

## ARE MODAL CONTEXTS REFERENTIALLY OPAQUE?

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Quine has endeavored to prove that modal propositions cannot be successfully quantified.<sup>1</sup> His strategy consists of two parts. First, he attempts to show that modal contexts are "referentially opaque". Second, he tries to demonstrate that quantification into a referentially opaque context results in either an unintended sense or in nonsense. This latter claim I will not dispute. I will, however, attempt to show in this paper that modal contexts are not referentially opaque.

What exactly does Quine mean by referential opacity? His answer is that a context is referentially opaque if a word or phrase appearing in that context is not being used strictly referentially.<sup>2</sup> The most common example of a referentially opaque context is when a word or phrase is placed in single quotes. Quine gives as an example the proposition "'Cicero' contains six letters," the referential opacity of which is obvious. Since the context of single quotes is only one of several which Quine believes to be referentially opaque, he provides a test for determining which contexts are referentially opaque based on the principle of identity. Any term,  $A$ , is said to be in a referentially opaque context if the identity statement  $A = B$  is true and if the substitution of  $B$  for  $A$  in the context in question results in changing a true proposition into a false one.<sup>3</sup> This test does show that "'Cicero' contains six letters" is referentially opaque since Cicero = Tully, and the substitution of 'Tully' for 'Cicero' results in the false proposition "'Tully' contains six letters".

Yet another referentially opaque context is "believes that". Quine gives the following example: Suppose that "Phillip believes that Tegucigalpa is in Nicaragua" is true. Since Tegucigalpa is identical with the capital of

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1. W. V. O. Quine, "Reference and modality," in *From a Logical Point of View*, Harvard University Press, Cambridge, Massachusetts (1953), pp. 139-159.

2. *Ibid.*, p. 142.

3. *Ibid.*, p. 140.

Honduras, substitution yields "Phillip believes that the capital of Honduras is in Nicaragua", which is clearly false. What Quine wants to do, of course, is show that modal contexts resemble the two contexts just mentioned insofar as they are all referentially opaque.

Quine's attempt to show that modal contexts, particularly "necessarily . . ." and "possibly . . .", are referentially opaque is based on what he calls "the sense of strict necessity and possibility as in Lewis' modal logic". Strict modalities, Quine continues, are based "on the putative notion of analyticity as follows: a statement of the form 'necessarily . . .' is true if and only if the component statement which 'necessarily' governs is analytic, and a statement of the form 'possibly . . .' is false if and only if the negation of the component statement which 'possibly' governs is analytic."<sup>4</sup> This definition of modalities is not precisely like any found in Lewis. The definition of strict modalities offered by Lewis is that a proposition, *p*, is necessary if "it is not logically conceivable that *p* should be false", and the proposition is said to be possible "if *p* is logically conceivable".<sup>5</sup> Quine's definition of strict modalities can be made to square with Lewis' only if we assume that every time Quine says "analytic" what he means is "analytically true". This is a confusing procedure on Quine's part since there are analytically true *and* analytically false propositions. However, I shall assume that this is what Quine meant.

Quine gives three examples of modal propositions which he claims would be regarded as true. It is his plan to show, as he did in the case of other referentially opaque contexts, that substitution of certain terms for others on the basis of true identity statements renders these propositions false. The three examples are:

- (1) 9 is necessarily greater than 7.
- (2) Necessarily if there is life on the Evening Star then there is life on the Evening Star.
- (3) The number of planets is possibly less than 7.

Substitution into these propositions on the basis of the identities "the number of planets = 9" and "The Evening Star = The Morning Star" yields:

- (4) The number of planets is necessarily greater than 7.
- (5) Necessarily if there is life on the Evening Star then there is life on the Morning Star.
- (6) 9 is possibly less than 7.

Since Quine takes (4)-(6) to be false, he claims to have demonstrated, by the criterion specified above, that modal contexts are referentially opaque. It does seem, at least at first glance, that (1)-(3) are true and (4)-(6) false. I believe, however, that closer examination will show that the

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4. *Ibid.*, p. 143.

5. C. I. Lewis and C. H. Langford, *Symbolic Logic*, Dover, New York (1959), pp. 160-161. First published by the Century Company in 1932.

falsity of (4)-(6) is not so obvious as one might think at first glance, and that the alleged identities are subject to certain ambiguities.

Consider first the two identity statements in question. Quine says that "given a true statement of identity, one of its two terms may be substituted for the other in any true statement and the result will be true."<sup>6</sup> Referentially opaque contexts constitute exceptions to this rule. However, if it can be shown as regards the identities in question that there are exceptions which are not due to referential opacity then the two identities might be suspect. Such exceptions can, in fact, be found. Consider the following pairs of propositions:

- (7) Astronomy studies the number of planets.
- (8) Astronomy studies the number 9.
- (9) The number of planets could be lessened. (E.g., if Neptune were to disintegrate.)
- (10) The number 9 could be lessened.

In both pairs of propositions the even numbered ones are true while the odd numbered ones, formed by substitution on the basis of the alleged identity "the number of planets = 9", are false. It seems then that the identity in question may indeed be "in question". Of course Quine could claim that the contexts "studies" and "could be lessened" are also referentially opaque, but such a stratagem would amount to nothing more than an *a priori* ruling out of all counter-examples by a continual widening of the field of referentially opaque contexts.

