

Incomplete Descriptions and Sloppy Identity

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Abstract

Through an examination of the binding possibilities displayed by down-stressed continuations of donkey sentences, this paper argues that incomplete definite descriptions are interpreted by means of situation variables.

Keywords definite descriptions, donkey anaphora, incompleteness, situation semantics

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1 Introduction

The purpose of this paper is to argue for a particular view of how the implicit content associated with incomplete definite descriptions is provided. I will be introducing some new data involving strict and sloppy readings of downstressed continuations of sentences containing donkey anaphoric definite descriptions. On the basis of these data, I will be arguing that the implicit content associated with incomplete definite descriptions is in fact introduced by situation variables.¹

In section 2 of this paper, I will outline the problem of implicit content and the particular case that I will be dealing with, the problem of incomplete definite descriptions. Section 3 contains summaries of five contemporary theories of incomplete descriptions.² The new data are introduced and discussed in section 4. Section 5 concludes.

2 Implicit Content and Incomplete Descriptions

In some utterances, some material does not seem to be explicitly expressed in words, but nevertheless seems to be part of the literal content of the utterance rather than an implicature. I call material of this kind *implicit content*. The following are some relevant examples from the literature.

- (1) Everyone was sick.
- (2) I haven't eaten.
- (3) It's raining.

Someone who says (1) might be claiming that everyone who attended his dinner party last night was sick (Neale 1990: 94–95), even though the property

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¹In Elbourne 2008, to which the current paper can be seen as a sequel, I presented some data that initially seemed problematic for this claim; but I believe that the analysis outlined in note 11 of that paper will enable the theory in question to deal with them.

²These theories are the ones that featured in Elbourne 2008. Readers of that article can safely skip or skim this section.

of attending his dinner party last night does not seem to be the denotation of any overt lexical items in the utterance. In uttering (2), I might be asserting that I have not eaten dinner today (Bach 1994: 135–136), even though I do not use any audible words meaning ‘dinner’ or ‘today’. And in saying (3), I might be claiming that it is raining in Dunwich, Massachusetts, even though I do not appear to mention any place (Perry 1986).

As is well known, the problem of incomplete definite descriptions arises as follows. Both Frege (1892) and Russell (1905) in their seminal remarks on the semantics of definite descriptions³ incorporated uniqueness as an essential part of their analyses: for a statement involving a definite description *the so-and-so* to be true, there must be exactly one so-and-so. But it was noticed by Quine (1940), Strawson (1950) and others that we can easily use a definite description *the so-and-so* when there is more than one so-and-so in the world. An example is (4):

- (4) The table is covered with books.

If we were, for example, in a room that contained exactly one table, we could say (4) quite felicitously, and thereby assert something true, even though there is more than one table in the world.

It is plausibly helpful to view the problem of incomplete definite descriptions as being a manifestation of the more general problem of implicit content. In particular, as Neale (1990) has emphasized, it is plausible to view the problem of incomplete definite descriptions as being merely a sub-case of the slightly more general problem of quantifier domain restriction exemplified by (1). Perhaps in (4) we assert something like ‘The table *in this room* is covered with books,’ parallel to the ‘Everyone *at my dinner party* was sick’ of (1). (This is merely a possibility for purposes of illustration; the exact content of utterances like this is controversial, of course, and will be considered at greater length in what follows.) In the current paper, I will concentrate on incomplete definite descriptions, but it is to be hoped that any conclusions we can draw about them might also have implications for implicit content as a whole. I will return to this issue in section 5 and sporadically throughout.

I will be concentrating on one main question concerning incomplete definite descriptions. It is the question of the levels of representation at which

³I will not in this paper be commenting on the rivalry between Fregean and Russellian accounts of definite descriptions. See Elbourne 2005, Chapter 3, and Elbourne 2009 for my view.

the implicit content in these cases makes its presence felt. Are there unpronounced items in the syntax of the sentence uttered whose semantic value is implicit content? If so, what are their syntactic properties? Or does implicit content leave no trace, as it were, in the syntax but appear only in the language of thought (Fodor 1975, 2008)?⁴

There is a second, related, problem that might be called the problem of the logical form of implicit content. How does it combine with the content provided by the overt constituents in the syntax? I distinguish two approaches to this latter problem: the global approach and the local approach. The global approach says that the content derived from the overt constituents in the syntax is asserted to be true only of a restricted spatiotemporal part of the world.⁵ The local approach says that implicit content can be interwoven with the content provided by overt constituents in the syntax: it could be the value of unpronounced variables in the syntax, as just mentioned, or it could be added to the language of thought constituents that indicate (or *are*) the semantic values of items in the syntax.

