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Review

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by Jaakko Hintikka

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## CRITICAL NOTICE

Jaakko Hintikka, *The Intentions of Intentionality and Other New Models for Modalities*, Synthese Library 90, D. Reidel Publishing Company, Dordrecht, 1975. xviii + 262 pp.

This book consists of an introduction and eleven essays written by Professor Hintikka approximately between 1970 and 1975. All but one of the essays is published in some form elsewhere. But more than most such collections, this one has a measure of unity and continuity. All the essays involve applications of Hintikka's semantical approach to epistemic notions. And although the book contains few major alterations in Hintikka's previously published views, reading the essays from first to last provides a good overall picture of his philosophical stance in this area. Read this way, the book does have limitations. Several of the articles largely elaborate on viewpoints more fully stated in earlier work (especially in 'Semantics for Propositional Attitudes,' 'Existential Presuppositions and Uniqueness Presuppositions,' and 'On the Logic of Perception' – all collected in Hintikka's earlier *Models for the Modalities*). There is also an unusually large amount of repetition in matters great and small. Nonetheless, the volume conveys a broad, coherent, and important viewpoint that has been applied to an admirably large number of interesting issues.

The method of this review will be to give the reader some notion of the contents of the book and then turn to a critical consideration of a few of its primary ideas. Chapter 1, 'Problems and Proposals,' argues that all constructions containing the expression 'knows,' or cognates, are reducible to the 'knows that' construction. The treatment of the 'knows how' construction is (to this reviewer) unintuitive; and the essay seems hurried – though perhaps this may be attributed to its purpose as a brief survey. 'The Semantics of Modal Notions and the Indeterminacy of Ontology,' reprinted from *Synthese* 1970, maintains that cross-identification over possible worlds is not to be stipulated or taken for granted. Hintikka further agrees with Quine in holding that, at least with the 'logical' modalities, quantification into modal con-

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texts is strictly speaking inadmissible. He holds that no object (possibly excepting abstract objects like numbers) can be reasonably traced through all possible worlds. Use of modal logic is claimed to depend on assumptions about the kinds of worlds that are contextually admissible for consideration. Quantified epistemic logic is supposed to be better off since in this domain quantification depends on tracing an object only through all worlds compatible with what the subject believes. Here, as with the rejection of stipulation in cross-identification, one feels that the issue could stand more clarification. A deeper consideration of what is at issue seems necessary to understanding how one could adjudicate between Hintikka's complex view and more common views among modal logicians. Both viewpoints can enlist at least some of our pretheoretical intuitions. Chapter 3, 'Objects of Knowledge and Belief: Acquaintance and Public Figures' discusses two methods of cross-identification based on contextual reference and description respectively. It is a compact and highly suggestive essay. Hintikka argues in 'Information, Causality and the Logic of Perception' that possible worlds analysis of the informational elements in perception is compatible with etiological conditions in the explication of perceptual statements. Chapter 5, 'Carnap's Heritage in Logical Semantics,' reprinted from *Synthese* 1973, contains an historical interpretation of the relation between possible worlds semantics and the tradition running from Frege through Carnap. 'Quine on Quantifying In: A Dialogue,' the only essay not published elsewhere, discusses Quine's doubts about the coherence of quantification into contexts governed by intensional operators. Chapter 7, 'Answers to Questions' defends the view, with various qualifications, that answers to Wh-questions purport to provide the questioner with knowledge of some particular individual. 'Grammar and Logic: Some Borderline Problems' is a rather rambling treatment of conundrums, discussed within linguistics, which hinge on the *de re* – *de dicto* distinction. In Chapter 9, 'Knowledge, Belief, and Logical Consequence,' Hintikka confronts the important problem that the most straightforward reading of the semantics of epistemic logic implies that a person believes all logical consequences of what he believes. He sketches a definition of the syntactical complexity of a

quantified sentence and maintains that a person necessarily believes all a belief's logical consequences whose derivation does not rely on sentences of greater complexity. The last two essays are historically oriented. 'The Intentions of Intentionality' takes up Husserl's view of *noema*. It argues that possible worlds semantics in epistemic logic provides an explication of the notion of intentionality which is superior to Husserl's. In 'Concept as Vision: On the Problem of Representation in Modern Art and in Modern Philosophy' Hintikka develops diverting comparisons between Husserlian and cubist concerns with perspective-free conceptual representation, and between cubist rejection of naturalistic perspective and the variations on intended interpretations characteristic of model-theoretic semantics.

