

WHY FODOR CAN'T HAVE IT BOTH WAYS
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"Since I am very busy just now, please do not ask me what `inputs' and `outputs' are." (Fodor 1987d: 68)

PART I: INTRODUCTION

1. Stich's Puzzle

In his influential paper, "Methodological Solipsism," (1980c) Jerry Fodor urges "the computational theory of the mind" ("CTM") according to which "mental states and processes are COMPUTATIONAL".

Fodor explains CTM as follows:

mental processes have access only to formal (nonsemantic) properties of the mental representations over which they are defined (p. 63).

Fodor calls this "the formality condition." He partly explains his use of `formal' as follows:

computational processes ... are formal because they apply to representations in virtue of (roughly) the syntax of the representations.

What makes syntactic operations a species of formal operations is that being syntactic is a way of not being semantic. (1980c: 64)

For Fodor, the terms, `formal', `syntactic', and `nonsemantic' are rough synonyms (1982: 100).

Consider next, Stephen Stich's "Syntactic Theory of the Mind" ("STM"):

cognitive states...can be systematically mapped to abstract syntactic objects in such a way that causal interactions among cognitive states, as well as causal links with stimuli and behavioral events, can be described in terms of the syntactic properties and relations of the abstract objects to which the cognitive states are mapped. (1983: 149)ⁱ

What is the relation between CTM and STM? Stich is saying that mental processes can be described syntactically, which for Fodor is much the same as saying that they can be described formally and nonsemantically. And Stich thinks that this is the only way they are described for the purposes of psychology (p. 154). So STM seems similar to CTM.

This leads to Stich's puzzle. For, there is another aspect of Fodor's view that is inconsistent with STM. Fodor is a friend of the folk.

Time and again Fodor has claimed that cognitive psychology should endorse folk psychology. The following is a typical statement:

Cognitivism lives in the expectation that folk materials, when subjected to experimental evaluation and theoretical elaboration, can provide the foundations of a science. (unpublished: 2)

Folk psychology ascribes thoughts or propositional attitudes to people; beliefs, desires, and so on. These thoughts have contents or semantic properties. It is common to think that these contents are "wide" truth-conditional ones. Fodor thinks that cognitive psychology endorses contents through its commitment to "the representational theory of the mind" ("RTM") according to which propositional attitudes "are relations that organisms bear to mental representations" (1980c: 63). These representations have contents and the generalizations of psychology advert to those contents.

Contrast this view with STM. According to STM the generalizations of psychology advert not to contents but to syntactic structures. So how can Fodor subscribe to RTM and CTM, a doctrine that seems so like STM?

How is it possible for Fodor to have it both ways, for him to urge both that cognitive generalizations apply to mental states in virtue of their content and that "only non-semantic properties of mental representations can figure in determining which mental operations apply to them?" (Stich 1983: 188; the quotation is from Fodor 1990: 6)

How can we reconcile the Fodor who is an enthusiast for the intentional talk of folk psychology with the Fodor who believes in CTM and the formality condition? That is Stich's puzzle.ⁱⁱ

I think that there is good reason to be puzzled by Fodor's position, yet Stich is almost alone in being so.ⁱⁱⁱ So far as I know, nobody posed the puzzle before Stich, and his posing of it has generated no discussion, except by Fodor himself.

2. Having It Both Ways (1)

In Psychosemantics Fodor responds to Stich's puzzle with a deal of impatience:

The vocabulary required to articulate the characteristic laws of a special science is - almost invariably - different from the vocabulary required to articulate the mechanisms by which these laws are sustained, the theory of the mechanisms being pitched - to put it crudely - one level down. So the typical laws of psychology are intentional, and the typical operations of psychological mechanisms are computational, and everything's fine except that Stich has missed a distinction. (1987d: 166n)

In the text that this note accompanies (pp.139-40), Fodor talks of the psychological mechanisms of mental causation as implementing psychological laws. He gives an analogy of the relation he has in mind:

it's a law, more or less, that tall parents have tall children. And there's a pretty neat story about the mechanisms that implement that law. But the property of being tall doesn't figure in the story about the implementation; all that figures in that story is genetic properties. (p. 140)

So, the way to explain both Stich's puzzlement and Fodor's impatience seems clear. Stich takes the formality condition to be a theory of mental processes at one level whereas Fodor takes it to be a theory of them at a different level. The problem is finding the appropriate levels.

Fodor's analogy with tallness suggests that we should solve our problem of levels along the following lines. Stich takes the formality condition to be a theory of the nature of mental processes qua mental and so to be at the psychological level. In contrast, Fodor takes the condition to be a theory of the realization of mental processes in something more physically basic; it is at the level of the implementation of psychological properties. We need to be more precise about this.

On the Stich interpretation of the condition, it says something about what properties of representations are mental (rather than biological or physiological, say); about the ones used to taxonomise the representations for psychological purposes: the ones postulated by psychology; the ones adverted to in psychological laws; the ones that subsume the states containing the representations under those laws; the ones essential for those states to instantiate those laws.

On the Fodor interpretation, in contrast, the condition says something about what properties implement or realize the properties of representations identified as mental in the above way; the ones the mental properties supervene on, in the way the tendency to tallness supervenes on genetic properties.

We might try to capture the two interpretations of CTM in a way that highlights this difference as follows:

PSYCHOLOGY The laws of mental processes advert to properties of representations that are only formal (nonsemantic).

IMPLEMENTATION The laws of mental processes advert to properties of representations that are implemented only by formal (nonsemantic) properties of representations.

If the formality condition is interpreted as PSYCHOLOGY then it may well seem to imply STM; hence Stich's puzzlement. If the condition is interpreted as IMPLEMENTATION then to infer STM from it would be gross; hence Fodor's impatience.

So far, our reconciliation of Stich and Fodor is going well. The difficulties start when we ask: What exactly is the implementational level? The analogy with the implementation of tallness suggests that the appropriate level is that of human brain descriptions and computer hardware descriptions; the level of "neurological (circuit-theoretic: generally `hard-science`) explanation" (Fodor 1985b: 82). The level is fairly "brute-physical." So, according to IMPLEMENTATION, CTM restricts psychology to properties that can be implemented in formal (non-semantic) properties at that hardware level.

There are certainly signs of commitment to IMPLEMENTATION, understood in this way, in Fodor's discussion of CTM. However, the discussion is predominantly concerned with a psychological level not this implementational level. As a result, CTM has been taken as PSYCHOLOGY, or something similar, by friend and foe alike.^{iv} The very use of the term "Methodological Solipsism" suggests this interpretation, for that term was introduced by Putnam as a psychological assumption (1975b: 220). So too does the name "the computational theory of the mind." We are left with Stich's original puzzle: insofar as CTM concerns a psychological level how can it not

concern the level of psychological laws; how can it be implementational?

The answer is that Fodor, in urging CTM, mostly has in mind a different implementational level from the brute-physical hardware one mentioned above. It is a level "between common-sense belief/desire psychology, on the one hand, and [the above-mentioned one] on the other" (1985b: 82). It is not the intentional level of psychological laws which advert to content, but it is nonetheless psychological. It is the level of the psychological theory of "mental processes", or "mental causation". Though this is not at the brute-physical level, it "worries about mechanism and implementation" (1987d: 153-4). Fodor attempts to distinguish the two psychological levels in the following passage.

Now the main point to be made about [psychological generalizations that quantify over the contents of mental states] ... is that CTM does not imply - and I see no reason to believe -that they can themselves be stated in purely syntactic terms. CTM constrains mental processes to define their ranges and domains by reference to the syntactic properties of mental symbols. But CTM leaves it open that there may be true, counterfactual supporting generalizations about the mind which specify their ranges and domains in terms of the contents of mental states.

Moreover, precisely because psychological generalizations typically apply to mental states in virtue of their contents (and not in virtue of such nonsemantic properties as, according to CTM, mental processes engage) the mental states subsumed by a given psychological generalization may well be quite heterogenous in their syntactic/computational characteristics.