On the basis of well known arguments by Westerståhl (1985) and Soames (1986), it is generally reckoned that the global approach is out of the running.⁶ I will henceforth confine myself to the local approach. Four versions of this latter theory, as applied to incomplete definite descriptions, are prominent in the literature; I added a fifth in Elbourne 2008.

3 Five Theories of Incomplete Descriptions

3.1 The syntactic relation variable approach

The first version of the local approach as applied to incomplete definite descriptions is what we might call the *syntactic relation variable approach*. According to this theory, there are unpronounced variables in the syntactic structure of the sentence. The content of these variables is established by whatever mechanism fixes the content of overt pronouns. Perhaps it is supplied by the linguistic intentions of the speaker and worked out by the hearer on the basis of their best guess at the intentions of the speaker (Neale

⁴Note the limited scope of this question. I will not, for example, be addressing the difficult problem of how hearers actually work out what implicit content speakers might have in mind.

⁵This is the same as what Neale (1990: 95) calls *the implicit approach*.

⁶I will be analyzing one of Soames's crucial examples in section 3.5.

2004: 7677). The positioning of such variables is in principle subject to syntactic constraints. Theories of this kind have been advocated by von Stechow (1994), Stanley (2000, 2002a,b), Stanley and Szabó (2000), Pelletier (2003) and Martí (2006).

There are two prominent varieties of the syntactic relation variable approach. According to von Stechow (1994: 30–31), determiners can come with an unpronounced pair of a relation variable and an individual variable. Determiners take this pair as their first argument and then take the overt nominal. In the case of (5), we would have a syntactic structure like that in (6).

- (5) The table is covered with books.
 (6) [[[the [f_1 v_2]] table] [is covered with books]]

In this example, we might imagine that v_2 , the individual variable, has as its value a particular room, the one containing the table in question. Let a be a name for this room. The relation variable might be assigned a meaning equivalent to that of *in*. In the semantics, the denotation of the definite article would take two arguments and intersect them. On this occasion, they would be the property of being in a and the property of being a table. So the definite description ends up meaning ‘the table in a ’.

The covert material in (6) contributes a property to the proposition expressed. Why do we need a combination of an individual variable and a relation variable, as opposed to a property variable? The following sentence (due to Heim (1991)) is a good reason why (von Stechow 1994: 31). (7) seems to have the reading in (8). This means that we can use the apparatus we have introduced as shown in the simplified syntactic structure (9).

- (7) Only one class was so bad that no student passed the exam.
 (8) Only one class x was so bad that no student in x passed x ’s exam.
 (9) [only one class] λ_2 [t_2 was so bad that no f_1 v_2 student passed the f_3 v_2 exam]

I follow Heim 1993 and Heim and Kratzer 1998 in positing a λ -operator in the syntax, below the subject. The individual variable v_2 is bound by this operator, as is the trace t_2 ; f_1 once again means ‘in’, and f_3 will be assigned a value something like ‘belonging to’ or ‘associated with’. This will produce the attested meaning.

Stanley and Szabó (2000) propose a variant of von Stechow’s theory whereby the silent variables appear on nouns rather than on determiners. So (10)

would have the syntactic structure in (11); (12) would have the syntactic structure in (13).

(10) The table is covered with books.

(11) [[the [table [f₁ v₂]]] [is covered with books]]

(12) Only one class was so bad that no student passed the exam.

(13) [only one class] λ₂[t₂ was so bad that no student f₁ v₂ passed the exam
f₃ v₂]

When two syntactic constituents denoting properties appear as sisters, as in the present examples, their semantic values will be intersected. Apart from the difference in placement of the variables, Stanley and Szabó's theory works like von Stechow's.

3.2 The language of thought relation variable approach

We can now consider a possibly novel approach, which I will call the *language of thought relation variable approach*. According to this theory (Elbourne 2008), there are no covert variables in the syntax to do the job of providing implicit content, contra von Stechow (1994) and Stanley and Szabó (2000). Lexical items in the syntax are translated into objects in the language of thought (Fodor 1975, 2008). Some of these language of thought objects are complexes that include variables that demand values to be assigned, as it were; at this level what this would presumably boil down to would be a requirement that certain dummy or place-holder language of thought objects be replaced by other, more contentful, ones. So a simplex lexical item *the* might be translated into a language of thought complex THE R PRO, where R PRO consists of a relation variable and an individual variable capable of being replaced by IN A; we could thus deal with (5).⁷ A variant, analogous to Stanley and Szabó's (2000) version of the syntactic relation variable approach, might have nouns or NPs translated into complexes of constant concepts, as it were, plus R PRO: so we might have TABLE R PRO in the first instance, at some point changed to TABLE IN A.