There can be no question of reviewing each essay here. What I want to do is to consider Hintikka's general approach to the logical form of propositional attitudes against the background of an alternative approach. The issue must be joined on a variety of fronts, most of which I will ignore. My aim is to outline a critical viewpoint which may stimulate further discussion.

Hintikka's approach to the semantics of propositional attitudes is founded on an analogy with the analysis of necessity in modal logic. Modal logic treats 'it is necessary that  $2 + 2 = 4$ ' as having the form of the application of an operator 'it is necessary that' to a sentence ' $2 + 2 = 4$ .' Hintikka sees 'John believes that  $2 + 2 = 4$ ' as the application of the two-place operator expression 'believes that' to the sentence ' $2 + 2 = 4$ ' and the term 'John.' Semantically, modal logic explicates the truth of the necessity sentence in terms of the truth of ' $2 + 2 = 4$ ' in all possible worlds. Hintikka explicates the truth of the belief sentence in terms of the truth of ' $2 + 2 = 4$ ' in all possible worlds compatible with what John believes. I shall call this general orientation 'the possible worlds approach' or 'the operator approach.'

Hintikka's orientation to the syntax and semantics of propositional attitudes contrasts with a more traditional line, first expounded within a modern semantical system by Frege. According to this older approach, one treats the relevant belief sentence as having the form of an application of the predicate 'believes' to two terms 'John' and

'that  $2 + 2 = 4$ '. The truth of the sentence is explicated in terms of John's standing in the relation of belief to the proposition that  $2 + 2 = 4$ . My word 'proposition' here is something of a catch-all expression. There are a number of options for explicating it which are available within the traditional approach that I shall be calling 'Fregean'. Frege himself treated that-clauses as denoting abstract, language-independent *thoughts*, whose components were senses expressed (sometimes contextually) by linguistic expressions. Others have taken that-clauses to denote sentence types or tokens. There are various other possibilities: subjective psychological entities, and a variety of non-Fregean abstractions. I will not be distinguishing among these options in what follows. Needless to say, a genuine theory along 'Fregean' lines must do so.

The traditional approach provides an immediate response to certain simple linguistic facts. For example, from our earlier mentioned belief sentence and the premise that the most frequently cited truth of arithmetic is that  $2 + 2 = 4$ , we commonly deduce that John believes the most frequently cited truth of arithmetic. The Fregean view represents the deduction as a simple substitution of identity. But since the operator approach does not recognize a singular term, or noun phrase, in direct-object position within propositional attitude sentences, this simple representation is not available. More generally, it is undeniable that the sentential expression in propositional attitude sentences is dominated by a noun-phrase. Some propositional attitude sentences (for example, the conclusion of the argument we just gave) do not even have a sentential expression embedded in the direct object of the verb. Perfectly ordinary deductions hinge on this syntactical fact.

A related point to which the Fregean approach gives a natural response is quantification onto the direct object position. From our original belief sentence, we deduce that John believes something: apparently a simple matter of existential generalization. The operator approach does not seem to provide one with an immediately attractive basis for explaining the deduction. One might suggest (though Hintikka does not) some version of substitutional quantification, according to which one can existentially quantify if the operator

produces a truth in syntactically applying to a sentence (e.g., ‘ $2 + 2 = 4$ ). But such a suggestion does not seem plausible for the general case, since it would seem at least *prima facie* possible to talk about someone’s belief quantificationally even if one did not have the resources to express the belief in one’s own language.

In both of these cases, the Fregean approach provides a natural explanation of a class of deductions where the operator approach *prima facie* lacks the resources to deal with the problem in a straightforward manner. I do not doubt that some of these facts can be accommodated. But I doubt that the accommodation will be satisfying or simple in comparison to the explanation afforded by the traditional view.

In previous writings, Hintikka’s remarks about the traditional approach have been rather sparse. But in the present volume, he gives Frege serious attention, particularly in the historical essay, Chapter 5. Hintikka’s repeated comparison and contrast between his own use of the notion of a world line – a function from possible worlds to individuals – and Frege’s notion of a sense seems to me to be illuminating in thinking about the two approaches (as well as helpful in providing some grip on Hintikka’s sometimes confusing views on quantification within epistemic logic).

