

ANTIREALISM/REALISM OF HINTIKKA'S GAME-THEORETICAL SEMANTICS

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Hintikka's game-theoretical semantics (GTS) is presented as an anti-Tarskian semantical approach to the context-dependent fragments of English, which overcomes the usual notion of semantical realism. Analysing Hintikka's critique of Tarski's interpretation of the truth-conditional theory of meaning, its recursive fashion and the narrow notion of realism, Hintikka's basic conception is presented in the following manner:

1. the Context-Principle vs. the Frege Principle,
2. First-order logic together with higher-order logic vs. the primacy of first-order logic,
3. verificationist/falsificationist theory vs. Taraski's narrow truth-conditional theory.

Comparing some reviews of Hintikka's GTS (M. Dummett, E. Itkonen, E. Saarinen, M. Hand) with a short examination of the antirealist/realistic controversies by C. Wright and M. Dummett, the following was reached:

Hintikka's GTS introduces a new, more extended notion of realism, which embraces Taraski-type realistic semantics, Hintikka's GTS and with this the question of the possibility to also include Dummett's neoverificationism or other orientations, remains open.

Hintikka's game-theoretical semantics (GTS) is an anti-Tarskian approach to natural language. It has been applied to some context-dependent fragments of English, illustrated with examples in Finnish too. A. L. Blinov, the Russian logician, used such examples translated into Russian (1978). So far GTS has not been applied to other languages.

The origin of Hintikka's GTS is the mathematical theory of games and Wittgenstein's language-game idea. Blinov presented, after Hintikka, the first source in the simplest and clearest way (1983), and the second source has been presented by Hintikka himself (1971).

Since Tarskian semantics, used for English by Davidson and Montague, was, so called, realistic semantics, it is natural to expect Hintikka's semantics to be antirealist. Indeed, M. Dummett (1976), E. Saarinen (1979) and Hintikka's exstudent M. Hand (1985) think that Hintikka's conception is verificationist/falsificationist, a conception which is believed antirealist, by, for example, C. Wright (1980), Hand (1984) etc. In this paper I wish to suggest a different interpretation.

It is well known that Tarski's realism is grounded on Frege's first-order semantical paradigm, i.e. on his compositionality principle (Componential Principle), or in short, the Frege Principle. Hintikka's books and articles were famous for being the sharpest critique of the Frege Principle.

I

Let me briefly review Hintikka's criticism of Frege. Hintikka first dealt with Frege's distinction sense/reference (1969a), later claiming the semantical insufficiency of such a distinction (1973). He first paid attention to the Frege Principle in 1975(1975). From then on Hintikka raised many objections against the Frege Principle (1979 a, 1981 a, 1983 b), but especially in his article on Frege (1984). Hintikka thinks that the only counterpart to Frege-Tarski-Davidson-Montague's »cornerstones« of semantics, i. e. the Frege Principle, is his new semantics (1984). He admitted that in abandoning deep-structure semantics Transformational Grammar gave up the Frege Principle, but that his game-theoretical semantics however gives up both, the Frege Principle and Tarski's C method (1981 a). Hintikka thought, that many philosophers of language believe in the Frege Principle, because they believe in extensionality, but the claim for extensionality is possible without such a principle (1981 a). The Frege Principle pushes the semantical analysis from inside-out into a sentence (1975), which privileges the discovery of context-independences, which was the common insight of Davidson, Montague and partly of the generativists too (1978 a), but it is not applicable to context-dependences (1975), which dictate the direction of semantical analysis from outside in (1981 a). For the Frege Principle in the semantics of natural language there is no hope, because natural language sentences can not always be analyzed into components with isolable meanings; we cannot hope to find such context-dependences in general that would enable us to carry out semantical analysis of a sentence from inside out (1983 b). Hintikka promoted this analysis which he strengthened with an other Fregean principle, the Contextual Principle, which he presented as following: »If the meaning of e depends on the context E(e) in which it occurs, the meaning of E(e) cannot be analyzed from inside out.« Because its meaning depends on context, it is outside (1981 a). In Hintikka's opinion the branching quantifiers in formal and natural languages are the best examples of the failure of the Frege Principle (1983 b) and the famous any-thesis is the main argument against it (1975). The general form of any-thesis is: »any« is acceptable in a certain context X — Y if and only if the replacement of »any« by »every« in X — Y changes its semantical interpretation. The example is: »Any man can become a millionaire« is true if and

