FODOR'S DILEMMAS ON REPRESENTATION AND INTENTIONAL REALISM
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Representations are about things other than themselves and are intentional in the sense of being about 'this' or 'that'. Because the mental representations have content, which is related to belief, intention, thought, and action, they are also intentional in the sense of being purposive. Now we may ask: What is it that distinguishes items that serve as representations from other objects or events? And what distinguishes the various kinds of symbols from one another? As for the first question, there has been general agreement that the basic notion of a representation involves things like 'standing for', 'being about', 'referring to', and 'denoting' something else. Some theorists have maintained that it is only the use of symbols that exhibits or indicates the presence of mind and mental states. Mental representations, like beliefs and thoughts, constitute the broad domain of cognitive science. They explain how cognition takes place in the human mind. Cognitive science (including cognitive linguistics and cognitive psychology) has brought about a cognitive revolution in the study of mind. Here, we can undertake two important developments in cognitive science. One is the representational theory of mind. For, to accept the representational theory of mind is to accept that mental representations are very much like the inter-representational states of a digital computer. The other is the adoption of a computational model of mind or computational theory of mind.

In turn, two questions have to be answered in this connection: What kinds of representational systems are employed in cognition? What is machine intelligence or artificial intelligence? Fodor has answered these questions in his computational representational theory of mind (CRTM in short). The computational representational theory of mind makes a strong assumption about mental processes: Mental processes are computational processes, i.e., formal operations defined over symbols. In Fodor's view, "computational processes are both symbolic and formal. They are symbolic because they are defined over representations, and they are formal because they apply to representations in virtue of (roughly) the syntax of the representations."[1] The

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[1] Fodor, J. A. 1983. *Representations: Philosophical Essay on the Foundation of Cognitive Science.* MIT: Cambridge, p. 226.

theory purports to offer a solution to the problem raised by the compositionality of propositional attitudes like beliefs, thoughts, etc.; secondly, it proposes to vindicate the strong reading of the intentional realist casual thesis regarding the mental phenomena. Again, it may be noted that the CRTM is consequently based on two fundamental assumptions; the first is Fodors' Language of Thought (LoT) hypothesis, and the second is the view that psychological explanation is both intentional and nomological.

Propositional Attitudes as Machine Representation

The representational theory of mind shows that any propositional attitude, such as belief, desire, doubt, etc, is literally a computational relation between an organism and some formula in the internal code of that organism. Fodor's view is, "to believe that such and such is to have a mental symbol that means that such and such is tokened in your head in a certain way; it's to have such a token 'in your belief box', as I shall sometimes say."[2] It is in virtue of this system for representing and processing information that mental states are related causally to one another. Moreover, according to Fodor, "propositional attitudes are relations between organisms and internal representations; precisely the view that the psychologists have independently arrived at."[3] By providing a relational treatment of the propositional attitudes, it is possible to state how they are contentful. For the relational treatment, propositional attitudes are dyadic relations and are the internal mental representations. The belief ascription statements are true, only if the organism stands in believed relation to the representational contents. First, it is naturally believable that propositional attitudes are relations. For example, when John believes in something, it seems that John stands in relation to something, that is, the object of the belief. Secondly, existential generalization applies to the verbs of propositional attitudes. For example, if John believes 'it is raining', then we can undoubtedly say that there is something that John believes, which shows that the belief is a relation between John and something that he believes.

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[2] Fodor, J. A. 1998. *Psychosemantics: The Problems of Meaning in the Philosophy of Mind*. Cambridge, Mass: The MIT Press, p.17.
[3] Fodor, J. A. 1981. *Representations: Philosophical Essay on the Foundation of Cognitive Science*. p. 177.

