The Philosophical Insignificance of Godel's Slingshot

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In "The Philosophical Significance of Godel's Slingshot"[1], Stephen Neale claims to answer all

<u>technical</u> questions about Godel's Slingshot, and also to highlight the <u>philosophical</u> significance

of that argument. Moreover, he (at least implicitly) defends the view that Godel's Slingshot is

philosophically important -- i.e. he (at least implicitly) suggests that Godel's Slingshot has

<u>important</u> philosophical consequences for theories of facts and for referential treatments of

definite descriptions. Finally, he explicitly claims: (i) that Godel's Slingshot highlights

unpleasant consequences of referential treatments of descriptions (p.817); (ii) that Godel's

Slingshot poses genuine philosophical questions about the logical and philosophical

consequences of rejecting Russell's Theory of Descriptions (p.765); (iii) that Godel's Slingshot

forces friends of facts to take a definite position on the semantics of definite descriptions

(pp.764, 817); (iv) that, on plausible assumptions, Godel's Slingshot forces anyone who is giving

a logic for causal statements to endorse Russell's Theory of Descriptions (p.814); and (v) that

Godel's Slingshot has important consequences for any theory of facts because of the

consequences which it has for the sentential operator FIC -- "The fact that () = the fact that []".

(p.815)

I have doubts about all of this. Most importantly, I am sceptical of the philosophical

significance of Godel's Slingshot (and of Slingshot arguments in general). In particular, I do not

believe that Godel's Slingshot has any interesting and important philosophical consequences for

theories of facts or for referential treatments of definite descriptions. More generally, I do not

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[1] Neale (1995). Subsequent citations refer to this article.

believe that any Slingshot arguments have interesting and important philosophical consequences for theories of facts or for referential treatments of definite descriptions.[2] Friends of facts and referential treatments of definite descriptions can, and should, proceed with the construction of their theories, blithely ignoring the many Slingshots which now litter the landscape. (Of course, there may be other considerations which should give such theorists pause -- but those are *other* considerations.)

What would it take for a Slingshot argument to have interesting and important philosophical consequences for theories of facts or referential treatments of definite descriptions? I assume that (i) such an argument would need to impose a further constraint upon those theories, beyond those constraints which may be deduced simply from consideration of general theoretical desiderata such as consistency, completeness, simplicity, accomodation of data, and so on[3]; (ii) such an argument should impose a constraint for which it is *prima facie* plausible that there are interesting theories of the kind in question which fail to meet the constraint -- i.e. it should not be obvious that all of the theories of the kind in question will meet

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[2] Although I shall occasionally make claims about Slingshot arguments in general, I shall not offer arguments in defence of these claims here. Those familiar with the literature will be readily able to see how the more extended arguments would go.

[3] So, for example, the constraint couldn't be merely the general claim that friends of facts need to say something about the semantics of definite descriptions. Independently, we have it that one general theoretical virtue is completeness: a good theory covers all relevant phenomena. So, any complete semantic theory has to say something about definite descriptions. It would be giving credit where it isn't due to claim that Godel's Slingshot shows that friends of facts have to say something definite about the semantics of definite descriptions.

the constraint, regardless of how they are developed; and (iii) such an argument should impose a

constaint which operates independently of theoretical assumptions which would, by themselves,

suffice to undermine or demolish the theories in question. That is, I assume that it would make

sense now to claim that Godel's Slingshot has interesting and important philosophical

consequences for theories of facts and definite descriptions provided that Godel's Slingshot

imposes some particular constraint on those kinds of views for which it is true both (a) that it is

at least *prima facie* plausible that there are interesting versions of the views in question which

fail to meet the constraint; and (b) that the constraint which Godel's Slingshot does impose isn't

due either to independent theoretical assumptions or to general theoretical considerations which

would have been taken into account anyway, regardless of the development of the Slingshot.

The claim that I wish to defend in this note is that Godel's Slingshot fails to meet these

constraints. While not wishing to deny that the discussion of Godel's Slingshot has technical

and historical significance, I want to insist that Godel's Slingshot does not impose any

philosophically interesting constraints upon theories of facts and referential treatments of

definite descriptions. On the one hand, there are many views which one might have about facts

but -- as far as I can tell -- it is almost impossible to construct a *prima facie* plausible theory of

facts which falls foul of Godel's Slingshot. On the other hand, while there are, perhaps, not many

plausible referential treatments of definite descriptions, it seems to me that assumptions involved

in the construction of Godel's Slingshot must be denied by any such referential treatment of

definite descriptions. In particular, it seems to me that any referential treatment of definite

descriptions will require rejection of semantic innocence (or direct reference, or both) -- i.e.

rejection of the claim that the semantic content of vocabulary does not vary as the non-

quotational sentential frames in which that vocabulary is embedded varies (or rejection of the

claim that the semantic content of (say) singular terms in extensional contexts is just the objects (if any) to which those singular terms refer, or both) -- and yet, the assumption of semantic innocence (or direct reference, or both) is implicitly built into the construction of Slingshot arguments.

In order to bolster the arguments which I give, I shall also try my hand at sketching a kind of theory which is fact-friendly, and in which definite descriptions can be treated as singular terms. The aim will be to provide enough detail to suggest (i) that it isn't obvious on independent grounds that no theory of this kind can succeed; and yet (ii) that it is quite clear that this theory will not fall to Godel's Slingshot. (Of course, even if the kind of theory which I sketch only meets the second of these criteria, it will still serve to illustrate the main point which I wish to make: Godel's Slingshot gets no credit if this kind of theory is only independently defeated.) I shall then close with some comments about statements about the identity of facts.

1. Godel's Slingshot

I begin with a statement of the Godel Slingshot argument, as it is formulated by Neale.[4] The Slingshot makes use of the following rules of inference, subject to the understanding that ι-SUBS and ι-CONV are rules which are to be applied only to extensional constructions which are themselves embedded within the scope of purportedly non-extensional S-connectives:

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[4] Godel's Slingshot argument appears in Godel (1944) at pp.125-133. Neale's formulation of the argument is in Section 10 , pp.789-790; and his discussion of the rules is in Sections 8 and 9, pp.783-789. Neale discusses the informal argument in Section 6, pp.776-780.