One would expect this whenever - to put it roughly but intuitively - similar psychological effects are produced by a range of different computational means. This suggest that the generalizations that cognitive theory construction starts from are quite likely irreducibly semantic. (Fodor unpublished: 5-6)

For Fodor, "counterfactual supporting generalizations about the mind" concern one psychological level and laws of mental processes concern another. So, for him, my discussion of PSYCHOLOGY and IMPLEMENTATION collapses three levels into two.

Fodor explained his attempt to have it both ways only recently in Psychosemantics, and then half in a note. His only other remarks clearly in support of the attempt are the unpublished ones just quoted.

So his impatience with Stich indicates that he must think that the distinction of levels on which his attempt rests is obvious. I think that it is very far from obvious.

Appeals to levels can be too easy. Suppose that a good scientific theory makes no reference to the entities and properties posited by folk opinion in that area. So eliminativism threatens. What is to stop us always saving folk opinion by claiming that it is "at a different level"? At least two things. First, folk opinion must be performing an explanatory task that is not performed by that scientific theory so that it seems plausible that we could develop it into another scientific theory that was compatible with the first

theory. Second, it must seem plausible that the folk entities and properties supervene on the entities and properties of the first theory in either of two ways: by reduction, the way water is reducible to H₂O; or by implementation, the way human pain is implemented by brain states.

Fodor's talk of the semantic being implemented in the syntactic is clearly an acknowledgement of the supervenience requirement. His discussion of CTM does not address the explanation requirement. I shall argue that Fodor's view meets neither requirement: folk psychology cannot be reconciled with CTM in the way Fodor thinks it can; the "counterfactual supporting generalizations about the mind" - let us call these, briefly, "the laws of the mind" - simply are the laws of mental processes. Most important of all, perhaps, these laws are not implemented syntactically. Fodor can't have it both ways.

Which way should he have it? In my view, he should have it the folk way. However, I think that he can partly have it the CTM way too. So he can partly have it both ways. But differences of level, and syntactic implementation, have nothing to do with managing this.

There is more to life than interpreting Fodor, fascinating though that is. In the next part I shall be concerned with CTM and related views as they arise not only in Fodor but also in others. I will mostly set aside the folk aspect of Fodor's view and therefore any attempt to come to conclusions about the correct interpretation of Fodor. In discussing CTM, I shall distinguish and assess a number of doctrines which are interesting in their own right, quite aside from their relations to Fodor's view. Some of the distinctions I shall make have often not been observed, leading to considerable confusion in the debate.

In this discussion of CTM I shall presuppose what I have just claimed and what Fodor denies:

PRESUPPOSITION The laws of the mind are the laws of mental processes. This alone makes any rush to judgement on the interpretation of Fodor inappropriate. I shall examine PRESUPPOSITION when I focus again on the interpretative question, taking account of the folk aspect of Fodor's view and his attempt to have it both ways (part III).

Central to my approach is an emphasis on three distinctions: that between formal properties and syntactic properties; that between thought processes and mental processes in general; and that between syntactic properties and narrow semantic properties.

PART II: CTM

3. 'Syntactic' and 'Formal'

We must start by examining carefully some of the terminology used to state the formality condition. This terminology fails to distinguish two notions one of which has its place at a psychological level, and so would be appropriate in PSYCHOLOGY; and the other of which has its place at a physical level, and so would be appropriate in IMPLEMENTATION. Furthermore, care about usage is necessary to sustain a central thesis of this paper: the mind is not purely syntactic at any level, even the implementational.

I have already noted that Fodor uses 'formal', 'syntactic', and

`nonsemantic' as rough synonyms (section 1). This usage is common in cognitive science. It is confusing, even if not confused.

In this section I will discuss `formal' and `syntactic'. I shall start with their "ordinary" meaning and then briefly consider a technical meaning of `formal' stemming from formal logic. I will discuss `nonsemantic' at the end of the next section.

Ordinarily, a form of an object is a "shape, arrangement of parts, visible aspect". A property of an object is formal if it concerns "the outward form, shape, appearance, arrangement, or external qualities". A form of a word is "one of the shapes [it takes] in spelling, pronunciation, or inflexion" (Concise Oxford Dictionary).

So the formal properties of an object are some of its intrinsic and fairly brute-physical properties. And its formal relations to another object are ones that hold in virtue of the objects' intrinsic brute-physical properties. A formal property of the inscription `Fa' is that of beginning with an inscription shaped such and such (replace `such and such' with a description of the shape of `F'). A formal relation between `Fa' and `Fb' is that of both beginning with an inscription of the same shape. A formal property of a symbol in a computer is that of being a certain pattern of on-off switches. A formal property of a symbol in the brain is a certain array of neurons.^v

Syntax is "sentence-construction, the grammatical arrangement of words in speech or writing, set of rules governing this" (COD).

Linguists use the term `syntax' to refer also to the study of such matters. "Syntax is the study of the principles and processes by which sentences are constructed in particular languages" (Chomsky 1957: 11). Syntactic properties and relations are ones that bear on that construction and are talked about in that study. A syntactic property of `Ron' is that of being a noun; of `loves', that of being a two-place predicate; of `Ron loves Maggie', that of being a sentence.^{vi} A syntactic relation between `Ron loves Maggie' and `Maggie is loved by Ron' is that of the latter being the passive of the former. Syntactic properties are ones that a representation has in virtue of its role in relation to other representations in the language; they are functional properties and extrinsic to the object.^{vii}

If the terms `formal' and `syntactic' are used in the way I have just explained, they refer to very different types of properties and relations. They have their places at different levels, the one physical, the other functional. It is not even the case that formal and syntactic properties of representations match up, so that whenever there is a difference in one there is a difference in the other.^{viii}

Written and spoken tokens of the one sentence are syntactically alike but formally very different. Two tokens of `Dad is cooking' printed out by the same machine are formally alike but may be syntactically different.

Aside from this "ordinary" sense of `formal' there is a technical sense that arises out of the notions of a formal language and a formal system. Formal properties and relations, in this technical sense, are functional just like syntactic ones. Indeed, they are often called "syntactic," most notably by Carnap (1937). They are quite

different from formal properties in the earlier "ordinary" sense.^{ix}

From now on I shall use the terms 'formal' and 'syntactic' in the "ordinary" senses explained first. And I shall take 'syntactic' to cover functional properties of symbols referred to by 'formal' in the technical sense just mentioned. I am thus going against the practice in cognitive science of using the two terms as rough synonyms.

My point in so doing is not to make a fuss about usage but to mark an important distinction in a convenient way. This distinction is the first of the three that I wish to emphasize.

The most important thing about syntactic properties for the purposes of this paper is that they are ones that a representation has solely in virtue of its relations to other representations within a system of representations. Its relations to anything outside that system are irrelevant to these properties.

Return to the formality condition. We can now distinguish two versions of both PSYCHOLOGY and IMPLEMENTATION, one talking of formal properties and one of syntactic, in my senses of those terms. However, the version of PSYCHOLOGY that talks of formal properties is obviously false: formal properties are at the level of brute-physical implementation of mental properties and hence at the wrong level to be adverted to by psychological laws. Psychological laws about cognitive states will no more advert to the formal properties of representations than will psychological generalizations about pain advert to the firing of c-fibres. If you go formal, you stop doing psychology. So we are left with three versions of the formality condition.

SYNTACTIC PSYCHOLOGY The laws of mental processes advert to properties of representations that are only syntactic.

SYNTACTIC IMPLEMENTATION The laws of mental processes advert to properties of representations that are implemented only by syntactic properties of representations.

FORMAL IMPLEMENTATION The laws of mental processes advert to properties of representations that are implemented only by formal properties of representations.

