkey-owning farmer and a farmer-owned donkey. In PL+D this amounts to shifting all the assignment functions in the context so that the updated context contains all the x-and-y-variants of the input assignment functions, which now assign x to a farmer and y to a donkey that stand in the owning relation. The denotation of Beats(xy), according to the semantic clause for atomic formulas, is all those assignment functions that assign x and y to the interpretation of the beats relation. If all the assignment functions in the intersection of the denotation of the antecedent and the context that assign x to a farmer and y to a donkey that stand in the owning relation are also in the denotation of the consequent, then the conditional is true.

One more thing has to be said about this derivation. To get the right result, we have to be sure the context will always contain at least as many assignment functions that assign x and y to the appropriate objects as the denotation of the antecedent does. Otherwise, there might be a farmer and a donkey that are possible witnesses for the antecedent, but get eliminated from consideration because they don’t appear as possible assignments in the context, and we would wrongly predict (38) as true in some cases in which some farmers do not beat the donkeys they own. Luckily, this should always be guaranteed, as long as nothing has gone awry with the context, and we have chosen the right variables for representing the discourse (roughly: no re-using of variables for existentials). Contexts start as the set of all assignment functions, and are only changed in two ways. Either assignment functions that falsify true sentences are eliminated, or assignment functions that attach certain variables to certain kinds of objects are added. Thus the context will always contain

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38 The no re-using variables for existentials rule is sensible if we are thinking of variables as labels for file cards. We would never give distinct file cards the same label.
at least as many assignment functions (regarding the relevant variables) as those that make a particular sentence true relative to the model. So (38) is true if all the assignment functions that satisfy \( \exists x (\text{Farmer}(x) \land \exists y (\text{Donkey}(y) \land \text{Owns}(xy))) \) are such that if they are also in the context (updated after the antecedent, which limits our consideration to all and only those assignments that assign \( x \) and \( y \) to the appropriate objects) also satisfy \( \text{Beats}(xy) \). This gives the intuitively right results: that (38) is true if all donkey-owning farmers beat all the donkeys they own.\(^{39}\)

In the end, in terms of accounting for the data, PL\(_+D\) seems to fair no better and no worse than DPL. One strength of DPL and PL\(_+D\) is that they avoid the problem of indistinguishable participants, and succeed in accounting for the formal link. Some of the weaknesses include suffering from the proportion problem, the inability to get weak readings of donkey conditionals, and analyzing indicative conditionals as material conditionals. Given its resemblance to DPL, it is unsurprising that the system described inherits its weaknesses. The encouraging, important result is that it also inherits its strengths – we can explain the same fragment DPL does on the pragmatic account, without resorting to a semantics that deals in functions from contexts to contexts. Thus the pragmatic account presents neither a conceptual nor formal problem for this type of account of conditional donkey anaphora.

### 3.4.2.3 Situation Semantics

Another way to treat donkey conditionals is with a situation semantics. This way of treating donkey conditionals is also open to the proponent of the pragmatic account. A situation is a part of a possible world. One way to think of a situation is as an ordered set of individuals, properties, and relations, but just like there is not one agreed

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\(^{39}\)The fact that the context always contains as least as many assignment functions as the model also guarantees that the appeal to context in the semantic clause for the conditional will have no effect on conditionals without existential antecedents.
upon way to think of a possible world, there is not one agreed upon way to think of situations. Situation semantics for conditionals has the advantage of being much more independently motivated as a treatment of indicative conditionals in general. It was the insight of Kratzer (1986) to treat conditionals along the lines of sentences containing generalized quantifiers, where the antecedent serves as the restrictor of the quantifier and the consequent as the nuclear scope. An extended discussion of the motivations and consequences of this sort of treatment of conditionals is beyond the scope of the present work; the interested reader should see Kratzer (1986). Kratzer’s idea is that even conditionals that do not have an overt adverb of quantification or modal in them contain implicit quantifiers. Heim (1990) following Berman (1987) argues that we can treat conditional donkey sentences as containing an implicit always.

A conditional \textit{Always If A, then B} has the following truth conditions:

\textit{Always if A, then B} is true iff for every minimal situation \(s_1\) in which A is true, there is a situation \(s_2\) such that \(s_1\) is a part of \(s_2\) and B is true in \(s_2\). (In other words, every minimal situation in which A is true can be extended to a situation in which B is true.)

A minimal situation in which a proposition \(P\) is true is a situation in which \(P\) is true and there is no situation that is a proper part of it in which \(P\) is true.\(^{40}\)

The logical form of our donkey sentence, (38) is roughly as follows:

\(^{40}\)Quantifying over minimal situations is often treated as a solution to a problem presented by e-type theories of anaphora, the problem of uniqueness presuppositions of definite descriptions (or e-type functions). In a minimal situation, there is only one object of each relevant kind, and so uniqueness requirements present no problems (with the notable exception of the problem of indistinguishable participants). But one can also think of employing minimal situations as necessary independent of whether or not we treat anaphoric pronouns as e-type. Rather, it is the solution to the problem of turning an existential into a universal – the antecedent of a donkey conditional is only \textit{a farmer owns a donkey} but somehow the truth conditions for the conditional get us to the point where we can quantify over all the donkey-owning farmers. It is worth noting that donkey conditionals are not the only sorts of conditionals in which we intuitively want to quantify over situations instead of worlds. For example, consider \textit{If John loses, he cries}. Intuitively, this is true iff every John-losing event or situation leads to a John-crying event or situation. King (2005) also makes this point.
(59) \( \exists x (\text{Farmer}(x) \land \exists y (\text{Donkey}(y) \land \text{Owns}(xy))) [\text{Beats}(xy)] \)

It is clear that in our example, a minimal situation in which the antecedent is true is one that contains exactly one farmer and exactly one donkey that stand in the owning relation, and nothing else. What sort of situation makes the consequent true? I'll assume an analysis of pronouns as free variables and file cards as sets of assignment functions, which I've been suggesting periodically as a good formalization given the pragmatic account I defend. The reader should keep in mind that other semantics for pronouns are compatible with the pragmatic view I'm defending. Assuming a standard predicate logic account of formulas with free variables, the consequent is true relative to an assignment function that assigns \( x \) and \( y \) to objects that stand in the beating relation. We also need to make the further assumption that the variables that are anaphoric pronouns look to the file cards in the context for possible assignment functions. This is a reasonable assumption to make if we are giving a theory of anaphoric pronouns, though it does deviate from standard predicate logic (but standard predicate logic was not invented to account for unbound anaphora, so this should not be seen as a downside of the view). So to figure out if the consequent is true, we need to know what file cards are introduced by the antecedent.