Fodor is realistic about intentionality and propositional attitudes. The main point of his theory of intentionality is that intentionality is primary and is originally a real feature in the brain. Language is intentional only in a secondary sense, for it is intentional only in so far as some of the sentences, which are uttered in our natural language, describe the real features of the mind of oneself or others. It is this fact which helps us in generating our natural languages, and also the special vocabulary in language that involves employment of verbs operating over a propositional content. For example, if we said that John decided to stay at the bus stop, rather than make a run to the local police station, because he believed certain persons had certain desires, came up with a certain evaluative decisions, then we are describing a series of real processes in John's brain which involve computational operations over propositional contents. John really has represented to himself the possible behavioural scenario 'that we should stay at the bus stop' and 'that we should run from it to the local police station.' Also, he has represented to himself a web of more general beliefs and desires, which he has correlated up with these two behavioural scenarios and which make these behavioural scenarios relevant and plausible and sensible solutions to his problem. That is, he has also evaluated these behavioural scenarios in such a way that he can be said truly and literally to decide on one of them for good reasons.[4] From the above example, we find that John's mind must be able to make use of some medium in terms of which he can represent the behavioural scenarios, beliefs, desires etc. And John's brain must have a language of thought whereby propositional contents of beliefs, decisions, and the other propositional attitudes are first represented, and then operated on or processed in the individual ways which go to form the different propositional attitudes. For the same propositional content, for example 'that there will be rain', could be the information content of two different attitudes. One can believe that there will be rain and hope that there will be rain or believe it but not hope for it.

According to Fodor,[5] the theory of propositional attitudes is required to meet some conditions. There are basically two such conditions. First, a theory of

[4] Lyons, William. 1995. *Approaches To Intentionality*. England Clarendon Press, p.43.
[5] Fodor, J. A. 1983. *Representations: Philosophical Essay on the Foundation of Cognitive Science*. p. 181.

propositional attitudes must explain the parallelism between verbs of propositional attitudes and verbs of sayings. Second, it must explain the opacity of propositional attitudes. By parallelism between verbs of sayings and verbs of propositional attitudes, it can be shown that 'John believes that it is raining' and its corresponding in verb of saying, namely 'John says that it is raining' exhibit isomorphism in syntax, semantics and logical form of structure. The opacity of propositional attitudes is a complex phenomena understood in terms of the following three characteristics. Firstly, statements containing verbs of propositional attitudes are not truth-functions of their components. For example, from the truth of the declarative sentence, 'George Orwell wrote *Animal Farm*', we cannot compute the truth of the statement 'John believes that George Orwell wrote *Animal Farm*.' Secondly, though the declarations warrant existential generalizations, a statement occurring as the object of verbs of the propositional attitudes does not warrant such existential generalizations. For example, from the truth of the statement 'George Orwell wrote *Animal Farm*', we can infer: There is George Orwell, who wrote *Animal Farm*. But from this we cannot infer 'There is a George Orwell John believes that George Orwell wrote *Animal Farm*'. The third feature of the opacity of propositional attitudes is that in the case of propositional attitude the principle of substitution fails. The principle of substitution says that given a true statement of identity, one of its terms can be substituted for the other in any true statements where one of the terms of the statement occurs and the resulting statement is true.

Hypothesis of Language of Thought and Semantic Engines

The representational theory of mind arises with the recognition that thoughts have contents carried by mental representations. For example, John thinks that snow is white. Here, John's mental representation or thought has the mental content that snow is white. As we know that there are different kinds of representation such as pictures, maps, etc, which refer to something. In this case, we are talking about only mental representations. Sententialism distinguishes itself as a version of representationalism by positing that mental representations are themselves linguistic expressions within a 'language of thought'. Moreover, on the other hand, some sententialists point out that the language of thought is just the thinker's spoken

language internalized, others identify the language of thought with the mentalese that is an unarticulated and internal language in which the computations occur.[6]

Beliefs are true or false. If beliefs are relations to mental representations, then beliefs must have been relations to representations that have truth-values among their semantic properties. And if sententialism says that mental representations have truth-values, we could readily account for the true valuation of mental representations. Belief plays a central part in reasoning. As well-known, reasoning is a process that attempts to secure new beliefs by exploiting beliefs. Reasoning would preserve truth of belief by being the manipulation of truth-valued sentential representations according to the rules. Thus the sententialist hypothesis is that reasoning consists in formal inferences; it is a process tuned primarily to the structure of mental sentences. Then, reasons are things very much like classical programmed computers.