A problem in discussions of CTM and STM is that the uses of 'syntactic' and 'formal' do not clearly distinguish the syntactic from the formal. When the terms 'syntactic' and 'formal' seem to refer to formal properties, as they sometimes do,^x it is reasonable to interpret statements of the doctrines as FORMAL IMPLEMENTATION.

On the other hand, when the terms seem to refer to syntactic properties, which they usually do,^{xi} it is reasonable to interpret the statements as SYNTACTIC PSYCHOLOGY.^{xii} Yet these are very different doctrines.

I think that it is because doctrines like STM and CTM have been understood as SYNTACTIC PSYCHOLOGY that they have seemed so excitingly radical to their proponents and so dangerously radical to their opponents.

Of course, SYNTACTIC PSYCHOLOGY does not seem radical to Fodor because he does not presuppose, as others do, that the laws of mental processes are the same as the "counterfactual supporting generalizations about the mind"; he does not accept PRESUPPOSITION.

So he does not, as others do, take SYNTACTIC PSYCHOLOGY to eliminate the need for content.

SYNTACTIC IMPLEMENTATION is of interest only because, if we adopt PRESUPPOSITION, it forshadows Fodor's attempted solution to Stich's puzzle. If it were true, folk psychology, with its wide truth-conditional content, could be at one level, and yet CTM could be concerned with a different psychological level that implemented those contents syntactically. For syntactic properties are functional; they are above the brute-physical level of formal properties. So they could plausibly be seen as psychological. I shall return to Fodor's attempted solution later (part III).

4. What do the Arguments for CTM show?

In this section, I shall consider the bearing of the two main arguments for CTM on SYNTACTIC PSYCHOLOGY and FORMAL IMPLEMENTATION. This will lead to the introduction of further doctrines.

The argument from the computer analogy: This argument has a dual aspect which is brought out nicely in the following passage from Zenon Pylyshyn:

the most fundamental reason why cognition ought to be viewed as computation ... rests on the fact that computation is the only worked-out view of process that is both compatible with a materialist view of how a process is realized and that attributes the behavior of the process to the operation of rules upon representations. (1980a: 113)

The aspect about the "behavior of the process" bears on SYNTACTIC PSYCHOLOGY; the aspect about materialism or, as I would prefer to call it, physicalism, bears on FORMAL IMPLEMENTATION.

Consider, first, the aspect about the behavior of the process. It is argued that we should take the computer analogy seriously and so see thought processes as computational. Now computational processes are defined syntactically; they are "syntactic operations over symbolic expressions" (Pylyshyn 1980a: 113); they are "both symbolic and formal" (Fodor 1980c: 64). So we should see thought processes as defined syntactically. A typical example of a law that satisfies this requirement might be one for modus ponens inferences: Whenever a person believes both a conditional and its antecedent, she tends to infer its consequent.

What we have learnt from formal logic is that all the properties of representations adverted to in such rules are syntactic. Examples like this lead Stich to STM (1983: 154-6).

This may seem to be an argument for **SYNTACTIC PSYCHOLOGY** The laws of mental processes advert to properties of representations that are only syntactic.

However, it is an argument only if we overlook a crucial distinction: the distinction between thought processes and mental processes in general. The mental processes that concern (cognitive) psychology come in three sorts, as our initial quote from Stich brought out (section 1):

- T-T** processes from thoughts to thoughts;
- I-T** processes from sensory inputs to thoughts;
- T-O** processes from thoughts to behavioral outputs.

What I have been calling "thought processes" are T-T processes: inferential processes. Computation is indeed a good analogy for those. In my view, the analogy provides a sufficient reason for taking T-T processes to be syntactic; it establishes

SYNTACTIC THOUGHT PROCESSES The laws of thought processes advert to properties of representations that are only syntactic.^{xiii} SYNTACTIC PSYCHOLOGY is much stronger than this doctrine. It requires that I-T and T-O processes also be syntactic. Since the literature provides no reason to believe that a computer's input and output processes are analogous to I-T and T-O nor, if they were, that such processes would be syntactic, the argument from the computer analogy gives no reason to believe the stronger doctrine. The argument has no bearing on whether the laws of mental processes in general have to advert to semantic properties or contents.

I have argued elsewhere that SYNTACTIC PSYCHOLOGY is false (1989a: 381-7). In brief, it makes I-T and T-O laws impossible. I-T laws must explain the distinctive role of a certain input, in conjunction with certain thoughts, in forming other thoughts. T-O laws must explain the distinctive role of a certain thought, in conjunction with certain other thoughts, in causing output. Laws that advert only to the syntactic properties of representations cannot possibly account for these distinctive roles. For, syntactic properties are constituted solely by relations among representations. To explain the distinctive roles, we need to advert to properties of representations that are constituted partly by relations between representations and other things, for example, perceptual causes.

The distinction between thought processes and mental processes in general is the second distinction that I wish to emphasize. Participants in the debate about the mind are strangely uninterested in this distinction. The problem is not that they are unaware of it: typically discussions will start with what amounts to an acknowledgement of the distinction - as, for example, in the initial quote from Stich. The problem is that from then on all processes except thought processes, T-T, tend to be ignored. T-T are treated as if they were representative of them all. Fodor is particularly striking in this respect. He begins his discussion of CTM by distinguishing the three sorts of process, referring to T-T as the "most interesting" (1987d: 12). Yet a few pages later, in a passage important enough to be displayed, he describes "the nature of mental processes" in a way that applies only to T-T:

Claim 2 (the nature of mental processes)

Mental processes are causal sequences of tokenings of mental representations. (p. 17)

The most interesting ones have become the only ones.^{xiv} Despite this, there is every sign that he takes CTM to cover all mental processes.^{xv}

Consider, next, the physicalist aspect of the argument from the computer analogy. Computers are undoubtedly physical things. So, by seeing the mind as like a computer, we can make our theory of the mind conform with the very plausible overarching principle of physicalism. However, the move from the computer analogy to the physicalistic doctrine,

FORMAL IMPLEMENTATION The laws of mental processes advert to properties of representations that are implemented only by formal properties of representations, is too swift. What the analogy shows is that syntactically defined processes are implemented formally, for that is how they are implemented in a computer. If SYNTACTIC PSYCHOLOGY were true then FORMAL IMPLEMENTATION would be true. But the computer analogy gives no reason to think that SYNTACTIC PSYCHOLOGY is true and I have argued that it is false.

If SYNTACTIC PSYCHOLOGY is indeed false (though SYNTACTIC THOUGHT PROCESSES is true), I-T and T-O laws involve nonsyntactic properties of representations. Such properties, unlike syntactic ones, cannot be implemented in the formal properties of representations. Syntactic properties, we have noted, are constituted solely by relations among representations. The computer analogy shows that these relations are implemented in formal relations that hold in virtue of the formal properties of the representations (shape, etc.). Nonsyntactic properties, in contrast, are constituted partly by relations between representations and other things. These relations cannot be implemented in formal relations that hold solely in virtue of the formal properties of representations. Of course, a physicalist (who is prepared to use 'formal' generously) will think that these relations are implemented in formal relations that hold in virtue of the formal properties of representations and of other things, for example, of perceptual causes. Strictly speaking, then, FORMAL IMPLEMENTATION, is false. However, if its talk of the "formal properties of representations" is extended to cover their formal relations, including their relations to other things, a physicalist will think it true. But that is a lot to read out of the computer analogy. The analogy supports FORMAL IMPLEMENTATION only insofar as it concerns thought processes.

The argument from methodological solipsism and psychological autonomy: The argument is familiar. It appeals, inter alia, to Twin-Earth considerations to argue that psychology should advert only to properties that supervene on what is "inside the skin."