Admittedly, mapping the pragmatic story onto the formal situation semantics is not straightforward. I think of it as an open philosophical question as to how to map a pragmatic explanation onto a formal system, one that I hope will be more widely investigated in the near future. But here is one plausible suggestion. Suppose for each minimal situation, a file card for a farmer and a donkey (that stand in the owning relation) is introduced. The \( x \) file card will assign \( x \) to but one object, the farmer in the minimal situation, and \( y \) file card will assign \( y \) to but one object, the donkey in the minimal situation, since they are the only candidate objects around. These will be the only available assignment functions for evaluating the consequent, and so the consequent will only be true in a situation in which the farmer from the antecedent
situation beats the donkey from the antecedent situation. Thus we predict that (38) is true iff every minimal situation in which a farmer owns a donkey can be extended to a situation in which the farmer from the minimal situation beats the donkey from the minimal situation, i.e. every farmer beats every donkey he owns.

One remaining problem with the view as presented is that it runs right into the problem of indistinguishable participants. The challenge for the present view is somewhat different from the one posed to the e-type view. On the implementation of file cards and pronouns I’ve been suggesting, the view predicts that (51) is true in a model in which one bishop blesses himself upon meeting another bishop, and no other blessing occurs. This is an undesirable result, but does not make the view hopeless. First of all, this is mostly a problem with the formal treatment of file cards and pronouns, not the pragmatic proposal. So one potential solution is to rethink our formal implementation of file cards and/or pronouns. Second, the present view is amenable to some solutions posed in the literature for e-type views, e.g. those suggested in Heim (1990).

3.4.3 Relative Clause Donkey Anaphora

Recall that relative clause donkey anaphora is exemplified by (39), repeated here:

(60) Every farmer who owns a donkey beats it.

Relative clause donkey anaphora presents a considerably easier task than conditional donkey anaphora. Conditional donkey anaphora presented a problem above and beyond the unbound pronoun in the consequent, because we also had to explain why the indefinites in the antecedent get a universal reading (though as we saw in the weak readings, in some cases the indefinite in the object position gets an existential reading). On the other hand, in relative clause donkey anaphora, it is first of all rather straightforward to see why we are dealing with multiple cases, since the indefinite
comes under the scope of the universal quantifier. Second of all, some people like Heim (1990) have argued that the desired reading for (60) is the weak one. Heim (1990) argues we don’t want a view (like DPL) that predicts (61) as equivalent to (60), since informants judge them to be true in different cases:

(61) Every donkey owned by a farmer is beaten by him.

The present account will predict the weak reading for relative clause donkey anaphora. Admittedly, the data here is somewhat complicated. Kanazawa (1994) argues that there are strong readings of relative clause donkey sentences, such as (62):

(62) Every student who borrowed a book from Peter eventually returned it.

It’s not clear what factors contribute to a weak or strong reading of donkey anaphora. As King (2005) discusses, among the contributing factors are “the monotonicity properties of the determiner on the wide scope quantifier [e.g. every, or most, or no], the lexical semantics of the predicates occurring in the sentence, and general background assumptions concerning the situations in which we are to consider the truth or falsity of the sentences”.

As he further points out, there seem to be no single sentence that possesses both readings, and this makes the notion that the two readings are a matter of semantics highly suspect. Thus I take it as no disadvantage of the present account that it predicts the weak reading.

I have already extensively discussed mid-sentence implicatures and updates to the context, so it should not present much of a conceptual challenge here to assume that the indefinite, despite being embedded in a relative clause, still implicates that the speaker is talking about something novel. Unfortunately, there is not as clear a conversational purpose that motivates the mid-sentence update in the particular case

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41 p.14
of the relative clause as there was for the conditional. It worth considering, however, whether in cases such as (63) below the relative clause gives rise to an implicature (rather than, say, the whole sentence).

(63)  A: Bryan scheduled the basketball tournament for early Friday afternoon.

          B: Anyone who has work will be angry.

It seems relative clause *who has work* generates the implicature that that those who have work will have to miss the tournament because of work, since the implicature is present even though the whole sentence itself does not entail that there is anyone who has to work.42

Nevertheless, given the argument at the beginning of this section about the calculation of implicatures based on clauses, it is not unreasonable to think that the pragmatic derivation of file cards based on the relative clause in the donkey sentence happens before we get to the end of the sentence. If this is the case, co-operative interlocutors should add a file card for a donkey relative to each farmer, for the same reasons as discussed in the section on universal quantifiers.

Given the PL+D clause for conditionals proposed above, PL+D also has the power to account for relative clause donkey anaphora in an analogous way to DPL. However, I will not pursue that further here, since DPL translates universal quantifiers in terms of the conditional. It is agreed, since the advent of generalized quantifier theory, that conditionals play no role in the logical form of universally quantified sentences and so I think exploring this option any further is a waste of time. Following King (2005), we can roughly represent the syntactic structure of (60) as:

(64)  [Every x: [x is a woman & [a y: y is a donkey & x owns y]]] [x beats y]

42Admittedly the intuitions here are unclear. Perhaps the implicature is of the entire sentence and something like: anyone who has to work will be angry because they will miss the game due to work.
According to standard accounts of generalized quantifiers, (64) is true iff every value for \( x \) that satisfies the domain of the universal quantifier, also satisfies the nuclear scope, i.e. all values for \( x \) that satisfy \( x \text{ is a farmer who owns a donkey} \) \( y \) also have to satisfy \( x \text{ beats } y \). Let’s again assume the treatment of file cards as sets of assignment functions. Then a value for \( x \) will satisfy \( x \text{ beats } y \) iff at least one of the functions in the file card \( y \) assigns \( y \) to something that is beaten by \( x \). Since the relevant assignment functions all assign \( y \) to a donkey owned by \( x \), this will end up yielding the conditions that \( x \text{ beats } y \) is true iff \( x \) beats at least one of the donkeys he owns, and the whole sentence will be true iff each farmer who owns at least one donkey beats at least one of the donkeys he owns, which were the desired truth conditions.