Moreover, the process of thinking is systematic and productive.[7] For example, John wonders whether William is taller than Russell. This implies that John is capable of considering that Russell is shorter than William. More clearly, the fact that John can have some thought entails that he can have certain other semantically related thoughts. Now the question is: How is this systematicity possible? In Fodor's word, "the property of linguistic capacities that I have in mind is one that inheres in the ability to understand and produce sentences. That ability is- as I shall say- systematic: by which I mean the ability to produce/understand some of the sentences is intrinsically connectd to the ability to produce/understand many of the others."[8] For example, suppose that John's thought that William is taller than Russell involves the registration of 'William is taller than Russell.' This mentalese sentence is itself a complex representation containing simpler representations. As complex mental representations, mental sentences result from processes ultimately defined on mentalese words and expressions. So if John can produce 'William is taller

[6] Fodor, J. A. 1998. *Psychosemantics: The Problems of Meaning in the Philosophy of Mind*. p.145.
[7] *Ibid*., p.147.
[8] *Ibid*., p. 149.

than Russell,' he must have access to 'William', 'Russell' and 'is taller than'. And if he has these mental representations, he is capable of producing 'Russell is shorter than William'. Thus sententialism posits that mental representations are linguistically complex representations whose semantic properties are determined by the semantic properties of their constituents.

Productivity and systematicity run together; if we postulate mechanisms adequate to account for the one, then we get the other automatically. Now the question is: What sort of mechanisms are involved? The sentences of a natural language have a combinatorial semantics. On this view, learning a language is learning a perfectly general procedure for determining the meanings of its lexical elements. Linguistic capacities cannot but be systematic on this account, because it gives the very same combinatorial mechanisms that determine the meaning of all of the rest. Language expresses thought and thought is as systematic as language is. To have the thought that William is taller than Russell is *ipso facto* to have access to the thought that Russell is shorter than William. Of course, anybody who is in a position to have one of these thoughts is *ipso facto* in a position to have the other. Thus the language of thought explains the systematicity of thought, which is an essential requirement of the structure of language of thought.

Moreover, in the mind there are two boxes: a belief box and desire box. The 'language of thought' hypothesis is a speculation on the form that storage takes place. Our belief and desires are encoded as sentences. According to Fodor,[9] our sentences that we think are not the English sentences or any sentences in natural languages. Our thinking occurs in a special language, called mentalese. Mentalese is organized into words and sentences. Mentalese words are concepts; mentalese sentences are thoughts. The sentences of Mentalese are stored in a neural medium because patterns of neural activity could develop sentential representations. Words can be configurations of neurons as easily as configurations of chalk marks on the black board. Fodor's language of thought fits with the multiple realizability arguments because according to LoT, cognition has nothing directly to do with its species-specific neurobiological embodiments, but rather concerns processes operating on the

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[9] *Ibid*., p.151.

common language of thought. Here, cognition is neural, but cognition is computational in Mentalese. However, we can imagine a device that could manipulate sentences without regards to their meanings, but it can be done in a way that coincides with the way those sentences would be manipulated by someone who knew their meanings. Such kind of a device, Haugeland calls 'semantic engines'.[10] This device would perfectly mimic the performance of a native speaker, but would do so without relying, as a native speaker would do, on the meanings of the sentence manipulated. Those sentences may express propositions, but the device cares only about their shapes that is 'syntax'. In this way, Haugeland said, "If you take care of syntax, semantics will take care of itself."[11]

Now the question is, is such a device possible? According to Haugeland,[12] not only are semantic engines possible, but they exist. An ordinary computing machine is a semantic engine. We design and programme computers so that they manipulate symbols in accordance with purely syntactic rules. The symbols are meaningful to us but the machines that deploy them care nothing about this. They operate on uninterrupted symbols, but in a way, that honour semantic constraints. The question is: How can syntax mirror semantics? The formal logic is the best example:

$P \supset Q$
P
Q

This rule tells us that if we have a particular configuration of symbols, we are permitted to write new symbols. Here what is significant about the modus ponens rule is that it is formulated and deployed without regard to semantics. But the rules make sense that is to say, they conform to the semantics of inferences. The concrete example is:

If it is raining, then I shall need an umbrella.

P= It is raining.

Q= I shall need an umbrella.

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[10] Haugeland, John. 1985. "Semantic Engines: An Introduction to Mind Design" in *Mind Design: Philosophy, Psychology, Artificial Intelligence*. John Haugeland (ed.), Cambridge: The MIT Press, p. 24.
[11] *Ibid*., p.23.
[12] *Ibid*., pp.22-31

Thus systems of formal logic mirror this kind of semantic knowledge in rules, and the application of which requires no semantic knowledge. The question is: What has this to do with minds? To explain the human mind by supposing that minds manipulate mental representations, we need sentences in the language of thought. If minds manipulate sentences, then this would seem to require a 'sentence under stander,' some component of the mind that inputs the symbols. Another job of the mind is to understand sentences in the language of thought. Against this background, it is easier to apply the notion of semantic engines. We have already mentioned that a semantic engine is a device that performs symbol operations in a way that reflects semantic relations holding among those symbols, but does so exclusively by syntactic principles. In the same way, we can also suppose that mind contains mechanisms which understand the meanings of those representations.