This argument is open to question, as Burge has shown (1986). Nevertheless, I think that it is basically correct (1989a: 387-94).^{xvi} Assume that it is. Then it establishes that truth-conditional properties are irrelevant to psychology. These do not supervene on the brain. The point to be made now is that the argument does not establish SYNTACTIC PSYCHOLOGY. Let us take for granted that syntactic properties are relevant to psychology. The argument does not establish that only syntactic properties are relevant. To establish that we need the further premise that there are no other non-truth-conditional properties, supervenient on the brain, that are relevant; that a "narrow" meaning that goes beyond syntax is not relevant. To my knowledge, no argument for this premise has ever been given.

Further, the argument does not establish that only "nonsemantic" properties are relevant to psychology, nor that representations are "meaningless" (Field 1978: 101) or "uninterpreted" (Schiffer 1981:

214-5; Churchland and Churchland 1983: 10) so far as psychology is concerned, unless `nonsemantic`, `meaningless`, and `uninterpreted`, simply mean non-truth-conditional.^{xvii} I am as enthusiastic as anyone about truth-conditional semantics, but surely the question whether it is the right semantics is an empirical one, not something to be settled by definition. Whether truth and reference are appropriate notions for explaining semantic phenomena is an open question to be answered by close attention to what semantics is for.^{xviii}

A narrow non-truth-conditional semantics is not a mere possibility. Consider functional- (conceptual-) role semantics. Typically such a semantics ascribes a meaning that is determined by the internal functional role of the representation. This meaning supervenes on the brain and so is narrow.^{xix} Syntactic properties, determined by functional relations between representations, are part of narrow meaning but do not exhaust it. The narrow meaning of a sentence is determined not only by its syntactic structure but also by the narrow meanings of the words that go into that structure. These word meanings are determined by the functional relations between representations, inputs and, perhaps, outputs. For example, what makes a token mean echidna (narrowly) and not platypus is being linked to echidna-ish not platypus-ish inputs and, perhaps, outputs. Being an `echidna' token is mostly not a matter of syntax at all, for it is not a property a representation has in virtue of its relations to other representations.

Insofar as the argument from methodological solipsism is good, it establishes that psychology needs at most a narrow semantics, whether a functional-role semantics or some other sort. So the argument is compatible with

NARROW PSYCHOLOGY The laws of mental processes advert to properties of representations that are only narrow semantic.

This should be read as a commitment to laws that advert to properties that are not syntactic; for example, narrow word meanings. Hence it is inconsistent with SYNTACTIC PSYCHOLOGY. However, it should also be read as allowing that some laws of mental processes may advert only to syntactic properties; narrow semantic should be taken to include syntactic. So NARROW SEMANTIC is consistent with SYNTACTIC THOUGHT PROCESSES. This is as it should be because the argument from methodological solipsism does not count against SYNTACTIC THOUGHT PROCESSES.

The distinction between syntactic and narrow semantic properties, hence the distinction between SYNTACTIC PSYCHOLOGY and NARROW PSYCHOLOGY, is the third distinction that I wish to emphasize. There is nothing in the argument from methodological solipsism to suggest that SYNTACTIC PSYCHOLOGY is correct.

The contrast between NARROW PSYCHOLOGY and what is alleged to be the folk view can be brought out neatly by the following statement of that view:

WIDE PSYCHOLOGY The laws of mental processes advert to properties of representations that are wide semantic.

I have argued elsewhere that NARROW PSYCHOLOGY is the correct doctrine (1989a).^{xx}

If both SYNTACTIC THOUGHT PROCESSES and NARROW PSYCHOLOGY are right, as I think they are, the significance of the distinction between thought processes and mental processes in general is apparent. The laws of thought processes - T-T laws - advert only to syntactic properties, but the laws of mental processes in general must cover I-T and T-O and so must advert to meanings. It is only when we are concerned with these latter, largely ignored, processes that there is a need for semantics in psychology.

Though doctrines like CTM and STM are most frequently urged using `syntactic` and `formal`, so that the doctrines seem to be SYNTACTIC PSYCHOLOGY, they are sometimes urged, often in the same breath, as if they were committed to narrow functional-role meaning; i.e., as if they were NARROW PSYCHOLOGY.^{xxi} Yet, as we have seen, these two doctrines about psychology are very different. Perhaps when people talk of "syntactic" or "formal" properties, they mean to cover some sort of narrow meaning. If so, their talk shows a Humpty-Dumptyish contempt for the conventions of language (and even Humpty Dumpty told us what he meant by `glory`). Narrow word meanings are not syntactic, in any ordinary sense of that term. Nor are they like the formal properties of symbols in a formal system.^{xxii}

Finally, FORMAL IMPLEMENTATION is unsupported by the argument from methodological solipsism just as it was by the argument from the computer analogy. The present argument for mental supervenience on the brain, but FORMAL IMPLEMENTATION requires something much more restrictive: supervenience on the formal properties of mental representations. The narrow meanings required to explain I-T and T-O do not supervene on those properties (though a physicalist may think they supervene on the formal properties of representations and other things).

In sum, the arguments from the computer analogy and methodological solipsism establish neither SYNTACTIC PSYCHOLOGY nor FORMAL IMPLEMENTATION. The argument from the computer analogy establishes SYNTACTIC THOUGHT PROCESSES and the related more restricted version of IMPLEMENTATION. The argument from methodological solipsism may support NARROW PSYCHOLOGY and the irrelevance of truth-conditional properties to psychology, but it does not establish that only syntactic ones are relevant. I have argued elsewhere that SYNTACTIC PSYCHOLOGY is false. A consequence of this argument is that FORMAL IMPLEMENTATION (strictly construed) is also false.

I think that the failure to attend sufficiently to the three distinctions I have been emphasizing has led to considerable confusion in the discussion of doctrines like CTM and STM. Each failure confuses the false SYNTACTIC PSYCHOLOGY with a different plausible doctrine.

(1) Failing to attend to the distinction between formal and syntactic properties confuses the doctrine with FORMAL IMPLEMENTATION. Though this doctrine is strictly false, it is close to one that a physicalist will find plausible. (2) Failing to attend to the distinction between thought processes and mental processes in general, a failure encouraged by the computer analogy, confuses the doctrine with SYNTACTIC THOUGHT PROCESSES, which is true. (3) Failing to attend

to the distinction between syntactic properties and narrow semantic ones confuses the doctrine with NARROW PSYCHOLOGY, which is also true.

All of this matters to psychosemantics because the difference between the syntactic properties required for thought processes and the narrow semantic properties required for mental processes in general is great. One important consequence of this difference is its bearing on the future of folk psychology. Folk psychology is committed to much more than syntactic properties and so a psychology restricted to syntactic properties is radically revisionist. In contrast, a psychology committed to narrow semantic properties may not be revisionist at all.

It is time to draw some conclusions about the interpretation of Fodor. To do this we must return to his solution to Stich's puzzle: Fodor's attempt to have it both ways.

PART III: INTERPRETING FODOR

5. Having It Both Ways (2)

We have seen that there are various natural ways to understand CTM depending on how one understands 'syntactic' and 'formal' and on whether talk of "mental processes" is taken to be about mental processes in general or only thought processes. Taking account of this, and the arguments offered for CTM, I think that there is a basis for attributing each of the following to Fodor: FORMAL IMPLEMENTATION and SYNTACTIC PSYCHOLOGY, which I have claimed are false; SYNTACTIC THOUGHT PROCESSES and NARROW PSYCHOLOGY, which I have claimed are true.

To complete the interpretation of Fodor, we must take account of the other aspect of his view: his enthusiasm for the intentional talk of folk psychology. Fodor attempts to combine this aspect with the CTM aspect by claiming that the semantic properties of folk psychology are implemented in the level that concerns CTM. That is how he hopes to solve Stich's puzzle and have it both ways.

There would be no puzzle if CTM were simply FORMAL IMPLEMENTATION, but that interpretation misses the predominantly psychological nature of CTM (section 2). There would be no puzzle either if the psychological nature of CTM were captured by SYNTACTIC THOUGHT PROCESSES, because a doctrine restricted to thought processes is quite consistent with the view that the theory of the mind in general must advert to contents. However, this restricted doctrine is inadequate as an interpretation because Fodor intends CTM to cover all mental processes.