The present account has a significant advantage over both standard e-type accounts and DPL. E-type accounts typically have a problem in situations in which a single farmer owns multiple donkeys. This is again because of the uniqueness presuppositions associated with these types of accounts – there is no unique donkey to be picked out by the definite description or e-type function in these cases. Since unbound variables come with no uniqueness presuppositions, we avoid this problem entirely. Dynamic semantic accounts like DPL also fair worse on the relative clause donkey sentences. As I said before, their analysis crucially depends on translating the sentence in terms of a conditional. Furthermore, DPL only predicts the strong reading, i.e., that (60) is true iff every farmer beats all the donkeys he owns.

For both the conditional and relative clause cases, the present proposal avoids the problem of the formal link. In general, I have argued that file cards are only added for objects explicitly mentioned – it is only mentioning an object and not just making it salient that reveals a speaker’s plan to potentially continue the discussion of it. In certain cases, I argued that a file card for a salient object can be added by accommodation, but in these cases we must be in a situation in which it would
be natural for interlocutors to accept a change in discourse plans, e.g. a long pause between utterances, a change in speakers etc. Crucially, since donkey anaphora occurs within a single sentence, none of these factors that make people ready to accept a change of plans are applicable. Thus the theory predicts there should be no file cards accommodated mid-sentence and sentences like (53) are infelicitous, which is the correct prediction.

In general, the pragmatic view defended in this paper poses little in the way of new conceptual or formal obstacles in accounting for donkey anaphora. It relies on an independently motivated notion of pragmatics and leaves open the possibility of treating donkey anaphora in a similar fashion to ways already proposed in the literature. Of course, I haven’t said much about how the view can account for all the problems I outlined earlier related to giving a complete theory of donkey anaphora. To my knowledge, there is no existing theory that has successfully accomplished all this, and as I mentioned earlier, this requires defending a particular view of pronouns, conditionals, and file cards. I have gestured towards some routes that are available to a person who wants to adopt the present view. For now, we can rest assured that the theory doesn’t close any major doors.

3.5 Conclusion

I’ve defended a view in which recognizing a speaker’s plans upon making an utterance that includes an indefinite description plays a crucial role in licensing pronominal anaphora. I’ve argued that this view extends naturally to many cases in which indefinites are embedded under other operators, such as conditionals, negation, modals, and universal quantifiers. The proposal does not explain the full range of data, but in this it fairs no worse than dynamic semantic proposals. In many cases we saw that it faired better. One of the open problems that remains to be investigated is how the
present view interacts with other semantic and pragmatic factors to predict the full range of data.
Chapter 4

Against Referential Intentions

4.1 Introduction

As we’ve been discussing, indefinite descriptions appear to have two puzzling discourse properties. They seem to introduce *novel* objects under discussion, and though they are not referring terms, they license unbound pronominal anaphora. I’ve been defending a view in which these discourse properties are accounted for pragmatically in the following way. Conversational participants recognize a speaker’s intention to talk about something novel based on her use of an explicit device of existential quantification, rather than a definite expression or an equivalent expression that involves no existential quantification at all. This raises the conversational participants expectation that the speaker will go on to say something more about that object, and so an appropriate *file card* is added to the context. The presence of this file card licenses the unbound pronoun because pronouns are sensitive to the file cards in the context. This view stands in opposition to dynamic semantic accounts, which aim to treat these discourse properties as part of the semantics of the indefinite, and e-type or d-type accounts, which try to explain the relationship between indefinite and pronoun solely through the semantics of the pronoun.
There are other views in a similar spirit to mine, in that they aim to account for the discourse properties of indefinites while maintaining a static semantics and explaining the interaction of content and context pragmatically. Examples of such views are Dekker (2004), Stalnaker (1998), and van Rooy (2001). These views appeal to the referential intentions of speakers when using indefinites to account for the data. The referential intentions views might be thought to be preferable because they appeal neither to file cards, which some consider metaphysically mysterious, nor to dynamic binding, which requires adopting a non-standard view of quantifiers and semantics more generally. Furthermore, there are certain examples involving pronominal contradiction that allegedly directly support a referential intentions view. In this chapter, I present several objections to these views and to the notion that the examples used to motivate the view actually force us to adopt it.

While the formal implementations differ, the essential idea of the referential intentions account is this. While indefinite descriptions are not referring terms, speakers use them with referential intentions. That is, when someone utters “A woman walked in”, the speaker has a specific woman in mind, even though that woman is not the semantic referent of the expression *a woman*. In Stalnaker’s terminology, this raises a particular woman to salience in the conversational context, and salient individuals are available to be the denotation of pronouns. Thus the woman that is the object of the speaker’s referential intentions is the referent of the anaphoric pronoun. In van Rooy’s terms, the individual the speaker has in mind is the speaker’s referent of the indefinite expression (in Kripke (1977)’s sense of speaker reference), and the value of the subsequent anaphoric pronouns is the speaker’s referent. Thus pronouns are treated straightforwardly as referring terms, and the connection between indefinite and pronoun doesn’t not appeal to dynamic binding or file cards. Of course, the conversational participants need not *know* who the speaker has in mind in order to process the discourse. Stalnaker argues that all we need to represent this uncertainty
as to the actual referent is that in each possible world in the context there is a salient individual that is the value of the pronoun in that world; which world is the actual world is unknown in many cases. Among these possible worlds, there will be worlds that are exactly the same except for the referential intentions of the speaker in that world.

In the next section, I present several arguments to the effect that the existence of referential intentions doesn’t generally pattern with the felicity conditions of pronominal anaphora, as a referential intentions view would have one expect. In §4.3, I argue that the referential intentions account yields the wrong truth conditions for at least some discourses involving pronominal anaphora. In the final section, I deny the claim that pronouns pick up on speaker’s reference even in cases involving pronominal contradiction.

### 4.2 General Intentions and Anaphora

A serious problem for these sorts of views is that indefinites are not always used with referential intentions. The referential intentions account would be vindicated if the times when indefinites were used with referential intentions patterned with when anaphora was licensed. I think the referential intentions account cannot be the correct view for the simple reason that these two phenomena do not in fact pattern together. A speaker can have completely general intentions when using an indefinite, yet pronominal anaphora on the indefinite is felicitous. Consider the following example. Suppose I have some unusual beliefs. Specifically, I believe that every time a black cat crosses my path it is a sure sign that some woman somewhere has just died. It is perfectly compatible with my beliefs that more than one woman has died. I do not think there is any causal connection between particular cats and particular women. Moreover, if it rains in the hour following sighting the black cat, I think the
woman or women who died are young. If it doesn’t rain during that time, I think
they are old. A black cat crosses my path. Suddenly, it starts to rain. I say:

(1) a. A woman has died.

b. She was young.