Hintikka believes that his own approach captures the essential insight in Frege’s notion of sense, an insight that Frege did not himself grasp. Frege explains senses as thought components that constitute abstract *ways of an object of reference’s being given* to a thinker. Hintikka hopes to turn this explication directly to the advantage of possible world semantics:

Now the functional dependence which this phrase “way of being given” clearly means can – and must – be spelled out by specifying how the reference depends on everything it might depend on, which in the last analysis is the whole possible world we are dealing with. . . . Here, possible world semantics therefore follows as closely as one can hope in Frege’s and Carnap’s footsteps. I cannot but find it very strange that it apparently never occurred to Frege that to speak of “die Art des Gegebenseins” is *implicite* to speak of a functional dependence of a certain sort. There does not seem to be an inkling of this idea in his writings. (p.80)

This interpretation seems to me to have an insight but also to be deeply misleading, both historically and substantively.

The passage is misleading historically because there is ongoing

work on propositional attitudes (most obviously, that of Church) that in numerous ways—some mentioned previously, some to cited below—follows far more closely in the footsteps of Frege than Hintikka’s approach does. The passage is substantively misleading because it suggests that “way of being given,” by the very meaning of the phrase, must be interpreted as indicating a function from something like possible worlds to individuals. But this is not so. We can think of a road map as a way in which a terrain is given to a person. Similarly, visual images, or traditional concepts, or Fregean thought components, or interpreted linguistic expressions might be seen as ways in which an object of reference may be given to a thinker. None of these need *be* (or be sloppy ways of talking about) functions of the sort Hintikka has in mind. (Actually, some Fregean thought components are functions and some are not; but those that are are functions from thought components to thoughts, or to other thought components.) In Frege’s system referents are functionally dependent on senses only in the sense that there is a function from senses, or ways of being given, to referents. This function is that of *being a concept of*. It is the analog of the function of denotation which maps *expressions* onto their referents. Frege’s theory does not appeal to something like possible worlds as arguments for functions because it does not need to do so. It is a different kind of theory.

Hintikka’s remarks do, I think, suggest an insight that one does not find in Frege. If one has mastered a sense, then one can conceive of how it would apply if the world were in certain ways different from the way it is. This seems to me to be an important idea. But one cannot take for granted, as against Frege, that the idea provides the key to a formal semantics for propositional attitude notions. It is, I think, an idea that can be expressed and developed within a Fregean system.

Hintikka’s critical comparison of possible world and Fregean approaches to propositional attitudes rests on two primary issues—the conditions for substitutivity and the conditions for existential quantification in propositional attitude contexts. I do not think that these are the only bases for choosing between the approaches. In addition to the issues mentioned earlier, there are questions about

embedded contexts, epistemic paradoxes, expressive power, ontological commitment, susceptibility to treatment within a standard unrelativized theory of truth, conservation of logical theory, explanatory power of overall semantical theory, and so forth. But the questions of substitution and quantification are certainly fundamental, and I shall spend the remainder of this review discussing Hintikka's treatment of them.

Hintikka argues that "possible world semantics conclusively shows the insufficiency of a semantics based solely on the distinction . . . *Bedeutung-Sinn*" (reference-sense) (p. 86). The purported demonstration seems to involve two stages, dealing with substitution and quantification respectively, with the emphasis on the latter. The argument concerning substitutivity (85, 87–8) is that identity of sense of two individual expressions is not a *necessary* condition for inter-substituting the expressions in propositional attitude contexts. On the Fregean view, identity of (customary) sense is the criterion for exchanging expressions in (unembedded) belief contexts. Within Hintikka's semantics, on the other hand, two expressions are interchangeable in discourse about a particular person's, *a*'s, beliefs if and only if they pick out the same individual in all possible worlds compatible with what *a* believes. For the identity of references of two terms in these worlds means that *a* believes the identity statement involving the two terms. And this belief insures that the terms are interchangeable, provided that *a* is consistent and (what Hintikka does not mention) perfect at drawing those logical consequences of his beliefs which are based on substitutivity of identity.

I find this argument for the superiority of Hintikka's approach over the Fregean approach on the matter of substitutivity unpersuasive. In the first place, a great deal hinges on what one means by "necessary condition for substitutivity." Hintikka is obviously right in holding that we may often exchange, within the *that*-clauses of propositional attitude reports, expressions with different senses (intuitively speaking) and even different denotations, without altering the truth value of the reports. If *a* believes that Paris is the capital of England, the two terms will be interchangeable in many of our attributions of belief to to him, *salva veritate*. But there is a question about whether this fact must be included in a semantical representation, or a logic, of propositional attitudes.