To capture both the general and the psychological nature of Fodor's discussion of CTM, the doctrine must be taken to be, at least partly, either SYNTACTIC PSYCHOLOGY or NARROW PSYCHOLOGY. The puzzle, then, is how Fodor reconciles these doctrines with the folk aspect of his view.

What is the folk aspect? It may seem to amount to a commitment to WIDE PSYCHOLOGY. However, the latter talks of "the laws of mental processes." Central to Fodor's attempt to have it both ways is his rejection of PRESUPPOSITION: he does not think that the "counterfactual supporting generalizations about the mind" which,

according to folk psychology, advert to content, are the laws of mental processes (section 2). Perhaps we can capture the folk aspect of Fodor's view by replacing WIDE PSYCHOLOGY's talk of laws of mental processes with talk of laws of the mind (for that is what the counterfactual supporting generalizations are):

WIDE PSYCHOLOGY (F) The laws of the mind advert to properties of representations that are wide semantic.

It has become clear recently that Fodor is not committed to quite this. He thinks that the difference between wide and narrow semantic properties is of little significance, because they both involve a commitment to intentional content. He thinks that narrow content is what we need for psychology (1987d: 45-53). So his commitment is really to

NARROW PSYCHOLOGY (F) The laws of the mind advert to properties of representations that are only narrow semantic.^{xxiii}

The properties mentioned by NARROW PSYCHOLOGY (F) are of the same sort as those mentioned by NARROW PSYCHOLOGY: both are narrow meanings.

So one way to solve Stich's puzzle and reconcile the folk aspect of Fodor's view with the CTM aspect would be to interpret CTM as NARROW PSYCHOLOGY.^{xxiv} Indeed, I have argued (1989a) that this is the right way to combine the considerations that led to CTM and STM with a respect for intentional content. A problem with the interpretation is that it construes Fodor's talk of 'syntactic' and 'formal' as meaning narrow semantic. However, there is a more decisive objection to the interpretation. This solution cannot be Fodor's. He does not think that the properties adverted to by the laws of the mind are those adverted to by the laws of mental processes. He thinks that the former properties are implemented by the latter.

Only one possible interpretation of CTM remains:

SYNTACTIC PSYCHOLOGY The laws of mental processes advert to properties of representations that are only syntactic.

We must reconcile this with NARROW PSYCHOLOGY (F). This interpretation has the disadvantage that SYNTACTIC PSYCHOLOGY is false. Aside from that, I shall argue that the reconciliation fails.

My interpretation of Fodor's CTM has rested on the assumption that he rejects PRESUPPOSITION. It is easy to see that the reconciliation depends on his being right in this rejection. If he is not, the laws of the mind become the laws of mental processes. So NARROW PSYCHOLOGY (F) becomes NARROW PSYCHOLOGY, which is straightforwardly inconsistent with SYNTACTIC PSYCHOLOGY: if the laws advert only to syntactic properties they do not advert to the narrow semantic ones which go beyond syntax. So, given PRESUPPOSITION, if the CTM aspect of Fodor's view is SYNTACTIC PSYCHOLOGY, that aspect cannot be reconciled with the folk aspect; Fodor cannot have it both ways.

Fodor's solution depends not only on the falsity of PRESUPPOSITION but also on:

SYNTACTIC IMPLEMENTATION (F) The laws of the mind advert to properties of representations that are implemented only by syntactic properties of representations.

According to the folk aspect of Fodor's view - NARROW PSYCHOLOGY (F)

- the laws of the mind advert to narrow meanings. According to the CTM aspect of his view - SYNTACTIC PSYCHOLOGY -the laws of mental processes advert to syntactic properties. According to SYNTACTIC IMPLEMENTATION(F), the former narrow meanings are implemented in the latter syntactic properties. (This solution was foreshadowed in the earlier discussion of SYNTACTIC IMPLEMENTATION; section 3.)

In rejecting PRESUPPOSITION, Fodor places the theory of the mind at a different level from the theory of mental processes. In this way he hopes to reconcile folk theory with CTM. I pointed out earlier that two requirements must be met to avoid spurious attempts to reconcile folk theory with science by appeals to levels: an explanation requirement and a supervenience requirement (section 2). Fodor clearly aims to meet the supervenience requirement with SYNTACTIC IMPLEMENTATION(F). So this doctrine is doubly important to Fodor.

In the next section, I shall start the defense of PRESUPPOSITION by considering the explanation requirement. In the following section I shall argue that SYNTACTIC IMPLEMENTATION(F) is false, which completes my defense of PRESUPPOSITION.

My conclusion is that Stich is right in thinking that Fodor can't have it both ways. But where Stich thinks that Fodor should be influenced by the arguments for CTM to adopt SYNTACTIC PSYCHOLOGY and abandon content,^{xxv} I think that he should be influenced by those arguments to adopt NARROW PSYCHOLOGY and abandon the view that the theory of the mind is purely syntactic at any level.

6. The Explanation Requirement

If the nonintentional theory of mental processes is to be reconciled with the intentional theory of the mind, the explanation requirement must be met:

There must be some explanatory task performed by the theory of mental processes that is not performed by the theory of the mind.

In the next section, we shall see how this requirement could be met for thought processes. The problem is meeting it for the processes involving sensory inputs and behavioral outputs. Fodor has argued, persuasively in my view, that behavior must be described intentionally for the purposes of psychology^{xxvi} and that we need content to explain behavior so described (see, for example, 1982).

What could the theory of mental processes explain if not behavior under that intentional description? Fodor says that "CTM leaves it open that there may be true, counterfactual supporting generalizations about the mind" which advert to contents (unpublished: 5). For CTM to leave this open there must be a place for these generalizations as well as the ones covering mental processes, which are of course equally counterfactual supporting. Behavioral output, and sensory input, must be involved in mental processes under some nonintentional description.

Fodor's discussions of CTM, focussed as they are on thought processes, give no indication of the appropriate form of description.

And it is hard to see how there could be a suitable description which, though nonintentional, was nonetheless psychological. What description, then, does Fodor have in mind? A wider reading of Fodor's work, and that of his collaborator Pylyshyn, suggests an answer:^{xxvii}

Fodor has in mind a description that is not psychological at all but brute-physical.

Fodor's picture of the explanatory task at the level of mental processes is as follows. I-T laws explain the formation of syntactically described thoughts as the result of physically described inputs. T-T laws explain the formation of syntactically described thoughts as the result of other syntactically described thoughts. T-O laws explain physically described outputs as the result of syntactically described thoughts. This whole level implements the laws of the mind, which are intentional throughout: intentionally described inputs lead to semantically described thoughts which lead to intentionally described output.

On this picture the theory of mental processes and the theory of the mind describe inputs and outputs differently and so the picture may seem to meet the explanation requirement. However, I do not think that it does. First, it is surely very misleading to call the processes from physically described inputs to thoughts, and from thoughts to physically described outputs, "mental" processes. They are psychophysical processes not psychological ones. And the I-T and T-O laws that explain them are psychophysical and hence not appropriately placed in a theory of mental processes. More importantly, these laws, together with the syntactic T-T laws, do not form a "level," in the appropriate sense. Psychophysical laws are between levels; they are bridging laws. They hold in virtue of the fact that a totally psychological level, including psychologically described inputs and outputs, is implemented in a totally physical level, including physically described thoughts.^{xxviii}

We started our discussion of Stich's puzzle with an easy solution that distinguished the psychological level from the physical (section 2). Wherever there are two levels, it will be necessary to explain the relations between them. So if Fodor's proposal were simply that there were these two levels, and the relations between them, the puzzle could have been laid to rest. What kept it alive was the implication in Fodor that there was a further psychological level, the level of mental processes, between the intentional psychological level and the brute-physical. The present picture undermines the idea of this third level (so far as I-T and T-O laws are concerned); explaining the relation between the psychological and the physical level does not establish another psychological level.