ι-SUBS:
$(\iota x)\phi=(\iota x)\psi$	$(\iota x)\phi=\alpha$	$(\iota x)\phi=\alpha$
$\Sigma[(\iota x)\phi]$	$\Sigma[(\iota x)\phi]$	$\Sigma[\alpha]$
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$\Sigma[(\iota x)\psi]$	$\Sigma[\alpha]$	$\Sigma[(\iota x)\phi]$

ι-CONV:
$\Sigma[x/\alpha]$	$\alpha=(\iota x)(x=\alpha.\Sigma[x])$
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$\alpha=(\iota x)(x=\alpha.\Sigma[x])$	$\Sigma[x/\alpha]$

The proof runs as follows ('Ω' is the allegedly non-extensional S-connective):

1	[1]	Fa	premiss
2	[2]	$a\neq b$	premiss
3	[3]	Gb	premiss
1	[4]	$a=(\iota x)(x=a.Fx)$	1, ι-CONV
2	[5]	$a=(\iota x)(x=a.x\neq b)$	2, ι-CONV
2	[6]	$b=(\iota x)(x=b.x\neq a)$	2, ι-CONV
3	[7]	$b=(\iota x)(x=b.Gx)$	3, ι-CONV
1,2	[8]	$(\iota x)(x=a.Fx) = (\iota x)(x=a.x\neq b)$	4, 5 ι-SUBS
2,3	[9]	$(\iota x)(x=b.Gx) = (\iota x)(x=b.x\neq a)$	6,7 ι-SUBS
10	[10]	$\Omega (Fa)$	premiss
10	[11]	$\Omega (a=(\iota x)(x=a.Fx))$	10, ι-CONV
1,2,10	[12]	$\Omega (a=(\iota x)(x=a. x\neq b))$	11,8, ι-SUBS
1,2,10	[13]	$\Omega (a \neq b)$	12, ι-CONV
1,2,10	[14]	$\Omega (b=(\iota x)(x=b. x\neq a))$	13, ι-CONV
1,2,3,10	[15]	$\Omega (b=(\iota x)(x=b.Gx))$	14,9, ι-SUBS
1,2,3,10	[16]	$\Omega (Gb)$	15, ι-CONV

This Slingshot establishes that any S-connective which is both +ι-SUBS and +ι-CONV will also be +PSME -- i.e. will allow substitution of material equivalents -- for sentences which contain occurences of singular terms. One might think to object that the Slingshot can be avoided by those who insist on reparsing singular terms using predicates and quantifiers (a la Quine) -- i.e. by those who insist that there are no singular terms in canonical notation. Moreover, and

relatedly, one might suggest that it can be avoided by those who suppose that there are only general facts (and not particular facts) -- in this case, the proof offers no reason to fear that non-extensional operators must collapse.

A partial remedy is to turn to the following rule of inference (to be understood in the same way as before):

IDENT: S   S.a=a

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           S.a=a   S

It is clear that any S-connective which is +ι-SUBS and +ι-CONV and +-IDENT will also be +PSME for all sentences. Of course, this doesn't help with the resolute Quineans -- but it does show how to amend Godel's Slingshot so as to get collapse for all sentences (and not merely those which contain occurences of singular terms) .

Quite apart from the considerations of the preceding two paragraphs, it is plain that we should agree with Neale that Godel's Slingshot shows that no nonextensional S-connective can permit the use of both ι-SUBS and ι-CONV on extensional sentences within its scope. The only way to evade the Slingshot is to make it impossible to apply the rules at all (by removing all occurrences of singular terms from the language); given that the rules can be applied, they guarantee that there will be collapse.

2. Facts

What consequences must this have for friends of facts? Well, if friends of facts were obliged to accept that non-extensional operators are +ι-SUBS and +ι-CONV -- and, in particular, if they were obliged to accept that FIC -- "The fact that () = the fact that []" -- is +ι-SUBS and +ι-CONV -- then they would be in trouble. So friends of facts need to be able to deny that FIC and other relevant operators are +ι-SUBS and +ι-CONV.

But nothing seems easier. Consider +ι-CONV. Suppose first that we are Russellians about definite descriptions. Then we shall suppose that 'Fa' expresses an atomic fact, and 'a=(ιx)(x=a.Fx)' expresses a general fact. The classes of atomic facts and general facts are disjoint. So FIC cannot be +ι-CONV. Suppose, instead, that we prefer a referential treatment of definite descriptions. Then we shall suppose that 'Fa' expresses a monadic fact (the attribution of the property F to a), and that 'a=(ιx)(x=a.Fx)' expresses a dyadic fact (the attribution of identity to the pair of a and a). The classes of monadic and dyadic facts are disjoint. So FIC cannot be +ι-CONV. Hence, however we decide to treat definite descriptions, it will turn out that FIC cannot be +ι-CONV.

Next, consider +ι-SUBS. Consider the facts that Hesperus is bright and that Phosphorus is bright. One fact or two? Well, if we say that there is only one fact here, it seems that we will be committed to the claim that the fact that Hammurabi believes that Hesperus is bright is identical to the fact that Hammurabi believes that Phosphorus is bright.[5] And -- the claims of

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[5] How? Well, suppose -- as many friends of facts do -- that facts are the objects of knowledge. Suppose that Hammurabi knows that Hesperus is bright. Given that the fact that Hesperus is bright is identical to the fact that Phosphorus is bright, it seems to follow that Hammurabi knows that Phosphorus is bright, and that Hammurabi's knowing that Hesperus is bright is the very

semantically innocent direct reference theorists aside -- that seems like a bad result. So, there is a good *prima facie* case for the view that friends of facts should deny that FIC is +ι-SUBS. Curiously, Neale says: "I take it that no fact theorist wants to deny that FIC is +PSST." (p.815) On the contrary, it seems to me that work needs to be done to show that friends of facts should *not* deny this.

