

## THE GRAMMAR OF BELIEF

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W.V. Quine argued, notoriously and persuasively, that it is meaningless to quantify into opaque contexts.<sup>i</sup> I will refer to this claim as "Quine's thesis." The idea is this. Suppose that C is any sentential context containing an occurrence of a singular term such that substitution of coreferential terms (SI) is an invalid mode of inference with respect to this occurrence. Thus, in Quine's terminology, C is an "opaque" context. Now let C\* result from C by substituting a variable  $\underline{y}$  for the term at the relevant opaque occurrence. Then Quine's thesis says that binding of this occurrence of  $\underline{y}$  by a quantifier outside the scope of C\* results in a meaningless expression.

It has become common in recent years to endorse semantic theories of 'be-lieves' and other cognitive operators on which Quine's thesis is taken to be false.<sup>ii</sup> However, this tendency has not been accompanied by any direct argument against Quine's thesis as it applies to belief contexts. My aim in this paper is to provide such an argument. I will argue that, contrary to Quine's thesis, there are in fact meaningful sentences of English that involve quantification into opaque belief contexts.

The basis of my argument will be the simple fact that there are meaningful sentences of English and other natural languages which in surface grammatical structure are indistinguishable from sentences that involve quantification into opaque contexts. Of course, on Quine's thesis, these sentences cannot really involve quantifying-in, since if they did, they would be meaningless. I will examine a number of different hypotheses, most suggested by Quine himself, which if true would explain why, despite appearances, the sentences in question do not really involve

quantificational binding of a variable in opaque position. I will argue that each of these hypotheses is false, and conclude that the best explanation of the surface phenomena is that the sentences in question do in fact involve meaningful quantification into opaque contexts. I will end by giving a brief explanation, based on Plantinga's (1974) and Kaplan's (1986) discussions, of where Quine's argument for his thesis goes wrong.

### 1. The surface problem.

To have an example of how Quine's thesis applies to ordinary language, consider a belief ascription like

(1) Bruce believes that the next chairman is a megalomaniac.

Suppose that (1) is true because Bruce believes that one of his colleagues, David, is a megalomaniac and Bruce is convinced that unfortunately, David will be the next chairman of his department. On one of its senses, (1) contains an opaque context, since SI can fail for the occurrence of 'the next chairman' in (1). Thus, suppose that unbeknownst to Bruce, the next chairman will not be David but will instead be the unambitious Jeff, who is Bruce's closest friend. In this case, even though (1) is true and it is also true that the next chairman = Bruce's closest friend, it is false that

(2) Bruce believes that his closest friend is a megalomaniac.

While (1) thus contains an opaque context, the following is also clearly true in our story:

(3) David is such that Bruce believes that he is a megalomaniac.

And since (3) is true, so is its existential generalization:

(4) Someone is such that Bruce believes that he is a megalomaniac.

The difficulty is in seeing how both (3) and (4) could be true in our story, given Quine's thesis and the opacity of (1). For the context 'Bruce believes that he is megalomaniac' that occurs in

both (3) and (4) certainly looks as if it comes by substitution of the pronoun 'he' for 'the next chairman' in the opaque (1). But if so, then on Quine's thesis, (4) is meaningless, since 'he' is bound by the quantifier 'someone' in (4). Yet (4) is plainly not meaningless.

The problem for a defender of Quine's thesis, then, is to explain how there can be meaningful sentences like (4) that on the surface are grammatically indistinguishable from purportedly meaningless sentences that quantify into opaque contexts. I will call this "the surface problem." To solve this problem, a defender of Quine's thesis must explain how a sentence like (4) could have such a meaning and structure that it is not a case of quantifying into an opaque context, even though it has exactly the same surface structure as a sentence that is a case of (meaningless) quantifying-in.

One obvious proposal for solving the surface problem, mentioned by Quine himself (1956, p. 186), is that the verb 'believes' is ambiguous in a certain way. On this hypothesis, 'believes' in one sense forms opaque or "notional" contexts like (1), into which quantification is forbidden; but in a second sense, 'believes' can form transparent (non-opaque) or "relational" contexts like (3) and (4), into which quantification is permissible. I will discuss this proposal below. The proposal is I think prima facie implausible, since 'believes' certainly seems to have the same sense in (1)-(4). However, in light of Quine's thesis, this evidence is perhaps inconclusive.

It is important to realize that Quine himself never endorsed the ambiguity hypothesis.<sup>iii</sup> Rather, he provides what he calls "a more suggestive treatment" (1956, p. 186). As we shall see, it is difficult to apply Quine's official treatment to natural language sentences like (4). But apparently, his proposal must be taken to imply that the belief contexts in (1) and (4), despite their surface similarity, have different logical (or "deep") structures, so that in fact the opaque

position occupied by 'the next chairman' in (1) is not the same as the position occupied by the pronoun 'he' in (4).

## 2. Structurally relational belief contexts.

Before I begin to argue against the ambiguity hypothesis, it will be worth-while stopping to distinguish this hypothesis from others with which it is easily confused. The defender of the ambiguity hypothesis seeks to solve the surface problem by associating all cases of permissible quantifying-in with one or more "relational" senses of 'believes'. The general claim, then, is that whenever meaningful quantificational binding of a free variable in the scope of 'believes' occurs, the sense of 'believes' is distinct from its sense when it forms (wholly) opaque contexts.<sup>iv</sup> In particular, the meaningfulness of sentences like (3) and (4) is alleged to be consistent with Quine's thesis because the sense of 'believes' in (3) and (4) is distinct from its sense when it forms (wholly) opaque contexts like (1).

I wish to deny the ambiguity hypothesis. This means that I wish to assert that there is at least one sense of 'believes' on which it can form both wholly opaque contexts and relational contexts that permit quantifying-in. Notice that on this understanding, my denial of the ambiguity hypothesis is consistent with the existence in English of more than one meaning of 'believes'. It is even consistent with the existence in English of one or more relational senses of 'believes'.

It is in fact no doubt true that there are several different meanings of 'believes'. For instance, we sometimes believe persons when they speak to us; we sometimes believe what people say, or propositions; and we sometimes believe objects to have properties. Here, it seems, we have three different, though no doubt closely related, senses of 'believes'. In the first sense, 'believes' expresses a relation that holds between one person and another; in the second, it

expresses a relation that holds between persons and propositions; and in the third, it is used to ascribe a relation that holds between a person and an object the person's belief is about.<sup>v</sup>

What is most important to notice is that one who like myself denies what I'm calling 'the ambiguity hypothesis' can nevertheless consistently agree that in one sense 'believes' forms wholly opaque contexts, while in another sense it forms contexts that are inevitably transparent with respect to one or more occurrences of singular terms. For instance, consider sentences of the form 'x believes y to be F' such as

(5) Ralph believes Ortcutt to be a spy.