Therefore, if the mind is a semantic engine realized by the brain, if the mental operations include the manipulation of symbols, i.e., sentences in the language of thought, then the embodiments of those symbols in the brain need not resemble the symbols we write with pen and paper. They might involve subtle electrical or chemical states. If there is a language of thought, its sentences are invisible from the point of view of an observer examining the microstructure of a brain.

Propositional Attitudes as Mental Representation

Generally, propositional attitudes (PAs) are the attitudes towards propositions. Our everyday conception of mentality bristles with notions like belief, desire, intention, hope, etc. These attitudes are identified by their propositional contents. For example, a belief that snow is white is identified by the proposition that snow is white. On the other hand, propositional attitudes are pervasive in our descriptive, explanatory, and justificatory practices. In this section, we shall show that propositional attitudes are relations between organisms and the external environment.

Before analyzing the above point, now we have to clarify the relationship between intentationality and propositional attitudes. Searle says, "intentionality is that property of many mental states and events by which they are directed at or about or of objects and state of affairs in the world."[13] For example, if I have a belief, it must be a

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[13] Searle, John R. 1983. *Intentionality: An Essay in the Philosophy of Mind*. Cambridge: Cambridge University Press, p.1.

belief that such and such is the case. If I have a fear, it must be a fear of something or that something will occur; similarly, if I have a desire, it must be desired to do something. The above grammar of intentionality shows that the propositional attitudes are intentional. This might be called a grammatical form of intentionality.[14]

The propositional attitudes should be analysed as relations.[15] For example, the verb in a sentence like 'John believes it is raining' expresses a relation between John and something else, and a token of that sentence is true if John stands in the belief-relation to that thing. 'John believes it is raining' is true in virtue of a belief-making relation between John and a token of F (it is raining). It is the complement of a belief-ascriber that determines which internal formula is involved in its truth conditions; in effect 'it is raining' in 'John belief it is raining' functions as an index which picks out F (it's raining) and not, for example, F (elephants have wings). Moreover, Fodor says, "I am taking seriously the idea that the system of internal representations constitute a (computational) language. Qua language, it presumably has a syntax and a semantics; specifying the language involves saying what the properties are in virtue of which its formulae are well-formed, and what relation(s) obtain between the formulae and things in the (non-linguistic) world. I have no idea what an adequate semantics for a system of internal representations would look like; suffice it that, if propositions come in at all, they come in here."[16] In particular, nothing stops us from specifying semantics for the IRS (Intentional Realism System) by saying that some of its formulae express propositions. If we do say this, then we can make sense of the notion that propositional attitudes are relations to propositions. Therefore, they are mediated relations to propositions with internal representations doing the mediating.

Folk psychology shows that the propositional attitudes like belief, desire, etc. are real, and that they are part of the mental world of the human beings. Fodor defends folk psychology against the anti-folk psychologists like Dennett and Churchland who maintain that the belief-desire psychology is dispensable as the

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[14] Lyons, William. 1995. *Approaches To Intentionality*. p.212.
[15] Fodor, J. A. 1983. *Representations: Philosophical Essay on the Foundation of Cognitive Science*. p.178.
[16] *Ibid*., p.200.

human mind is nothing but the brain. According to P. M. Churchland,[17] mental states are identical with brain states and so, if our mental states are in some sense identical with those states, then we have no reason to refute materialism. Churchland holds that folk psychology which displays propositional attitudes is similar with mathematical physics which displays numerical attitudes. For example, in folk psychology if X fears that P, then X desires that not-P. Similarly, the laws of mathematical physics display a precisely parallel structure; in the latter it is only numerical relations that are being exploited, rather than logical relations. For example, if X has a mass of M, and X suffers a net force of F, then X has an acceleration of F/M. As P. M. Churchland says, "What is taking place in such examples is the same in all cases. The abstract relations holding in the domain of certain abstract objects numbers, or vectors, or propositions-are drawn upon to help us state the empirical regularities that hold between real states and objects, such as between temperatures and pressures, forces and accelerations, interacting momenta, …and between various types of mental states. The conceptual framework of folk-psychology is exploiting an intellectual strategy that is standard in many of our conceptual endeavours. And just as a theory is neither essentially physical, nor essentially nonphysical, for exploiting numbers and vectors; neither is a theory essentially physical, nor essentially non-physical, for exploiting numbers or vectors; neither is a theory essentially physical, nor essentially non-physical, for exploiting propositions. It remains an empirical question whether the propositional attitudes are ultimately physical in nature. The mere fact that they are PAs (and hence displaying intentionality) entails nothing one way or other."[18]