Let us consider a crude analogy within a purely extensional semantics of ordinary extensional discourse. In such a theory it would be customary to hold that individual expressions are 'intersubstitutable' if and only if they denote the same object. For example, in the sentence '5 is a prime predecessor of 11,' we can substitute for '5' any expression that denotes the same object, say, the expression '10 divided by 2'. Imagine someone who held that identity of denotation with '5' is not a "necessary condition for substitutivity." He might point out that '2', '3', '7' would also substitute for '5' *salva veritate*. He might go on to say that this point is generalizable. In the context, 'x is a prime predecessor of y,' one can substitute for the term in the position of 'x' any singular expression that denotes a number which is divisible evenly only by 1 and itself and is numerically smaller than the object denoted by the term in the position of 'y.' (The example, of course need not come from mathematics.)

Now it would be quite reasonable to question the level of generality at which this person had chosen to construct his semantics. But what is more important for present purposes is that he would have failed to provide a plausible objection to the standard extensional criterion of substitution. For the standard criterion is supposed to apply purely on the basis of a) the semantical relation (co-denotation) between the potentially exchangeable terms and b) the extensional nature of the relational predicate. There is perhaps nothing apriori sacred about this conception of substitutivity. But it has proved powerful and is certainly traditional. The criterion offered by the objector depends for its application on one's using information about the other term (y) of the relation and on the meaning of the particular relational predicate. Loosely speaking, applying the criterion depends upon arithmetical facts about the prime predecessor relation. The standard view would be to treat the arithmetical generalizations as postulates independent of those of the semantical theory.

Hintikka's objection to the Fregean theory bears some resemblance to the objection to extensional semantics just considered. Hintikka's own semantical proposal is certainly set at a more interesting level of generality than the arithmetical proposal. His basic method does seem

to carry over to all propositional attitude predicates (although it yields different substitutions for different propositional attitude predicates and different people). My present point is not to object to the level of generality on which he operates. The point is rather that the Fregean theory is couched at a different level, and one that can hardly be rejected out of hand. Applying Hintikka's criterion of substitutivity requires one to have information about the person that has the propositional attitude and about the meaning of the relevant propositional attitude predicate. Different substitutions will be countenanced for different cases. The Fregean approach is aimed at a criterion of substitutivity that yields uniform substitutions regardless of who the person is or what the attitude is. This aim is roughly speaking (the issue is really somewhat more complicated) continuous with the aims of extensional semantics. Hintikka gives no reason to think that the aim is misconceived or theoretically undesirable.

From the point of view of the Fregean approach, the substitutions that Hintikka demands be accounted for, but which do not depend on identity of sense, depend on special psychological facts about the particular person involved and do not have to be treated in a semantical theory. For example, on Hintikka's view, if a person believes that grass is green and that snow is yellow, the two sentences are 'intersubstitutable' in his truth-functional beliefs. But one might well hold that the generalizations this example suggests should be seen as broad postulates included in cognitive psychology, but dispensable in a logic or semantics of propositional attitude discourse. For example, if a person believes  $p$  and believes  $q$ , then if  $p$  and  $q$  are simple, they will (probably) be intersubstitutable in the person's simple truth-functional beliefs. Similar probabilistic generalizations are plausible for exchange of singular terms when the person believes the identity statement formulated with the two terms, and for other simple logical transformations among his beliefs.

I place no special weight on whether one segregates such broad postulates off into cognitive psychology narrowly so-called, or includes them in one's semantical theory. One could simply add the postulates to a Fregean theory. Given the appropriate idealizations (or the ap-

propriate probabilistic qualifications), one would thereby provide a notion of substitutivity additional to the classical one. Such additions would in no way change the underlying principles of the theory.

A further point worth noting in Hintikka's substitutivity criterion is that it depends on two idealizations not invoked in the Fregean notion of substitutivity. To apply Hintikka's criterion of substitutivity one *must* assume that people are consistent and have a certain logical consequentiality, at least as regards substitution of identity. But people are notoriously inconsistent and inconsequent. So there is some reason to think that the Fregean criterion is less limited in its applicability in the sense that it does not require these idealizations.

The issue of substitution has another aspect that deserves attention. In discussing Carnap's theory, Hintikka observes that Carnap was concerned with the problem that logically equivalent expressions, or expressions equivalent in all state descriptions, are not generally substitutable in propositional attitude contexts. Hintikka forthrightly admits that the problem is "not automatically solved by possible world semantics, but remains a problem there" (85). The problem of course, is that if one attempts to give a semantics for *a*'s believing that \_\_\_ in terms of the truth of '\_\_\_' in all possible worlds compatible with what *a* believes, it follows that *a* believes all logical consequences of what he believes, and believes (if anything at all) all necessary truths and no necessary falsehoods. A few philosophers have been willing to swallow these consequences. But I shall assume here (what Hintikka accepts, pp. 123–4, 179–182) that they are unpalatable. Thus some restriction needs to be placed on the possible worlds idea in its application to propositional attitudes.