It seems clear that in sentences of this form, both SI and existential generalization (EG) are valid with respect to the term following 'believes' (in this case 'Ortcutt'). In this kind of locution 'believes' would seem to be an operator that transforms infinitive phrases into two-place predicates.<sup>vi</sup> Both SI and EG are then valid with respect to the two terms that, when combined with the resulting two-place belief predicate, yield a complete sentence.

Sentences like (5), which we might call 'believes-to' constructions, provide real examples of a kind of belief ascription that is very much like Quine's idea of a "relational" sense of belief. Moreover, since the 'believes-to' operator cannot form contexts that are wholly opaque, there must, it seems, be at least two distinct belief-operators in English, one of which forms wholly notional (opaque) contexts, and one of which forms partly transparent contexts.

But the correct view that there are two such distinct belief operators in English should not be confused with the ambiguity hypothesis, which implies the much stronger claim that the notional belief operator does not ever form contexts that are relational. This is the claim that I deny, even though I accept the existence of (at least) two different belief operators in English.

I would define the 'believes-to' operator as follows:

(6)  $x$  believes  $y$  to  $\phi =_{df} (\exists z)(z=y \ \& \ x \text{ believes that } z \text{ is } \phi)$ .

A defender of the ambiguity hypothesis can of course also accept this definition. But what such a defender cannot accept, and what I affirm, is the thesis that the sense of 'believes' in the definiens of (6) is the same as the sense of 'believes' when this verb forms wholly opaque contexts such as (1).

In addition to the 'believes-to' construction, there is a second common way of forming explicitly relational belief ascriptions, as in

(7) Ralph believes of Orcutt that he is a spy.

'Believes-of' constructions like this are transparent with respect to the term following 'of', so that both SI and EG are valid on the occurrence of this term. But unlike 'believes-to' constructions, no new or different sense of 'believes' is found in 'believes-of' constructions. This is because sentences like (7) result simply from modifying a basic 'believes that p' construction with a prepositional phrase of the form 'of  $\alpha$ ', where  $\alpha$  is a singular term.

We can give a definition of the 'believes-of' construction that is just like the definition (6) of 'believes-to':

(8)  $x$  believes of  $y$  that he (she, it) is  $\phi =_{df} (\exists z)(z=y \ \& \ x \text{ believes that } z \text{ is } \phi)$ .

But clearly, we should not say that a new sense of 'believes' has been introduced in (8), any more than we should say that 'paints' has a different sense in 'x paints y with z' than it has in 'x paints y'. For every instance of the form 'x believes of y that p' just contains an instance of the form 'x believes that p' of the sort that occurs in the definiens of (8). We would do better to say that (8) de-fines expressions of the form 'of  $\alpha$ ' when they attach to 'believes', or that (8) defines the whole form of construction which is its definiendum. So the belief op-erator that occurs in 'believes-of' constructions (in contrast to 'believes-to' con-structions) is the same operator that occurs in

'believes that p' constructions. And in my view, this is also the same operator that forms (wholly) opaque contexts.

I have stressed the existence in English of two explicitly relational belief constructions, because the existence of these constructions has, I think, done much to encourage philosophers to accept something like the ambiguity hypothesis. But in fact, the existence of different notional and relational senses of 'believes' in English is not the real issue. The real issue is whether or not there is a single sense of 'believes' that can form both notional (wholly opaque) contexts and relational contexts. Again, contrary to the ambiguity hypothesis, I think that there is such a single sense.

### 3. Difficulties with the ambiguity hypothesis.

By the ambiguity hypothesis I will understand the conjunction of the following two theses:

- (A1) There is a fundamental notional (opaque or de dicto) sense of 'believes' on which this verb forms contexts that are wholly opaque; that is, both SI and EG are invalid with respect to all occurrences of terms in such a context; moreover, quantifying into such a context at any position is strictly meaningless.
- (A2) There are cases in which 'believes' meaningfully forms contexts that permit quantifying-in; that is, a position in such a context may be occupied by a variable that is bound by a quantifier lying outside the context. In every such case, the verb 'believes' has a different sense than the notional sense mentioned in (A1); moreover, both SI and EG are valid with respect to any occurrence of a singular term that occupies such a bindable position.

Different specific views will result from adding different specific accounts of the the various (notional and relational) senses of 'believes' to the general theses (A1) and (A2). For instance, one view of the notional 'believes' would be that it is part of a sentence operator 'believes that' which forms one-place predicates of the form 'believes that p' out of sentences 'p'. A different view would be that in its notional sense, 'believes' is a two-place predicate that in sentences of the form 'S believes that p' expresses a mental relation that is said to hold between the person referred to by 'S' and the proposition referred to by the complex term 'that p'.

I will not be particularly concerned here with different specific accounts of the notional sense of 'believes', since I am mainly interested in refuting the more general theses (A1) and (A2). My procedure will be to argue against various attempts to characterize a relational sense of 'believes' that satisfies thesis (A2) and that can also be used to solve what I earlier called "the surface problem." The failure of these various attempts will strongly suggest that the only way to solve the surface problem is to suppose that there is a single sense of 'believes' that both forms wholly opaque contexts and also permits quantificational binding of variables that occur in opaque position.

Consider again the apparent case of quantifying-in:

(4) Someone is such that Bruce believes that he is a megalomaniac.

Since (4) is a patently meaningful sentence in which the pronoun 'he' is bound from outside by the quantifier 'someone', it follows from (A1) that 'believes' in (4) cannot have its notional sense, and thus it must have a different, relational sense of the sort described in (A2). But then the question arises, what is the grammar of the verb 'believes' when it has this relational sense? Does it express a relation, and if so, then what relation? Or does it perhaps form part of a sentence operator 'believes that', and if so, how does this operator work?



On the ambiguity hypothesis, the notional sense of 'believes' is one on which this verb is supposed to form contexts that are wholly opaque. So it might seem plausible to suppose that in its relational sense, 'believes' must form contexts that are wholly transparent. On one version of this idea, 'believes' in its relational sense is part of an operator 'believes that' which operates on whole sentences (open or closed). When the sentence operated upon contains singular terms, SI and EG are valid with respect to all occurrences of the terms, so that these occurrences are fully transparent.