Even if one is not convinced by this argument involving proper names, it seems perfectly clear that those who wish to treat definite descriptions as singular terms will deny that FIC is +ι-SUBS (and +PSST). After all, there *is* a reading on which the inference from "Necessarily, nine is the square of three" to "Necessarily, nine is the number of the planets" is invalid, even though it apparently involves substitution of co-referring descriptions in an intensional context. (If "Nine is the square of three" and "Nine is the number of the planets" do express the same fact, then there is at *least prima facie* reason to think that the inference in question should be valid.) More generally, the point to make here is that if Godel's Slingshot is to tell against referential

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same thing as Hammurabi's knowing that Phosphorus is bright. But, in that case -- since knowledge entails belief -- it seems to follow that Hammurabi's believing that Hesperus is bright is the very same thing as his believing that Phosphorus is bright. In other words, it seems to follow that that fact that Hammurabi believes that Hesperus is bright is identical to the fact that Hammurabi believes that Phosphorus is bright. (There seem to be only two avenues of reply: (1) deny that facts are the objects of knowledge; (2) deny that facts individuate states of knowledge, while accepting that facts are the objects of knowledge. Both of these options seem to me to be counter-intuitive. Of course, that is not much of an argument against them -- but the point here is just to show that there **is** *prima facie* reason to think that FIC is not +ι-SUBS even in the case of co-referring proper names.)

theories of definite descriptions, then it should not be the case that we have already foreclosed the possibility of constructing such theories. But, on any such theories, it is clear (i) that definite descriptions will be treated as singular terms; and (ii) that definite descriptions will not obey +ι-SUBS in non-extensional contexts. So any such theory will immediately have the resources to avoid Godel's Slingshot -- and the construction of Godel's Slingshot adds nothing at all in the way of difficulties in the path of constructing such theories.

Moreover, since, as Neale convincingly argues, the friend of facts who endorses Russell's theory of descriptions will have no trouble in rejecting +ι-SUBS, we have it that the friend of facts will reject +ι-SUBS regardless of the view which they take about the semantics of definite descriptions. So the friends of facts are doubly secured against Godel's slingshot: regardless of what they think about the semantics of definite descriptions, they will reject BOTH of the principles which are required for the construction of the argument.[6]

These considerations strongly suggest that there isn't even *prima facie* reason for friends of facts to be afraid of Godel's Slingshot, nor of the more familiar Quine-Church-Davidson Slingshots. Consequently, we should be suspicious of the idea that Godel's Slingshot is an important and interesting constraint on theories of facts -- and we should also think that it is

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[6] Thus, it is clear that Neale is wrong to claim that Godel's Slingshot forces the friend of facts to take a definite position on the semantics of definite descriptions: one could be a friend of facts who is undecided about which way to go on that question. Of course, as one develops one's theory, one will need to make a choice (and one will incur different commitments depending upon the choice which one makes) -- but it is the general theoretical desideratum of completeness which forces this outcome, not anything to do with Godel's Slingshot (c.f. footnote 3).

quite unlikely that any of the strong claims which Neale makes about the philosophical

significance of Godel's Slingshot are likely to be correct.

Naturally, this isn't to deny that Godel's Slingshot is *a* constraint on theories of facts.

However, it is also true that "Oppy's Cheapshot" is a constraint on theories of facts. (Oppy's

Cheapshot says that no theory of facts should allow that it is a fact that the moon is made from

green cheese.[7]) Oppy's Cheapshot is a genuine constraint: no decent theory of facts should

violate it. Moreover, Oppy's Cheapshot forces fact theorists to take a definite stance on the

analysis of definite descriptions (how else is one to understand talk about "the moon"?) And

Oppy's Cheapshot is easily evaded by those who accept a Russellian analysis of definite

descriptions: it is clearly false that there is exactly one (contextually salient) moon which is

made from green cheese.

Of course, this rhetorical comparison of Godel's Slingshot with Oppy's Cheapshot isn't

entirely fair. It *is* interesting that Godel produced a Slingshot whose premises are quite different

from -- and perhaps in some sense weaker than -- those used by Quine, Church, and Davidson. It

is interesting that Russell's Theory of Descriptions provides an immediate means of escape. It *is*

interesting that discussions of Slingshot arguments are often vitiated by mistaken applications of

substitution principles for co-referring descriptions. And so on. But there is a serious point to the

comparison, nonetheless: unless there is at least *prima facie* reason for friends of facts and

referential treatements of definite descriptions to feel threatened by Godel's Slingshot, there isn't

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[7] For those who think that a theory of facts should only constrain what facts there could be, and

not what facts there are, there is another Cheapshot: no theory of facts should allow that it is a

fact that the greatest prime number is less than 200. The same rhetorical points can be made in

connection with this Cheapshot as well.

even *prima facie* reason to think that Godel's Slingshot will have philosophically important consequences for theories of facts (and, in particular, for theories of facts which involve referential treatements of definite descriptions).

One final point. *My* initial reaction to the informal version of Godel's Slingshot is that it is pretty obvious that 'Fa' and 'a=(ɩx)(x=a.Fx)' express distinct facts, regardless of what one thinks about the semantics of definite descriptions -- and this is what justifies my claim that it is more or less obvious that friends of facts need have nothing to fear from souped-up versions of Godel's Slingshot. However it is probably worth noting that I don't say that friends of facts *need* to say that 'Fa' and 'a=(ɩx)(x=a.Fx)' express distinct facts in order to look with scorn upon Godel's Slingshot. Consider, for example, those friends of facts who start from metaphysics, and who insist that facts are simply truth-makers. Such theorists might well say that 'Fa' and 'a=(ɩx)(x=a.Fx)' are made true by the same fact -- namely, the instantiation of the property F by the object a. However, such theorists will also insist that 'a=(ɩx)(x=a.x≠b)' is made true by a different fact -- namely, the failure of the instantiation of the relation of identity between a and b (or, for those who don't like negative facts, the instantiation of the relation of distinctness between a and b). From this perspective, the metaphysics provides a constraint on philosophy of language -- it is obvious that FIC is not +ɩ-SUBS -- but there is again not the slightest reason to think that this has any bearing on the question of the semantic analysis of definite descriptions.[8]

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[8] Those who start from metaphysics might well have other objections to make to Godel's Slingshot. Consider sentences of the form "a exists", where a is a singular term. Some friends of facts hold that, where true, sentences of this form are made true by the object which is the referent of "a" -- i.e. individuals are (some of the) facts. A collapsing argument against this kind

3. Semantic innocence and referential treatments of definite descriptions

Neale's discussion of Godel's Slingshot owes a lot to Davidson's discussion of *his* Slingshot. In particular, the methodology which underlies the construction of the Slingshot comes straight from Davidson.