If this is right, Fodor has failed to meet the explanation requirement and so has failed to show, *contra* PRESUPPOSITION, that there is a level of mental processes different from the level of the intentional laws of the mind. However, the strongest support for PRESUPPOSITION in the face of Fodor's discussion comes from a consideration of SYNTACTIC IMPLEMENTATION(F). For this is the doctrine by which Fodor relates his level of mental processes to the laws of the mind. So it is his way of meeting the supervenience requirement. I shall argue that SYNTACTIC IMPLEMENTATION(F) is false.

7. SYNTACTIC IMPLEMENTATION(F)

The arguments for CTM (section 4) do not establish SYNTACTIC

IMPLEMENTATION(F): the argument from the computer analogy is for SYNTACTIC THOUGHT PROCESSES; the argument from methodological solipsism is for NARROW PSYCHOLOGY. Does Fodor offer anything in support of his claim that the semantic level of intentional psychology is implemented syntactically? The unpublished remarks quoted earlier (section 2) suggesting that the intentional is multiply implemented at the computational level are the only ones that seem clearly directed to this end. I shall discuss the suggestion at the end of this section. First, however, I shall discuss some other remarks, not clearly directed to this end, about the relation of the semantic to the syntactic. My case against SYNTACTIC IMPLEMENTATION(F) will emerge in these discussions.

Fodor has some important things to say about the connection between the contents of mental states and their causal roles:

- (1) the causal roles of mental states typically closely parallel the implicational structures of their propositional objects. (1985b: 90; see also 1987d: 18)
- (2) within certain famous limits, the semantic relation that holds between two symbols when the proposition expressed by the one is entailed by the proposition expressed by the other can be mimicked by syntactic relations in virtue of which one of the symbols is derivable from the other. (1987d: 19; see also 1985b: 93)
- (3) You connect the causal properties of a symbol with its semantic properties via its syntax. (Fodor: 1987d: 18; see also 1985b: 93)

According to SYNTACTIC PSYCHOLOGY, the causal relations between mental states are determined by their syntactic properties. (1) says that these syntactically determined causal relations parallel semantic relations. (2) says that syntactic relations mimic semantic ones. (3) says that the mimicking explains the parallelism.

'Mimick' and 'parallel' would be weazel words to use to talk about the robust relation of implementation. There is no clear evidence that Fodor intends (1) to (3) to support his view that the psychological laws which advert to content are implemented syntactically. However, (1) to (3) certainly relate the semantic to the syntactic and so might appear to support Fodor's view. And Fodor has said so little else in support. I shall examine the appearance.

First comment: At best, (1) to (3) are evidence for the syntactic implementation of T-T laws, laws of thought processes. They could provide no evidence on the implementation of the laws of the mind in general, which include I-T and T-O laws as well. So they could not justify SYNTACTIC IMPLEMENTATION(F).

The intentional I-T laws will talk of certain sorts of input, together with other factors, causing thoughts with a certain sort of content; a crude example of an application of such a law might be that the sight of Maggie, along with various background thoughts, cause thoughts about Maggie. The claim that causal relations between inputs and mental states parallel semantic relations between propositions would be absurd. The claim that the syntactic relations

between inputs and mental states mimick semantic relations would be nonsensical: inputs are not representations and so stand in no syntactic relations.^{xxix} Fodor does not make these claims: he talks only of the causal, semantic, and syntactic relations between states/symbols. So his remarks about syntax mimicking semantics could cast no light on how I-T laws are syntactically implemented. The same goes for T-O laws.

(1) to (3) provide no support for the view that the word meanings adverted to in intentional I-T and T-O laws could be implemented syntactically. Furthermore, the view is obviously false. This can be brought out using Fodor's own semantics (1987d: 45-95). He urges a "denotational" semantics according to which wide meanings are simply extensions and narrow meanings are simply functions from contexts to extensions. So the wide meaning of 'Maggie' is its role of denoting Maggie, and its narrow meaning is a function that has the value Maggie on Earth, Twin Maggie on Twin Earth, and so on.^{xxx} The property of denoting Maggie can no more be implemented syntactically than it can be implemented in the formal properties of representations; similarly the property that becomes that of denoting Maggie in the Earthly context (section 4). There is no level at which a representation has these properties simply in virtue of its relations to other representations; it has them partly in virtue of, for example, its relation to Maggie or Twin Maggie. So there is no level at which it has these properties simply in virtue of its syntactic properties. SYNTACTIC IMPLEMENTATION(F) is false.

Fodor's semantics raises a further problem, which warrants a short digression. It is unclear how his narrow meanings do, or could, have any bearing on mental causation. If narrow meanings were implemented syntactically, it would be clear how they played a causal role in the life of the mind. But we have just seen that they are not. If they were identified with functional-role meanings, as I think they should be,^{xxxi} their causal role would also be clear. But Fodor will have nothing to do with functional-role semantics.^{xxxii} He thinks that it leads to meaning holism, which threatens Life As We Know It. Why, then are his narrow meanings not mere epiphenomena?

At one point (1987d: 89-91), Fodor confronts the objection that his theory breaks the internal connection between believing a certain thing and behaving in a certain way. Fodor accepts the break, blithely outSmarting the objector. He appeals to Duhem, pointing out that no behavioral predictions do follow from a belief on its own: ancillary hypotheses are needed. This is beside the point of the objection.

The key thing about beliefs -what makes us posit them in the first place - is that each one has a distinctive causal role in producing behavior: if all the ancillary hypotheses are held constant, then believing such and such will have different behavioral consequences from believing so and so. A theory of content cannot break this causal connection.

Returning to the main theme, Fodor's discussion of the relation between the causal, semantic, and syntactic properties of representations exemplifies the usual lack of interest in the distinction between thought processes and mental processes in general.

A theory of thought processes is being falsely packaged as a theory of the mind. This is especially important because it is the theory of processes other than thought processes that needs semantics.

Second comment: I shall now consider the bearing of (1) to (3) on the implementation of the laws of thought processes T-T laws - only. So this comment is much less important than the first one. I have claimed that the argument from the computer analogy shows that T-T laws are syntactic: SYNTACTIC THOUGHT PROCESSES is true. I shall go on to allow that they are also implemented syntactically. So, I think that, if restricted to T-T laws, SYNTACTIC IMPLEMENTATION(F) is true. However, (1) to (3) are irrelevant to establishing this. Further, this implementation is not a case, contra Fodor, of the semantic being implemented in the syntactic.

Consider the earlier example of a T-T law:
Whenever a person believes both a conditional and its antecedent, she tends to infer its consequent.

This law specifies a causal process that parallels the semantic relations between propositions in modus ponens inferences, as (1) requires. And these relations are indeed mimicked by the syntactic ones between symbols in those inferences, as (2) requires. Finally, that mimicking does explain the parallelism, as (3) requires.

This is important, but it has got nothing to do with SYNTACTIC IMPLEMENTATION(F). That doctrine requires that the mechanisms underlying the law be syntactic. So, it requires that the properties adverted to by the law be implemented syntactically, and that the causal process specified in the law hold because of that implementation. The law does not advert to any semantic relation - for example, entailment - between representations; it adverts to the syntactic properties of being a conditional, being an antecedent, and being a consequent. So the parallelism of the causal process it specifies to any semantic relation, and the mimicking of any semantic relation by a syntactic one, are irrelevant to the implementation of the law. What is relevant are the mechanisms underlying those syntactic properties - for example, being a conditional - in virtue of which the specified process holds.

The parallelism and the mimicry are indeed relevant to something, just not to SYNTACTIC IMPLEMENTATION(F).