⁷I follow the usual convention of representing language of thought strings as English sentences in capitals.

3.3 The pragmatic enrichment approach

The third version of the local approach to implicit content can be called the *pragmatic enrichment approach* (Sperber and Wilson 1986: 189). According to varieties of this theory, the output of the semantics is an object in the language of thought. Supplementation of this object occurs in the language of thought to obtain the mental object that corresponds to (or *is*) the literal content of the utterance. For example, suppose that John and Mary have a baby, John enters the house noisily and Mary says (14) to him.

(14) The baby is asleep!

From the conceptual representation in (15), John (or some aspect of John's inferential faculties) proceeds to (16).

(15) THE BABY IS ASLEEP

(16) THE BABY BEGOTTEN BY MARY AND ME IS ASLEEP

The syntax, then, is not involved, in contrast to the syntactic relation variable approach. Theories along these lines have been advocated by Sperber and Wilson (1986), Recanati (1993), Bach (1994), Bezuidenhout (1997), Carston (2002) and Hall (2008).

Importantly, these theories do not generally incorporate any syntactic restrictions on where in a language of thought object this supplementation can take place (using *syntactic* now to refer to the hypothesized syntactic qualities of the language of thought—see Fodor 1975). Sperber and Wilson, for example, say that this kind of enrichment “involves the application, not of special-purpose decoding rules, but of general-purpose inference rules, which apply to any conceptually represented information” (1986: 176); they suggest only a pragmatic principle (their principle of relevance) for arriving at appropriately disambiguated and enriched propositional representations (1986: 184). Theories of this kind, then, are potentially vulnerable in the following way: if a reading turns out to be unavailable for a given sentence, they cannot avail themselves of syntactic constraints to explain its absence, unlike the theories that belong to the syntactic relation variable approach; and they will face real difficulty if the reading in question can be argued to be pragmatically plausible.

3.4 The explicit approach

The third version of the local approach is the ‘explicit approach’ of Stephen Neale (1990, 2004). Here is a description of it (Neale 2004: 121):

The basic idea is explicitly modal: the nominal is often shorthand for, elliptical for, an abbreviation of at least one richer nominal the speaker could have used and could produce if asked to be more explicit. (Hence the name.) Consider the following dialogue:

A: The table is scratched.

B: Which table?

A: The table I bought this morning. (Or: The one I bought this morning.)

According to the explicit approach, this type of dialogue is suggestive of what is going on when we make felicitous uses of incomplete descriptions. B is intended to interpret A’s utterance of ‘the table’ as if it were an utterance of ‘the table I bought this morning’. There need not be a unique description that A can supply, but there had better be at least one—and one that B could reasonably have been expected to construct at that—if the speech act is to be felicitous.

Neale (2004: 122, 167) is emphatic that the explicit approach does not involve syntactic deletion of the kind seen in discussions of VP-ellipsis and NP-deletion in syntactic theory. It is not the case, for example, that the relative clause *I bought this morning* is present in the syntax in A’s first utterance above, but just not pronounced.

Is there any difference, then, between Neale’s position and what I just referred to as the pragmatic enrichment approach? There is. According to the pragmatic enrichment approach, we act directly on language of thought representations without further reference to the syntax when we understand an utterance that involves implicit content. Neale (2004: 82–83) is content to assume a language of thought and to assume that understanding an utterance involves entertaining a particular language of thought representation. But according to Neale there is a limit on the kind of enrichment of language of thought strings that is permitted: we have to understand phrases involving implicit content as if they were phrases produced by adding words to the phrases actually uttered. Neale (2004: 122) says:

the basic idea [. . .] is that sometimes the matrix $\phi(x)$ of a quantified DP is understood, in context, as if it were a richer matrix $\phi(x, a)$ containing an additional argument or a conjunction $\phi(x) \bullet \zeta(x)$ which the speaker could readily have produced.

The mention of quantified DPs makes it clear that Neale is talking about phrases in the syntax here. Note that the original nominal $\phi(x)$ is part of the enriched nominal that is understood.

This difference between Neale's explicit approach and the pragmatic enrichment approach makes Neale's theory in a certain respect more constrained. Enrichment in Neale's theory can only yield meanings that could be obtained by syntactically building on the material present in the syntax. No such constraint is present in the pragmatic enrichment theory.