However, there seems to be no such meaning of 'believes' in English. Consider:

(9) Someone is such that Ralph believes that she is looking at the evening star.

Since 'she' occurs as a bound variable in (9), 'believes' must have its second, relational meaning, according to the present view. But then, also on this view, the occurrence of 'the evening star' in (9) must be transparent, and this is false. For when (9) is true it may nevertheless be false that

(10) Someone is such that Ralph believes that she is looking at the morning star,

even though of course the evening star = the morning star. For instance, suppose that Ralph sees Janet looking at Venus, which Ralph (correctly) believes is the evening star. So (9) is true. But Ralph may not realize that the evening star = the morning star, and in fact he might explicitly deny that Janet is looking at the morning star. In these circumstances (10) would be false.<sup>vii</sup> So there seems to be no meaning of 'believes that' on which it must form wholly transparent contexts.

The same result follows from a slightly different type of example. Consider

(11) Janet is such that Ralph believes that her mother's brother is a pipefitter.

On the present view, the occurrence of 'her' in (11) must be transparent, since this occurrence is subject to quantificational binding, as in

(12) Someone is such that Ralph believes that her mother's brother is a pipefitter.

But then, also on the present view, the complex term 'her mother's brother' must also occur transparently in both (11) and (12), and it doesn't. Suppose, for instance, that Janet's mother's brother is also Janet's favorite uncle. It does not follow from this assumption plus (11) that

(13) Janet is such that Ralph believes that her favorite uncle is a pipefitter.

For perhaps Ralph is Janet's father's brother, believes that he is Janet's favorite uncle, and knows quite well that he is not a pipefitter. In these circumstances, (11) and (12) would be true while (13) is false. Again, contrary to the present view, there seems to be no meaning of 'believes' on which it must form wholly transparent contexts.

The general difficulty is that a relational belief operator must be able to form contexts within which some occurrences of terms are transparent while others are opaque. The first proposal, on which all occurrences of terms in the scope of the relevant operator must be transparent, is inevitably insensitive to this fact, and so the proposal must be rejected.

A second proposal which might seem to fare better in this regard would be that in its relational sense, 'believes that' is a predicate operator that transforms n-place predicates into n+1-place predicates. For instance, we might treat 'be-lieves that' as operating on the one-place predicate 'is fat' to yield a two-place predicate that is true of a pair of objects  $\langle x,y \rangle$  just in case x believes that y is fat. On this proposal, the n+1 terms that yield a complete sentence when combined with such a belief predicate would be understood to all occur transparently, so that SI and EG are valid with respect to such occurrences. On the other hand, occurrences of terms that are within the operated-upon predicate would be understood to occur opaquely.

Because it allows for some sorting between transparent and opaque occurrences of terms in a relational belief context, this proposal fares somewhat better than the first. Consider again the sentence

(9) Someone is such that Ralph believes that she is looking at the evening star.

In contrast to the first proposal, this sentence poses no problem for the second. Assuming that (9) contains a two-place predicate formed by applying the operator 'believes that' to the one-place predicate 'is looking at the evening star', it follows that 'she' occurs transparently in (9), while 'the evening star' occurs opaquely, just as desired.

However, the second type of example cited against the first proposal seems to also refute the second. The case was

(11) Janet is such that Ralph believes that her mother's brother is a pipefitter.

The only predicate in (11) on which 'believes that' could operate is the predicate 'is a pipefitter'. But then it follows from the second proposal that the description 'her mother's brother' occurs transparently in (11), and as we saw, this result is false. The only way to avoid this result is to suppose that (11) somehow contains an additional predicate like 'has a mother whose brother is a pipefitter' for 'believes that' to operate upon, and this supposition surely seems false.

So far then, we have seen that any defender of Quine's thesis who posits a relational sense of the 'believes that' operator faces a serious "sorting" problem. For given Quine's thesis, it must be possible for a single relational belief context to contain both transparent and opaque occurrences of terms. Thus a correct account of the relational sense of 'believes that' must be capable of explaining how occurrences of terms in such contexts get sorted into transparent and opaque. So far, neither of the two views we've described succeed in this task. It is thus fitting that we now

turn to Quine's own proposal, since Quine seems to have designed his proposal specifically with the goal in mind of solving the sorting problem.

#### 4. Quine's proposal.

Regarding the simplest sort of relational belief ascriptions such as

(7) Ralph believes of Ortcutt that he is a spy,

Quine suggests that we take 'believes' to express a certain triadic relation that holds among a believer, an object, and an attribute. To reflect this suggestion, he rewrites (7) as

(14) Ralph believes  $z(z \text{ is a spy})$  of Ortcutt.

(Quine, 1956, p. 187.) Here, the variable-binding notation ' $z(z \text{ is a spy})$ ' provides a general way of forming names of attributes (in this case, the attribute of being a spy) out of open sentences that express those attributes (' $z \text{ is a spy}$ ').

Similarly, Quine allows a tetradic belief relation to hold between a believer, a two-place attribute (or relation) and a pair of objects, so that

(15) Tom believes of Cicero and Catiline that the former denounced the latter  
becomes

(16) Tom believes  $zy(z \text{ denounced } y)$  of Cicero and Catiline.

In (1956), Quine writes as if belief were either a variably polyadic relation or a series of different relations (dyadic, triadic, tetradic, and higher). But later (Quine, 1977), he makes clear that he all along intended belief to be a three-place relation that holds between believers,  $n$ -place intensions (attributes or relations), and  $n$ -place sequences of objects.<sup>viii</sup> For example, both the triadic (14) and the "tetradic" (16) can be given formally uniform treatments in terms of a single three-place belief relation as follows:

(17) Believes(Ralph, <Ortcutt>,  $z(z \text{ is a spy})$ )

and

(18) Believes(Tom, <Cicero,Catiline>, zy(z denounced y))

On Quine's suggestion, any occurrences of terms in a belief construction that are not within an intension-name are counted as transparent, while occurrences of terms within an intension-name are all counted as opaque. This feature of Quine's view allows for a neat regimentation of transparent and opaque occurrences of terms within relational constructions, so that in Quine's notation the sorting problem is automatically solved. For instance, in Quine's notation my problematic sentences (9) and (11) would be rendered respectively as

(19)  $(\exists x)(\text{Believes}(\text{Ralph}, \langle x \rangle, z(z \text{ is looking at the evening star})))$ ,

and

(20) Believes(Ralph, <Janet>, z(z's mother's brother is a pipefitter)).