The parallelism between the causal and the semantic is relevant to the rationality of people. If people were ideally rational, their thought processes would always be perfectly parallel to sound inductive and deductive semantic relations. Statements of (1) and (2) can often suggest that people are close to ideally rational, though this is certainly not Fodor's view (1987d: 88). There is no a priori reason to think that people are close to ideally rational^{xxxiii} and a good deal of empirical evidence to show that they are not.^{xxxiv} Thus there is considerable evidence that people are very bad at modus tollens. The following might be a law:

Whenever a person believes both a conditional and the negation of its consequent, she tends not to infer the negation of its antecedent.

Here there is no parallelism between the causal and a sound semantic

relation. The lack of parallelism is a failure of rationality.

Such failures have no significance at all to T-T laws. The causal role specified by the above law is no more, nor any less, problematic than that specified by the earlier law where there was a parallelism.

To say this is not, of course, to say that the rationality reflected in parallelism is unimportant. Without some of it, "there wouldn't," as Fodor puts it, "be much profit in thinking" (1987d: 14). But how much there is of it is beside the point of T-T laws. The causal relations between mental states have to be connected to the semantic and syntactic relations between representations, whether the causal relations parallel rational or irrational semantic and syntactic relations.

The mimicking of the semantic by the syntactic is relevant to the explanation of semantic relations. A syntactic relation of derivability holds between the representations mentioned in the modus ponens law. This relation mimicks the semantic relation of entailment between the representations. Why? Because the syntactic one is the semantic one. Or rather, it would be if we could overlook the famous limits. Entailment is (partially) reduced to, derivability. (In saying this, I am not of course saying that, limits aside, 'derivable from' means 'entailed by'. Water is H₂O even though 'water' does not mean 'H₂O'.) This reduction, achieved by logicians, is very significant for semantics but it has no significance for T-T laws, or their implementation, because those laws say nothing about entailment.

This is not to deny the significance of the reduction to the theory of the mind. Put the reduction together with the computer analogy of thought processes, and we can explain how people can be, at least partially, rational. That is what Fodor's (1) to (3) bring out. So (1) to (3) are certainly important. However, they are irrelevant to SYNTACTIC IMPLEMENTATION(F) even when the doctrine is restricted to T-T laws. (I repeat that there is no clear evidence that Fodor thinks otherwise.)

How true is the doctrine so restricted? The first thing to notice is that, whatever the facts are about the implementation of T-T laws, those laws themselves advert to syntactic properties; properties like being a conditional already are syntactic. That is what we learnt from formal logic and the computer analogy, which led us to embrace SYNTACTIC THOUGHT PROCESSES (section 4). Syntax gets into the psychological picture first at the level of the laws not their implementation.

T-T laws are not semantic at any level. In saying this, I am not of course denying that the representations adverted to in the laws have semantic properties. It is essential to their role in explaining behavior that they do have. That is a conclusion of the argument against SYNTACTIC PSYCHOLOGY mentioned in section 4. The point is simply that the laws that explain the transitions from one thought to another do not need to advert to any semantic properties.

The computer analogy is apt for T-T processes only, and is primarily concerned with their nature not their implementation. What the analogy with computation throws light on, primarily, is the nature

of part of the mind, not the implementation of the whole of the mind.

Of course, the fact that thought processes are syntactic does not show that they are not also implemented syntactically. The computer analogy suggests that they are indeed so implemented.

This brings us to Fodor's unpublished remarks that are clearly offered in support of SYNTACTIC IMPLEMENTATION(F). Where there is implementation there is the possibility of multiple implementation.

In a passage quoted before (section 2), Fodor suggests, somewhat tentatively, that there is multiple implementation of the semantic in the syntactic; "similar psychological effects are produced by a range of different computational means" (unpublished: 5-6; also 1987d: 52.

This claim, just like (1) to (3) above, must be restricted to thought processes if it is to be true. However, so restricted, it is true. There are many different ways of getting a computer to implement laws like the ones above. And many of these may be at levels above the brute-physical hardware level. Using Marr's distinction (1982: 22-5), we can think of the law as at the computational level, and the various computational means as at the algorithmic level. The properties at the algorithmic level are indeed syntactic. So, if we continue to follow the computer analogy, the properties adverted to in T-T laws are implemented in syntactic properties at the algorithmic level. To this extent then, SYNTACTIC IMPLEMENTATION(F) is correct.

However, this is not a case of the semantic level being implemented in syntax, for the properties that are implemented - ones like being a conditional - are themselves syntactic. T-T laws advert to syntactic properties in one symbol system. These properties are implemented in syntactic properties in a different symbol system. Note further that SYNTACTIC IMPLEMENTATION(F) is true only for thought processes. The reasons for thinking that it is false in general, set out in my first comment, still stand.

Return to PRESUPPOSITION. In rejecting this, Fodor must meet two requirements. To meet the explanation requirement he must show that the laws of mental processes have a different explanatory task from that of the intentional laws of the mind. I argued that this requirement was not met so far as I-T and T-O laws were concerned (section 6). We can now see that it could be met for T-T laws: the explanatory task at the algorithmic level is different from that at the computational level. Fodor's way of meeting the supervenience requirement is SYNTACTIC IMPLEMENTATION(F). We have just seen that this also could be met for T-T laws but not for I-T and T-O laws. Given the failure to meet either requirement for the I-T and T-O laws, Fodor has not shown that we can distinguish a level that is the concern of the theory of mental processes from the level that concerns the laws of the mind.

Summary of this part. For Fodor to have it both ways he must combine the CTM aspect of his view with the folk aspect, NARROW PSYCHOLOGY(F). Discussions of CTM suggests four distinct doctrines.

FORMAL IMPLEMENTATION must be ruled out as an interpretation of Fodor because it misses the psychological nature of his discussion.

SYNTACTIC THOUGHT PROCESSES must be ruled out because it is not general enough. NARROW PSYCHOLOGY must be ruled out because it is incompatible with Fodor's view that CTM concerns a level that implements the semantic properties at the folk level. One possible interpretation remains: SYNTACTIC PSYCHOLOGY. Combining this with NARROW PSYCHOLOGY(F) is impossible if PRESUPPOSITION is right and the laws of the mind are the same as the laws of mental processes; the laws cannot be only syntactic and yet also narrow semantic. I have argued that PRESUPPOSITION is right. Further, Fodor's way of combining the two aspects requires SYNTACTIC IMPLEMENTATION(F). I have argued that SYNTACTIC IMPLEMENTATION(F) is unsupported and wrong, except insofar as it concerns thought processes. Insofar as it concerns thought processes, it is right, but this implementation is not a matter of the semantic being implemented in the syntactic, as Fodor claims. It is a matter of the syntactic being implemented in the syntactic.

We have seen that I-T and T-O laws are not syntactic at any level. In contrast, T-T laws are syntactic at every level above the formal.

PART IV: CONCLUSION

8. Conclusion

Stich is puzzled: How can Fodor have it both ways? Fodor urges CTM, according to which the theory of mental processes adverts only to syntactic properties, and yet remains an enthusiast for intentional psychology, which adverts to meanings. Fodor thinks the answer is easy: intentional psychology is at one level; the theory of mental processes is at a different level that implements the first level.

In brief, the syntactic implements the semantic.

I have argued that the theory of mental processes is not at a different level from intentional psychology. The theory does not have a separate explanatory task from that psychology, and the psychology is not, in general, implemented in the syntactic properties which, according to Fodor, are adverted to in the theory. The mind as a whole is not purely syntactic at any level (though part of it is). Fodor's attempt to have it both ways fails.

Along the way, I have accepted that the laws of thought processes advert only to the syntactic properties of representations - SYNTACTIC THOUGHT PROCESSES, whilst denying that the laws of mental processes in general do - SYNTACTIC PSYCHOLOGY. So Fodor can partly have it the CTM way. Elsewhere (1989a) I have argued that the laws of mental processes in general advert to narrow semantic properties - NARROW PSYCHOLOGY. So he can have it the folk way. Implementation has nothing to do with this partial solution to Stich's puzzle.

