Quine and his Critics on Truth-Functionality and Extensionality

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Abstract

Quine argues that *if* sentences that are set theoretically equivalent are interchangeable *salva veritate*, then all transparent operators are truth-functional. Criticisms of this argument fail to take into account the conditional character of the conclusion. Quine also argues that, for any person P with minimal logical acuity, if 'belief' has a sense in which it is a transparent operator, then, in that sense of the word, P believes everything if P believes anything. The suggestion is made that he intends that result to show us that 'believes' has no transparent sense. Criticisms of this argument are either based on unwarranted assertions or on definitions of key terms that depart from Quine's usage of those terms.

Keywords: Quine, Mackie, Sleigh, Sharvy, truth-functional, extensional

I Introduction

Quine writes:

> Let us return, for a final sweeping observation, to our first test of referential opacity, namely, failure of substitutivity of identity; and let us suppose that we are dealing with a theory in which (a) logically equivalent formulas are interchangeable in all contexts *salva veritate* and (b) the logic of classes is at hand. For such a theory it can be shown that any mode of statement composition, other than truth functions, is referentially opaque. For, let φ and ψ be any statements alike in truth value, and let Φ(φ) be any true statement containing φ as a part. What is to be shown is that Φ(ψ) will also be true, unless the context

> represented by Φ is referentially opaque. Now the class formed by φ is either V or Λ, according as φ is true or false; for remember that φ is a statement devoid of free α. (If the notation φ without recurrence of α seems puzzling, read it as $(\alpha = \alpha \cdot \varphi)$.) Moreover φ is logically equivalent to $\varphi = V$. Hence, by (a), since $\Phi(\varphi)$ is true, so is $\Phi(\varphi = V)$. But φ and ψ name one and the same class, since φ and ψ are alike in truth value. Then, since $(\alpha = \alpha \cdot \varphi)$ is true, so is $\Phi(\psi = V)$ unless the context represented by 'Φ' is referentially opaque. But if $\Phi(\psi = V)$ is true, the so in turn is $\Phi(\psi)$, by (a). (Quine 1953, p.159)

I will call a term which forms sentences from sentences a *sentence forming operator*, or, for short, an *operator*. Let S be any sentence in which co-referential singular terms interchange *salva veritate*. Then, on Quine's usage, a sentence forming operator M is *transparent* if, for any such sentence S, co-referential terms interchange *salva veritate* in their occurrences in the occurrence of S in M(S).

Quine's argument connecting transparency with truth functionality assumes the principle that logically equivalent sentences are interchangeable *salva veritate*, where, as Quine puts it, "the logic of classes is at hand". The principle he has in mind thus comes to this: Set theoretically equivalent sentences are interchangeable *salva veritate*.

In this there is an obvious infelicity. For he speaks of *the* logic of classes as being at hand. But there isn't just one such logic, for what embodies a logic of classes is a theory of sets, and of these there are many.

To cut off disputes about which set theory is to set the standard for equivalency in the principle of which Quine speaks, we revise that principle to read as follows:

L Sentences equivalent by all set theories are everywhere interchangeable *salva*

veritate

where sentences A and B are "equivalent by all set theories" just in case the assertions on which all set theories agree provide premises enough to derive the biconditionals formed from A and B.

The conclusion of Quine's argument is often put as follows:

All transparent sentence forming operators are truth functional

i.e., for sentence forming operators, transparency is sufficient for truth functionality. But in fact the argument he gives has a different conclusion, namely:

If L, then any transparent sentence forming operator is also truth functional.

We shall say that an operator M *satisfies* principle L just in case, for any sentence S and set theoretically equivalent sentences A and B, the result of completing a sentence forming operator M with S and the result of completing M with the sentence S' which results from S by the interchange in S of A and B are always the same in truth value. In symbols: M (S) if and only if M (SA/B) if A and B are set-theoretically equivalent sentences. Given this we can express the conclusion of Quine's argument in the following more minimal form:

F For each transparent sentence forming operator M, if M satisfies principle L then M is truth functional

It is obvious to most philosophers that there are *some* sentence forming operators for which this conclusion holds, e.g., sentence forming operators for negation and conjunction.