Dennett argues that we can attribute internal functional states to humans not on the basis of any neurophysiological knowledge, which ordinary people do not have, but on the basis of an observation of how that person behaved in the light of what she or he perceives in his or her environment. Dennett puts it in the light of perceptual input and behavioural output we project upon that person certain central (in the hand) functions for that is how our ordinary, everyday psychological explanations operate. Thus it can be said, to attribute an in-the-head or centralist function to some person neither as a result of correctly inferring real internal

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[17] Churchland, P. M. 1988. *Matter and Consciousness*, Cambridge: The MIT Press, p.65.
[18] *Ibid*., pp. 65-66.

'intervening' processes. Rather, we make such attribution as a result of guessing what part, when speaking in a special 'intentional function' way, the brain and central nervous system would have played in the complex production line of perceptual input, central processing, and behaviour output, if it were an 'intentional engine'.[19]

This intentional description can be seen to be the expression of a particular sort of attitudes or stance, which the humans have towards other humans and animals. As Dennett put it, "I wish to examine the concept of system whose behaviour can be- at least sometimes- explained and predicted by relying on ascriptions to the system of beliefs and desires (and hopes, fear, intentions, hunches…). I will call such systems, and predications intentional explanations and predications, in virtue of the intentionlity of the idioms of beliefs and desire (and hope, fear, intention, hunch…)."[20]

In general one can take up the intentional stance in order to explain and predict and so plan or take action. But, we should be clear that Dennett's view differs from Fodor's. As Dennett makes it clear, "the definition of intentionl system I have given does not say that intentional systems really have beliefs and desires, but that one can explain and predict their behaviour by ascribing beliefs and desires to them."[21] Dennett points out there are other stances, besides the intentional, which we take up to things. For example, we might consider a machine from the point of view of its design, that is, we might take up the design stance. If one knows exactly how a computer or machine is designed, one can predict its designed response to any more one makes by following the computational instructions of the program. For example, the radio engineer's schematic wiring diagrams have symbols for each resistor, capacitor, transistor, etc., each with its tasks to perform and he or she can give a design-stance prediction which are generated by assuming that each element performs its task.

The essential feature of the design stance is that we make predictions solely from knowledge or assumptions about the system's functional design, irrespective of the physical constitution of the particular object. That Dennett calls this the physical

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[19] See Dennett, D. C. 1987. *Intentional Stance*. Cambridge: The MIT Press.
[20] Dennett, D.C. 1981. *Brainstorms: Philosophical Essays on Mind and Psychology.* Cambridge: The MIT Press, p.3.
[21] *Ibid*., p.7.

stance.[22] This attitude or stance is to consider something only in so far as it is made of a certain material or certain types of material which have certain properties. To take up the physical stance to humans is to investigate their psychology or at a more basic level, their physics and chemistry. However, on the other hand, the core of Dretske's account of intentionality lies in his account of the human brain and its perceptual organs as an information processing system, which in turn is based on 'information theory' developed by the cognitive theorists. This information-processing account of our mental life is purely physicalist in nature. So Dretske's account of intentionality of mental function is materialistic. The information-processing input mechanisms we call the senses, and by treating the brain as an information processor, we can build up an account of intentional states such as knowledge and belief.

Dretske suggests, "The interplay of our human perceptual and cognitive systems is based on this transformation of information from analogue to digital form. It is the successful conversion of information into digital form that constitutes the essence of cognitive activity."[23] Now we have to find out how physical structures which carry information in analogue form can be transformed into physical structures that carry information into digital form, so that this digitalized information becomes a true semantic content and so able to be the content of some mental act such as a belief. For example, humans acquire the concept of red by seeing the red objects, that is, by having his or her visual perception stimulated by red objects. Internally some structures will be selected as the analogue registering structures for 'red stimulation of the visual system' if the person concerned is also exposed to a good number of things which are not red. Such structures become one which has semantic content, and so one which is presenting a utilizable concept of red to the person whose brain contains structures, only when this structure has been made precise and determinate. In this way, it can be shown that the semantic content has nothing to do with the behavioural output of the system. When this semantic content is utilized so as to guide behaviour, it is employed as a map by which the person whose head contains this semantic structure finds his way about the world. Semantic contents become

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[22] *Ibid*., p.4.