The idea is this: One begins with rules of inference which are clearly valid for extensional contexts. It follows from this that if Ω is an extensional S-connective and S is an extensional sentence, then the truth (falsity) of Ω (S) guarantees the truth (falsity) of Ω (T), where T is the result of applying one of the rules of inference to S. One then asks: if Ω is a nonextensional S-connective and S is an extensional sentence, does the truth (falsity) of Ω (S) guarantee the truth (falsity) of Ω (T), where T is the result of applying the rules of inference to S? In the case at hand, it is clear that ι-SUBS and ι-CONV are both valid for extensional contexts. And what Godel's Slingshot shows is that there cannot be a non-extensional S-connective which satisfies the conditions outlined in the question.

There are semantic theories for which it seems *prima facie* most unlikely that the asking of this kind of question will deliver interesting results, namely: those semantic theories which deny the principle of semantic innocence -- i.e. which deny that the semantic contents of

of view would need to show that there is only one object (an absurd conclusion). Moreover, it would be question-begging to try to develop such an argument in the context of classical logic (in which it is assumed that all singular terms refer); rather, the proper venue for a formulation of putative Slingshot arguments would be some kind of free logic. It isn't obvious that Godel's Slingshot can be successfully reformulated in (all versions of) such logics.

expressions vary with the non-quotational contexts in which those expressions are embedded.[9]

Suppose one thinks that expressions have different contents when embedded in non-extensional

contexts than they have when not thus embedded -- and, in particular, that sentences have

different contents when embedded in non-extensional contexts than they have when not thus

embedded. Then, there is good reason to think that Davidson's method -- the method embodied

in Godel's Slingshot -- won't tell you anything interesting about non-extensional S-connectives.

After all, there is no reason to think that a valid rule of inference which takes you from S to S*

will still be valid when different contents are assigned to S and S*.[10]

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[9] A note about terminology. Very roughly: Semantic theories are <u>directly referential</u> (with

respect to singular terms) if they hold that the semantic contents of singular terms in extensional

contexts are the objects (if any) to which those terms refer. Semantic theories are <u>semantically</u>

<u>innocent</u> (with respect to singular terms) if they hold that the semantic contents of singular terms

in non-extensional, non-quotational, contexts are just the semantic contents which those singular

terms have in extensional contexts. Semantic theories are both <u>directly referential and</u>

<u>semantically innocent</u> (with respect to singular terms) if they hold that the semantic contents of

singular terms in non-quotational contexts are just the objects (if any) to which those singular

terms refer. Similar principles can be formulated for other categories of vocabulary. More

precise versions of these principles -- capable of dealing with indexicals, and so on -- would

refer to tokens in particular contexts of tokening. (Such refinements will not be important here.)

[10] Suppose, for example, that you think that definite descriptions are directly referential singular

terms. Then application of Davidson's method to (the relevant reading of) the sentences

'Necessarily, nine is the square of three' and 'Necessarily, nine is the number of the planets' tells

you immediately that 'Necessarily' is not an extensional S-connective (since substitution of co-

The relevance of this point is that it seems plausible to think that referential theories of definite descriptions will involve denial of semantic innocence. If definite descriptions are to be directly referential singular terms, then their contents in extensional contexts should be the objects to which they refer (if they do refer)[11]. However, in order to get the truth values for modal claims involving definite descriptions right, it is plain that there must be something more

referring singular terms is truth-preserving in extensional contexts), and that definite descriptions are not semantically innocent. But that's all it tells you. If you are antecedently committed to non-extensional connectives and the denial of semantic innocence (for definite descriptions), then you haven't learnt anything at all which you should find disturbing. (Note that this example has nothing at all to do with propositional attitude ascriptions. Davidson introduced the label 'semantic innocence' in the context of a discussion of propositional attitudes, but the phenomenon identified is one which could be exemplified in other parts of language.)

[11] There are theorists who reject the assumption, which I make here, that singular terms in extensional contexts are directly referential. In particular, theorists who think of propositions as vehicles of communication -- items which get transferred from the mind of the speaker to the mind(s) of the hearer(s) -- may well deny the suggestion that the semantic contents of extensional occurrences of singular terms are just the objects to which those singular terms refer. This provides a different line of response to critics of fact-friendly referential treatments of definite descriptions than the one which I develop in the paper: accept semantic innocence, but deny direct reference for singular terms. For simplicity, I shall continue to focus on the approach which I find most congenial; however, it should be borne in mind that there are other areas of logical space which must be ruled out of bounds before Slingshot arguments can be made to look even *prima facie* plausible.

to the content of definite descriptions which occur embedded in the scope of modal operators. (This is one lesson which we all learned from Quine's discussion of modal sentences -- c.f. footnote 8 above.) In order to satisfy these desiderata, it seems that we should agree that semantic innocence will go by the board. Of course, this is a cost: other things being equal, semantically innocent theories are simpler. But, until the theories in question have been constructed, we don't know whether other things are equal. (One immediate advantage of the denial of semantic innocence is that one can get to treat definite descriptions as singular terms, thereby satisfying one (defeasible) pre-theoretical intuition which many theorists share.)

If this is right, then we have a theoretical diagnosis of the reasons why one shouldn't expect to get any consequences for referential treatments of definite descriptions to flow from Godel's Slingshot. Godel's Slingshot is formulated in an environment in which referential treatments of definite descriptions are more or less ruled out by *fiat*. But it is the decision to operate in that environment -- rather than the Slingshot argument itself -- which seems to create the problems for referential treatments of definite descriptions. In order to give referential treatments of definite descriptions a fair trial, one needs to draw back from the assumptions implicit in the methodology which underlies Godel's Slingshot.