Further, at least some philosophers are inclined to suppose that if a sentence forming operator is transparent then replacing one sentence to which it applies by another *set theoretically equivalent* one cannot yield a change of truth value. And even more so if the interchanged sentences are *logically* equivalent.

If so, then the conclusion of Quine's argument will strike us as having an interesting consequence. For that conclusion will then be one which shows that *all* transparent sentence forming operators are truth functional.

But will we, after reflection, remain inclined to think, or to take it as obvious, that all transparent sentence forming operators satisfy principle L?

II Principle L

Counting logic a part of any set theory, logical equivalence will be included in set theoretical equivalence. So let's begin with that.

How will things stand with principle L read as referring only to equivalence by *first order* logic? Won't that more limited version of L hold for all transparent operators? Indeed, won't it hold right across language?

But does everyone who believes that Bush is President also believe *this*: that both Bush is President and he is not President if there are mangoes that are not mangoes?

Many philosophers would hold that the refusal to assent to this on the part of many of those who would affirm that Bush is President shows that some people believe that Bush is President but do not believe that both Bush is President and he is not President if there are mangoes which are not mangoes. Yet, the sentences

Bush is President

and

Bush is President and Bush is not President if there are mangoes that are not mangoes

are *first order logically equivalent*. This, and a multitude of other similar examples serve to put it in doubt whether L holds "right across language".

On the other hand, there is a certain inclination to hold that anyone who really believes that Bush is President believes as well that both Bush is President and Bush is not President if there are mangoes which are not mangoes. What may incline us to this view is the thought that the two sentences, *since* they are first order logically equivalent, *say* the very same thing. Those inclined to this view of the matter will then say that the refusal to agree that both Bush is President and Bush is not President if there are mangoes that are not mangoes is due to a failure to fully grasp what is said by these words.

The guiding idea would be this: Sentences that are first order logically equivalent say the same thing. If so, it will be plausible to say that replacing a sentence S in its occurrence in some belief context by another sentence S* which says the very same thing as S says always yields a pair of materially equivalent belief sentences.

Perhaps.

Reflection on the idea that first order logically equivalent sentences say the same thing leads directly to the further idea that any sentence which is first order logically true either says nothing at all or says something said by every sentence. For if any first order logically true sentence did say something not said by every other sentence, then the conjunction of it with one of those other sentences must be a new sentence which says something not said by either sentence alone. And so for *that* case a sentence will not say the same as one of its logical equivalents. But do first order logically true sentences say something said by *all* sentences?

Perhaps.

Or, do first order logically true sentences say nothing at all?

Perhaps.

But how things stand on such points is far from immediately evident. Indeed, the points

are ones philosophers have thought about and disagreed on at least since the publication of Wittgenstein's *Tractatus*.

So I am inclined to think that the principle that first order logically equivalent sentences are everywhere interchangeable *salva veritate* is not one that just obviously holds with full generality – right across language.

So far as I can see, it *may* be that there are at least some sentences, or at least some non-extensional sentences, in which logically equivalent sentences will not always interchange *salva veritate*.

Now let's look at another case, that of the pair of sentences

> The match lit because the match was struck
>
> The match lit and all whales are whales because the match was struck.

The second results from the first by the interchange of sentences that are first order logically equivalent. Now, the second sentence entails both of the following sentences:

> The match lit because the match was struck
>
> All whales are whales because the match was struck

But of these the second pretty clearly falls short of truth (and perhaps even falls short of sense). So, the second of the initial pair of sentences also falls short of truth, and does so even if the first of those sentences is true.