I believe this on purely general grounds. Intuitively, I have no woman in mind. More specifically, on any more formal way of cashing out the notion of having an individual in mind, I have no woman in mind. Stalnaker admits pinning down the notion of having something in mind is notoriously difficult, but suggests that we should think of it as the dominant causal source of the speaker’s beliefs about the individual.\(^1\) Van Rooy gives a similar definition:

I will assume that object \(d\) is the speaker’s referent of John’s use of an indefinite iff (i) John has a representation of an individual; (ii) this representation was caused by \(d\); and (iii) this representation is responsible for John’s use of the indefinite.\(^2\)

But in the case just outlined, the causal source of my beliefs is the cat (and the rain), not any woman at all! For this reason, on neither definition do I have a woman in mind. (It’s also not clear whether I have a representation of a woman, but that depends what one means by having a representation of a woman, and I have no idea what van Rooy means.) But (1) is perfectly felicitous. Therefore, it can’t be the presence of referential intentions that explains this felicity.

The case for the referential intentions account only worsens if one tries to extend it to cases in which the indefinite is embedded under modals, propositional attitudes, or generic operators. Consider the following case, adapted slightly from a case that Stalnaker (1998) himself considers:

\(^{1}\text{Stalnaker (1998) p.13 fn.}\)

\(^{2}\text{van Rooy (2001) p.625 fn.5}\)
(2) a. I predict that an openly atheist lesbian will be nominated for president of the U.S. by the end of the century.

b. Furthermore, I predict that she will win.

Since the speaker is making a prediction about the distant future, she clearly does not have a particular candidate in mind. There can be no appropriate individual that is the causal source of her beliefs, since whoever such an openly atheist lesbian presidential candidate may turn out to be, she is likely not even born yet at the time of utterance in 2010. It seems that referential intentions can play no role in picking out a particular individual (in each world). Yet the anaphora in (2b) is perfectly felicitous. Stalnaker suggests that the individual raised to salience just is the (unique) openly atheist lesbian nominated for president in each world, and the pronoun refers to whoever that individual may be in that world. If there is more than one such individual in the world there can be no determinate fact about who the pronoun refers to, and thus no determinate truth value (relative to that world). When it comes to cases in which the speaker has no referential intentions, the defendant of a referential intentions account seems to have to retreat to something like an e-type account (where the pronoun stands for an individual determined by the relevant definite description). Even if this account did work, the referential intentions proponents importantly cannot give a uniform account of cross-sentential anaphora, appealing sometimes to referential intentions and sometimes to e-type descriptions.\(^3\)

The pragmatic file card account I have given does not suffer from this defect.

I also do not share Stalnaker’s intuition that (2) only has a determinate truth value in the case where there is a unique atheist lesbian presidential candidate. As Stalnaker himself admits, in the case in which there are two such presidential candi-

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\(^3\)van Rooy (2001) explicitly treats pronouns as sometimes referential and sometimes e-type descriptions.
dates, “it would seem churlish to say that her prediction was anything but completely correct”. But he goes on to say that “it is not clear that our semantic intuition, strictly speaking, support this judgment”. The only evidence he offers in support of this claim, however, is that there is no determinate object to be the referent of the pronoun she in this case. But this presupposes the correctness of his account rather than proving it.

In fact, Stalnaker appears to start from the assumption that pronouns must be treated as referring terms. He writes that “a pronoun such as it presumably requires a context in which a certain individual of the appropriate kind is uniquely salient, or in some way available for reference”. Furthermore, at the beginning of his discussion of indefinites and pronouns, he presents the following example:

(3) a. I met an interesting woman at the dinner last night.

b. She was a member of Clinton’s cabinet.

Stalnaker’s crucial comment for our purposes is this: “A second fact (a fact about the discourse) that is presupposed after the first statement has been made is that a woman that the speaker met at the party last night is uniquely available to be the referent of the pronoun she in the conversation in question.” But it is not at all an obvious starting point that pronouns require a unique referent (that is salient in the context). This is a theoretical matter, a matter of the semantics of pronouns. On many accounts of pronouns, such as dynamic semantic accounts, the context dependent quantifier (CDQ) approach, and some kinds of e-type or d-type accounts,
pronouns require no such thing. Such a statement should be a conclusion, rather than a starting point, of an account of cross-sentential anaphora.

Similar remarks apply to other embedded cases, such as modals, generics, propositional attitudes, and so on. In each of the following cases, it is clearly impossible for a speaker to have referential intentions, since there is no particular object about which to have the intentions.

(4) a. A bear might come to our campsite.
   b. It would eat our food.

(5) a. I wish I had a pet unicorn.
   b. I would take her out at night and fly all around.

(6) When you call a woman to hang out, make sure you have a game plan. Don’t put the burden on her or she won’t see you as the type of guy who can show her a good time. (Source: http://www.bullz-eye.com/relationships/double_your_dating/top_10/2009/things_to_never_say.htm)

(7) A woman who is interested will want to be physically closer to the person she likes. She will lean toward you when she’s near you and may try to touch you nonchalantly. (Source: http://www.ehow.com/how_2307774Know-woman-likes-you.html)

By contrast, the pragmatic file card account gives a uniform explanation of both the embedded and unembedded data. Proponents of the referential intentions account have to adopt an e-type or d-type account for these cases (as Stalnaker implies and van Rooy explicitly does). But once we have to adopt a hybrid account, it really seems that referential intentions don’t buy us the sort of explanatory or predictive power we might desire from such a theory. So why employ referential intentions at all?
There are some examples in the literature that have been used to directly motivate such an account. I turn to them in §4.4, but first I will look at one more problem the referential intentions account faces.