The occurrences of 'x' in (19) and 'Janet' in (20) are transparent, while the occurrences of 'the evening star' in (19) and 'z's mother's brother' in (20) are opaque. These are of course desirable results.

It remains to consider how Quine's proposal deals with notional, or fully opaque, belief constructions. Since Quine explicitly suggests that in its notional sense 'believes' may be taken to express a dyadic relation between a believer and a proposition (1956, p. 186), it is easy to construe him as endorsing a version of the ambiguity hypothesis. On this construal, Quine is saying that 'believes' in its notional, opaque sense expresses this dyadic relation, while in its relational sense it expresses the different triadic relation described above.

But this construal conflicts with Quine's own words. Having raised the possibility that there are two senses of belief involved in notional and relational constructions, he quickly rejects the idea, saying "But there is a more suggestive treatment." (1956, p. 186.) He then begins anew

with the single sense of belief in which it is used to ascribe a dyadic relation between a believer and a proposition, and he goes on to characterize triadic, tetradic, and higher degrees of belief as we described earlier, remarking that it is the same sense of belief that is involved at all these levels:

Hereafter we can adhere uniformly to this narrow sense of belief, both for the dyadic case and for triadic and higher; in each case the term which names the intension (whether proposition or attribute or intension of higher degree) is to be looked upon as referentially opaque. (Quine, 1956, p. 187. My emphasis.)

Apparently Quine wishes us to assume that notional or "dyadic" belief ascriptions are a limiting special case in which the triadic belief-relation is said to hold between a believer, a zero-place attribute (i.e., a proposition), and a zero-place (empty) sequence. Thus, a notional ascription like (1) above ('Bruce believes that the next chairman is a megalomaniac') would be rendered using the triadic belief-relation as

(21) Believes(Bruce, <->, [the next chairman is a megalomaniac]),

where '<->' names the empty sequence, and '[the next chairman is a megalomaniac]' names the proposition that the next chairman is a megalomaniac.<sup>ix</sup>

Taken as an account of the meaning of notional belief ascriptions in natural language, this view has the serious drawback of implying that in all such ascriptions, there is an invisible reference to the empty sequence, a consequence which surely seems false. Perhaps a more plausible but closely similar view would be one that accepts Quine's triadic belief-relation but also adopts a minimal version of the ambiguity hypothesis. Such a view could define the dyadic notional belief relation by use of Quine's triadic belief relation plus quantification, as follows:

(22) Believes<sub>N</sub>(x, [p]) =<sub>df</sub> (∃s)(Believes(x, s, [p])).

(Here the variable 's' ranges over sequences, and dyadic belief is taken to be the special case of triadic belief about every sequence, rather than the special case of triadic belief about the empty sequence.)

Adoption of (22) has the advantage of eliminating the need to posit hidden references to the empty sequence in ordinary belief ascriptions. But there really seems very little to choose between this view, which endorses the ambiguity hypothesis, and Quine's own view, which officially rejects it. What both of these views have in common is Quine's proposal for understanding relational belief constructions, and the main question is, does this proposal provide a solution to the surface problem?

#### 5. An evaluation of Quine's proposal.

Consider once more our apparent case of quantifying into an opaque context:

(4) Someone is such that Bruce believes that he is a megalomaniac.

On Quine's proposal, (4)'s meaning and logical structure are given by

(23)  $(\exists x)(\text{Believes}(\text{Bruce}, \langle x \rangle, z(z \text{ is a megalomaniac})))$ .

In (23), the second occurrence of the variable 'x' is fully transparent, allowing unrestricted application of SI and EG. So if (23) accurately reflects (4)'s structure, then despite appearances (4) is not really a case of quantifying into an opaque context.

It appeared otherwise, since (4) appeared to be the straightforward existential generalization of such clearly opaque sentences as

(1) Bruce believes that the next chairman is a megalomaniac.

But on Quine's proposal, (1)'s structure is given by

(21)  $\text{Believes}(\text{Bruce}, \langle - \rangle, [\text{the next chairman is a megalomaniac}])$ ,

and (23) is not the existential generalization of (21). This is because the position occupied by the second (transparent) occurrence of 'x' in (23) is not the same as the position occupied by the (opaque) occurrence of 'the next chairman' in (21). Thus, if (21) and (23) depict the meanings and structures of (1) and (4) respectively, then we have a solution to the surface problem, that is, the problem of how Quine's thesis could be consistent with the fact that there are meaningful quantified belief sentences like (4).

However, there is a very serious difficulty facing Quine's proposal. This is the difficulty of explaining how relational belief constructions such as (4) that are found in natural languages could possibly have the sort of structure that is representable by use of Quine's triadic belief relation. Constructions in English like (4) and

(7) Ralph believes of Orcutt that he is a spy,

are certainly relational all right, but the relation involved seems to be at most a two-place relation holding between a believer and the object of his belief. On the surface at least, constructions like (4) and (7) do not ascribe a three-place relation that holds between a believer, an object, and an attribute, for the simple reason that these constructions, unlike Quine's, contain no singular term that refers to an attribute.

A defender of Quine's proposal thus seems driven to claim that Quine's triadic constructions, while not in English surface structure, are to be found in the deep structures or logical forms of natural language sentences like (4) and (7). But of course, this is just a claim, when what is needed is some account that explains how, for instance, a deep structural form like that of (23) could generate a surface structure like (4). And there is one very good reason to believe that no such account can be given. For in order for English deep structures to contain Quine's triadic belief constructions, the verb 'believes' must in one of its lexical meanings express a three-place



relation that can hold between a believer, an object, and an attribute. Yet 'believes' seems to have no such meaning in English.

Quine's explanation of his proposal apparently assumes otherwise since it assumes that the reader will understand perfectly such mixed English-logic expressions as

(14) Ralph believes  $z(z \text{ is a spy})$  of Ortcutt.

The variable-binding notation is not really essential to (14). If (14) makes sense, then it should still make sense when the term ' $z(z \text{ is a spy})$ ' is replaced by any term referring to the same attribute, thus:

(24) \*Ralph believes the property of being a spy of Ortcutt.