The key point is that sentences of form 'A and B because C' entail both 'A because C' and 'B because C'. If the match broke and the match lit because the match was struck, then the match broke because it was struck and the match lit because the match was struck. And if someone claims that the water boiled and the butter melted because the burner was on high, and

the butter did not melt because the burner was on high but because it was left in a warm oven, then it is *not* the case that both things happened because the burner was on high.

So it really isn't at all evident that principle L holds quite generally, even if it is read as concerning only those sentences which are equivalent by first order logic.

But perhaps principle L, still read as concerning only logically equivalent sentences, holds for any *transparent* sentence forming *operator.*

Not obviously so, and the example just considered itself makes the point. For suppose the match lit and broke because it was struck. Then, as we might put it, the match, *however described*, lit and broke because it was struck. More generally, it seems that for any transparent sentence S, the interchange of co-referential singular terms in the occurrence of S in

S because the match was struck

is an interchange *salva veritate*. If so, the sentence forming operator

because the match was struck

is transparent.

But as we noted above, the pair of sentences

The match lit because the match was struck

The match lit and whales are whales because the match was struck

differ by the interchange of logically equivalent sentences in the context formed by the operator 'because the match was struck' and yet may differ in truth value, as will be the case if indeed the match lit because it was struck. Thus the principle seems not to hold for *all* transparent sentence forming operators, even when the principle is read in terms of first order logical equivalence.

All the more so if we bring in the interchange sentences which are only set-theoretically equivalent. To see this, run the example just presented using 'there are sets' in place of 'all

whales are whales'.

Another example would be this. By any set theory, the following sentences are equivalent:

The match lit

$\{x: x \neq x$ and the match lit or $x=\varnothing$ and the match did not

light$\}=\{x: x=x\}$

Now consider the sentences

The match lit, and that happened because the match was struck

$\{x: x \neq x$ and the match lit or $x=\varnothing$ and the match did not

light$\}=\{x: x=x\}$, and that happened because the match was struck

They differ just by the interchange of the set theoretically equivalent sentences displayed above. But even if the first is true, the second will fall short of truth. Indeed, it may even fall short of sense. For what sense does it make to say of what you assert when you assert that sets are one and the same that *that* is something that *happened*.

That sets are one and the same set hardly has the feel of an *event.*

III John Mackie

If there is any value in my remarks it lies in this, that they help us to resist a certain *misinterpretation* of his argument – the misinterpretation which consists in thinking that what the argument shows, if it is sound, is that transparency is sufficient for truth functionality.

But is there ever a tendency to thus misinterpret Quine's argument? I think so. Early on in his discussion of Quine's argument John Mackie writes as follows:

[Quine's argument] purports to show that if a context is transparent

> it is truth-functional. (Mackie 1974, p.250)

He also says of Quine's argument that

> ...it can be applied to prove that since causal contexts are not truth-functional they cannot be [transparent] either. (Mackie 1974, p.250)

It is true that, immediately upon presenting Quine's argument, he reports its conclusion in the following words:

> ...it has been proved...[that] if 'F(...)' is both transparent and allows substitution of logical equivalents, it is truth-functional. (Mackie 1974, p.251)

But this quite accurate understanding of the conclusion of Quine's argument is not sustained. Within a page Mackie writes as follows:

> ...the conclusion of [Quine's] argument is paradoxical. It seems intuitively obvious that *some* causal statements are transparent without being truth-functional, even if *others* are referentially opaque, and we must be suspicious of an argument that purports to exclude the former possibility. (Mackie 1974, p.252)

With this he repeats his initial misunderstanding of the conclusion of Quine's argument

Since Mackie takes it to be quite clear that (certain) causal contexts *are* transparent and *aren't* truth-functional, and takes Quine's argument to purport that *no* context is both transparent and non-truth-functional, he comes to think there must be *some* error in Quine's argument. But what?