Two main strategies for establishing such restrictions are syntactical and semantical. (If the syntactical is used, it must of course be complemented by the semantical). The former follows in the direction of Carnap's intentional isomorphism idea in placing restrictions on derivations between belief in \_\_\_ and belief in logical consequences of \_\_\_. Hintikka develops this sort of strategy in Chapter 9. This paper is careful, sophisticated, and repays reflection. But it also seems to illustrate how hard it is to find a natural and persuasive level of idealization on which to found a logic of propositional attitudes.

Hintikka is appropriately dissatisfied with the most pat defense of the unpalatable consequences – a defense to the effect that “some idealization is necessary in doxastic and epistemic logic: we cannot get a consistent system and at the same time take account of the vagaries of infants or idiots” (180). Idealization in philosophy, like security in national affairs, can be used to cover almost any monstrosity. Hintikka’s dissatisfaction begins with the point that even the best mathematician cannot see all the logical consequences of the axioms he studies. What is it about the consideration of mathematicians that gives this point punch? The issue is subtle and difficult. At the least sophisticated level, it is that such failures are compatible with paradigm cases of normal, rational human cognitive behavior. Hintikka sees the point as deriving from the issue of when a man can be said to *understand* the meanings of his symbols. Mathematicians understand their axioms, even when they fail to draw all necessary consequences of them. But sufficient understanding is supposed to guarantee certain deductive inferences, on Hintikka’s view, if not others.

In perfectly ordinary cases, I think, we do count people as believing things that they do not fully understand. An adequate semantical representation of belief sentences must deal with these cases. But in and of itself, an idealization requiring understanding as a necessary condition for ‘belief’ is perhaps not an unreasonable one if one is interested in constructing an idealized ‘logic of belief.’ The trouble is, of course, that the notions of understanding and meaning relied on in this sort of idealization are themselves unclear and extremely subject to dispute.

Hintikka takes the only possible line, having come thus far: We must postulate an idealized notion of understanding. The aim of such idealization is to produce “an interesting theoretical model of people’s ‘deductive behavior’ which facilitates the description and analysis of the inferences they draw as well as failure to draw certain inferences” (p.182). Hintikka compares the aim here with the model of maximizing expected utility, a model which has furthered theories of human behavior, even though few if any people behave fully in accord with the model.

Hintikka's proposed syntactical restrictions on attributing to a person belief in the logical consequences of his beliefs seem to this reviewer to have significant intuitive drawbacks. In the first place, they do not seem to be based on an independently motivated notion of understanding. Hintikka does define a notion of understanding according to which if a person understands his belief, he believes the consequences which accord with the syntactical restriction: "Surely the most concrete sense imaginable of understanding what a first-order proposition  $p$  says is to know which sequences of individuals in which combinations one can expect to hit upon if it is true – sequences no longer than those already considered in  $p$ . Now this is just what the distributive normal form of  $p$  (at the depth of  $p$ ) spells out as fully as possible" (189). The notion of understanding seems tailored to the restrictions rather than vice-versa. Anyone who has worked with distributive normal forms must admit that there are quite ordinary senses of 'understanding' according to which one frequently understands the meaning of two formulas without having yet realized that their distributive normal forms are the same, or equivalent. Perhaps in such cases we are also inclined to say that in a certain sense we did not understand the full meaning (or implications?) of the formulae. But we are equally ready to say this in numerous cases not covered by Hintikka's restrictions: for example, cases which depend on reasoning in the propositional calculus, or cases using fundamentally different methods of proof from distributive normal forms, or deductions which are complex because of their length rather than because of the complexity (in Hintikka's sense) of individual formulae occurring in them. And there is the matter of mathematical reasoning, most of which is not touched by the proposal.

Of course, it is not to be forgotten that the relevant notion of understanding is admitted to be idealized – and no doubt only a first step. I am inclined to think, however, that syntactically oriented explications of what consequences of his beliefs a person necessarily believes inevitably carry an air of the arbitrary – particularly in the absence of relatively detailed empirical knowledge of uniformities in what counts as complex and what counts as simple for different people. The tactic of facilitating the acquisition of such knowledge by

erecting, then criticizing and refining idealized restrictions may remain a reasonable one. But if one takes this tack, one must look forward, I think, to a long series of progressively weakened idealizations.