The identity statement "The Evening Star = The Morning Star" also fails of substitutability in contexts which are not referentially opaque. Consider the following pairs of propositions:

- (11) The Evening Star was seen at 10 P.M.
- (12) The Morning Star was seen at 10 P.M.
- (13) The Evening Star crosses the local meridian before midnight.
- (14) The Morning Star crosses the local meridian before midnight.

Again, propositions (11) and (13) are true while (12) and (14), formed by substituting on the basis of the alleged identity "The Evening Star = The Morning Star", are false. Still, it must be admitted that, in some sense at least, "the number of planets = 9" and "The Evening Star = The Morning Star" are true identities. The explanation for this puzzle is given below.

The truth of any identity statement,  $x = y$ , sometimes depends in part on which of several possible meanings of  $x$  is asserted to be identical to  $y$ . Homonyms are a trivial example of this. A more interesting sort of example is when a term has both an extensional and an intensional meaning. The word 'dogs', for example, may be said to refer either to the concept of a group of domesticated carnivores (intensional meaning) or to an actual collection of animals (extensional meaning). This results in two true identity statements:

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6. Quine, "Reference and modality," p. 139.

(15) Dogs = *Canis Familiaris*

(16) Dogs = Rover, Fido, Bowser, et. al.

(15) is true since both 'dogs' and '*Canis Familiaris*' refer to the same thing. (16) is also true since 'dogs' and the list of names refer to the same group. However, if we use 'dogs' in the sense of (15) and claim that it is identical to the list of names, we assert a false identity since Rover and his friends are certainly not concepts. This point can also be illustrated by one of the identities in question: The Evening Star = The Morning Star. The extension of these two phrases is the same—a certain heavenly body. This accounts for their apparent identity. But their intensions are distinct. The Evening Star is the brightest star in the evening sky while the Morning Star is the brightest star in the early morning sky. Quine seems to admit this in another work.<sup>7</sup> This gives us four possible interpretations of the identity in question:

(17) The Evening Star (extensional meaning) =  
The Morning Star (extensional meaning).

(18) The Evening Star (intensional meaning) =  
The Morning Star (intensional meaning).

(19) The Evening Star (extensional meaning) =  
The Morning Star (intensional meaning).

(20) The Evening Star (intensional meaning) =  
The Morning Star (extensional meaning).

Only (17) is a true identity statement. What effect this has on Quine's sample modal propositions is very interesting. Proposition (2) which Quine took to be true was:

(2) Necessarily if there is life on the Evening Star then there is life on the Evening Star.

Substitution of 'Morning Star' for 'Evening Star' yielded:

(5) Necessarily if there is life on the Evening Star then there is life on the Morning Star.

Quine took (5) to be false. However, the substitution is legitimate only if it is done on the basis of (17), and if 'Evening Star' and 'Morning Star' are both being used extensionally then (5) is true! Furthermore, Quine claims in another work that only extensional identities are valid.<sup>8</sup> While I do not agree with Quine on this point it is obvious that the identity used to go from (2) to (5) must indeed be extensional.

Quine might object that (5) is true only if we know the extensions of both terms in question. This, the objection would continue, constitutes an

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7. Quine seems to admit this in "On what there is" in *From a Logical Point of View*, *op. cit.*, p. 9.

8. W. V. O. Quine, *Methods of Logic*, Holt, Rinehart and Winston, Inc., New York, third edition (1972), p. 221. First published in 1950.

introduction of epistemological considerations which are irrelevant to logic and independent of the proposition in question. Such an objection is rebutted by noting that the very point Quine is attempting to illustrate depends on the substitutability of identicals which itself requires that we know whether the terms are in fact identical. To know this, we must know whether the two terms are being used extensionally or intensionally, and what those extensions or intensions are. It must also be noted that we cannot gain this information from an examination of the identity statement itself. Consider the following example:

(21) The Edgar Pierce Professor of Philosophy is a man.

Substituting on the basis of the identity "Quine = the Edgar Pierce Professor of Philosophy" we get:

(22) Quine is a man.

(21) is a true proposition, but the truth of (22) depends on whether 'Quine' in the identity statement refers to W. V. O. Quine or some other person with the same name. Since presumably there are several Ms. Quines, we must know the extension of the term 'Quine' (or who is being named by that name) in order to know whether proposition (22) is true.

The case of the other identity, "the number of planets = 9", is somewhat more difficult. The extension of '9' is open to debate but the most common way of treating numbers is as sets of sets. That is, '9' is the name for the set which contains all sets with exactly 9 elements. In this sense '9' is certainly not identical with 'the number of planets'. In fact, 'the number of planets' is merely one of the sets of exactly 9 elements which belongs to the set 9. When we say "The number of planets is 9" the 'is' is not an 'is' of identity but an 'is' of membership. When we say "Socrates is a man" we do not mean that 'Socrates' is identical with 'man', nor should we make the same mistake as regards 'the number of planets' and '9'. Since Quine feels that identity statements are extensional, and since the extensions of the two terms in question are not the same, it follows that the examples making use of this supposed identity fail to establish Quine's point.

In summation, Quine's argument depends in large measure on demonstrating that substitution on the basis of true identities into three sample modal propositions which are true yields three modal propositions which are false. My own analysis shows that this is not the case. When the identities are legitimate the resultant propositions are not false, and when they are false it is due to illegitimate identity statements.