3.5 The syntactic situation variable approach

The fifth and final version of the local approach to incomplete descriptions that I will consider might be called the *syntactic situation variable approach*. Kuroda (1982), Recanati (1996, 2004) and Kratzer (2004) have proposed that implicit content in these cases is provided by each predicate being associated with a situation variable in the syntax, so that different predicates in one sentence can be evaluated with respect to different parts of the world (or even different parts of different possible worlds).⁸

Detailed versions of the compositional semantics of systems like this have been provided by Percus (2000) and Büring (2004). Here is a brief sketch, based roughly on their ideas. In order to analyze a historically important example by Soames (1986), I will depart temporarily from definite descriptions and consider another case of quantifier domain restriction; but the application to incomplete descriptions should be clear enough. A sentence like (17), then, would have an LF like (18).

(17) Every subject is asleep.

(18) Σ_8 [[every [subject s_8]] [is [asleep s_8]]]

By means of a syncategorematic rule, the operator Σ_8 is interpreted as a lambda operator binding coindexed variables in its scope. A predicate like

⁸See Elbourne 2005, 99–109, for some empirical advantages of systems like these, and Elbourne 2010 for a defence of them against a well-known objection by Soames (1987, 2008).

subject or *asleep* will take a situation variable as its argument and return the characteristic function of the set of individuals with the relevant property *in the situation in question*. So the semantic value of [asleep s_8] might be something like $[\lambda x.x \text{ is asleep in } s_8]$, where s_8 will end up being bound. The semantic value of the whole LF (18) will be something like (19).

(19) $\lambda s_8.every subject in s_8 is asleep in $s_8$$

Suppose that the semantic value of an utterance is an Austinian proposition (Barwise and Perry 1983), that is a pair of a topic situation about which the speaker tries to say something and a characteristic function of a set of situations. In the present case, we might have something like (20).

(20) $\langle s^*, \lambda s_8.every subject in s_8 is asleep in $s_8 \rangle$$

The utterance will be true if the topic situation s^* is a member of the set defined by the lambda-term.

In this initial example, all situation variables are bound by the Σ operator. But at least some of the situation variables in a sentence, according to the current theory, are capable of being referential. They can refer to particular spatiotemporal parts of the world. Take Soames's classic (1986) example (21).

(21) Everyone is asleep and is being monitored by a research assistant.

This would have a simplified LF something like the following:

(22) Σ_8 [[every [-one s_1]] [[is asleep s_8] and [is being monitored s_8 by a research assistant s_8]]]

The situation variable s_1 would refer to a (possibly doughnut-shaped) part of the world s_1 that contained the experimental subjects and no-one else, while the variables s_8 would be bound, as before, by the Σ operator. The semantic value of this LF would be as follows:

(23) $\lambda s_8.everyone in s_1 is asleep in s_8 and being monitored by a research assistant in $s_8$$

If this function is paired with a topic situation that includes the experimental subjects and the research assistant, the right results, it seems, will be obtained.

The situation semantics in Elbourne 2005 can also deal with examples like the one just analyzed. This system does not have situation variables in the syntax, but can imitate the effect of the unbound s_1 in (22) by means of its operator s_0 (Elbourne 2005: 103), shown in (24).

$$(24) \llbracket s_0 \rrbracket^g = \lambda f_{\langle se, st \rangle} . \lambda u_{\langle s, e \rangle} . \lambda s . f(u)(g(0)) = 1$$

The denotation of the *-one* in *everyone* would be (25) without s_0 adjoined and (26) with it.

$$(25) \llbracket \text{one} \rrbracket^g = \lambda u_{\langle s, e \rangle} . \lambda s . u(s) \text{ is a person in } s$$

$$(26) \llbracket \text{one } s_0 \rrbracket^{[0 \rightarrow s_1]} = \lambda u_{\langle s, e \rangle} . \lambda s . u(s_1) \text{ is a person in } s_1$$

In this way, a restriction to a situation s_1 can be achieved to deal with examples like (21), and the truth conditions in (23) can be obtained. The next section of the present paper contains more details of the system in Elbourne 2005. I will count it as an honorary member of the class of syntactic situation variable approaches, since, although it does not have situation variables in the syntax, it does provide an operator in the syntax for introducing reference to particular situations.

4 An Argument from Sloppy Identity

4.1 The argument

The new data are as follows. Small italics indicate downstressing, which in turn indicates, roughly, that the phrase in question conveys old information—a property repeated from another part of the sentence in the current cases.⁹

- (27) a. In this village, if a farmer owns a donkey, he beats the donkey and the priest *beats the donkey* too. (strict, *sloppy)

⁹The literature on the information-theoretic effects of focus and downstressing is huge. For discussion of downstressed definite descriptions in particular, see Umbach 2002. The observation that pronouns in downstressed continuations give rise to both strict and sloppy readings goes back to Fiengo and May (1994: 110). Examples (27) and (28) are based on examples (72) and (74) of Elbourne 2005: Chapter 2, 69–70; but these original examples featured donkey pronouns in the place of the donkey-anaphoric definite descriptions of (27a) and (28a). The data in (27) and (28) are replicable with VP-ellipsis, but the effects are sharper with downstressing.