[23] Dretske, Fred. 1981. *Knowledge and the Flow of Information*. Cambridge: The MIT Press, p.142.

beliefs in so far as they are used as maps or representations to guide output behaviour. Therefore, semantic content becomes a cognitive content when it gains a functional role.

Revisiting Computational Representational Theory of Mind

Fodor[24] has advocated the computational representational theory of mind. This theory is unlike the non-computational version of representational theory of the mind. CRTM makes a strong assumption about mental processes: mental processes are computational processes. Therefore, the formal operation is defined over symbols. Consequently, the computational representational theory is based on two important assumptions; the first one is the Language of thought (LOT), and the second one is based on the view that psychological explanation is both intentional and nomological, that is, it involves law-like generalizations which refer to or quantify over the contents of propositional attitudes, which Pierre Jacob calls the nomic intentional character of mental causation.[25]

The mental representations are not only constructed realistically but only as a sort of useful, predictive psychological calculus.[26] Possibly, ascriptions of thoughts are simply attempts to explain behaviour in the face of massive ignorance of the internal dynamics. For example, a small child may speak grammatically correct English, and we may say of her that she knows that 'corn' is a noun. However, from this it would be infered that the child actually deploys a mental representation that itself literally means that 'corn' is a noun. But it could be said that some specific cognitive architecture is installed in the child because of which she implicitly knows 'corn' to be a noun and not that she manipulates any representation explicitly representing 'corn' is a noun. The child's knowledge is perhaps best viewed as simply a state supervenient to any cognitive architecture. On the other hand, for a representationlist, not only thought ascriptions do point to specific mental representation, but also those that do not nevertheless depend upon these that do. Strictly, the child does not think that 'corn' is a noun. Rather, she literally thinks that

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[24] Fodor, J. A. 1983. *Representations: Philosophical Essay on the Foundation of Cognitive Science.* p.233.

[25] Jacob, Pierre. 1997. *What Minds Can Do: Intentionality in a Non-intentional World.* Cambridge: Cambridge University Press, p.143.

[26] Dennett, D.C. 1981. *Brainstorms*: *Philosophical Essays on Mind and Psychology*. pp.16-20.

it is permissible to utter "please pass the 'corn' but not 'please corn the plate'." A representationlist will hold that the child's way with 'corn' is the result of her processing specific mental representation in certain ways.

The CRTM provides twofold ways of type-individuating mental states.[27] That is, mental states can be individuated either on the basis of the kind of computational relations they have or on the basis of the content of the representations. The belief that the 'snow is white' is differentiated from the belief that 'snow is black' on the basis of the difference in the contents of the string of symbols that express the corresponding proposition. Similarly, the belief that the snow is white is differentiated from the doubt that the snow is black on account of the differences in syntactical/computational relations. The CRTM will throw light on three questions, which are interrelated with each other. The questions are: How can complex propositional attitudes have complex semantic properties on the basis of the simpler semantic properties of their constituents? How can propositional attitudes generate other propositional attitudes?, and How can propositional attitudes be involved in the production of intentional behaviour? If we think of an individual's language of thought on the model of a digital computer's machine language, then the computer model of the mind promises to provide answers to these questions. It can explain how the semantic properties are assigned to the propositional attributes and also how causal properties are ascribed to them.[28]

As Fodor notes it, "Computers are a solution to the problem of mediating between the causal properties of symbols and their semantic properties. So, if the mind is a sort of computer, we begin to see how you could have a theory of mental processes that succeeds, where –literally -all previous attempts had objectively failed; a theory which explains how there could be non-arbitrary content relations among causally related thought. But, patently, there are going to have to be mental representations if this proposal is going to work. In computer design, causal role is brought into phase with content by exploiting parallelisms between the syntax of a symbols, and its semantics. But that idea would not do the theory of mind any good

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[27] Fodor, J. A. 1983. *Representations: Philosophical Essay on the Foundation of Cognitive Science.* p.226.