But to my ear, (24) sounds ill-formed. For if (24) were well-formed, then one possible appropriate answer to the question 'What is it that Ralph believes of Ortcutt?' would be 'the property of being a spy'. But this answer would not be appropriate. To give an appropriate answer, one would have to use a 'that'-clause containing a complete sentence such as 'that he is a spy'. In short, people do not believe properties; they believe propositions. Even when a person is said (relationally) to believe something of or about a given object, what the person is said to believe of or about the object is not a property, but a proposition.

I think that Quine's use of (14) gives his readers an illusion of understanding because we all just assume that by (14) Quine means

(25) Ralph believes the property of being a spy to be true of Ortcutt.

But the 'believes-to' construction in (25) is of no use to Quine, since in such constructions 'believes' does not express a three-place relation. For it has the same meaning in (25) that it has in

(5) Ralph believes Ortcutt to be a spy,

and here it is quite clear that 'believes' does not express a three-place relation. Moreover, notice that in (25) the position occupied by 'Ortcutt' is opaque, a fact made clear by examples like

(26) Ralph believes Venus to be the evening star.

But of course, if the position occupied by 'Ortcutt' in (25) is opaque, then 'Ortcutt' cannot be used in this position to transparently refer to a relatum of a three-place relation.

So the verb 'believes' has no meaning in English on which it expresses a three-place relation that can hold among a believer, an object, and an attribute. But then, Quine's proposal cannot be used to solve the surface problem, for it cannot be used to explain how a meaningful English sentence like (4) could fail to be a case of quantifying into an opaque context.

Now of course one could always define a new sense of 'believes' on which it expresses the relevant sort of three-place relation. But this fact is of no theoretical interest, since the terms in which one would have to state such a definition would be the very forms of expression for which the surface problem arose in the first place. Thus one could easily give a general definition, one of whose in-stances is

(27)  $\text{Believes}(x, \langle y \rangle, z(z \text{ is a spy})) =_{\text{df}} (\exists w)(w=y \ \& \ x \text{ believes } z(z \text{ is a spy}) \text{ to be true of } \langle w \rangle).$

This defines a three-place belief relation by using a construction that apparently involves quantification into an opaque context (the final bound occurrence of 'w'). But of course, no relation defined this way could possibly be used to help explain (or explain away) the possibility of such apparent quantification.

#### 6. Quine's second proposal.

Quine (1960, p. 216) later proposes what he apparently takes to be a pre-ferable notation for relational belief. On this proposal, 'believes' is a variable-binding operator which operates on sentences containing  $n$  free variables to form  $n+1$ -place predicates. Notional belief is the special

case in which the operated-upon sentence is closed, so that  $n=0$ . Occurrences of the terms surrounding the resulting belief predicate are transparent, while all occurrences of terms within the operated upon (closed or open) sentence, and thus all occurrences of terms in the scope of the belief operator, are opaque. In both Quine's view and my own, this second proposal has a distinct advantage over his first, in that it does not imply that relational belief constructions involve (implicit) reference to attributes and relations.

However, like Quine's first proposal, his second also seems to be inapplicable to natural language. The idea works best when applied to structurally relational belief sentences like

(7) Ralph believes of Ortcutt that he is a spy.

On the present view, the occurrence of 'he' in (7) is bound by the operator 'be-lieves' (or 'believes that'), so that contrary to appearances, this occurrence of 'he' is not being used as a referring expression. Thus, the logical form of (7) would be

(28)  $\text{Believes}_z(z \text{ is a spy})_{\text{Ralph,Ortcutt}}$ .

But the view has a more difficult time dealing with quantified relational constructions like

(29) Someone is such that Ralph believes that he is a spy.

The structure of (29) would apparently have to be given by

(30)  $(\exists x)(\text{Believes}_z(z \text{ is a spy})_{\text{Ralph,x}})$ .

Notice that (30) contains two occurrences of bound variables, while (29) contains only one. This is not in itself a problem, since English quantifier expressions often go unaccompanied by any explicit pronoun for them to bind, as in 'Someone is believed by Ralph to be a spy'. But the fact that (29) contains no second pronoun for 'someone' to bind does raise a problem for Quine's proposal. On this proposal, 'believes that' operates on 1-place open sentences to form 2-place

predicates. Thus 'believes that he is a spy' must be a 2-place predicate in which 'he' occurs bound by 'believes that'. But then it follows not only that 'Ralph believes that he is a spy' is not an open sentence, but also that it is not a sentence at all. For a 2-place predicate, of course, requires two surrounding terms to form a sentence.

However, in order for (29) to be a well-formed sentence, the expression 'Ralph believes that he is a spy' must itself be a sentence. This is because it is a rule of English that the expression 'such that' operates only on whole sentences (open or closed) to form predicates. For instance, in 'Orcutt is such that he is a spy', the predicate 'such that he is a spy' is formed by applying 'such that' to the sentence 'he is a spy'. But we've just seen that on Quine's proposal, 'Ralph believes that he is a spy' is not a sentence. It follows that 'is such that Ralph believes that he is a spy' is not a well-formed predicate, and hence it follows that (29) itself is not a well-formed sentence of English. Yet of course (29) is in fact perfectly well-formed. This consideration shows that in English, 'believes that' is not a variable-binding operator. Hence, Quine's second proposal, like his first, cannot be applied to natural language.<sup>x</sup>

#### The two-scope view.

The final attempt to defend Quine's thesis that I will consider has never, as far as I know, been expressed in print. But I suspect that the view has been pretty widely held. Indeed, it is a view that I myself once endorsed, and that I have heard endorsed by several colleagues. I will call it "the two-scope view."

Like both of Quine's proposals, the two-scope view explicitly denies the ambiguity hypothesis and affirms that the very same belief operator is involved in both notional and relational constructions. The view is in fact very similar to Quine's second proposal, since it also holds that every occurrence of a term that is logically in the scope of the belief operator is an

opaque occurrence. But unlike Quine's second proposal, the two-scope view does not hold that 'believes that' is a variable binding operator. Instead, it attempts to rely on the well known fact that belief sentences containing singular terms are often ambiguous, and can be given one of two different readings depending on whether the term is understood to have small or large scope relative to the belief operator. Consider our earlier example:

(1) Bruce believes that the next chairman is a megalomaniac.

In the notional or opaque sense of (1), the term 'the next chairman' is taken to express one of Bruce's ways of thinking or conceiving of things. This interpretation assumes that 'the next chairman' has small scope, or in other words, that the occurrence of the term is not only grammatically but logically in the scope of the operator 'believes that'.