only if any man can become a millionaire. The quoted »Any« is universal while the second (unquoted) »any« has as its preferred reading the existential quantifier (1975). So, the biconditional cannot be true in general, but it depends on the context. The second Frege principle is extensional too; Hintikka explicitly emphasized the extensional claim — with game rules for quantifiers (Ex), (Ux) the players must search for and find suitable individuals in the 'world' (1971, 1976 d). Hintikka allows the Frege Principle in computerized languages. Moreover, it remains in some even non-extensional contexts, as in possible-world semantics. He does not abandon the Frege Principle as a whole, but only its general use (1981 a). M. Hand is correct in writing, that in game-theoretical semantics the »compositionality in its strongest form« is not used (1984); or better, the extensional claim, characteristic for the Frege Principle, is legitimately put forward by the other principle, the Contextual Principle, but the claims must not *eo ipso* mean the standard, Tarski-type realistic approach.

Hintikka's critiques of the Frege Principle, of course, are connected with the objections which he put to Tarski-type realistic semantics, to its truth-conditional theory of meaning, to the recursive truth-definition and to the very notion of realism. Answering Peacocke's objections that the game-theoretical semantics fixes nothing not already fixed by truth-conditions (TC), he explained that recursive truth-definition cannot capture context-dependences while game-theoretical semantics can (1978 a). He has shown the failure of (TC) when applied to quantificational sentences, to English questions (1974), to anaphoric and deictic sentences (1976 a), to conditionals (1979 c), even to formal languages that are »bottomless« (1981 a, 1984). For the first failure we have seen the example of »any« sentences, which reveals that Tarski's schema is only half true (1976 b). In GTS the sentence, if it is true, is verified by one player (Myself) following the game rules, while, on the other hand, if it is false, the other player (Nature) falsifies it (1971). So, verification/falsification becomes the other approach to truth-condition, which Hintikka calls the »realistically understood move« (1974). In that sense he refers to verification/falsification several times (from 1968 a, b up to 1984). This aspect of GTS deserves separate treatment — and we will call attention to it later in our conclusion.

II

Let us now turn to the issue of realism. Criticizing Tarski's semantics in connection with the name 'realism', Hintikka accused it of not being realistic enough; reality can not be compared with the sentence directly, at a glance (1969 b), 1979 b), but »step by step« (1969 b). With the game rules the transaction with reality is more successful (1969 a, b).

The products of the constructions which are obtained by the long process of introducing one by one the game rules immediately correspond to reality and such a linkage to reality Hintikka considered »no longer very realistic« (1969 b), obviously thinking of Tarski-type realism. But Hintikka does not reject the term 'realism', neither the truth-condition, nor recursivity.

The term 'realism' and the truth-conditional approach enter the notion of GTS through Wittgenstein. It is obvious that Hintikka thinks that Wittgensteinian picture-view is not foreign to semantical realism such as model theory (Frege-Tarski) and that model is one step which can lead to the next, characterized by the other important Wittgensteinian notion, the language-game. He explained the picture-view as a truth-conditional approach which holds for the true sentences as the isomorphic representations of reality (1969 b). Then Hintikka extended such a picture-view to quantificational theory considering model sets as logical pictures of the world which are isomorphic representations of parts of the world (1969 b). So quantificational sentences are not themselves 'pictures' of reality, but certain model sets representing it which are verbal descriptions of certain logically possible states of affairs, or partial pictures of the same states of affairs (1969 b). The constructions of model sets for sentences show what the world is like when a sentence is true (1969 b). Following Stegmüller, Hintikka changed the Wittgenstein-Stenius picture-view (1976 m) and admitted the similarity between Wittgenstein's picture-theory and logical model theory (1976 c). That is the reason Hintikka does not refuse the theory of pictorial (isomorphic) relationship (1976 c). Hintikka thinks that the general idea of model theory is one of freely varying the representational relationship between language and reality (1972—1974), but he claims that realistic semantics has not offered a satisfactory account on this freely varying relationship (1976 c). So, the idea of language-games deprives the picture-theory of its primacy, the fundamental link between language and reality is no longer a pictorial relation, but language-activities (1976 b, c). The activities are not the natural relations, but human activities and institutions (1971), which are the bridge between language and reality, the link between language and reality (1976 c, 1978 b, 1983 c). But Hintikka refutes the notion that such human activities are social (1976 c). Such linking activities he considers constructed as games in the strict sense of the mathematical game-theory. They are 'semantical games' on which semantics is grounded, the game-theoretical semantics, Hintikka's GTS (1983 c). It is interesting, that E. Itkonen mentions Hintikka writing only about the formally prepared synthetic model of linguistic behaviour for psycholinguistics (1982). So, if it is not connectible with sociolinguistics, GTS is perhaps useful for psycholinguistics in the above sense. Indeed, Hintikka uses the term 'psychosemantical' in connection with 'realism' (1981 a), or