(I think that it is also worth remarking that, "for purposes of ease of exposition", Neale decides to "exile terms that fail to refer, if there are such expressions" (p.781). It is clear that, if definite descriptions are singular terms, then there are lots of terms which fail to refer -- and that one of the important questions which must be faced by referential treatments of definite

descriptions is what to say about such cases. This also seems to me to show that Neale does not try to locate Godel's Slingshot on a level playing field.[12])

Naturally, none of this need be taken to undermine Neale's discussion of the *technical* significance of Godel's Slingshot. Godel's Slingshot certainly does show that there cannot be semantically innocent non-extensional S-connectives of a certain kind. This does place a constraint on friends of facts (and, in particular, on those friends of facts who wish to give a referential treatment of definite descriptions). However, there is nothing in the argument which shows that one cannot reject semantic innocence -- and so there is nothing in the argument which shows that the constraint is severe. Moreover, since it is independently plausible that friends of facts who give referential treatments of definite descriptions will wish to deny semantic innocence, it seems independently plausible to think that the constraint must be shown -- and not merely assumed -- to be severe.

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[12] I find it curious that Neale notes *here* that there might be a genuine question about whether there are empty singular terms. It seems clear that there can be names which have no extension (e.g. 'Santa Claus'), and names which have neither extension nor intension (e.g. 'Primo', whose reference is fixed by the description 'the greatest prime'). But I see no reason to think that there could be names which fail to have hyperintensions (in all contexts). Of course, those -- such as semantically innocent direct reference theorists -- who wish to collapse the distinction between extension, intension, and hyperintension for names may well find reason in this to doubt that there are any genuinely empty terms. (See, e.g., Salmon (1987). Yet Neale is operating in a context in which he is not -- and ought not to be -- assuming semantic innocence (and direct reference).

Of course, it remains to be seen whether viable semantic theories which deny semantic innocence can be constructed. There may be good reason to doubt that this can be done. Indeed, one might take Neale's paper as a challenge: do it; or show that it can be done; or, at least, show that there is good reason to think that it can be done. It is to this challenge that I now turn.

4. Sketch of a Kind of Theory

My aim is to give a plausible sketch of *one* kind of theory which is fact-friendly, and in which definite descriptions are treated as singular terms. I don't say that this is the only kind of theory of this sort which deserves consideration; however, it is the one which *I* find comes most readily to mind.

As foreshadowed in the previous section, the kind of semantic theory is not one which is semantically innocent (though it is one which is directly referential -- i.e. the contents of singular terms in extensional contexts are just the objects to which those singular terms refer). As a consequence of this fact, there are ambiguities in questions about the semantic contents of linguistic expressions -- and, in particular, there are ambiguities in questions about the semantic contents of (the propositions expressed by) sentences. It is one question what is the proposition expressed by a sentence S when that sentence stands alone. (Call this the *extensional* proposition expressed by the sentence.) It is another question which proposition is expressed by a sentence S when that sentence is embedded in an intensional context. (Call this proposition the *intensional* proposition expressed by the sentence.) It is yet another question which proposition is expressed by a sentence S when that sentence is embedded in a hyperintensional context. (Call this proposition the *hyperintensional* proposition expressed by the sentence.) In virtue of these

distinctions, we shall need to be very careful when we come to talk about "*the* proposition expressed by the sentence S". (Note, by the way, that it could be that there are many different intensional and/or hyperintensional propositions associated with a given sentence (in a given context of tokening). The possibility of this kind of complication is irrelevant to the discussion here.)

Mainly for the sake of ease of exposition, I am going to assume that facts are true propositions. This assumption is not compulsory, and, indeed, may even involve some kind of category error. (We ordinarily say that propositions are true or false, but that facts obtain or fail to obtain.) However, if facts are not true propositions, then there is some close connection between the two. For example, it could be that facts are the truth-makers for true propositions. Of course, if this is right, one needn't suppose that there are distinct facts for distinct true propositions -- a single truth-maker might make many distinct propositions true. However, these considerations are irrelevant for the purposes at hand: our concern here is more with philosophy of language than it is with metaphysics -- so we shall leave the metaphysics for some other occasion.

In view of the above, we have a distinction between kinds of facts associated with a given true sentence: there is the extensional fact, the intensional fact, the hyperintensional fact, and so on. Again, we shall need to be very careful when we come to talk about "the fact expressed by a sentence S".[13]

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[13] The proliferation of kinds of facts corresponding to a single sentence is a cost. However, it is worth pointing out that one *could* say, e.g., that intensional facts are simply extensional facts in intensional garb (by construction, the extensional fact is properly contained in the intensional fact); and that hyperintensional facts are simply extensional (and intensional) facts in

So much for facts.[14] The other important topic is the semantics for singular terms. Since the semantic theory is not semantically innocent, the semantic contents which get assigned to expressions -- and, in particular, the semantic contents which get assigned to singular terms -- depend upon the sentential contexts in which those expressions are embedded. Expressions

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hyperintensional garb. These points allow one to give a nice treatment of, e.g., the intuition that facts are the objects of knowledge. (Cf. footnote 4) States of knowing are individuated by hyperintensional facts -- so, in one sense, it is the hyperintensional facts which are the objects of knowledge. But, in another sense, at least in the simplest cases in which there is no iteration of hyperintensional operators, it is the extensional (and intensional) facts presented in hyperintensional garb which are the objects of knowledge. Similar points can be made in connection with the intuition that facts stand in relations of entailment. If entailment is a modal matter -- the necessitation of material implication, say -- then it is intensional facts which are thus related. If entailment is a hyperintensional matter -- *a priori* material implication, say -- then it is hyperintensional facts which are thus related. Thus, the proliferation of kinds of facts in not obviously *utterly* unintuitive -- and it does bring some benefits in train. (Thanks to Mark Sainsbury for comments which prompted this footnote.)