Here is the gist of Quine's argument. Let p and q be any materially equivalent sentences,

and let F be any operator which is transparent and satisfies the principle of interchange for set theoretically equivalent sentences. Then consider the following sequence of sentences:

F (p)

F ({x: x=x & p}={x: x=x})

F ({x: x=x & q}={x: x=x})

F (q)

Quine points out that by the principle of interchange of logical equivalents the first two sentences have the same truth-value and the last two sentences have the same truth-value. He further points out that by the principle of interchange for co-referential singular terms the middle two sentences have the same truth-value. Thus, the first and fourth sentences have the same truth-value.

Mackie suggests that the "problem" lies in the substitution of the co-referential singular terms. For with that interchange "the sense of 'p' is lost" (Mackie 1974, p.253).

But how is that a problem? Perhaps the sense of 'p' indeed *is* lost but nothing in Quine's argument says or assumes it would not be lost.

Still, Mackie forges on. He agrees that

> If the assumptions [of the argument] apply to the *context* 'F(...)' as such, and hence to *any* statement of the form 'F(p)', then we must...construe [those assumptions]...as meaning not merely that each kind of substitution is allowed on its own, but that substitutions of the one kind are allowed within the products of substitutions of the other kind. (Mackie 1974, p.253)

But then he suggests that

> ...there might be a *particular* sentence 'p'...such that when it was inserted into the context 'F(...)' each kind of substitution was allowed separately but successive substitutions of the two kinds were not allowed. (Mackie 1974, p.253)

Perhaps. But then 'F(...)' both would not be transparent and would not satisfy the principle of interchangeability *salva veritate* for set theoretically equivalent sentences. And Quine's argument says nothing about the truth functionality or lack thereof for such operators.

Nor is this suggestion much in tune with Mackie's own understanding of the contexts which most concern him. For he is much inclined to say of those contexts that they really *are* transparent.

And is there any sentence of the kind he suggests there might be? Let the context be our familiar '...because the match was struck'. Now, what would be a sentence which might fit into this context and "allow" both interchanges in either order, and what would be a sentence which might fit into this context and "allow" either interchange but not both, one within the result of making the other?

Well – let p be just any sentence. Then there will be just the interchanges utilized by Quine. Make them one after the other and the sense of p is lost! So if that is our sign that p doesn't "allow" both interchanges in either order, then *no* p "allows" both such interchanges in either order. But then the "disallowing" has nothing to do with what kind of sentence p is. Rather, the "disallowing" has to do with the context 'F (...)'. *It* will not "allow" both kinds of interchanges in either order. And if the loss of the sense of p is *not* our sign that certain interchanges are not allowed, what is?

Mackie offers no clue, and I can think of none on my own.

Eventually Mackie makes a "concession":

> We can concede that if the *context* 'F (...)' is such that substitutions of both kinds in the contained sentence *always* preserve the truth-value of the whole statement, then it must be truth-functional... (Mackie 1974, p.258)

But this is not a concession. It is simply the recognition all is well with Quine's argument. For the conclusion of that argument is precisely what this "concession" concedes!

What seems to be going on with Mackie (and we think not he alone) is that he finds the principles to which Quine appeals somehow correct. In particular, Mackie seems to think that all operators that are transparent really do satisfy principle L. If so, then since he thinks the causal operators of the sort he has in mind certainly *are* transparent, he thinks *they* must also satisfy principle L. But then he seems to be stuck with what he takes to be Quine's conclusion, that such causal operators are truth functional – a conclusion he feels he *knows* to be false. So he examines the argument and comes up with the "flaw" of making one substitution within the result of another substitution. But if this is a "flaw" then the substitution of co-referential is not *always* a substitution *salva veritate*. But then the operator in question is not transparent. But it was to affirm its transparency while denying its truth functionality that Mackie undertook his examination of Quine's argument. So he can "detect" *that* flaw only at the cost of denying the very point which led him to think the argument must be flawed!

A far simpler "solution" to the "problem" Mackie thinks we confront if we accept Quine's argument is just to note that Quine's argument in no way implies that every transparent operator is truth functional, and thus doesn't imply that any of the operators which form singular causal statements are truth functional.