But of course (1) also has a relational, de re reading. On this second interpretation, the speaker of (1) would be using 'the next chairman' to refer to a person, Jeff say, and would be asserting that Bruce believes that he is a megalomaniac. On this understanding, the term 'the next chairman' is used to reflect not Bruce's, but the speaker's way of thinking of things. So understood, the logical form of (1) would be unambiguously expressed by

(31) The next chairman is such that Bruce believes that he is a megalomaniac.

In (31), the occurrence of 'the next chairman' lies outside the scope of 'believes that', and so this occurrence is transparent and subject to valid application of both SI and EG.

Now what does the scope ambiguity in (1) have to do with Quine's Thesis and the surface problem? Just this. The two-scope view maintains that every occurrence of a singular term that lies (logically) in the scope of 'believes that' is an opaque occurrence. By Quine's thesis, then, no position occupied by such an occurrence can be meaningfully occupied by a variable bound by a quantifier from outside the belief context. Thus, meaningful sentences of English in which a

pronoun in the grammatical scope of 'believes that' are bound by an outside quantifier cannot really be cases of quantifying into an opaque context. In such cases, the pronoun's scope must be logically outside the belief operator, and so the occurrence of the pronoun is not really opaque. Rather, the pronoun's occurrence would really be transparent, like the occurrence of 'the next chairman' in (31), so that quantificational binding of this occurrence is both perfectly legitimate and consistent with Quine's Thesis.

Consider again our apparent case of quantifying into an opaque context:

(4) Someone is such that Bruce believes that he is a megalomaniac.

Suppose that 'the next chairman' has small scope in (1). Now (4) may look like the existential generalization of (1) taken in this sense. But according to the two-scope view, this is wrong.

Rather, (4) is the existential generalization of (1) with 'the next chairman' given large scope.

Thus (4) - insofar as it makes sense - must really be the existential generalization of (31), or of (1) taken to mean the same as (31). This is a plausible claim, for it is certainly plausible to suppose that (4) is the existential generalization of (31).

However, there is a serious flaw in the two-scope view, a flaw that is revealed by a fact emphasized by Nathan Salmon (1986, p. 4). In a sentence like (31) we do indeed succeed in giving the term 'the next chairman' large scope relative to the belief operator. But notice, as Salmon points out, that we do so only by tying the large-scope term to the anaphoric pronoun 'he' which in turn must be assumed to have logically small scope within the belief operator. 'He' must be assumed to occur both grammatically and logically in the scope of 'believes that' in (31), because (31), remember, is supposed to reveal the logical form of the de re reading of (1). However, it seems quite clear that it is this same small-scope occurrence of 'he' that is bound by

the quantifier 'someone' in (4). But if so, then (4) is a case of quantifying into an opaque context after all.

The main problem with the two-scope view is that it employs a notion that cannot even be understood unless the two-scope view is false. For the idea that a term with grammatically small scope in fact has logically large scope cannot really be understood without assuming that the relevant large-scope occurrence of the term (in the deep structure) is semantically tied to a bindable occurrence of an anaphoric pronoun that has small scope (in the deep structure). So the two-scope view is self-refuting.

To avoid this difficulty, a defender of the two-scope view might try to maintain that in (31) 'he' is not really a genuinely referring expression, and that as a consequence, 'he' is not really bound by the quantifier 'someone' in (4). But to make sense of this suggestion, it seems, we would have to suppose that 'he' is bound by the 'believes that' operator in both (4) and (31). In effect, then, the two-scope view must just reduce to Quine's second proposal, if it is to avoid inconsistency. But then the two-scope view is faced with the same problem that faced Quine's proposal: the suggestion that 'believes that' is a variable-binding operator is false, because it falsely implies that English sentences like (4) are not well-formed.

We may conclude that the two-scope view cannot be used to solve the surface problem.

#### 8. The argument's conclusion and a possible objection.

So far, we have found no plausible account on which English sentences like

(4) Someone is such that Bruce believes that he is a megalomaniac

can be interpreted as involving quantificational binding of transparent positions only. The first two accounts we examined, both based on the ambiguity hypothesis, ran afoul of the sorting problem. Quine's two proposals, on the other hand, both neatly deal with the sorting problem; but

neither proposal is applicable to English sentences like (4). Finally, we saw that the two-scope view either reduces to Quine's second proposal, or it inconsistently implies that quantifying-in is permissible.

In short, there seems to be no viable way for a defender of Quine's Thesis to solve the surface problem. The best explanation of this apparent fact would seem to be that the surface structure of (4) is also its logical structure, and that (4) is therefore a case of a meaningful sentence that involves quantificational binding of a term in opaque position. Hence, Quine's Thesis is false.

Now some defenders of Quine's Thesis might say that the unsolvability of the surface problem is no proof that Quine's Thesis is false. I criticized Quine's proposals because they cannot be applied to natural languages like English. However, it is not entirely clear that Quine intended his proposals to have application to natural language. Having argued for his thesis that it is meaningless to quantify into opaque contexts, Quine makes his first proposal in response to the question: "...how then to provide for those indispensable relational statements of belief like 'There is someone whom Ralph believes to be a spy?'" (1956, p. 189). But in what sense did Quine intend his notation to "provide for" relational statements of belief?

Perhaps a defender of Quine's thesis (such as Quine himself) would be happy to agree that Quine's proposal is not applicable to natural language. Perhaps such a defender might also agree with my contention that the surface problem is unsolvable for quantified belief contexts in English like (4), and thus also agree with my conclusion that such sentences as (4) do in fact involve quantification into opaque contexts. But our Quinean might just react to this conclusion by saying:



"So much the worse for English! The fact that English grammar allows construction of sentences like (4) reflects an incoherence in the language that results in our utterance of expressions that are strictly meaningless. To correct this incoherence while 'providing for those indispensable relational statements of belief' we should revise English in accordance with Quine's proposal, explicitly prohibiting quantification into opaque contexts and using his notation to neatly regiment transparent and opaque occurrences of terms."

I cannot tell from Quine's own words whether or not he would agree with this defense or any part of it. But in any case the defense has two very serious defects. First, its bald claim that all English sentences like (4) are meaningless is exceedingly implausible. The intuition that such sentences are meaningful seems to me about as certain as anything ever gets in philosophy. One who agrees with me that Quine's thesis conflicts with the meaningfulness of sentences like (4) should at the very least begin to wonder if perhaps one or more of the assumptions which led Quine to endorse his thesis might in fact be less certain than the intuition that (4) is meaningful.