- b. In this village, if a farmer owns a donkey, he beats the donkey he owns and the priest *beats the donkey he owns* too. (strict, sloppy)
- (28) a. In this village, every farmer who owns a donkey beats the donkey, and the priest *beats the donkey* too. (strict, *sloppy)
- b. In this village, every farmer who owns a donkey beats the donkey he owns, and the priest *beats the donkey he owns* too. (strict, sloppy)

According to one reading of the (b) sentences, the village priest is said to beat his own donkey; whereas no such claim can be made with the (a) sentences. The basic observation, in other words, is that, given a sentence with a donkey-anaphoric definite description containing no overt pronouns, a repetition of the definite description in a downstressed continuation does not give rise to a sloppy reading.

How well do the five theories that we surveyed in section 3 deal with these data? To start with, the syntactic relation variable approach seems to be in trouble, since it effectively analyzes (27a) and (28a) as silent versions of (27b) and (28b) respectively. Recall that this theory analyzes (7), repeated here as (29), as something like (30).

- (29) Only one class was so bad that no student passed the exam.
- (30) [only one class] λ_2 [t_2 was so bad that no f_1 v_2 student passed the f_3 v_2 exam]

This theory posits combinations of relation variables and bindable individual variables that attach to determiners (or, in Stanley and Szabó’s version, to nouns). So there is nothing to prevent *the donkey* in (27a) or (28a) from meaning ‘the donkey owned by x ’. But that would mean that it should behave exactly like *the donkey he owns*, which also contains a bound individual variable combined with an item denoting the owning relation. But it does not.

The language of thought relation variable approach would also seem to have met a significant problem, for a very similar reason. This theory would be able to analyze (27a) or (28a) as giving rise to LOT strings containing OWNED-BY combined with a bound individual variable. But then we would expect these sentences to behave like (27b) and (28b), contrary to fact.

The pragmatic enrichment approach and the explicit approach also appear to overgenerate here. On these approaches there is nothing to prevent the addition of LOT material equivalent to ‘he owns’ to the definite descriptions in (27a) or (28a); but that would give rise to unattested sloppy

readings. Note that the addition of material equivalent to ‘he owns’ satisfies the constraint placed on LOT insertions by the explicit approach. The explicit approach says that such insertions can only take place if they give a LOT string that is the interpretation of a natural language sentence formed from the original one by the addition of extra material in the syntax; but (27b) and (28b) precisely constitute such sentences with respect to (27a) and (28a).¹⁰

Lastly, let us turn to the syntactic situation variable approach. This approach seems to be corroborated. The other theories provide enough material to make the final *the donkey* in (27a) and (28a) interpretable by means of *the priest* binding an individual variable in it, thus wrongly predicting a sloppy reading. But this is impossible on the syntactic situation variable approach, which generally does not supply individual variables at all for this kind of thing.¹¹

But how exactly would the syntactic situation variable approach analyze (27a) and (28a)? As it happens, I have already, in effect, provided detailed situation semantics analyses of these sentences in another context (Elbourne 2005: 71–77), and so will not fully recapitulate them here.¹² But, to give the flavor of the enterprise, here is an analysis of (27a) in the system of Elbourne 2005.

The system in Elbourne 2005 does not posit situation variables in the syntax. Here is a representative sample of lexical entries.

¹⁰The considerations in Hall 2008 do not help the pragmatic enrichment approach with these examples. Hall (2008: 445) proposes that “free enrichment is essentially local: it applies to subpropositional constituents, either replacing encoded concepts with inferred concepts, or adding material (unarticulated constituents) to change the interpretation of some encoded element.” The changes necessary to give (27a) and (28a) the meanings of (27b) and (28b) clearly satisfy this desideratum, and yet they do not seem to be possible.

¹¹This does not rule out the possibility that a few words like *local* might idiosyncratically subcategorize for a silent individual variable, a possibility entertained (but not endorsed) by Partee (1989).

¹²To be precise, I have provided analyses of sentences whose LFs I claimed were the same as those of (27a) and (28a). My thesis in that part of my book was that *If a man owns a donkey he beats it* has the same LF as *If a man owns a donkey he beats the donkey*, and similarly with donkey sentences introduced by *every*. I made up sentences with donkey pronouns and downstressed continuations, closely analogous to (27a) and (28a), and showed that they do not have sloppy readings, contrary to the prediction of theories such as Cooper 1979 that would place bound individual variables in donkey pronouns. I should have added that my theory correctly predicted that the sentences with donkey pronouns would display the same strict/sloppy behavior as (27a) and (28a).