Other philosophers have found other "flaws" in the argument e.g., by distinguishing different kinds of occurrences of singular terms ("narrow scope" and "wide scope"), and with much the same motivation as Mackie's. I shall later take a look at whether there is any profit in scrutinizing Quine's argument with this distinction in mind. But I think that if it were recognized that Quine's argument leads to the conclusions which trouble us only in conjunction with the additional premise that such and such transparent operators satisfy principle L, it might not be felt to be so pressing to find a fault in that argument.

Indeed, I think it is a good thing about Quine's argument that it leads us as a question we otherwise might never have asked – namely, the question whether even *first order logically* equivalent sentences are quite generally interchangeable *salva veritate*. What I think we can learn, and in a way with Quine's help, is that this is by no means evident. And not just for the cases of intensional constructions, but for the cases of causal statement as well.

IV Robert Sleigh Jr.

Now let's take a look at another argument from Quine similar to the one just reviewed. To a first approximation, the argument purports to show that if Tom has a certain minimal level of logical acuity – a level many of us possess – then if 'belief' has a sense in which it is a transparent operator, then Tom, if he *in that sense of the word* believes anything, he *in that sense of the word* believes everything.

Quine writes:

> Where 'p' represents a sentence, let us write 'δp' (following Kronecker) as short for the description:
>
> > The number x such that ((x = 1) and p) or ((x = 0) and not p).

> We may suppose that poor Tom, whatever his limitations regarding Latin literature and local philanthropies, is enough of a logician to believe a sentence of the form ‘δp = 1' when and only when he believes the sentence represented by ‘p’. But then we can argue from the transparency of belief that he believes everything. For, by the hypothesis already before us,
>
> (3) Tom believes that δ (Cicero denounced Catiline) = 1.
>
> But, whenever ‘p’ represents a true sentence,
>
> δp = δ(Cicero denounced Catiline).
>
> But then, by (3) and the transparency of belief,
>
> Tom believes that δp = 1,
>
> from which it follows, by the hypothesis about Tom’s logical acumen, that
>
> (4) Tom believes that p.
>
> But ‘p’ represented any true sentence. Repeating the argument using the falsehood ‘Tully did not denounce Catiline’ instead of the truth ‘Cicero denounced Catiline’, we establish (4) also where ‘p’ represents any falsehood. Tom ends up believing everything. (Quine 1960, pp. 148-9)

Robert Sleigh thinks Quine’s argument is invalid because of a certain shift in sense (Sleigh 1966, pp. 91-3). I can lay the matter out as follows. For the case in which co-referential terms interchange *salva veritate* after ‘believes’ I shall write ‘BELIEVES’, thus retaining ‘believes’ for the case in which such terms do not interchange *salva veritate*. The word in caps is to always bear the alleged transparent sense, and the word written lower case is to always bear the alleged non-transparent (opaque) sense. Now, suppose the following sentence is true:

Tom BELIEVES snow is white

then if Tom is minimally logically acute one of the following two sentences will express that acuity for the case at hand:

Tom BELIEVES {x: x=x & snow is white}={x: x=x} if and only if

Tom BELIEVES that snow is white.

Tom believes {x :x=x & snow is white}={x: x=x} if and only if

Tom believes that snow is white.

Now, {x:x=x & snow is white}= {x: x=x & grass is green}. Thus the next sentence follows from the first of the two sentence just displayed by interchange of co-referential terms.

Tom BELIEVES {x: x=x & grass is green} ={x: x=x}

so since Tom has that minimal logical acumen one, of the two next sentences will express that acuity for the case at hand:

Tom BELIEVES {x: x=x & grass is green} ={x: x=x} if and only

if Tom BELIEVES grass is green.

Tom believes {x: x=x & grass is green} ={x : x=x}if and only if

Tom believes grass is green.

So if the first does, and he is thus acute, we can infer to the following:

Tom BELIEVES grass is green.