### 4.3 Truth Conditions and Pronouns

The referential intentions accounts predict that a pronoun picks up on the speaker’s referent. That is their essential tenet on how cross-sentential anaphora works. But who a speaker has in mind is often intuitively irrelevant to the truth of their utterances using pronominal anaphora. Consider the following case. Suppose a professor is teaching a class and tells his students the following:

\[ 8 \]

\[ a. \text{An anthropologist discovered the skeleton called ‘Lucy’.} \]

\[ b. \text{He named it after a Beatles song.}^8 \]

Suppose further that the professor has a particular anthropologist in mind, say, Eric Wolf, and fully consciously intends to be talking about him. The next day, the professor realizes he had the wrong person in mind, it was actually Donald Johanson who made the discovery. Did the professor utter a falsehood to his class? According to the referential intentions account he did. For the individual raised to salience and thus the value of the pronoun he is Eric Wolf, and so (8b) is false. Of course, the defender of a referential intentions account has an obvious explanation of why the professor does not need to tell his class he made a mistake, for the class does not know who he had in mind. The referential intentions account could say that while strictly false, (8b) is not misleading. But I think it is intuitively clear that there is nothing about what the professor said that is false. We don’t need to give some sort

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\[ ^8 \text{This example is from King (2005)} \]
of error theory about why what he said was okay. He uttered something true: an anthropologist did discover the skeleton named ‘Lucy’ and he did name it after a Beatles song. Who the professor has in mind doesn’t affect the truth value.\footnote{Thanks to Jeff King for bringing up this point.}

The referential intentions defender might reply and say that the individual raised to salience is the dominant causal source of the speaker’s beliefs about the individual – in this case, though the professor had the wrong anthropologist in mind on that day, certainly the reason he had any beliefs about an anthropologist making such a discover is caused by Donald Johanson – the actual anthropologist who made the discovery. But it isn’t difficult to a construct a case in which the wrong individual is the dominant causal source of the speaker’s beliefs – suppose the individual planted false rumors about himself – and I still do not have the intuition that what the speaker said was false.

4.4 Pronominal Contradiction

Both van Rooy and Stalnaker present positive arguments for the referential intentions view. One cannot dismiss the view without addressing the arguments in its favour. Both van Rooy and Stalnaker (among others) think that Strawson (1952)’s examples of pronominal contradiction show that anaphoric pronouns are at least sometimes used referentially, and moreover they pick up on speaker’s reference, not semantic reference:

(9) a. John: A man jumped off the bridge.

   b. Mary: He didn’t jump, he was pushed.
This sort of example seems to present a problem for dynamic semantic, file card, CDQ, and d/e-type accounts of anaphora, since the pronoun in (9b) can't stand for \textit{the/a man who jumped off the bridge} or simply update a file card that includes the information \textit{is a man} and \textit{jumped off the bridge}. What appears to be going on is that Mary uses the pronoun \textit{he} to refer to the person John had in mind when uttering (9a), regardless of the fact that he mis-described the relevant individual. I will return to these examples shortly, but first I want to raise a related point that people give in favour of the referential intentions account.

Stalnaker and others claim there is an inequivalence between utterances using personal pronouns and relative pronouns, such as the contrast between (3), repeated below, and (11) (this example is from Stalnaker (1998) but van Rooy and others give analogous examples):

(10) \begin{align*}
    \text{a. I met an interesting woman at the dinner last night.} \\
    \text{b. She was a member of Clinton's cabinet.}
\end{align*}

(11) I met an interesting woman who was a member of Clinton's cabinet at the dinner last night.

The proponents of the referential intentions account argue that these examples can differ in truth value, as in the following situation described by Stalnaker. Suppose the (gullible and naive) speaker met two interesting women at the dinner. One was actually a philosopher, but as a joke someone introduced her as the secretary of defense. The other was actually the secretary of health and human services, but the speaker is ignorant of this. The claim is that (11) is true (by lucky coincidence), but (10b) is false, since the woman the speaker has in mind is not actually a member of Clinton's cabinet. The evidence for (10b)'s falsehood comes from the appropriateness of a pronominal contradiction response. Suppose I know all the relevant facts about the speaker’s interactions at the dinner; I might appropriately reply to (10) with:
Stalnaker argues that this straightforwardly contradicts (10b) in a way that it doesn’t straightforwardly contradict (11). So the conclusion is that any view that predicts (10) and (11) to be true in all the same circumstances can’t be correct. Most dynamic semantic, file card, or CDQ accounts make this prediction.

As Stalnaker himself points out (a point he attributes to Kai von Fintel), (12) is also an appropriate response to (11) in these circumstances. Stalnaker thinks the relevant difference between the two cases is that while (12) “gives us a reason to reject (11)”, it does not follow that it contradicts it, so it does not show it to be false in the circumstances. By contrast, (12) does straightforwardly contradict (10b), and so they cannot be both be true. But it is not at all obvious that the two contradict each other. Whether (12) and (10b) contradict each other depends on the semantics of the pronoun. Any account that treats the pronoun as an indefinite description (such as King’s CDQ account), for example, won’t treat them as contradictory, for *an interesting woman whom John met was a member of Clinton’s cabinet* and *an interesting woman whom John met was not a member of Clinton’s cabinet* are perfectly compatible. The same is true of most dynamic semantic accounts. All we can say about both cases (10b) and (11) is that (12) can be given as a reason to reject them. If one sees this as a reason to think the original statements were false, then we have no more reason to think (10b) is false than (11). If we think this is no reason to think they are both false, then again I can see no reason to hold one as true and the other false.

Furthermore, one certainly doesn’t want the pronoun to always pick up on speaker’s reference. One reason is that (13) also seems like a perfectly felicitous response to (10):

(13) Yes, you did. She was the secretary of health and human services. But she’s
not the woman you’re thinking of.

At the very least, it seems that the pronoun can pick up on (where ‘pick up on’ is meant to be a neutral term) either the speaker’s reference or the semantic reference.\(^{10}\)

The foregoing example was meant to establish that we don’t always want pronouns to pick up on speaker’s reference. I now want to raise a few examples that call into question the assumption that we ever need pronouns to pick up on speaker’s reference, even in cases of pronominal contradiction. Heim (1990) raised an example analogous to Strawson’s, but one in which there can’t be a single individual in the speaker’s mind:

(16) A: Every time I was here, a man jumped off the bridge.

        B: I bet that in most cases he didn’t jump, but was pushed.

Van Rooy suggests that (16) can be accounted for on the referential intentions view, since A could have a specific individual in mind for each time he was at the bridge, therefore determining a function from times A was at the bridge to referents. However, I think the same phenomenon can be found in cases in which there is neither a particular individual in the mind of the speaker nor a determinate function to specific individuals. For example:

(17) A: Usually, a man jumps off this bridge at least once a week.