with 'reality' (1976 e, 1977 b, 1980). He is very interested in psychosemantical realism and thinks that this semantics can be useful for psycholinguistics (1981 a). M. Hand nevertheless noted in relation to this connection of Hintikka, that it is important to make the difference between psycholinguistics and semantics (epistemology) (1986 b). We think that Hintikka maintains the difference between his semantics and psycholinguistics, but due to his interest in psychosemantical realism he indicates their narrow connection.

In Hintikka's realistic conception truth and the truth-condition have also their place. Knowing the truth of a statement is comparable to knowing certain things in one's game of investigating the world, he said (1972). Even more, the declarative meaning should be based on truth-conditions (1976 a), because the account of the truth-conditions is the best theory of meaning (1976 b) — so his game-theoretical semantics has as its purpose to create an entirely new paradigm for truth-conditional semantics (1983 a). Hence, it was not surprising that he proclaimed his GTS as »truth-conditional« (1979 b); he stubbornly believed that every satisfactory semantics must be that (1981 b). His more systematic and far reaching perusal of the way those truth-conditions operate (1981 a) is found in the thesis of the existence of the winning strategy (1974, 1975, 1980, 1981 b, 1983 a, c) and the main result against narrow realism was the fact that the truth-conditions can be expressed in higher-order logic if the strategies can be represented with functions or functionals (as in subgames) (1979 c, 1981 a).

Recursivity, which was the natural consequence of first-order logic's consideration of Tarski-type realistic semantics, was also applicable to GTS. Several times Hintikka emphasized the need for the representation of the strategies by functions or functionals which are recursive (1974, 1976 c, 1977 a, 1978 a, 1981 b, 1983 a, d). Here recursivity has another characteristic; it is not in the service of the principle of bivalence which supports the first-order logics of Tarski-type realistic semantics, because the bivalence fails (M. Hand 1986 b). It seems, it is used in the sense of a wider realism.

If we want to understand Hintikka, we are better advised not to take the terms antirealism/realism as clear and cut contrasted notions, though it is as natural to use the term 'realistic' for theories emphasizing truth and the term 'antirealistic' for those exchanging truth for other items, such as verification or proof. Such a distinction received its place in semantics and methodology of science because of the influence of the controversies about mathematical foundations between Platonist realism on the one side and constructivisme (intuitionism) and instrumentalism (Hilbert) on the other side. The make-believe in such a survey is becoming yet more apparent in the more sophisticated picture of relation between realism and antirealism which aims to establish an intermediate position as it is e.g. visible in Wittgenstein's

attempt, or recently in the philosophy of mathematics, as it is in the case of Detlefsen's *Hilbert's Program* (1986). Our aim cannot be the detailed examination of the mentioned distinctions, neither the detailed exposition of the notions antirealism/realism. Simply, we choose the most convenient interpretation for our purpose, i.e. Davidsonian interpretation of C. Wright and, the so called, antirealistic interpretation of M. Dummett. Wright thinks that the core of realism is made up of following thesis: a. the truth of a statement need not require that we can (in principle) recognize its truth, b. all intelligible statements are determinate in truth-value, c. truth is timeless. Antirealism is so opposite that of the six possible world-pictures not one can become a generalised antirealistic ontology (1980). Dummett holds the opinion that realism and opposite, idealism, are metaphysical doctrines. The first treats the world as something existing in itself, but it is consistent to adopt a realist view of some things and not of others. The question of realism is possible as a question belonging to the province of logic, i.e. as a problem of truth. Abandoning his previous idea of the acceptance of the principle of bivalence as sufficient for realism, he limited the recognizable characteristics of a full-fledged realistic semantics to the following elements: a. truth-conditional theory of meaning, b. unmodified classical two-valued semantics, c. the appeal to the notion of reference (1981). In both approaches one feels on one hand the endeavour to eliminate antirealism, and on the other the gradual indulgence in realism. Except this, we can see the similarity between the first and second elements in both interpretations. For our purpose we can note that the notion 'realism' begins to be too narrow and the case of Hintikka's GTS furthermore questions the scope and the characteristics of such a term. If we compare the realistic aspects of GTS with previously mentioned C. Wright's and Dummett's three basic elements of the standard realistic semantics, we can find the following elements in common: in comparison with Wright one element (a.) and partly b., and in comparison with Dummett two (a. and c.) and partly b. (Hintikka does not refute b. in all cases). So Hintikka's GTS is in great part not hostile to realism. Our analysis shows that Hintikka's supposed realism is of a special kind, so far not displayed by any other author.