So if Tom is minimally logically acute and what expresses that acuity are the 'BELIEVES' sentences, he BELIEVES grass is green if he BELIEVES snow is white. And on those conditions he BELIEVES as well that my dog Mysty likes romping in the snow.

But, says Sleigh, what expresses his minimal logical acuity are the 'believes' sentences, not the 'BELIEVES' sentences, and for *them* the step taken by interchanging co-referential terms is not one sure to yield a truth from a truth. For them the inference by interchange of co-

referential terms is invalid.

Let's review the matter. Note that we can perfectly well represent Quine's argument as follows:

1 Tom BELIEVES snow is white.

2 Tom BELIEVES {x: x=x & snow is white} ={x: x=x} if and only if Tom BELIEVES that snow is white.

3. *Thus*, Tom BELIEVES {x: x=x & snow is white}={x: x=x}.

{x: x=x & snow is white}={x: x=x & grass is green}.

4 *Thus*, Tom BELIEVES {x: x=x & grass is green}={x: x=x}.

5 Tom BELIEVES {x: x=x &grass is green} ={x: x=x} if and only if Tom BELIEVES grass is green.

6 *Thus*, Tom BELIEVES grass is green

So far as I can see Sleigh has no objection to *this* argument. But, he suggests, the premises at the lines 2 and 5 – the one's which are supposed to express Tom's minimal logical acuity – do not express any such acuity.

Sleigh will agree that anyone satisfying the appropriate BELIEF biconditionals will BELIEVE every truth if they BELIEVE any truth, and by a similar argument will BELIEVE every falsehood if they BELIEVE any falsehood. So anyone who satisfies those biconditionals and BELIEVES something true and also BELIEVES something false will BELIEVE everything.

That is, suppose Tom is such that the following holds:

∀p (Tom BELIEVES p if and only if Tom BELIEVES {x: x = x & p} = {x: x = x})

Then, by an argument to which Sleigh offers no objection, if Tom BELIEVES something false

and BELIEVES something true, he BELIEVES everything.

Sleigh's only point is that the just displayed quantification does not express the kind of logical acumen to which Quine referred when he said "suppose that poor Tom is enough of a logician...".

What Quine supposed about poor Tom's logical acumen was, according to Sleigh, this:

$\forall p$ (Tom believes p if and only if Tom believes $\{x: x = x \ \& \ p\} = \{x: x = x\}$)

not this:

$\forall p$ (Tom BELIEVES p if and only if Tom BELIEVES $\{x: x = x \ \& \ p\} = \{x: x=x\}$.

But apart from that point – a point of how to *interpret* the biconditionals which occur in the argument as premises – Sleigh offers no objection.

Now, the interesting question is not whether the type of logical acumen of which Quine spoke is expressed by

$\forall p$ (Tom BELIEVES p if and only if Tom BELIEVES $\{x: x = x \ \& \ p\} = \{x: x=x\}$

but whether there is any logical acumen fairly broadly shared among us which is expressed by that sentence. If so, then anyone who possesses that kind of logical acumen will BELIEVE everything if they BELIEVE something true and also BELIEVE something false.

So if Sleigh's point is to carry much weight it must take the form of a claim that no logical acumen, or at least none at all widely shared, is expressed by the quantification of the BELIEVES biconditional.

But so far as I can see that simply goes unargued in his paper. Indeed, so far as I can see

the paper contains no argument that the logical acumen to which Quine referred is not expressed by the BELIEF formula. It is simply and baldly asserted.

V Richard Sharvy

Philosophers speak of the scope of definite descriptions. We are told that a sentence like

It must be that the King is a kind man

can be read in either of two ways:

The King is such that it must be that he is a kind man

and

It must be that the King is such that he is a kind man.

Well – let's grant the point. But then the sentence just displayed is one in which 'the King' has just the "scope" it seems to have. The narrow one

Sharvy is inclined to think that the second one of Quine's arguments fails due to a failure to observe distinctions of scope. How will his criticism go?