\(^{10}\)This is similar to a point that Kripke (1977) makes about pronominal anaphora. In response to the case in which a speaker says “her husband is kind to her” upon seeing a woman with her lover (to whom she was driven because of her husband’s cruelty), Kripke writes that the following two dialogues are equally felicitous:

(14) A: Her husband is kind to her.

        B: No, he isn’t. The man you’re referring to isn’t her husband.

(15) A: Her husband is kind to her.

        B: He is kind to her, but he isn’t her husband.
B: No, he’s almost always pushed.

In this case, suppose A believes on general grounds that men jump off the bridge in question on a fairly regular basis, say because she has read a statistical report about the bridge or has heard rumors. When A and B are giving C a tour of the town, A utters (17a). Intuitively, not only does A have no particular individual in mind, but has no particular individual in mind relative to some series of events, as might be the case in (16a). B, knowing that men rarely jump off the bridge, but are generally pushed, corrects A with (17b). Despite the lack of definable function from events to particular men in the actual world, B’s statement seems perfectly felicitous.

Now suppose A and B are walking up to the bridge and upon observing a swarm of police cars parked on the bridge with their lights flashing, the following dialogue occurs.

(18) A: A man might have jumped off the bridge.

B: No, in this town, he would have been pushed.

In this case, it seems even more obvious that A can have no particular individual in mind, since she is surmising about a mere possibility from the sighting of police cars.

These cases suggest that whatever is going on in pronominal contradiction is independent of speakers’ referential intentions. When Stalnaker discusses the pronominal contradiction cases, he claims that they show that conversational participants may reject the content of an assertion, but still accept that an individual has become salient. (That is, participants can refuse to update the context with the content of the assertion, but still update the context by noting that an individual has become salient in each world in the context set.) I have given many arguments demonstrating that appealing to salient individuals is the wrong way to go. But the insight itself may be applied to the file card view. Conversational participants may reject the content of an utterance while accepting the addition of a new file card. In (9)
B might recognize that A intends to talk about a new man under discussion, and so add a file card for a man, while rejecting the content of the claim, that the man jumped of the bridge, and so will not record that on the file card. The pronoun in (9b), then, would pick up on a file card for a man, but not for a man who jumped off a bridge, which gives the intuitively right result. There are many reasons why a conversational participant might accept the addition of a file card based on an utterance while rejecting the content of the utterance. One reason might be that the participant knows who the speaker has in mind, but also knows the speaker has said something false about that individual. In this case, the participant should be willing to co-operate with the speaker on adding a file card, since they both agree there is something under discussion, but not insofar as adding all the predicative material to that file card. This seems to be what is going on in cases like (9) and (12). In (18), the hearer seems willing to hypothetically entertain a man under discussion, but disagrees about what was more likely to have happened to this hypothetical man. So the hearer has a reason to accept a file card for a man, but not to accept the content of the speaker’s utterance.

4.5 Conclusion

While I appreciate the spirit of the referential intentions accounts, in that they maintain a traditional semantics and seek to explain discourse phenomena pragmatically, I do not think there is good reason to adopt their style of account. In fact, I have argued that there are decidedly good reasons not to adopt the account. The referential intentions view is unmotivated: the presence of referential intentions does not pattern with the felicity of cross-sentential anaphora on indefinites. We saw this even in cases involving pronominal contradiction, which are supposed to be paradigmatic cases in favor of the referential intentions view. The view also gets the truth condi-
tions wrong for some sentences involving anaphoric pronouns. It has long been an
objection to a referential intentions semantics for indefinites that they get the wrong
truth conditions for some sentences with indefinites. We saw that the referential
intentions semantics for anaphoric pronouns fairs no better: the sentence contain-
ing the antecedent indefinite might come out true regardless of the intentions of the
speaker, but the truth of the sentence containing the anaphoric pronoun depends on
these intentions. And this comes into conflict with our basic intuitions regarding the
truth of these sentences. The pragmatic view I defended in the previous two chapters
– appealing to the discourse plans of speakers rather than their referential intentions
– encounters none of these problems.
Appendix A

CCPs in Heim’s Semantics

I argued in §1.4.1 that despite the similarities between Heim and Stalnaker’s views, they were importantly different, and in fact taking the CCP out of the content in Heim’s system robs it of its power to account for presupposition projection. In this appendix, I’ll support this claim with further detail. As I mentioned towards the end of §1.4, the updates in Heim’s CCPs are eliminative and distributive. This is often thought (falsely, as I have argued) to collapse into an equivalence with static semantics and a globally defined notion of update (a la Stalnaker) based on a theorem proved in van Benthem (1986):

**Theorem 1.** For any update $\tau$, context $c$ and minimal context$^1$ $\mu$, $\tau(c) = c \cap \tau(\mu)$ if and only if $\tau$ is distributive and eliminative.

I will argue that Heim’s semantics satisfies the lefthand side of equation, but not the righthand side, despite the updates being eliminative and distributive. In Heim’s system, an update is defined in a context just in case the context admits the sentence. Admittance conditions on atomic sentences are stipulated; for example,

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$^1$The minimal context is a context with the least information. This will be made clearer in the example below.
the admittance condition of a simple sentence with a factive verb will be that every world in the context is a world in which the propositional complement of the factive is true. The projection facts for molecular sentences are read off of the definedness condition of the CCPs. For example, the CCP for a negated sentence $\neg S$, given a context $c$, is $c \setminus (c + S)$, where ‘\’ is set subtraction and ‘+ S’ means updating with $S$. Since a sentence is admitted just in case its CCP is defined, $c$ admits $\neg S$ just in case $c \setminus (c + S)$ is defined, which will be the case whenever $c + S$ is defined (which, if $S$ is atomic, depends on the stipulated admittance conditions for $S$). This is supposed to explain, for example, why sentences like (1) presuppose that Joe voted for Bush.

(1) Joe does not regret voting for Bush.