The other strategy of restricting the possible worlds approach so as to avoid attributing all logical consequences of a belief is a semantical strategy. Hintikka makes references to incomplete work in this direction, and admits that the problem remains difficult. But what is needed in any case is the appeal to impossible worlds, or less paradoxically, intensional (or quasi-intensional) notions that characterize a person's beliefs, but which cannot be combined to form (express, characterize) a genuinely possible world (pp. xiv–xv, 123–4).

The need to make this sort of move comes as no surprise to someone working in the Fregean tradition. For Frege postulated logically equivalent but distinct senses and thoughts precisely because of the fact that one might, even reasonably, believe one thought and fail to believe a logically or mathematically equivalent thought. I think one can begin to see here some of the appeal of the Fregean approach. The notion of proposition – in our catch-all usage – must be understood so as to be sufficiently fine-grained to be capable of representing all possible differences in belief, even those that do not correspond to objectively separable possibilities. Fregean semantics is directly fitted to handling the problem of substitutivity. This appeal can be formulated more provocatively: Granted that in order to give a credible account of propositional attitudes, one must invoke something approximately as fine-grained as 'propositions' even on the possible worlds approach, it would seem more straightforward to drop out possible worlds as a primitive idea. Objective *possibility* is not a refined enough notion to distinguish among different belief contents. Different belief contents may be equally impossible or equally necessary. Not *worlds*, but smaller scaled entities – playing the role that senses and thoughts play in Frege's system – seem to be the crucial elements in a semantics for propositional attitudes. Of course, these entities might be used to recapture at least formal analogs of possible worlds. But the semantical theory would center on the 'propositions' and their components.

These considerations suggest that the Fregean approach has a

*prima facie* advantage in dealing with the problem of substitutivity in propositional attitude contexts. It need not carry around the baggage of an intuitively inadequate possible worlds idea. It also is not pressured by its underlying semantical notions into making idealizations about people's consistency or consequentiality that are not independently motivated. Nor will the problem of instituting special syntactical restrictions arise. 'Senses' are postulated so as to be distinct when substitutivity is not logically guaranteed. (Broadly speaking, they are possible thought components.) Substitutivity of identity remains the key to the syntactical system. This point suggests advantages in conserving a simple and powerful logical theory, avoiding the sorts of special restrictions that are beginning to mount up in Hintikka's approach.

Of course, idealizations are always open to someone taking the Fregean line. Even for those taking this line, there is perhaps much to be said for joining Hintikka in the attempt to find an appropriate notion of understanding for explicating an idealized concept of belief, according to which a person 'fully understands' all his 'beliefs.' Such concepts might be used in idealized models of human reasoning – 'logics' of belief, knowledge and so forth. On the other hand, there seems to be every reason to pursue also a semantics for belief that does not assume even this sort of idealization. Formal work on propositional attitudes can be used as a means of representing our present mentalistic concepts as well as a method for stimulating new applications of them.

The second stage of Hintikka's argument against the Fregean approach fixes on the issue of quantification. The argument is as follows. In order to account for the failures and successes of existential generalization in intensional contexts, we have to be able to cross-identify – we must be able to say of a member of one possible world that it is or is not identical with a member of another. There are intensional entities (Hintikka assumes contrary to Frege that they are functions and calls them 'individual concepts') that pick out individuals in the various possible worlds. A proper subset of these entities will pick out the same individual in all possible worlds. Call these latter 'individuating functions.' In an explicit semantics, these

individuating functions, or restrictions of them to certain sets of possible worlds, are the main ingredients for giving the truth conditions for quantifications into intensional contexts. But the individuating functions cannot be defined in terms of individual concepts. Give or take a few qualifications, the Fregean approach only recognizes the individual concepts. Thus it cannot give an adequate explication of the truth conditions of sentences that involve quantification into intensional contexts. Hence the Fregean system is 'seriously incomplete' (89–90).

This argument seems to me to be highly questionable, and certainly not conclusive as Hintikka claims (86). In discussing the argument I shall accept the assumption that quantifications into that-clause contexts at least sometimes make literal sense—an assumption some Fregeans, including Church, deny. (I side with Hintikka on the point.)

To begin with, even if the argument were entirely sound, the seriousness of the incompleteness that it demonstrated would be dubious. In a semantics for belief sentences, the Fregean might seek special causal or contextual pragmatic conditions that justified 'quantifying in.' A project of this sort within a general Fregean framework is illustrated by Kaplan's 'Quantifying In.' The causal or pragmatic concepts needed seem no more foreign to the Fregean approach than the causal and pragmatic concepts that Hintikka invokes to limit the set of relevant possible worlds or to explain a method of cross-identification appropriate to an epistemic notion (Chapters 3 and 4). In fact, Kaplan's move and Hintikka's are parallel. Both illustrate pragmatic restrictions on traditional semantical concepts.

