

CAN THE LOGIC OF INDIRECT DISCOURSE BE FORMALISED?

Recent attempts¹ to analyse or explicate assertion-statements and other kinds of indirect discourse in formal terms seem to have overlooked an even greater difficulty than the familiar problems arising about equivalence, synonymy, translatability, etc. This difficulty is created by the fact that in judicial, journalistic, or historical fact-finding, as well as in everyday conversation, we frequently cite statements about a witness's truthfulness alongside the report of his testimony as the premisses from which we argue about the facts. It is then an essential part of our argument that it should appear to jump from one level of statement to another, and perhaps back again. So that the difficulty emerges: how can the formalisation of such an argument adopt any of the usual hierarchy-principles as a guarantee against semantical antinomies?

Consider, for example,

- (1) If the policeman testifies that anything, which the prisoner deposes, is false, and the prisoner deposes that something, which the policeman testifies, is true, then something, which the policeman testifies, is false and something, which the prisoner deposes, is true.

As a statement in colloquial English (1) could reasonably be called a logical truth, since the only words occurring 'essentially' in it, to use Quine's terminology,² are words with the analysis of which formal logicians have professionally concerned themselves, viz., 'and,' 'if,' 'then,' 'is,' 'anything which,' 'something which,' 'true,' 'false,' and 'that.' Anything that is substituted throughout for 'the policeman testifies' or 'the prisoner deposes,' and keeps (1) meaningful, also keeps (1) true. *I.e.*, the pattern of (1) is

- (2) If A that anything, which B, is false, and B that something, which A, is true, then something, which A, is false and something, which B, is true,

and informally it is easy enough to prove that the consequent of such a conditional is deducible from its antecedent. But formalisation turns out to be much more difficult.

An informal proof might run as follows. The premises are

- (3) A that anything, which B, is false

and

- (4) B that something, which A, is true.

It is required to prove from these that

- (5) Something, which A, is false

and

- (6) Something, which B, is true.

It will first be proved from (3) and (4) that

- (7) Anything, which B, is false

is false, and it will then be proved from (3) and the falsity of (7) that (5) and (6) are both true:

According to (4)

- (8) Something, which A, is true

satisfies the relative clause of (7). Hence, if (7) is true, (8) must be false (by universal instantiation), and the contradictory of (8), viz.,

- (9) Anything, which A, is false

must be true. Now, according to (3), (7) satisfies the relative clause of (9); so that, if (9) is true, (7) must be false (by universal instantiation). Hence, if (7) is true, (7) is false; and therefore (7) is false. Now, if (7) is false, its contradictory (6) is true. And, since, according to (3), (7) satisfies the relative clause of (5), it follows that, if (7) is false, (5) is true (by existential generalisation). But (7) is false. Therefore both (5) and (6) are true.

But no sentence on the pattern of (2) could even be formulated – let alone proved – in a formalised language that was constructed according to either of the two familiar proposals for analysing indirect discourse.

According to one such proposal, advocated in particular by Church, the analysans of a statement reporting someone's belief, assertion, etc. in the form of indirect discourse should be formulated in a non-extensional object language: the analysans reports a relation of belief or assertion between a person and an intensional entity like a proposition. Now, in Church's development of intensional logic intensional entities are conceived to belong in a hierarchy of successively higher orders, since the name of each such entity must have as its sense an intensional entity of higher order.³ But it seems impossible to assign the proposition that is the sense of an analysans for (7) or the proposition that is the sense of an analysans for (9) to any order whatever in such a hierarchy. For in an analysans of (7) we should quantify over a universe which, as we are told in (4), includes the sense of (8) and therefore also presumably the sense of (9) – (8)'s contradictory; so that the sense of (7) must belong to an order higher than that to which the sense of (9)" belongs. At the same time, in an analysans of (9) we should quantify over a universe which, as we are told in (3), includes the sense of (7) ; so that the sense of (9) must belong to an order higher than that to which the sense of (7) belongs. And it is impossible for the sense of (7) to belong to an order both higher and lower than that to which the sense of (9) belongs.

According to another proposal, advocated in particular by Carnap, the analysans of a statement reporting anything in the form of indirect discourse should be formulated in a metalanguage : the analysans reports a relation of some kind (the precise nature of which is still disputed) between a person and a sentence of the object-language. On this approach the hierarchy principle adopted is the language-level policy. Each symbol or formula used or mentioned in the analysis must belong to one or more distinct languages which are so constructed, and so assigned to numbered levels, that statements about the semantics of any language assigned to level n may only be expressed in a language assigned to level $n + 1$. But according to such a policy, since (4) implies that the semantics of (8) are a topic of (7), the analysans of (7) must belong to a language of higher level than the analysans of (8) and that of its contradictory (9). At the same time, since (3) implies that the semantics of (7) are a topic of (9), the analysans of (9) must belong to a language of higher level than that of (7). *I.e.*, if a normal language-level policy is to be applied in the formal analysis of statements patterned on (2), the analysans of (7) must be higher than that of (9) and the analysans of (9) must be higher than that of (7) – which is impossible. (Analogous difficulties arise if we substitute a ramified type structure for a language-level policy. For then any property designated by a function corresponding to 'A' in (2) must be both lower and higher in order than