Let M be an operator forming sentences from sentences. Then, says Quine, consider the case in which M is such that co-referential terms interchange in S in its occurrence in M(S) *salva veritate* if they also do so in S. Quine calls any such operator "transparent" and argues that every transparent operator, will also be truth functional. Sharvy speaks of such operators as ones which "preserve referential transparency". (Sharvy 1970 p.6)

It is just here that Sharvy wants to make a distinction of scope. The idea is this: Suppose we attach a sentence forming operator M to 'The King is kind'. Then we have

M (the King is kind)

Now, says Sharvy, that sentence is ambiguous. It has two readings. They are:

The King is such that M(he is kind)

and

M (the King is such that he is kind).

(Think of the two sentences ‘The King is such that it is widely believed he is kind’ and ‘It is widely believed the King is such that he is kind’.)

Sharvy next suggests that we call M *transparent* if on the wide scope reading of M(S) referential transparency is preserved for the singular terms in S. On this count we *might* then say that the operator ‘It is widely believed’ is transparent. For if, for example, the King is such that it is widely believed he is kind, then, as we *might* be inclined to think, the King by any name or description is such that it is widely believed he is wise. (Sharvy 1970, pp. 6-8)

Consider now the following argument:

(a) ‘It is widely believed that the King is such that he is kind’ is true.

(b) ‘It is widely believed that’ is transparent.

(c) ‘the King’ and ‘the cruelest of men’ are co-referential.

(d) Thus, ‘It is widely believed that the cruelest of men is such that he is kind’ is true, from (a)-(c)

(e) Thus, if ‘It is widely believed that the King is such that he is kind’ is true, then ‘It is widely believed that the cruelest of men is such that he is kind’ is true, by conditionalization.

A similar argument would be given for the converse.

Note what (b) comes to. It says, on Sharvy’s use of ‘transparent’, only that wide scope occurrences of singular terms retain referential transparency in relation to ‘it is widely believed that’. So we really have *this* argument:

(a) ‘It is widely believed that the King is such that he is kind’ is true

(b*) ‘It is widely believed that’ is large-scope transparent.

(c) ‘the King’ and ‘the cruelest of men’ are co-referential.

(d) Thus, ‘It is widely believed that the cruelest of men is such that he is kind’ is true, from (a)-(c)

(e) Thus, if ‘It is widely believed that the King is such that he is kind’ is true, then ‘It is widely believed that the cruelest of men is such that he is kind’ is true, by conditionalization.

This argument is pretty clearly invalid. For the new premise (b*) underwrites only large scope interchanges, and the argument proceeds by a narrow scope interchange. (Sharvy 1970, pp. 6-8)

But Sharvy’s definition of transparency is not Quine’s. Accepting the scope distinction, Quine would simply say that an operator is transparent just in case it preserves narrow (as well as wide) scope referential transparency.

He would then say: Suppose that there were a sense of ‘believes’ in which the occurrence of ‘the King’ in

It is widely believed that the King is such that he is kind

is purely referential – so that replacing ‘the King’ in that occurrence by any other term for the King yielded a sentence the same in truth value as the original. Then, he would say, I have a proof that *in that sense of the word* all truth is believed if it is true that the King is kind, or all falsities are believed if it is false that the King is kind.

And to this Sharvy has no objection.

Still, he has a point to urge, if not to make. He might say: What inclines us to think that ‘believes’ may have a transparent sense is precisely the circumstance that such sentences as

It is widely believed the King is kind

are ambiguous. In one sense of this sentence, truth value will shift as other terms for the King are put in place of 'the King'. In the other sense, it won't. Sensitive to this ambiguity, we may mistakenly think it evidences another sense of 'believes' – one in which there is transparency, in which what is widely believed about the King is believed about him however named or described.

And perhaps Sharvy, or someone else who sees things his way, will suggest that this taking of a scope ambiguity to be a word ambiguity is what misleads Quine into thinking there might be a transparent sense of 'believes'.