[14] Of course, there are lots of other things to say about facts (and propositions). Are there negative facts? Are there conjunctive and disjunctive facts? Are there totality facts? Are there facts which correspond to true propositions with "naked" gaps -- e.g. is there a fact which corresponds to the proposition < NOT < GAP, exists >> ? Should we suppose that the contents of predicates are properties -- or should we suppose that predicates too have different extensional, intensional, and hyperintensional contents? The answers to these questions seem to me to be irrelevant to our present concerns.

embedded in extensional contexts are simply assigned extensions. Expressions embedded in intensional contexts are assigned ordered pairs of extensions and intensions. Expressions embedded in hyperintensional contexts are assigned ordered triples of extensions, intensions, and hyperintensions. And so on. (Perhaps there are contexts in which expressions only get assigned extensions and hyperintensions. Perhaps there are other kinds of contexts. These kinds of questions needn't concern us here.) Extensional operators are sensitive to merely extensional content; intensional operators to intensional content (and perhaps to extensional content as well); hyperintensional operators to hyperintensional content (and perhaps to extensional and/or intensional content as well). There is no presumption that intensions or hyperintensions "determine" extensions: it is left to the details of the theory to decide what relations (if any) are required to hold between the different kinds of components of semantic content.[15]

What about empty singular terms? On the version of the theory which comes to mind first -- and hence which I do not suppose to be compulsory -- I propose that we should allow that the semantic contents which get assigned to sentences can be gappy, and in particular, I propose that we should allow that "empty" terms in extensional contexts do not have semantic contents. However, I also suggest that these semantic gaps do not -- or, at any rate, need not -- engender

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[15] Perhaps it is worth stressing that the resulting theory will be compositional: the semantic content of sentence is determined by the semantic content of its constituents. However, what content gets assigned to particular constituents depends upon the sentential frame in which those constituents are located -- i.e. the compositionality in question is not of the simplest possible kind. (The Fregean apparatus of indirect senses could be taken to illustrate the *possibility* of constructing a compositional semantics which is not semantically innocent.)

truth-value gaps in the sentences to which they correspond.[16] Taking advantage of a self-explanatory symbolism, I suggest that the proposition < GAP[17], exists > -- expressed, e.g., by the sentence 'Santa Claus exists' -- is false; and that the proposition < NOT < GAP, exists >> -- expressed, e.g., by the sentence 'Pegasus does not exist' -- is true. The proposition < GAP, lives at the North Pole > -- expressed, e.g., by the sentence 'Santa Claus lives at the North Pole' -- is also false; but the sentence 'According to the Santa Claus story, Santa Claus lives at the North

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[16] Note that I am certainly not assuming here that every (declarative) sentence has a truth-value: there are hard questions about, e.g., the paradoxes, vagueness, indexicals, category mistakes, etc., which need to be addressed. Moreover, I am also taking no stand on the question whether predicates can fail to have semantic contents (and, if so, whether propositions which have such gaps can nonetheless yield truth-values); nor on the question whether there are apparently declarative sentences to which no propositional content should be assigned. Perhaps the sentence 'John is good' expresses the proposition < John, GAP > -- which is either false, or lacking in truth-value; perhaps the sentence does not express a proposition at all. None of these details matter for the discussion at hand.

[17] Don't be misled into thinking that 'GAP' denotes a semantic value, such as the empty set, or the null object, or whatever. It would be less misleading simply to leave a space here (since that corresponds exactly to the idea under consideration, viz. that there is nothing to which the terms in question refer, and nothing which they contribute in the way of extensional semantic content); but it is much harder to read the more perspicuous notation. (Some of the reasons why one should wish to deny that 'GAP' is a semantic value are made clear by Neale's discussion in Section 12 of his paper: the null object and the empty set have properties which can be exploited to the detriment of theories which make use of them.)

Pole' -- which is governed by a non-extensional operator which is sensitive to more than merely extensional content -- expresses a true proposition.[18]

This theory sketch could be wedded to a Russellian account of definite descriptions. However, it needn't be. Instead, we might suppose that definite descriptions should be given a referential treatment. Proper descriptions embedded in extensional contexts have their referents as semantic contents; improper descriptions in extensional contexts have no semantic content. (So: 'The man in the moon is happy' expresses the proposition < GAP, is happy >, which is false. Etc.) Descriptions embedded in intensional contexts have intensions -- which might be given a Russellian gloss -- and they also have extensions as before. Typical modal operators -- e.g. "It is necessarily the case that .." -- operate on the intensions (and/or extensions) of descriptions to deliver the standard results. (One might think that the expression 'Santa Claus' has neither extension, nor intension: in that case the sentence 'It is possible that Santa Claus exists' expresses the false proposition < POSSIBLY << GAP, GAP > exists >>. On the other hand, one might think that 'Santa Claus' has an intension: in that case, the sentence in question could be taken to express the true proposition < POSSIBLY << Santa Claus$_{int}$, GAP > exists >>. Likewise, the sentence 'Possibly the largest unicorn is white' -- on the reading on which the description takes narrow scope -- can be made to come out true or false according to taste. Etc.) Descriptions in hyperintensional contexts have hyperintensions, which may or may not differ

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[18] This fact allows the theory to accomodate facts about ordinary usage -- e.g. our preparedness to assent to tokenings of sentences such as 'Santa Claus lives at the North Pole'. The root idea is that we should see those tokenings as governed by implicit prophylactic operators of the 'according to the Santa Claus story' kind.

from intensions (depending upon the details of the theory), as well as intensions and extensions as before.[19]

The theory sketch could also be wedded to a directly referential, semantically innocent account of proper names. But, again, it needn't be. The extension, intension and hyperintension of a proper name could all be identified with the referent (if there is one). But this -- when combined with the second of our assumptions -- would deliver unfortunate results; and, even prescinding from those kinds of considerations, would deliver verdicts about truth-values considerably at variance with those of pre-theoretical intuition. Better to think that (at least) the

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[19] Perhaps this is a good place to mention another aspect of Neale's paper which I found very puzzling, namely his discussion of the argument at pp.148-149 of Quine (1960). I take it that the argument which Quine advances there is supposed to show that if co-denoting definite descriptions are intersubstitutable in belief ascriptions, then an agent who believes one true proposition believes every true proposition -- i.e. the Quinean argument is a collapsing argument for 'transparent belief ascriptions'. However, the argument which Neale discusses -- at pp.807-811 -- is a collapsing argument for modal connectives. Given Neale's warning about assimilating the treatment of hyperintensional operators and contexts to the treatment of intensional operators and contexts, it seems to me that Neale should at least have alerted readers to the fact that he has modified the argument which Quine actually gives. Even if one is a Russellian about definite descriptions, one could think that definite descriptions have hyperintensions when they are embedded in attitude contexts -- i.e. even Russellians need to justify the claim that there are no important differences between the modal argument which Neale discusses and the hyperintensional argument which Quine actually gives. (Quine's argument is discussed further in Oppy (1994).)