- (31) $\llbracket \text{Mary} \rrbracket^g = \lambda s. \text{Mary}$
 $\llbracket \text{brays} \rrbracket^g = \lambda u_{\langle s, e \rangle}. \lambda s. u(s) \text{ brays in } s$
 $\llbracket \text{donkey} \rrbracket^g = \lambda u_{\langle s, e \rangle}. \lambda s. u(s) \text{ is a donkey in } s$
 $\llbracket \text{owns} \rrbracket^g = \lambda u_{\langle s, e \rangle}. \lambda v_{\langle s, e \rangle}. \lambda s. v(s) \text{ owns } u(s) \text{ in } s$
 $\llbracket \text{every} \rrbracket^g = \lambda f_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda g_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda s. \text{for every individual } x: \text{ for every minimal situation } s' \text{ such that } s' \leq s \text{ and } f(\lambda s.x)(s') = 1, \text{ there is a situation } s'' \text{ such that } s'' \leq s \text{ and } s'' \text{ is a minimal situation such that } s' \leq s'' \text{ and } g(\lambda s.x)(s'') = 1$
 $\llbracket \text{a} \rrbracket^g = \lambda f_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda g_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda s. \text{there is an individual } x \text{ and a situation } s' \text{ such that } s' \text{ is a minimal situation such that } s' \leq s \text{ and } f(\lambda s.x)(s') = 1, \text{ such that there is a situation } s'' \text{ such that } s'' \leq s \text{ and } s'' \text{ is a minimal situation such that } s' \leq s'' \text{ and } g(\lambda s.x)(s'') = 1$
 $\llbracket \text{the} \rrbracket^g = \lambda f_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda s : \exists! x f(\lambda s'.x)(s) = 1. \iota x f(\lambda s'.x)(s) = 1$
 $\llbracket \text{he} \rrbracket^g = \lambda f_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda s : \exists! x f(\lambda s'.x)(s) = 1. \iota x f(\lambda s'.x)(s) = 1$
 $\llbracket \text{always} \rrbracket^g = \lambda p_{\langle s, t \rangle}. \lambda q_{\langle s, t \rangle}. \lambda s. \text{for every minimal situation } s' \text{ such that } s' \leq s \text{ and } p(s') = 1, \text{ there is a situation } s'' \text{ such that } s'' \leq s \text{ and } s'' \text{ is a minimal situation such that } s' \leq s'' \text{ and } q(s'') = 1$
 $\llbracket \text{who} \rrbracket^g = \lambda f_{\langle \langle s, e \rangle, \langle s, t \rangle \rangle}. \lambda u_{\langle s, e \rangle} : \forall s u(s) \text{ is a person. } \lambda s. f(u)(s) = 1$
 $\llbracket \text{if} \rrbracket^g = \lambda p_{\langle s, t \rangle}. p$

A *minimal* situation s such that p is one that contains just enough individuals, relations and properties to make p true (Heim 1990). Situations in this kind of framework are subject to an ordering \leq , the reflexive *part-of* relation (Kratzer 1989). A situation s is part of a situation s' if and only if s' contains all the individuals, properties and relations that s does (and possibly some others).

We assume a set of composition rules as follows, based on the ones in Heim and Kratzer 1998.

- (32) a. *Functional Application (FA)*
 If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment g , α is in the domain of $\llbracket \]^g$ if both β and γ are, and $\llbracket \beta \rrbracket^g$ is a function whose domain contains $\llbracket \gamma \rrbracket^g$. In that case, $\llbracket \alpha \rrbracket^g = \llbracket \beta \rrbracket^g(\llbracket \gamma \rrbracket^g)$.
- b. *Predicate Modification (PM)*
 If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then,

for any assignment g , α is in the domain of $\llbracket \cdot \rrbracket^g$ if both β and γ are, and $\llbracket \beta \rrbracket^g$ and $\llbracket \gamma \rrbracket^g$ are of type $\langle \langle s, e \rangle, \langle s, t \rangle \rangle$. In that case, $\llbracket \alpha \rrbracket^g = \lambda u_{\langle s, e \rangle} . \lambda s . \llbracket \beta \rrbracket^g(u)(s) = 1 \ \& \ \llbracket \gamma \rrbracket^g(u)(s) = 1$.

c. *Predicate Abstraction (PA)*

For all indices i and assignments g , $\llbracket \lambda_i \alpha \rrbracket^g = \lambda u_{\langle s, e \rangle} . \llbracket \alpha \rrbracket^{g^{u/i}}$.

d. *Traces (TR)*

If α is a trace, g is a variable assignment, and $i \in \text{dom}(g)$, then $\llbracket \alpha_i \rrbracket^g = g(i)$.