What we need now is a conclusion about GTS's verificationism/falsificationism character. Dummett accepts Hintikka's terms »verification/falsification«, because he thinks that his own idea of verificationist/falsificationist theory has »obvious affinities« with semantics developed by Hintikka (1976). E. Saarinen is not against the attempt to bring together Dummett's theory and GTS (1979). But Hintikka rejects Dummett's proposal, because Dummett generalized the intuitionistic mathematical approach for a purpose outside mathematics, identifying methods of verification with methods of proof (1982). M. Hand wrote, that Hintikka made extended criticisms of the »neoverificationist«

theory, but he does not agree with such criticism, because Hintikka refuses to recognize that the key notion in developing verificationist theory in nonmathematical discourse demands the restriction of allowed strategies in semantical games to those that are effective (1986 a). The answer here is possible in a more historical perspective — the analysis of Wittgenstein's notions 'verification' and 'proof' in connection with Hintikka's notions. This deserves a separate article. For the moment it is important to take, as Hand thinks, neoverificationism as arising from 'meaning is use', which is a feature shared by GTS (1986 a). To take into account differences between them, we shall keep the term »verificationist/falsificationist conception« for Hintikka, and »neoverificationism« for Dummett's version.

This is enough to conclude that it is necessary to rearrange the terms antirealistic/realistic. In the extended meaning of »realism« we must include the verificationism/falsificationism semantical theory. Then the map of realism can be the following:

a. Tarski-type realism, or context-independences semantics, based on the Frege Principle with the truth-conditional characteristics, as it is primarily the principle of bivalence, i.e. the favourization of first-order logic,

b. GTS-realism, or context-dependences semantics, grounded on the Contextual Principle, with the truth-conditional claim, based on verification/falsification strategies with the possibility to use higher-order logic.

It is an open question how to continue the list. One possibility would be:

c. (neoverificationism),

d. other form.

C., d., and some other possibilities are open for further research.

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HEDA FESTINI: ANTIREALIZAM/REALIZAM HINTIKKINE SEMANTIKE TEORIJE IGARA

Sažetak

Hintikkina semantika teorije igara (GTS) predstavlja se kao anti-Tarskijevski semantički pristup kontekstno ovisnim fragmentima engleskog jezika, koji nadilazi uobičajeni pojam semantičkog realizma. Analizirajući Hintikkinu kritiku Tarskijeve interpretacije teorije značenja istinosnih uvjeta, Hintikkina osnovna koncepcija iznosi se na ovaj način:

1. princip konteksta vs. Fregeovom principu,
2. logika prvog reda i logika višeg reda vs. primatu logike prvog reda,
3. verifikacijska/falsifikacijska teorija vs. Tarskijevoj uskoj teoriji istinosnih uvjeta.

Usporedbom nekih osvrta na Hintikkinu GTS (M. Dummett, E. Itkonen, E. Saarinen, M. Hand) s kratkom obradom antirealističko/realističkih kotroverzi C. Wrighta i M. Dummetta, došlo se do slijedećeg zaključka:

Hintikkina GTS uvodi novi, mnogo širi pojam realizma, koji obuhvaća Tarskijev tip realističke semantike, Hintikkinu GTS, ostavljajući otvorenim pitanjem mogućnosti uključivanja Dummettovog neoverifikacionizma, kao i drugih orijentacija.