the property designated by a function corresponding to 'B' - which is impossible. Nor would an axiom of reducibility help us at all, since it would presumably state 'To any function designating a property of any order and any type there corresponds. . . ' (whereas we cannot regard the properties in question as belonging to any order at all).⁴ There are perhaps four main ways of trying to get round this *prima facie* impossibility:

(A) We might reject any informal criterion which leads us to accept a statement like (1) as a logical truth. But this would be methodologically questionable for two reasons. First, we should not be solving any problems thereby, but simply dismissing certain problems because we cannot solve them in the same way as certain others. Secondly, the criteria, like Quine's, which lead us to accept (1) as a logical truth axe, broadly speaking, those which have always determined the subject-matter of formal logic from Aristotle's time to the present day. Someone might, of course, object that in this respect 'that' is not in the same category as the other words which occur essentially in (1) since, while they can occur in connection with any predicates whatever, 'that' can only occur in connection with predicates introducing indirect discourse, like 'testifies,' 'doubts,' etc. He might therefore maintain that (1) is not a truth of logic but merely analytic of 'that.' But such an objection would have to be backed up by the further contention that at least one of the three terms 'true,' 'false,' and 'proposition' is not to be classed along with 'and,' 'anything which,' etc. as a term of logical interest, since an analogous problem is created even if we eliminate any reference to speech, direct or indirect, from (2) by reformulating it as

- (10) If 'Any Y proposition is false' is an X proposition, and 'Some X proposition is true' is a Y proposition, then some X proposition is false and some Y proposition is true.

even if this further contention seemed plausible, so that (2) and (10) were called patterns of 'analytic,' rather than of specifically logical, truth, we should still have on our hands the problem of how to formalise such demonstrably true statements.

(B) We might agree to accept (1) as a logical or, more broadly, as an analytic truth, but regard it as too trivial a truth for us to be worried by its exclusion from a formalisation of indirect discourse. But there are at least four reasons why it would be unsatisfactory to shelter under the excuse of triviality here, even if that excuse is available in other cases, like 'If this statement is true, this statement is true.' First, enquiry among those who are not professional logicians soon elicits the fact that (1) is not self evident to every educated person. If one substitutes 'denies' for 'testifies' and 'doubts' for 'deposes,' (1) becomes even

less self-evident to many people. Secondly, we can construct an infinite number of patterns of logical (or analytic) truth much more complex than (2) which for analogous reasons are equally resistant to formalisation according to any usual hierarchy principle. Thirdly, statements like (1) express logical principles on which people stand trial for perjury and on which historians sort out conflicting testimonies in their source material. If a formal logician were to reject such principles as trivial he would abdicate the importance of his own subject over a very wide field of rational discourse. Fourthly, although recently considered problems about synonymy or equivalence are no doubt among the fundamentally important ones in regard to the logic of indirect discourse, (1) is a good deal more logically complex than some of the statements that have to be considered in connection with these problems about synonymy and equivalence.

(C) If we accept that statements on the pattern of (2) deserve analysis in our formalisation of indirect discourse we might aim to avoid adopting any hierarchy-principle that would create trouble. On the intensionalist approach we should then need (*pace* Church) to assign all intensional entities to a single order of reality: on the other approach we should need (*pace* Carnap) to assign all sentences to a single level of language. But how then could we prevent the occurrence of semantical antinomies? In the one case there would be nothing to bar a sentence like 'The proposition hereby asserted is a concept of falsehood': in the other, nothing to bar 'This sentence is false.' The best we could do would be to prohibit specifically each sentence that we know to generate a semantical antinomy. But this gives us no guarantee whatever that other such antinomies might not arise to vitiate the quality of our formalised language as a deductive system – at least if that language were as rich, and its sentences as unrestricted in length, as would be required to analyse all statements containing indirect discourse.⁵

(D) We might seek to achieve such a guarantee, despite abandoning reliance on a hierarchy-principle of any kind, by restricting each formalised language we construct to the terminology and length of sentence this language required in order to afford an analysis of some given piece of informal argumentation. If we had only to operate with a formalised language of this poverty-stricken character its vocabulary would in most cases be insufficient for the formulation of any sentence generating a known semantical antinomy. Where it was sufficient for this, we should need rules specifically banning each such sentence: and with so restricted a vocabulary and length of sentence there would be a reasonable likelihood that we should spot, and thus be in a position to bar by further specific prohibitions, any sentences generating new and unfamiliar kinds

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