However, it is not so clear that Quine is thus disposed. He sees that others are inclined to detect a transparent sense of 'believes' in how we speak. The argument he presents is one which seeks to show that if there were such a sense for 'believes' then *in that sense of* 'believes' whoever believes anything true believes everything true, and whoever believes anything false believes everything false.

It would seem that Quine's own view is not that there may be a transparent sense of 'believes', but that he has an argument which should persuade people that there is no such sense of the word as we actually use it.

But isn't it well known that Quine admits the transparency of such locutions as

The King is such that it is widely believed he is kind

Well, by an easy inference, legitimate if 'the King' here has purely referential occurrence, we go to

For some x, it is widely believed that x is kind.

Quine would then argue that to make sense of this quantification we must after all treat the narrow scope occurrence also as purely referential. But that, he argues, would be to misconceive

the sense of ‘believes’ since then the absurd results about belief noted above follow.

Perhaps then we should instead infer only this:

For some x, x = the King and the King is such that it is widely believed that he is kind

But then we in effect refuse to treat the occurrence of ‘the King’ in ‘The King is such that it is widely believed he is kind’ as purely referential – for we don’t quantify at that occurrence!.

And so Quine might argue that if we take the wide scope occurrence of ‘the King’ as transparent, we must do so as well for the narrow occurrence.

But what about the sentence

It is widely believed of the King that he is kind.

Surely Quine acknowledges that here replacing ‘the King’ by any other co-referential term is a replacement *salva veritate*.

Perhaps. But this case is unrelated to his argument. For note that the kind of operator we here encounter is not one which forms a sentence from a sentence, but rather is one which forms a sentence from a singular term and a predicate. For the operator is *this*:

it is widely believed of x that he is F

Against this it might be urged that what we have are such operators as

it is widely believed of x that

which form sentence forming operators from singular terms. But to what *sentence* might

it is widely believed of the King that

attach to form a new sentence? Surely not the sentence ‘The King is kind’ for the result in this case would be

It is widely believed of the King that the King is kind

and that makes no sense at all. What is believed *of* the King is that *he* is a certain way, not that *the King* is a certain way.

As Quine defines transparency, 'it is widely believed that' is transparent just in case, for any singular term *a*

It is widely believed...a...

will not yield a sentence different in truth value by putting co-referential term *b* in for *a* if that conditions holds for the context

...a...

itself. But if the resulting sentences are ambiguous in a way that affects truth-value, then among the resulting sentences will be ones *both* true and false and so constancy of truth-value will not be preserved. A sentence that is not false will by certain substitutions of co-referential terms yield a sentence that is false, and by certain other such substitutions yield from a sentence which is not true one which is true.

(Ambiguous sentences may be true in one of their senses and false in another of their senses. A non-ambiguous sentence is true or false in its one and only sense. So, in the sense in which an unambiguous sentence is true or false, an ambiguous sentence may be both true and false. Indeed, one of the recognized signs of ambiguity is this, that a syntactically consistent sentence is both true and false. 'Bill went to the bank'. Well, he did (truth) and he didn't (falsity). So we seek to explain and do so (in this case) by fixing on the word 'bank'.)

So, as Quine defines transparency, transparency requires that both narrow and wide scope occurrences of singular terms be purely referential, and his argument goes through.

And this is not *just* a "technical adjustment" of Quine's view. For though it is such an adjustment, it isn't that alone. What Quine has in mind when he says an operator is transparent is

that the interchange of co-referential singular terms *within the scope of the operator* never yields a shift in truth-value.

His *own* view is not that words like 'believes' in their use to form operators which form sentences from sentences bear a transparent sense, but that *if* they did then in *that* sense of believes if you believe anything which is true you believe everything which is true, and if you believe anything which is false you believe everything which is false. And so, if you believe something that is false and also believe something that is true – as is virtually certain will be the case – then in *that* sense of 'believes' you believe everything.

I think that he intends that result to show us that 'believes' has no transparent sense.

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