extension and hyperintension of proper names can differ. (On my preferred version of the theory, hyperintensions for proper names are contributed from context, much like the extensional content of demonstratives. This allows a natural treatment of various puzzles about belief, etc. However, we needn't worry about those details here.[20])

At this point, we seem to be well advanced on the project of constructing a theory which is both fact-friendly, and which gives a referential treatment of definite descriptions. Of course,

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[20] See Oppy (1992a) (1992b) for a few more details. It is worth noting that the idea alluded to here provides one way to answer Davidson's worry that denial of semantic innocence requires infinitely many semantic primitives (and hence unlearnability of the language). In general, one *could* learn a language which allows for an iterated hierarchy of distinct hyperintensions (for every syntactic primitive) provided only that there is some finite collection of rules which details how these hyperintensions are to be obtained. So, if there is a finite collection of rules which details how the hierarchy of hyperintensions can be provided from context -- much in the way that the extensional content of demonstratives is provided -- then there is an answer to Davidson. Of course, one might doubt that there is much -- indeed, any -- evidence for these rule-governed hyperintensions. But, on the other hand, we don't actually go in for extensive iterations of hyperintensional operators (and there might be special explanations which can be invoked in those cases in which we do); there is some plausibility to the thought that we typically iterate verbs of propositional attitude only when those constructions are given an extensional reading. (Naturally, there are other ways to try to reply to Davidson's worry. For example, one might try to follow Dummett in denying that there are more than two hyperintensions for any given piece of vocabulary -- a limited relaxation of semantic innocence. However, my own view is that this option is probably less attractive.)

there are lots of questions still to be answered. In particular there are hard questions about quantification and about 'scope' ambiguities in sentences containing definite descriptions still to be addressed. I shall make the merest gesture at treatments of these difficulties here.

First, quantification: To parallel the treatment of singular terms, we should suppose that assignments to free variables depend upon the sentential contexts in which those free variables occur. We can then allow that different occurrences of the same variable -- i.e. different occurrences of a variable bound by a single quantifier -- have different values assigned, depending upon whether those occurrences are extensional, intensional, hyperintensional, or whatever. This affords a natural treatment of 'quantifying-in', among other benefits. (So, for example, 'There is some-one whom John believes to be guilty and who is guilty' could be rendered as <<SOME <X, X_{hyp}>> <<Believes, <John, <<X, X_{hyp}>, is guilty>>> AND <X, is guilty>>> -- or perhaps even as <<SOME X> <<Believes, <John, <<X, X_{hyp}>, is guilty>>> AND <X, is guilty>>>.)[21]

Second, ambiguity: Consider the example considered earlier: "Possibly the largest unicorn is white" (under the assumption that the intension of "the largest unicorn" is not a gap). This sentence has at least two different readings: on one, it says that the thing which is actually the largest unicorn could have been white; on the other, it says that it could have been the case that there was something which was both the largest unicorn and white. One way to capture

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[21] I don't know what logic the system of gappy propositions will obey, but it will probably be ugly. For a start, we won't have ordinary existential introduction: the inference from ~Fa to $(\exists x)$~Fa won't be valid if 'a' is non-denoting. So, at the very least, we will be looking at something like a kind of free logic. However, giving up standard classical logic is another cost which might be worth paying -- it all depends upon the end result.

these readings would be to provide distinct propositions: e.g. < GAP, < POSSIBLY < is white >> and <POSSIBLY << The largest unicorn$_{int}$, GAP > is white >>, allowing the modal operator to operate on predicates as well as on propositions. Another -- not necessarily entirely distinct -- way to capture these readings would be to allow the modal operator to operate on distinct things, i.e. to allow, as it were, that the sentence expresses the 'ambiguous' proposition < POSSIBLY << The largest unicorn$_{int}$, GAP > is white >>, where the modal operator can operate on the extension alone, or on the intension (and perhaps extension as well) of the description. And yet another way -- again not necessarily distinct -- would be to allow that there are two modal operators, one purely extensional, one intensional. In general, the hope would be that ambiguities can be captured by allowing: (i) distinct propositions to be associated with a given sentence by changing the internal structure of the proposition (e.g. the order in which functions are concatenated); (ii) functions within propositions to operate on disinct embedded components (e.g. extensions or intensions or hyperintensions); and (iii) distinct functions to be associated with a given sentential operator (e.g. extensional vs. hyperintensional senses of 'believes', extensional vs. intensional sense of 'possibly', and so on).

Perhaps this proposal for the treatment of ambiguities will fail. (If so, there are other possibilities to be tried.) Perhaps there are other reasons why a theory of the kind I have sketched is doomed to fail. However, it seems to me that there is a largely unexplored field here waiting to be investigated. Moreover, there is some promise that such an exploration would yield fruit. In these circumstances, it would be sad if people became persuaded of the mistaken view that Slingshot arguments -- and, in particular, Godel's Slingshot argument -- somehow, all alone, foreclose the possibility of developing a theory of this sort.