[28] Jacob, Pierre. 1997. *What Minds Can Do: Intentionality in a Non-intentional World.* p.144.

unless there are mental symbols: mental particulars possess of both semantical and systematic particulars. There must be mental symbols because, in a nutshell, only symbols have syntax, and our best available theory of mental processes that is not known to be false –needs the picture of the mind as a syntax-driven machine."[29] In the language of thought, there are two ingredients namely, a semantic ingredient and a syntactic ingredient, and thus provides language with a reasonable explanation of the compositionality of the semantic properties of an individual's propositional attitudes consistent with the assumptions of international realism. Thus the computational theory reduces the semantic properties of an individual's propositional attitudes to the semantic properties of mental representations; the latter reduce in turn to the semantic properties of symbol in a language of thought, which, according to Fodor, is like a machine-language.

For the computational theory, mental states causally interact among themselves and produce overt behaviour just by virtue of the form of the internal representations. This means that for the type-individuation of mental states, the form of the internal representations has to be taken into account. Fodor argues, "the computational theory of mind requires that two thoughts can be distinct in content only if they can be identified with relations to formally distinct representations. More generally; fix the subject and the relation, and then mental states can be (type) distinct only if the representations which constitute their objects are formally distinct. This is a very important consequence for the study of cognitive mental processes."[30] We do not have to be bothered about contents of mental states as such because the formal aspects of the mental representations exhaust them. As Fodor says, "if mental processes are formal then they have access only to the formal properties of such representations, of the environment as the senses provide. Hence, they have no access to the semantic properties of such as representations, including the properties of being

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[29] Fodor, J. A. 1998. *Psychosemantics: The Problems of Meaning in the Philosophy of Mind*. pp.19-20.
[30] Fodor, J. A., 1981. *Representations: Philosophical Essay on the Foundation of Cognitive Science*. P. 226.

true, having referents, or, indeed, the property of being representations of the environment"[31]

The idea that the content of a mental state can be reconstructed as an aspect of its form, that is, that mental states have different content only if they are relations of formally distinct mental representations, successfully explain the opacity of propositional attitudes. The difference in the contents of mental states implies that the internal representations are formally distinct. This means that if mental states differ in content, they are also functionally different, because they have functional relations to formally different takers of the formulae of the internal language. To be precise, the mental states differ in their computational structure as well. By using the notions of computation and content together, it is possible to explain how mental states are sensitive for their content in the causal interaction of the various mental states and the production of overt behaviour. This is one within the syntactic framework of the CRTM. Semantic notions such as truth and reference do not have any explanatory role in the syntactic theory because the semantic notions do not figure in the formal structure. According to Fodor, the ideal mental processes are basically formal in the sense that they can be explained computationally according to formal rule.

Intentional Realism

A realistic theory of mind holds intentional realism. Intentional realism is a thesis that the mind is primarily a representational system or that an individual individual's mind is a system whose job it is to deliver representations of the environment for the benefit of the individual whose mind it is. An important problem for intentional realism is to offer an account of how intentional states can be causally related to one another and to the world and to the behaviour of the rational agents. Intentionality is admitted by Fodor as a real feature of the mental representations which can be computationally studied. But, there is distinction between intentional realism and intentional irrealism. The weak sense of representation is intentional irrealism. This thesis claims that the so-called propositional attitudes can be thought of as mental representations of state of affairs. The strong-sense of representationalism which is the claim that the representation properties of

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[31] Fodor, J. A., *Representations: Philosophical Essay on the Foundation of Cognitive Science*. p. 227.

propositional attitudes can take us some way towards understanding aspect of conscious experience.

According to intentional irrealism, any utterance of a sentence ascribing a semantic property to an individual's propositional attitude express false properties. The intentional irrealist is also known as an eliminativist materialist according to whom "no mental difference without some physical difference"[32]According to eliminative materialism, "the thesis that our commonsense conception of psychological phenomena constitutes a radically false theory, a theory so fundamentally defective that both the principles and the ontology of that theory will eventually be displaced, rather than smoothly reduced, by complicated neuroscience."[33] This theory says that our folk concepts of propositional attitudes with their purported semantic properties are best compared to such concepts as the physical and chemical concepts of caloric and phlogiston and other alchemical concepts, that is, concept devoid of reference. Therefore, there are no such states as propositional attitudes with semantic properties. On the other hand, the non-factual version of intentional irrealism is the claim that predicates that are used to refer to semantic properties of an individual's propositional attitude simply do not stand for any genuine properties at all. This version of intentional irrealism has been advocated by Stich. According to him, "such predicates typically do not express properties at all. What this suggests is that there is no such thing as the property of believing that P. The predicate 'is a belief that P' does not express or correspond to a property. If this is right, then we have yet another reason for not thinking of folk psychological beliefs as state tokens, since a state token is the instantiation of a property by an individual during a time interval, and if there is no property, then there can be no state token. It is important to realize, however, that the non-existence of belief properties and belief state tokens do not entail that predicates of the form 'is belief that P' are meaningless or never apply to anything…."[34]