Second, we have already seen the reason why Quine's notation cannot provide the basis for any adequate revision of English. Again, this notation contains a predicate 'believes' which is supposed to have something to do with belief. Yet the defense under discussion agrees that this predicate corresponds in meaning to no English expression. Thus the predicate itself so far has no meaning. It is uninterpreted. Again, one could give a relevant meaning to the predicate, but to do so one would have to use the very belief-vocabulary that has been rejected as meaningless! So this defense of Quine's thesis is just incoherent. For it is quite impossible to both throw out all natural language belief-vocabulary and retain the basis for a revision of such language that "provides for those indispensable relational statements of belief."

9. The flaw in Quine's argument.

Since Quine's thesis is falsified by some rather simple and obvious facts about natural language, it is important to understand where Quine's argument for his thesis goes wrong. Although the argument is exceedingly persuasive, it contains a subtle flaw which, I believe, was first pointed out with precision by Plantinga (1974, pp. 222-233). Later, essentially the same point was made by Kaplan (1986, pp. 233-238), with perhaps even more precision and in somewhat different terms. I will rely here mainly on Plantinga's discussion.

Quine's argument depends upon a connection that he sees between the meaning of quantified sentences and the validity of SI (see especially Quine (1953), pp. 147-148). On its standard objectual interpretation, an existentially quantified sentence of the form ' $(\exists x)C(x)$ ', for instance, says that at least one object in the universe of discourse has the property (trait or characteristic) that is ascribed by instances of the sentential context ' $C(x)$ '. Contexts into which quantification is meaningful must, then, be "property-ascribing" contexts, in this sense. But, Quine maintains, any context that is property-ascribing in the relevant sense must be a context with respect to which substitution of coreferential singular terms (SI) is valid. Thus, since SI is not valid with respect to contexts formed by modal and cognitive operators, quantification into such con-texts is not meaningful.

To evaluate this argument, we need to make clear the assumptions underlying Quine's claim that a context is property-ascribing in the relevant sense only if SI is valid in the context. Let us say that an instance  $C(\alpha)$  of a context  $C$  is property-ascribing just in case there is a property  $P$  expressed by  $C$  such that  $C(\alpha)$  is true if and only if the referent of  $\alpha$  has  $P$ . An important fact emphasized by Kaplan (1986, p. 235) is that the failure of SI with respect to given instances of a context shows at most that at least one instance of the context fails to be property-ascribing.<sup>xi</sup> If terms  $\alpha$  and  $\beta$  both refer to an object  $x$ , and  $C(\alpha)$  and  $C(\beta)$  are both property-

ascribing, then each of  $C(\alpha)$  and  $C(\beta)$  will be true if and only if  $x$  has the property expressed by  $C$ . Hence if  $C(\alpha)$  and  $C(\beta)$  have different truth values when  $\alpha$  and  $\beta$  have the same referent, then  $C(\alpha)$  and  $C(\beta)$  cannot both be property-ascribing. But it doesn't follow that both  $C(\alpha)$  and  $C(\beta)$  fail to be property-ascribing, let alone that no instance of  $C$  is property-ascribing.

Thus, when SI fails for some instances of a context  $C$ , this shows only that not every instance of  $C$  is property-ascribing. But when this happens, Quine goes on to infer that the context  $C$  itself fails to be property-ascribing in a sense sufficient to allow meaningful quantification into  $C$ . In making this inference, Quine is evidently making the following assumption:

(32) A context  $C$  is property-ascribing in a sense sufficient to allow meaningful quantification into  $C$  only if every instance  $C(\alpha)$  of  $C$  is property-ascribing.<sup>xii</sup>

But why should we believe that (32) is true? Why should the meaningfulness of a quantified sentence of the form ' $(\exists x)C(x)$ ' require that every instance of ' $C(x)$ ' be property-ascribing? To cite a similar question of Plantinga's, why is it not sufficient for the meaningfulness of ' $(\exists x)C(x)$ ' that "some large and systematically identifiable range of" instances of ' $C(x)$ ' be property-ascribing? (Plantinga, 1974, p.229.)

It is by now a matter of fairly common assent that instances of contexts that contain genuine terms in the scope of modal and cognitive attitude operators are (at least typically) property-ascribing. By a "genuine term", I mean a term whose sole semantic contribution to the propositions expressed by sentences containing the term is the term's referent. Standard examples of such terms are proper names, demonstratives, and other indexical pronouns. Plantinga considers modal contexts containing proper names, such as

(33) Necessarily 9 is composite.

The position occupied by '9' in (33) is opaque, since substitution of a coreferential term (e.g., 'the number of planets') for '9' in (33) is not truth preserving. Nevertheless, it surely seems that (33) ascribes a property to 9, namely the property that an object  $x$  has if and only if necessarily  $x$  is composite. Or perhaps we should say that the property in question is the property that an object  $x$  has if and only if the singular proposition that  $x$  is composite is necessary (or necessarily true). In any case, we do seem to have an intuitive grasp of the property so ascribed, and so we have an intuitive grasp of the property involved in such existential generalizations as

(34)  $(\exists x)(\text{necessarily } x \text{ is composite})$ .

Surely, we should accept that (34) is both meaningful and true, since it just innocently says that some object has the very property which (33) ascribes to 9.

Similarly, consider belief contexts containing genuine terms such as

(35) Bruce believes that David is a megalomaniac.

(36) Bruce believes that he (or: that man) is a megalomaniac.

(37) Bruce believes that you are a megalomaniac.

(38) Bruce believes that I am a megalomaniac.

Assuming that in each of (35)-(38) the speaker's utterances of the indexicals all refer to David, it seems that (35)-(38) all ascribe the same property to David, namely, the property that an object  $x$  has just in case Bruce believes that  $x$  is a megalomaniac. (This is no doubt the same as the property of being believed by Bruce to be a megalomaniac.) The positions occupied by the relevant terms in (35)-(38) are all opaque, since substitution of a coreferential term (e.g., 'the next chairman') fails to preserve truth. But again, we seem to have an intuitive grasp of the property ascribed in each of (35)-(38), and so there seems to be no problem in grasping the

property involved in the existential generalization of these sentences, namely the sentence (4) ('Someone is such that Bruce believes that he is a megalomaniac').