But Hintikka's argument can be questioned at a prior point. The Fregean approach to propositional attitude sentences is based on the hypothesis that the failures of substitution in (surface) natural language are evidence for a referential equivocation between occurrences of terms in identity contexts and occurrences in intensional contexts. The failure of existential generalization receives an analogous explanation. Now the most natural way for the Fregean approach to accommodate successes of existential generalization on terms within the that-clauses of natural language is to see the terms in such cases as functioning (at least partly) to refer to the same object they



would refer to in an identity context, not merely to senses or propositional entities. According to this idea, no pragmatic or causal statements need to be invoked to restrict existential generalization. Viewed as a rule of logic, the transformation is unrestricted (except perhaps by ramification conditions). If this idea is correct, – and I think that it is – then Hintikka’s argument against the Fregean approach is unsound. One does not need, in the Fregean semantical system, to distinguish between ‘individual concepts’ and ‘individuating functions’ to explain the success of ‘quantifying in.’ Such a distinction would be crucial only within the possible worlds approach.

Two objections frequently raised against this idea (though not by Hintikka) can be set aside. One objection is that many occurrences, in natural language belief contexts, of terms on which we intuitively want to existentially generalize do not seem to be purely referential. The subject is said to believe something *of* a given entity, but he is represented as conceiving the entity in a particular, specified way. This sort of problem has been handled within the Fregean framework by construing the relevant occurrences of terms in belief contexts as doing double duty. They referentially pick out an entity of which the believer holds his belief. But they also indicate a way in which the entity is given or presented to the believer. These two functions are granted distinct representations in the logical form of the sentence: For rough example, *a* believes of the *F* that the *F* is *G*, where ‘the *F*’ is the two-faced term. (For more on this point, see my ‘Belief *De Re*,’ *The Journal of Philosophy* 74 (1977), and references cited therein.)

A second objection is perhaps hinted at by Hintikka (pp. 89–90, 111–112), and I have often heard it pressed informally. If one accounts for successes in existential generalization by construing the relevant terms as having a transparent function (and accounts for failures by taking the terms to have oblique reference to ‘proposition’ components), then one has done nothing to illuminate the philosophically interesting differences between *de re* and *de dicto* attributions. This point should be granted. But it does not constitute an objection. Anyone taking the line I have suggested has not thereby avoided the philosophical problem of characterizing the conditions under which a subject has *de re*, or *de dicto*, beliefs. One will still want

a philosophical explication, insofar as one is possible, of when terms in natural language that-clauses retain their customary referents and when they take on propositional denotations. But there is no reason to think that the Fregean is at any particular disadvantage in providing the relevant pragmatic explication. It simply does not affect transformation rules in his formal semantical or logical theory. To develop an objection here, one must give some reason for thinking that the philosophical explication should be built into the transformation rules of the formal theory.

Many philosophers with a formal bent have taken on the task of couching philosophical problems, insofar as possible, in terms of problems in formulating various intensional logics. This practice has the effect of making one's logic at least as controversial as the philosophical problems one is dealing with. Whether a given restriction on a transformation is correct hinges on the outcome of a specifically philosophical debate. I do not want to object *a priori* to going about things in this way. I think, in fact, that the strategy has provided some illumination. But I do claim that such an approach provides no clear reason against following the alternative, Fregean line. From the Fregean vantage point, philosophical problems are seen as bearing on the application conditions of (possibly complex) predicates – not on formal transformations in one's logical theory. There is a sense in which, even from this viewpoint, the philosophical problems are semantical. They are certainly no less philosophically relevant. We still want as precise and clearly formulated an account of the application conditions as can be found. But these issues do not infect logical transformations in the Fregean approach to propositional attitudes. In effect, this is another version of the point about level of generality we made earlier.

In a passage distinct from (and not explicitly related to) his main argument against Frege, Hintikka considers the sort of approach to quantification in belief contexts just adumbrated and offers an argument against it (Chapter 6, pp. 107–110). Hintikka presents the argument by reference to a variation on Quine's durable Orcutt example. There is a certain man in a brown hat whom Ralph knows to be a spy. There is also a gray-haired man, Orcutt, known to Ralph as a

pillar of the community, whom Ralph is not aware of having seen except once at the beach. Though Ralph does not know it, the ‘two’ are one. Now suppose that the Fregean approach (a version of which is sketchily and half-heartedly set out by Quine) holds

- (1) Ralph knows ‘ $x$  is a spy’ of Ortcutt.