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[32] Jacob, Pierre. 1997. *What Minds Can Do: Intentionality in a Non-Intentional World*. p. 9.
[33] Churchland, P. M. 1992. "Activation Vectors versus Propositional Attitudes: How the Brain Represents Reality," *Philosophy and Phenomenological Research*, 52, 2, pp.419-24.
[34] Stich. S. 1983. *From Folk Psychology to Cognitive Science*, Cambridge: The MIT Press, pp.225-226.

The above, non-factualist interpretation of intentional irrealism is the influential view of Dennett, who has introduced the concept of intentional stance. The intentional stance says that to attribute propositional attitudes to a physical system is not to attribute semantic properties to the system. Rather, it consists in adopting a certain heuristic stance towards it which in turn serves pragmatic goals. According to Dennett, "the decision to adopt the strategy is pragmatic, and is not intrinsically right or wrong."[35] Thus the intentional stance view says that semantic properties of an individual's propositional attitudes arise from the stance taken towards the individual by an observer or an interpreter. Intentional realism is different from both error-theorism and non-factualist irrealism because intentional realist is committed to the view that the semantic properties of an individual's propositional attitudes are genuine properties of the individual's brain. According to P. Jacob, we can ascribe three theses to intentional realism:[36]

(i)   The semantic properties of an individual's propositional attitudes are genuine of the individual.
(ii)   The semantic properties of an individual's utterance are derivative from the semantic properties of his or her propositional attitudes.
(iii)   The semantic properties of an individual's propositional attitudes must contribute to the production of the individual's intentional behaviour.

If semantic properties are genuine properties, then having a mind must make a causal difference. Minded systems must be able to do things which systems lacking a mind must be unable to do. And if having a mind did not make a causal difference, then the question is, what would it do to have a mind? Therefore, states of mind must be causes. But the fact that minds can occupy states with semantic properties can explain why systems having a mind can do things which systems without a mind cannot do. This is the problem of mental causation. Thus Fodor says, "I suppose that sooner or later the physicists will complete the catalogue they have been compiling of the ultimate and irreducible properties of things. When they do, the likes of spin, charm, and change will perhaps appear upon their list. But aboutness surely would not; intentionality simply does not go that deep. It's hard to see, in face of this consideration, how one can be Realist about intentionality without also being, to some extent or other, a Reductionist. If the semantic and the intentional are real

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[35] Dennett, D.C. 1981. *Brainstorms*: *Philosophical Essays on Mind and Psychology*. p.7.
[36] Jacob, Pierre. 1997. *What Minds Can Do: Intentionality in a Non-Intentional World*. p.18.

properties of things, it must be in virtue of their identity with (or may be supervenient on) properties that are themselves neither intentional nor semantic. If aboutness is real, it must be really be something else."[37]

The problem raised by Fodor shows the intentional realist's dilemma. On the other hand, that intentional realist is a physicalist. The mind must be complex physical systems. On the other hand, he is a realist about minds. It is the view of the anti-reductionist that mind passes semantic properties which must make a causal difference. The issue is closely related to the issue of reducibility of a system's semantic properties to its non-semantic properties. There are two ways one can think about reduction.[38] For example, water turned out to be identical to H2O molecules; and genes turn out be nothing but DNA molecules. Such identities are nomic in the sense that what is claimed is that nothing would be water unless it was composed of H2O molecules. On the other hand, semantic properties are reduced to non-semantic properties, on the ground that the latter provide necessary and sufficient non-semantic conditions for the possession of semantic properties. The intentional realist like Fodor tries to bridge the gap between semantic properties and non-semantic properties. This is the main dilemma of intentional realist.

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[37] Fodor, J. A. *1998. Psychosemantics: The Problems of Meaning in the Philosophy of Mind.* p.97.
[38] Jacob, Pierre. 1997. *What Minds Can Do: Intentionality in a Non-Intentional World.* p.21.