Suppose $c$ is a context in which Joe voted for Bush in every world. Then $[[((1))]]$ is admitted and therefore defined in $c$. The theorem claims that $c[[((1))]] = c \cap (W[[((1))]])$, where $W$ is the minimal context (the set of all worlds). But the update is not defined on the right hand side, since there are some worlds in $W$ in which Joe did not vote for Bush. The CCPs are supposed to predict when a complex sentence will be admitted in a context, but the above example shows that while the left hand side predicts that the sentence will be admitted, the right hand side predicts that it won’t. Thus Heim’s dynamic system, despite being distributive and eliminative, does something more than Stalnaker’s static one; something that cannot be captured by intersection with a classical proposition.
Appendix B

DPL and PL_{+D}

In order to get a sense of how my view compares to the dynamic semantic views described in §2.2, I will compare a standard example of such a dynamic semantics with a simple formal implementation of my view. The dynamic semantics I will look at is Dynamic Predicate Logic (henceforth DPL, Groenendijk & Stokhof (1991)). I will compare it with static, ordinary first order predicate logic augmented with the pragmatic view argued for in this paper, a system I call Predicate Logic plus Dynamics (PL_{+D}). First order predicate logic is almost certainly not the best logic for capturing natural language semantics. I mean to endorse neither of these systems as the ultimate examples of their genre. However, they serve as convenient illustrative examples, since most readers are familiar with predicate logic, and we need not look at a more complicated logic to capture the point I wish to make.

B.1 DPL

The syntax of DPL is that of ordinary first order predicate logic, and so I will not review it here. A DPL model is standard model for predicate logic, a pair \langle D, F \rangle, where D is a non-empty set of individuals, and F is an interpretation function. Contexts are sets of assignment functions, which are total functions from variables to individuals.
in the model. Semantic values on this formulation of DPL are relations between input and output assignment functions, but this is equivalent to stating them in terms of functions from contexts to contexts (from sets of assignment functions to sets of assignment functions). See Groenendijk & Stokhof (1990b) for a detailed discussion of this equivalence. Here are the semantic clauses relevant to the examples discussed in this paper. (I suppress reference to a model since it shouldn’t cause any confusion for the present examples. I use the letters g, h, and k for arbitrary assignment functions.)

**DPL Semantics (relevant clauses)**

1. \([t]_g = g(t)\) if t is a variable  
   \(= F(t)\) if t is a constant

2. \([R_t \ldots t_n] = \{ \langle g, h \rangle | h = g \ & \ [t_1]_h \ldots [t_n]_h \in F(R) \}\)

3. \([\phi \land \psi] = \{ \langle g, h \rangle | \exists k : \langle g, k \rangle \in [\phi] \ & \ [k, h] \in [\psi] \}\)

4. \([\exists x \phi] = \{ \langle g, h \rangle | \exists k : k[x]g \ & \ [k, h] \in [\phi] \}\)

Let’s work a central example from chapters 1 and 2 and its (D)PL translation:

(1)  
   a. A woman walked in.  
   b. She ordered lunch.

(2)  
   a. \(\exists x (\text{woman}(x) \land \text{walked.in}(x))\)  
   b. \(\text{ordered.lunch}(x)\)

DPL treats discourses as conjunctions of the sentences in the discourse. Given the definition of conjunction, this amounts to finding the semantic value of the first sentence of the discourse, and using the output assignment functions of that sentence as the input functions to the second sentence in the discourse. So let’s just go sentence by
sentence. Plugging (2a) into the semantic clause for existentials, we get \( \{\langle g, h \rangle \mid \exists k : k[x]g \land \langle k, h \rangle \in [\text{woman}(x) \land \text{walked.in}(x)]\} \). This result will be much more perspicuous if we first reduce the last part (the semantic value of \( \text{woman}(x) \land \text{walked.in}(x) \)).

This is a conjunction, so we apply clause 3, which guarantees that the output assignments of the first conjunct serve as the input to the second. Since each conjunct is an atomic formula, the formulas act as tests on the input context, passing through only those assignment functions from the input that assign \( x \) to something in the interpretation of the appropriate predicate. Since we’re dealing with all atomic formulas, for which in each input-output assignment function pair the output is identical to the input, we need not worry about going through the steps of calculating the value of the conjunction. After applying clauses 3, then 2, and then 1 inside the existential, we now have \( \{\langle g, h \rangle \mid h[x]g \land h(x) \in F(\text{woman}) \land h(x) \in F(\text{walked.in})\} \). Now it’s easy to see what the existential does. (In fact, all the extra steps we just took are because the definition must apply in the general case in which there may be another quantifier inside the scope of the existential.) An existential is an assignment shifter – it takes each of the assignment functions in the input and returns all of those that differ at most from it in that they assign \( x \) to an individual in the interpretation of \( \text{woman} \) and \( \text{walked.in} \). The output context of (2a), therefore, is the set of \( x \)-variants of the input context that assign \( x \) to a woman who walked in. The output context of (2a) serves as the input to (2b), which, as an atomic formula, tests the context, allowing through just those assignment functions that assign \( x \) to something in the interpretation of \( \text{ordered.lunch} \). The result is that the final output context contains all and only assignment functions that assign \( x \) to a woman who walked in and ordered lunch.

The discourse is true if and only if the output context is not empty, that is, there is at least one woman who walked in and ordered lunch. Thus DPL succeeds in giving the intuitively right truth conditions for the discourse and accounting for both novelty
and licensing. We can think of the assignment functions as recording information about the objects under discussion. Changes to the assignment functions reflect changes in information about objects under discussion. As outlined above, the CCP of an indefinite resets the potential value of a particular variable. This is what accounts for novelty – $x$ is treated like a brand new variable, with which no previous information is associated. At the same time, it explains licensing. Though the pronoun is not syntactically bound by the indefinite, on this view it is semantically bound: the indefinite shifts the assignment functions and it is this new set of assignment functions relative to which the pronoun is interpreted. Finally, changing the context so that it includes only assignment functions that assign $x$ to something in the interpretation of $ordered.lunch$ is tantamount to updating the relevant file card with that information.

**B.2 $\text{PL}_+D$**

$\text{PL}_+D$ is just ordinary first order predicate logic augmented with two pragmatic principles. It is intended to cover the same fragment of English as $DPL$. Models and contexts are defined in the same way as for $DPL$. Strictly speaking, treating contexts as sets of assignment functions doesn’t exactly match the informal description of contexts employed in this work. In chapter 2, I took a context to be a set of file cards, but this implies that each assignment function represents a file card, which it clearly doesn’t. Technically, a more appropriate formal implementation of a file card is as a set of (partial) assignment functions, and so our formal contexts should be sets of sets of assignment functions. I will suppress this complication for present purposes, since the simpler version offers a better comparison with $DPL$, and still captures information about objects under discussion, even if the context is not strictly speaking a set of file cards. (One can think of the set of partial assignment functions for each variable as the file cards.) Following the ordinary Tarskian interpretation of predicate
logic, the semantic value of formulas in $\text{PL}^+_D$ are sets of truth-making assignment functions. A formula is true (relative to a model) iff its denotation is not empty.