Ralph knows of Ortcutt (the man in the brown hat) that he is a spy, though he does not know that the spy is Ortcutt. From (1), there follows by unrestricted existential generalization:

- (2)  $(\exists y)$  (Ralph knows ‘ $x$  is a spy’ of  $y$ ).

But (2) is the only serious candidate for

- (3) Ralph knows who is a spy.

And in terms of the story, (3) is not true.

I think that this is infirm ground for a purportedly conclusive argument against the Fregean approach to come to rest upon. Someone taking such an approach may simply find another reading of (3) besides (2), denying that (3) is a necessary condition for the truth of (2) or (1). We can well imagine Ralph, an FBI agent, saying to his newcomer companion as they stalk the man in the brown hat: “We know someone to be a spy – it’s the man in the brown hat there – but we don’t yet know who he is.” This would seem to be a clear case of *de re* knowledge or belief, the sort of knowledge represented by (1) and (2). But it does not involve the truth of (3), in Hintikka’s sense. Although ‘knowing who’ is frequently pragmatically implicated in *de re* attributions, it is not a necessary condition for *de re* knowledge.

Whether ‘knowing who’ is in any important sense a sufficient condition for *de re* knowledge is a complicated question that I shall not try to answer here. But if the answer were affirmative, it would be because ‘knowing who’ carries with it the sort of pragmatic conditions in terms of which we must understand *de re* attitudes – conditions governing the *de re* paradigms: perception and demonstrative reference. Again, these conditions are philosophically important. But they do not restrict logical transformation in Fregean semantics.

On Hintikka’s view, “to know who John is is not to know certain

particular things about him, but to know enough of him and his behavior in space and time – enough that is to say, to recognize his manifestations in all possible worlds compatible with what I know by tracing them back to where I know John has been at the time” (pp. 131–132). Even within the possible worlds framework, this explication does not seem intuitive. It would seem one could know who *a* is without being able to trace him in space-time to any particular spot; and it would seem that quite exhaustive knowledge about a person’s spatiotemporal history might not be sufficient to enable one to know who he is.

Hintikka seems to do more toward illuminating ‘knowing who’ in his essay on questions (Chapter 7). This essay is committed to the complex of ideas about quantification, tracing, and knowing-who which I have been criticizing. But it also makes a number of points – some in the nature of qualifications on the major thesis – that emphasize the extremely contextual character of ‘knowing who.’ For example, Hintikka notes that giving a person’s name may not be enough to answer a question ‘Who is he?’ – since that information may not be sufficient to establish the properties or information *essential to the questioner’s purposes* (148). Hintikka also cites a range of cases where answering a ‘who’ question may not even approximately establish the ability to cross-identify. (He calls such cases ‘partial answers.’) All of these cases can be seen in terms of providing or having sufficient information to meet contextual purposes. For example, knowing who Titian is may in one context be to know that Titian was an Italian painter – or in another context to know a few facts about his biography that serve (perhaps contingently, even relative to one’s beliefs) to distinguish him from other painters of his period. There also seem to be cases in which the ability to cross-identify in Hintikka’s sense is not sufficient for ‘Knowing who\_\_\_is.’ For example, within a narrow context of inquiry, knowing who Titian is may be to be capable of characterizing the most singular and essential elements of his aesthetic achievement or his psychological makeup. But one may be able to cross-identify Titian via other notions without being able to produce these characterizations. There may also be different contextual conditions governing ‘know-

ing who—is' depending on whether a name, a demonstrative, or a description fills the blank. I think it at least an open question whether, even within the possible worlds approach, cross-identification is the key concept in understanding 'knowing who.' One might think instead that fulfillment of contextual purposes (which may or may not coincide with cross-identification) is the core concept. If it is, then it would appear a mistake to formulate sufficient conditions for *de re* knowledge in terms of knowing who.

I have tried to show that the Fregean approach resists Hintikka's direct objections. I have further cited a number of advantages it holds over the approach Hintikka espouses. My aim here has not been to exhaust the issues between the two approaches. Indeed, the exact extent of their rivalry is not yet as clear as one would like. It has rather been to try to indicate that the Fregean approach, in the broad way I have been representing it, is a powerful alternative to Hintikka's program.

In concentrating on Hintikka's discussion of Frege, I have not conveyed the complexity and interest of many of Hintikka's own views. In both substance and range, they present a challenge to anyone who wishes to think hard about propositional attitudes.

The book is well edited and contains a useful index.

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