We will also need a standard notion of λ -conversion.

Now let us consider the LF structure of our example (27a), repeated here with the addition of an explicit quantificational adverb as (33).

(33) In this village, if a farmer owns a donkey, he always beats the donkey and the priest *beats the donkey* too. (strict, *sloppy)

Following Berman (1987) and Heim (1990), I assume that quantificational adverbs impose the structure in (34) on their LFs.

(34) $\llbracket [\text{always} [\text{if } \alpha]] \beta \rrbracket$

This means that the donkey sentence in (35) has the LF structure in (36), momentarily abstracting away from any complexity there may be behind the pronouns.

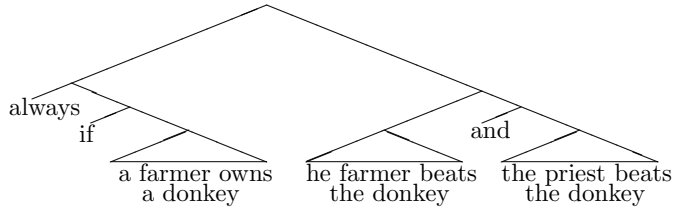
(35) If a man owns a donkey, he always beats it.

(36) $\llbracket [\text{always} [\text{if} [\llbracket [\text{a man}] \lambda_6 [\llbracket [\text{a donkey}] \lambda_2 [\text{t}_6 \text{ owns } \text{t}_2] \rrbracket] \rrbracket] \llbracket \text{he beats it} \rrbracket] \rrbracket$

The LF structure of (33) depends on what the two conjuncts of *and* are. The sentence *the priest beats the donkey too* must form one of the conjuncts. Since it is a sentence, there seem to be two possibilities for the overall structure. Either *the priest beats the donkey too* is conjoined with *he beats the donkey*, and thus forms a continuation of the consequent of the conditional; or it is conjoined with *if a farmer owns a donkey he beats the donkey*. I will here examine only the first possibility, and refer interested readers to Elbourne 2005 for the second.

The structure of the first option, where the sentence with the phonologically reduced VP simply forms part of the consequent of the conditional, is shown in (37). I assume the theory of Elbourne 2005 whereby donkey pronouns are definite determiners with nominal content supplied by NP-deletion: thus we have $\llbracket \text{he farmer} \rrbracket$ for *he*.

(37)



Applying our semantics, we obtain the truth-conditions in (38), given in simplified form in order to aid exposition.

- (38) λs_1 . for every minimal situation s_2 such that $s_2 \leq s_1$ and there is an individual x such that x is a farmer in s_2 and there is an individual y such that y is a donkey in s_2 and x owns y in s_2 , there is a situation s_3 such that $s_3 \leq s_1$ and s_3 is a minimal situation such that $s_2 \leq s_3$ and the unique farmer in s_3 beats in s_3 the unique donkey in s_3 and the unique priest in s_3 beats in s_3 the unique donkey in s_3

These truth conditions are intuitively correct. Each situation s_2 contains exactly one donkey, since it is a *minimal* situation in which a farmer owns a donkey. Each situation s_2 , furthermore, is part of a corresponding situation s_3 , and so, for each situation s_2 , the unique donkey in s_2 is a constituent of the corresponding situation s_3 . This means that, for each pair of a situation s_2 and a situation s_3 , ‘the unique donkey in s_3 ’ must be the donkey that also appears in s_2 . If it were any other donkey—if, in other words, some other donkey tries to sneak into one of the situations s_3 —we would no longer be able to talk about ‘the *unique* donkey in s_3 ’. This means, then, that the donkeys beaten by the priest are the same as the ones beaten by the farmers, and were introduced in the definition of the situations s_2 as belonging to the farmers. A strict reading is obtained, therefore, as desired, and there is no evident way of obtaining a sloppy reading.

Inspection of the lexical entries in (31) will reveal that, as one would expect, it is the meaning of *always* that sets up the situation structure just explicated. And inspection of the lexical entry of *every* in that list will reveal that it works in a very similar way, lending plausibility to the contention that only strict readings are available here. But in order to avoid unnecessary duplication I will not analyze (28a) here, or the other possible syntactic structure for (27a), but will refer interested readers to Elbourne 2005: 71–77.

4.2 Possible counterarguments

It might be objected¹³ that we cannot accommodate presuppositions unless their content is introduced by overt lexical items. To explain, if the Fregean approach to definite descriptions is correct, the unavailable sloppy readings in (27a) and (28a) would require the hearer to accommodate the presupposition that the priest owns exactly one donkey.¹⁴ Exactly this presupposition is accommodated for the sloppy readings of (27b) and (28b), of course. But in (27b) and (28b) we have the help of the overt material *the donkey he owns*. What if we cannot accommodate the fresh presupposition about the priest owning a donkey when all we have to go on is *the donkey*?