**$\text{PL}^+_D$ Semantics (relevant clauses)**

1. $[[t]]_g = g(t)$ if $t$ is a variable
   
   $= F(t)$ if $t$ is a constant

2. $[[Rt_1...t_n]] \equiv \{g \mid \langle \langle[t_1]]_g...[t_n]]_g \rangle \in F(R)\}$

3. $[[\phi \land \psi]] = \{g \mid g \in [[\phi]] \land g \in [[\psi]]\}$

4. $[[\exists x \phi]] = \{g \mid \exists k : k[x]g \land k \in [[\phi]]\}$

In addition, there are two pragmatically motivated operations that relate utterances to contexts. One adds the truth-conditional content of an utterance to the context, and is formally modeled as set intersection. Intersective updates apply to every utterance: they take the truth-conditional content of an utterance (the set of truth-supporting assignment functions) and intersect them with the input context, thereby outputting only those assignment functions that are compatible with the information conveyed by the utterance. The other pragmatic update adds a new file card to the context. Adding a new file card is modeled as a function that takes all the assignment functions in the input context and returns all the $x$-variants (or, more generally, variants for the appropriate variable) that assign $x$ to an object with the properties predicated of $x$ in the logical form of the utterance. As the reader can probably already guess, this update is pragmatically triggered when a sentence containing an indefinite in an introductory context is uttered. The function that returns the appropriate $x$-variants of assignment functions is the formal operation that represents what we’ve been informally glossing as adding a new file card. If we are modeling information about objects under discussion in terms of assignment
functions, then updates regarding the objects under discussion must be modeled as changes to the assignment functions.

**PL+D Pragmatic updates**

Where C is the input context, P is the content of an arbitrary assertion, and H is an arbitrary predicate, the 2 pragmatic updates are:

1. \( C[P] = C \cap P \) (Truth-conditional update)

2. \( C[\exists x H x] = \bigcup_{g \in C} \{ h \mid h[x]g \wedge h(x) \in F(H) \} \) (New file card update)

Let’s see how PL+D explains (2). Conversational participants always update the context with the informational content of an assertion (by intersection). The content of (2a) is the set of assignment functions such that for each assignment function, there exists at least one x-variant that assigns \( x \) to a woman who walked in. If there is such an object in the model, this will amount to the denotation being the set of all assignment functions. The intersective update, therefore, has no effect on the input context. (2a), as an existential, also triggers the second pragmatic update. The function for adding a new file card takes the input context and returns all the x-variants of each assignment function that assign \( x \) to a woman who walked in. So after semantically and pragmatically processing (2a), the context is in the same state as after the semantic processing of the same sentence according to DPL. (2b) will trigger the normal intersective update. Its content is the set of assignment functions that assign \( x \) to something that ordered lunch. Since all the the assignment functions in its input context assign \( x \) to a woman who walked in, the resulting output context will include only assignments that assign \( x \) to a woman who walked in and ordered lunch. The final output context is therefore the same one DPL predicts, and intuitively the

\[ I \text{ present the rule based on the simple case for purposes of perspicuity. The general rule for } \exists x \phi \text{ is a little more complicated to define.} \]
correct one; the assignment functions record the information that there is at least one object that is a woman, and walked in, and ordered lunch.

I have been glossing over one complication of PLD. The problem with treating pronouns as straightforward free variables in a static semantics is that formulas containing free variables do not get the truth conditions we really want. The set of assignment functions (2b) determines, for instance, is the set of all assignment functions that assign x to an object that ordered lunch, and so the sentence would be true so long as something in the model ordered lunch. This may or may not be a bad consequence, depending on one’s take of the data. This may just be the correct way of modeling the truth conditions of a pronominal sentence out of context. But within a context, we want a sentence containing a pronoun to pick out a subset of these assignment functions. In (2), this is the set of assignment functions that assign x to a woman who walked in and ordered lunch. This is easily fixed, however, by making the semantic clause for pronouns sensitive to the assignment functions in the input context. This is an intuitive way to model the fact that pronouns are anaphoric – they must look to something prior for their value. Moreover, dynamic and static semanticists alike agree that it is perfectly acceptable to have context-sensitive expressions in a static semantics. It is the context-affecting nature of certain expressions that make some people think we need a dynamic semantics. If we want to leave the semantic clause for free variables alone (say, because we want to employ free variables for something other than the translation of pronouns), we can always introduce a new sort of symbol for translating the pronoun into the logic that acts as a context-sensitive free variable. I propose we translate pronouns as lower case p’s (loosely following Dekker (2004)) with alphabetical subscripts that connect them to the variable associated with their antecedents. For example, (2b) would be translated as follows:

\[(3) \quad \text{ordered.lunch}(p_x)\]
And the semantic clause for such phrases would be:

$$[R_{p_x...p_z}] = \{ g \in C \mid \langle [x]_g...[z]_g \rangle \in F(R) \}$$

(where $C$ is the input context)

The added context-sensitivity in the semantics of the pronoun is also unsurprising given our general investigations into the similarities and differences between dynamic and static semantics. Where a dynamic semantics has a CCP that does more than truth-conditional update work, one would expect some context-sensitivity to appear in an analogous static semantic account.

$PL_{+D}$ offers analogous explanations of novelty and licensing to DPL, though pragmatically instead of semantically explained. Adding a new file card resets the x-values of the assignment functions in the context (like the semantic value of an existential in DPL); this accounts for novelty. It also outputs all the x-variants of the input assignment functions; it is this new context relative to which the anaphoric pronoun is interpreted, thus accounting for licensing. Whereas in DPL we saw something we thought of as semantic binding, in $PL_{+D}$, we can think of the relationship between indefinite and pronoun as pragmatic binding. A sentence containing an indefinite pragmatically triggers the assignment functions in the context to be set up in a way such that when the information conveyed by a pronominal sentence is added to the context, the pronoun receives the correct interpretation.

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