In sum, such contexts as 'Necessarily \_\_\_\_ is composite' and 'Bruce believes \_\_\_\_ is a megalomaniac' are opaque because some of their instances are not property-ascribing. But this does not prevent other instances of the contexts from being property-ascribing. And as long as there are such property-ascribing instances, it is intuitively clear what property the context is used to ascribe, and so quantification into the context makes sense.

#### 10. Conclusion.

Quine's argument against the possibility of meaningful quantification into opaque contexts is inconclusive, since it rests on the doubtful and unjustified assumption (32). This leaves the way open for a unified theory of belief ascriptions that (1) would explain the general invalidity of SI and EG in belief contexts, and yet (2) would explain how some instances of such contexts can be property-ascribing, and thus would show that quantifying into such contexts is legitimate. Although I have attempted elsewhere (McKinsey, 1994) to sketch the basic elements of such a view, I think that no adequate theory of belief ascriptions that accomplishes goals (1) and (2) has yet been stated.<sup>xiii</sup>

The task of constructing such a unified theory of belief ascriptions may in fact seem so daunting that one is led to just accept Quine's thesis for the case of belief and hope that the distinction between notional and relational belief ascriptions of the same form must at bottom be due to some sort of ambiguity in the verb 'believes'. But if my argument in this paper has been correct, it would be wrong to abandon the goal of finding a unified theory of belief ascriptions. For according to my argument, the surface phenomena of English show both that quantification into opaque contexts is meaningful and that there is no relevant ambiguity in the verb 'believes'.

If this is right, then some unified theory of belief must be true. And so we should just keep on looking for it.

## NOTES

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<sup>i</sup> See, for instance, Quine (1943), (1953), and (1956).

<sup>ii</sup> See, for instance, Salmon (1986), Richard (1990), and McKinsey (1994).

<sup>iii</sup> Oddly, most commentators on Quine, including myself (McKinsey, 1994), have failed to note this fact. (Others making this common error include Kaplan (1986), p. 232 and Richard (1990), p. 129.) I had not until recently seen that on Quine's own proposal, 'believes' is explicitly said to be univocal whether it appears in a notional or a relational context. See Quine (1956), p. 187, and see my discussion of Quine's proposal below in Section 4.

<sup>iv</sup> The qualification provided by 'wholly' is necessary because, as we shall see below, even a relational sense of 'believes' may form contexts that contain some opaque occurrences of singular terms.

<sup>v</sup> In my view, the basic sense of 'believes' is its meaning in sentences of the form 'S believes that p'; here, I hold, 'believes' has still a fourth sense in which it expresses no relation at all. See McKinsey (1986) and (1994).

<sup>vi</sup> What should we say about cases in which two terms follow 'believes', as in 'Ralph believes John and Mary to be lovers'? I am inclined to think that here the belief-predicate remains two- (not three-)placed, with the expression 'John and Mary' a single term that refers to the (un-ordered) pair {John,Mary}.

<sup>vii</sup> It might be objected that there is a sense of (10) on which it would be true in the circumstances described. For (10) can be read with 'the morning star' given largest scope in (10), so that it means:

(10\*) The morning star is such that someone is such that Ralph believes that she is looking at it. But this fact is irrelevant to my argument. I am assuming that (9) has such a logical form that it contains the predicate 'believes that she is looking at the evening star' where this predicate was formed by applying the operator 'believes that' to the open sentence 'she is looking at the evening star'. Thus, I assume, this open sentence is logically in the scope of 'believes that' and thus so is the term 'the evening star'. Since (10) comes from (9) by substitution of 'the morning star' for 'the evening star', the former term also has smallest scope in (10). Understood this way, it is possible for (11) to be true and (12) false, even though the evening star = the morning star.

<sup>viii</sup> As Wallace (1972), basing his discussion on Quine (1956), explicitly suggested.

<sup>ix</sup> Again, this approach was explicitly suggested by Wallace (1972), p. 86. Apparently, then, what Wallace first suggested as a plausible embellishment of Quine's view just was in fact Quine's view all along!

<sup>x</sup> A possible reply to this argument would be to maintain that in (29) 'Ralph believes that he is a spy' is indeed a sentence, even though 'he' is bound by 'believes that'. This could be so, if the pronoun bound by 'someone' in (29) is hidden in the surface structure. Perhaps, for instance, in the deep structure 'believes' always carries with it a phrase of the form 'of  $\alpha$ ', where  $\alpha$  is a singular term, perhaps a free variable. On this idea, (29) is really short for

(29a) Someone is such that Ralph believes of him that he is a spy.



The problem with this suggestion is that it just seems false that 'believes' always carries with it a phrase of the form 'of  $\alpha$ '. For instance, a purely general belief of the sort ascribed by a sentence like 'Ralph believes that there are spies' is not of, or about, any particular object at all. Hence this sentence does not contain an implicit occurrence of any phrase of the form 'of  $\alpha$ '.

<sup>xi</sup> Kaplan puts the point in a slightly different way. Where  $\alpha$  and  $\beta$  are co-designative singular terms and  $C(\alpha)$  and  $C(\beta)$  differ in truth value, Kaplan points out that it follows only that at least one of the occurrences of  $\alpha$  and  $\beta$  is not purely designative. An occurrence of a term is "purely designative" only if the truth value of the formula containing the occurrence "depends only on what the occurrence designates not on how it designates." (Kaplan, 1986, p. 234. His emphasis.)

<sup>xii</sup> Plantinga identifies this assumption of Quine's and states it as follows (1974, p.228):

((ii)            A singular context C expresses a property only if there is some property P such  
                          that an instance  $C(\alpha)$  of C is true if and only if the denotation (if any) of  $\alpha$  has P.

See also Kaplan (1986), p. 235.

<sup>xiii</sup> In his discussion of Quine's argument, Plantinga (1974, pp. 231-232) states a plausible account of the relevant sort for modal contexts. (Plantinga's account is in turn based on Hintikka's (1963)). Kaplan (and many others) have stated a view of belief ascriptions that is analogous to Plantinga's account of modal contexts. On this view, (1) 'believes' expresses a two-place relation between persons and propositions, and (2) property-ascribing belief contexts that support existential generalization are those in which a person is said to believe a singular proposition that essentially involves a particular object. (See Kaplan (1986), pp. 239-241; also McKay (1981), and Salmon (1986), pp. 1-9.) However, I have presented counterexamples to the relation theory of 'believes' and other cognitive operators in McKinsey (1986) and (1994).