It seems, however, that there is in fact evidence of presuppositions being accommodated without overt lexical items specifying all their content. To start with, let us examine the following straightforward case of a sloppy reading in VP-ellipsis:

- (39) Farmer Giles beats the donkey he owns, and the priest does too.
(strict, sloppy)

Even though we have no overt lexical items at all to introduce the relevant presupposition, we have no difficulty in this case in assuming that the priest owns exactly one donkey.

Of course (39) is not an exact parallel to the cases at hand. The material introducing the desired presupposition in (27a) and (28a) would be partly overt (*the donkey*) and partly covert, instead of completely covert as in (39). And the mechanism in (39) is VP-ellipsis, whereas the mechanism in (27a) and (28a) would presumably be something different. Is it possible, then, to accommodate presuppositions whose content is introduced in exactly the manner that would be involved in (27a) and (28a)?

It is. Let us examine the following example, where the sentences in (a)–(c) represent three possible continuations of a discourse begun by the initial sentence:

- (40) I went up to John's house.
a. The front door was white.

¹³I am grateful to Pauline Jacobson for drawing my attention to this possibility.

¹⁴If the Russellian analysis of definite descriptions is correct, this counterargument would not get off the ground.

- b. The front doors were white.
- c. The battlements were white.

In (40a), we understand ‘the front door of John’s house’. The description is clearly incomplete, and implicit content is presumably in play, since there is more than one front door in the world. And the relevant presupposition, that John’s house has exactly one front door, is introduced in exactly the manner that would be in play in (27a) and (28a), by a mixture of overt (*the front door*) and covert content. The accommodation is eased here, perhaps, because it is well known and generally assumed that houses have one front door? Perhaps so, but this cannot be the case in the equally felicitous (40b) and (40c), since houses do not generally have two front doors or battlements (unless we are moving in very exclusive social circles). I do not believe, then, that the manner in which the necessary presupposition would be introduced in (27a) and (28a) can account for the lack of sloppy readings.

It might also be objected that the transition from the overt *owns* in (27a) and (28a) to the required covert ‘owned by’ is too great. Recall that some of the theories we looked at were claimed to predict meanings like ‘the donkey owned by him’. Would the occurrence of the active form of the verb render the passive participle meaning sufficiently salient? I believe so. The first thing to note is that voice mismatches of this kind occur even in cases of VP-ellipsis:¹⁵

(41) *Passive antecedent, active ellipsis*

- a. This problem was to have been looked into, but obviously nobody did.
- b. The system can be used by anyone who wants to.

(42) *Active antecedent, passive ellipsis*

- a. Actually, I have implemented it with a manager, but it doesn’t have to be.
- b. The janitor must remove the trash whenever it is apparent that it should be.

If an active form can make a corresponding passive one sufficiently salient to use in VP-ellipsis (and vice versa), I do not see why an active form should not

¹⁵The phenomenon was noted at least as far back as Sag 1976: 75; the examples in the text are from Merchant 2008, which should be consulted for further references and discussion.

be able to make a corresponding passive one salient enough to understand in implicit content. It is also worth noting that a sloppy reading is not available in the following variant of (28a):

- (43) In this village, every farmer who owns a donkey beats the donkey owned by him, and the priest *beats the donkey* too. (strict, *sloppy)

This variant, although perhaps slightly awkward, is clearly grammatical and clearly does not have a sloppy reading, in spite of the fact that the words *owned by him*, which should be an ideal model for implicit content according to every theory except the syntactic situation variable theory, actually occur just before the incomplete definite description whose interpretation is in question.

5 Conclusion

The examples I have examined concern the interpretation of incomplete definite descriptions, and strictly speaking I have established at most that situation semantics must be the method by which these phrases are interpreted. But, as Neale (1990) has emphasized, there is no good reason to think that definite descriptions are any different from any other DPs when it comes to the provision of implicit content, and so we might tentatively take the result of the present paper to generalize to other DPs too.

What consequences can be drawn from the present paper for the larger debate concerning implicit content? Stanley (2000) has claimed that implicit content is always the semantic value of some item or items in the syntax, whereas Sperber and Wilson (1986) and others have claimed that the syntax is never involved in the provision of implicit content. The current paper, in arguing in favor of the syntactic situation variable approach, provides evidence against any theory whereby implicit content is never the semantic value of items in the syntax. Could situation variables even be responsible for all kinds of implicit content? Maybe, but the kinds of implicit content are many, and any wide-ranging conclusion would have to be argued for case by case.

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