One last point to note. Neale worries about a dilemma which faces theories of facts, namely (i) that such theories must allow that there are many distinct facts (no collapse), but (ii) that such theories must also allow that many distinct sentences express the same fact (and/or proposition) -- i.e. the theory must not allow that facts are individuated by true sentences. It is clear that this theory will avoid this dilemma -- for it allows that there are many distinct facts, and it also allows that there are many distinct sentences which express the same fact. In particular, it allows that passivisation, topicalisation, substitution of co-referring singular terms in extensional contexts, produce distinct sentences which express the same extensional facts. Of course, there is a question whether there are distinct sentences which express the same hyperintensional facts -- but I don't see that it matters how this question gets answered. It may be true that hyperintensional facts are "so fine-grained that they are sentence-like" (c.f. p.816) [22] -- but it seems to me that this should occasion no unease amongst friends of facts. After all, it is clearly true that the theory can allow that extensional facts do not reflect much of the structure of

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[22] As noted in the text, Neale sometimes claims merely that facts should not be "sentence-like" (as opposed to the more precise claim that there should be many facts, and many sentences which express the same facts). This is a vague worry; consequently, it is difficult to know how to respond to it. However -- countering vagueness with vagueness -- it seems to me that friends of facts should not want it to be the case that there is no sense in which facts are "sentence-like": after all, part of the point is that there should be a correspondence between facts and true sentences. No doubt, there is more to be said here: but exactly what depends upon how the vague worry is articulated.

the sentences which they make true -- and it is the extensional (and intensional) facts which might plausibly be thought to be *basic* building blocks of the world.[23]

5. Fact Identity Connectives

The connective FIC -- "the fact that () = the fact that []" -- has some interesting properties. I shall suppose that the expression "the fact that ()" is a definite description, which can be analysed with the help of canonical names for facts. (I shall use 'Canon (S)' as the canonical name for the fact that S.) On a Russellian analysis, "John knows the fact that S" comes out as "$(\exists x)(\forall y)((x=y)\leftrightarrow((Fact(y)\&y=Canon(S))\&Knows(John,x))$; and on my referential treatment of descriptions, it comes out as: "Knows(John, Canon(S)).

Now, according to the theory which I have sketched, Canon(S) is radically ambiguous -- it could refer to the extensional fact expressed by 'S', or to the intensional fact expressed by 'S', or to the hyperintensional fact expressed by 'S', and so on. So, before we can draw conclusions about fact identity using substitutions in FIC, we need to disambiguate. Is it true, for example, that FIC (Fa, F(ιx)Gx), given that a is actually the unique G? Well, on the theory sketched in the previous section, if we are talking about the extensional facts expressed by 'Fa' and 'F(ιx)Gx', then the fact identity claim is true; but if we are talking about the intensional facts expressed by

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[23] For those who think that facts should have no sentential structure, let me offer a different model: take David Lewis' philosophical system, and add the claim that facts are true propositions (i.e., as a first approximation, sets of possible worlds which include the actual world). Many will think that there are good objections to this system -- but Godel's Slingshot surely won't number amongst the putative candidates!

these sentences, the fact identity claim is false. This should make it abundantly clear why I said that it makes perfect sense for friends of facts to deny that FIC is +PSST (and hence to deny that Godel's Slingshot has important consequences for any theory of facts *because* of the consequences which it has for FIC): it is only if one supposes that we are talking about *extensional* facts that one is entitled to conclude that FIC is +PSST; yet most ordinary uses of FIC will involve it in talk about (at least) *intensional* facts.

Perhaps my supposition that "the fact that S" should be treated as a definite description might be disputed. However, I don't see that this has any bearing on the main point which I wish to make. Substitute your favourite account of FIC here -- adapted to the theory sketched in the previous section -- and the same results should follow. So, for example, if you think that FIC (S,T) should simply be treated as a two-place sentential operator, there will still be the question whether the identity at issue is identity in extension, or identity in intension, or identity in hyperintension, and so on.

6. Conclusion

Time to sum up. Let's return to the claims which I mentioned in the introduction, and which I said I do not believe. Suppose that some theory of the kind which I have sketched can be defended. Then, surely: (i) it will be false that Godel's Slingshot highlights unpleasant consequences of referential treatments of descriptions; (ii) it will be false that Godel's Slingshot poses genuine philosophical questions about the logical and philosophical consequences of rejecting Russell's Theory of Descriptions; (iii) it will be false that Godel's Slingshot forces

philosophers to take a definite position on the semantics of definite descriptions[24]; (iv) it will be false that, on plausible assumptions, Godel's Slingshot forces the causal logician to endorse Russell's Theory of Descriptions; and (v) it will be false that Godel's Slingshot has important consequences for any theory of facts because of the consequences which it has for the sentential operator FIC -- "The fact that () = the fact that []". Moreover, and more generally, if some theory of the kind in question can be defended, then it will be perfectly clear that Godel's Slingshot has *no* interesting philosophical significance for theories of facts and referential treatments of definite descriptions.[25]

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[24] The theory sketched could easily be adapted to a Russellian account of descriptions. Moreover, it might well be true that it would be improved by such a move. However, the point is that -- as things stand -- there is no clear reason to choose: it all depends upon global consideration of the virtues of the developed theories. Note, too, that this means that one could be a friend of facts without taking a stand on the semantics of definite descriptions. Of course -- from general considerations of theoretical virtues such as completeness -- one knows that one will ultimately need to take a stand (and that will bring certain commitments in its train); but Godel's slingshot gives one no further reason to make such a choice (and it also does not make it any more urgent to make the choice now).

[25] Although I haven't emphasised this much, we have also found at least two reasons to think that Neale hasn't succeeded in answering *all* technical questions about Godel's Slingshot. On the one hand, there are questions about the extension of the argument to cover sentences which contain no singular terms, languages which contain no singular terms, languages which contain empty singular terms (and in which the rules of some free logic or other apply) and so on. And, on the other hand, there are technical questions about the framework in which the discussion of

At present, it is an open question whether such a theory can be developed. However, it seems to me that there is no reason for pessimism: if there is some reason why friends of facts cannot adopt referential treatments of definite descriptions, that reason remains to be produced -- and it certainly has nothing at all to do with Godel's Slingshot.

Of course, in saying all of this, I am not taking any stand on the correctness -- or otherwise -- of Russell's Theory of Descriptions. It may well be that Russell is right. The point is just a question about what the arguments which we have now can establish: I don't believe, e.g., that we are at present in possession of compelling reasons for insisting that our semantic theories should be semantically innocent. In particular, we should not be misled into attributing any special importance to Slingshot arguments: if they seem to be powerful, that is only -- at least in part -- because we are ruling out of bounds the territory on which competing theories might hope to build.[26]

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Godel's Slingshot should take place: i.e. questions about semantic innocence, direct reference, and the like.

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