Central to my approach has been an emphasis on three distinctions; that between formal properties, which are intrinsic to a representation and fairly "brute-physical", and syntactic properties, which are extrinsic and functional; that between processes that hold between thoughts, and processes that hold between inputs and thoughts and between thoughts and outputs; and that between syntactic properties, which a representation has solely in virtue of its relations to other representations, and narrow semantic properties (other than syntactic ones), which a representation has partly in

virtue of its relations to inputs and, perhaps, outputs.^{xxxv}
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NOTES

- i. Similar views have been urged by others, including Hartry Field (1978: 100-02) and Stephen Schiffer (1981: 214-5).
- ii. Zenon Pylyshyn generates the same puzzle: on the one hand he endorses CTM and the formality condition (1980a: 111-15; 1980b: 158-61; 1984: xiii); on the other, folk psychology (1980b: 159-161).
- iii. Patricia Kitcher is some company: she finds the combination of CTM with RTM "rather perverse" (1985: 89).
- iv. E.g., Baker 1986: 41; Demopoulos 1980; Kitcher 1985: 89; LePore and Loewer 1986: 598-9; Lycan 1984: 91-2; McGinn 1982: 208; Schiffer 1981: 214-5; Stich 1980: 97. Surprisingly, none of these philosophers, apart from Stich and Kitcher, seems worried by the fact that Fodor is also an enthusiast for folk psychology (cf note 24).
- v. Note that a sentence or word can appear in indefinitely many forms. Similarly, a letter, if letters are taken to make up a word in all its forms. However, letters are often taken to be restricted to inscriptions, in which case a letter can appear in a more limited number of forms.

vi. I do not mean to suggest that properties like being a noun may not also be semantic.

vii. This is the deep truth in the structuralist tradition in linguistics. For the deep falsehood, particularly in the French version, see Devitt and Sterelny 1987: ch. 13.

viii. Formal and syntactic properties obviously don't match up if we remove the restriction to representations. Objects like the Harbour Bridge and the Opera House have a form but no syntax.

ix. For more on this technical sense of formal, see my 1989, pp. 372-3, which draws on Haugeland 1978: 5-10, 21-2; 1985: 4, 50-2, 58-63, 100-3.

x. E.g., Fodor 1980c: 64; 1980d: 106; 1982: 102. See also the following commentaries, with which Fodor largely agrees: Haugeland 1980: 81-2; Rey: 1980b: 91. Stich also sometimes seems to have this interpretation in mind; 1983: 44.

xi. E.g., Fodor 1985b: 93; 1987d: 18-19, 156n. In comments on Fodor 1980c, with which Fodor also agrees (1980d: 105), Loar distinguishes the two senses and takes Fodor to intend the functional one; 1980: 90. See also Pylyshyn 1980a: 111-15 (but note that Pylyshyn takes syntactic properties to be intrinsic to a representation); Stich 1983: 152-3. Many show no interest in the distinction; e.g., Baker 1986: 27; Block 1986: 616. See also note 21 and accompanying text.

xii. See note 4 for some examples of people who seem to interpret the formality condition in this way.

xiii. What about laws like, "If x believes that y is a bachelor, x will tend to believe that y is unmarried"? I think that the analogy shows that such lower level laws are derived from an application of upper level laws like, "If x believes that all Fs are G and that y is an F then he will tend to believe that y is a G." Such upper level laws are the concern of the theory of thought processes and they advert only to syntactic properties of representations. The semantic content comes in only at the level of the application of the laws.

xiv. See also the transition in Fodor 1985b from a start in which thinking is "the paradigm of mental process" (p. 78) to an ending in which it is as if thinking were the only such process. For an example of a swifter transition, see Block 1986: 628.

Note that the common view that the mind goes representational very soon after receiving a sensory input does not save Claim 2. Certainly all processes from then on until the formation of a thought are, on this view, causal sequences of representations. However, the total I-T process is not, for that process has a beginning - the

sensory input - that is not representational. Whether or not I-T processes should be broken down into subsidiary processes involving representational states that are prior to thoughts is beside the point.

Claim 2 could be saved by taking the psychologically relevant inputs and outputs themselves to involve representations. However, this seems a very strange idea. It is plausible to think, as Fodor does, that the psychologically relevant nature of a piece of behavior is partly determined by the nature of the representational states - the thoughts - that caused it; the thoughts determine that the behavior has a certain intentional description (1975a: 28-31). It is another thing to think that the intentional description applies because the behavior itself involves a representation. I take it that Fodor does not believe this (1981d: 152-63).

xv. Some evidence for this. (i) Fodor takes the formality condition to show that *prima facie* mental states involving semantic notions - like knowledge and perception - have no place in psychology (1980c: 64). (ii) He argues that we need a psychology that accepts the formality condition and that this is all we can have (1980c: 66). (iii) He takes CTM to tell "the whole story about mental causation" (1987d: 139). (iv) He relates CTM to methodological solipsism (1980c: 64-5; 1987d: 43), which concerns psychology in general, not just thought processes.

xvi. After leaving my hands, the heading of this section changed from the correct, "The Sufficiency of Narrow Meaning," to the incorrect, "The Insufficiency of Narrow Meaning."

xvii. It is common to use 'semantic', 'meaning' and 'content' as if they must involve truth and reference as Loar (1980: 90) and Rey (1980b: 91) note in their commentaries on Fodor 1980c.

xviii. For more along these lines, see my 1989b

xix. Harman's conceptual-role meaning is an exception (1982, 1983).

xx. The version of NARROW PSYCHOLOGY that I argue for posits a narrow functional-role meaning for an expression that is part of its wide truth-conditional meaning. The narrow part is obtained by abstracting from the reference-determining causal links that are "outside the skin." My theory differs, therefore, from "two-factor" theories which tend to treat the truth-conditional factor as if it were unrelated to the functional-role factor; see e.g. McGinn 1982: 211, 230; Loar 1982: 280-2; 1983: 629. On my theory, the first factor includes the second; 1989a: 377-81. (After leaving my hands, a 'not' was mistakenly added to the last sentence of this paper, which should read: "One semantic theory will do for psychology and linguistics"; p. 395).

xxi. For evidence of this in Fodor, see Loar's commentary (1980: 90) and Fodor's response (1980d: 105); and Fodor's response to Geach (p. 102). Note further that Fodor takes the formality condition as "a sort of methodological solipism" (1980c: 65), and takes the ordinary opaque taxonomy of mental states as roughly the same as that according to the formality condition (pp, 66-70). See also: Block and Bromberger's commentary (1980: 74) and Fodor's response (1980d: 99); Rey's commentary (1980b: 91) and Fodor's response (1980d: 106). For evidence in some others, see Field 1978: 100-01; Stich 1983: 190-1; Baker 1986 (a critic of CTM and STM): 27.

xxii. A claim to have meant by 'only syntactic properties,' only syntactic properties, or narrow semantic properties needed to explain behavior, might be compared with a vegetable grower's claim to have meant by 'only natural fertilizers,' only natural fertilizers, or artificial fertilizers needed to keep vegetables alive. Stich's claim (1990) to have meant fat syntax by 'syntax' is of this sort. If the claim is correct, STM is NARROW PSYCHOLOGY not SYNTACTIC PSYCHOLOGY. The only radical part of his view is, then, the sadly fashionable commitment to meaning holism. Stich has been enjoying the rhetoric of a revolution without being prepared to put up with the revolution itself.

xxiii. The only examples of narrow semantic properties that I gave were functional-role meanings (section 4). Fodor rejects functional-role semantics in favor of a "denotational" semantics to be described later (section 7).

xxiv. Bill Lycan tells me that it is because people interpret CTM in this way that they are not worried by Fodor's attempt to have it both ways; cf note 4.

xxv. Taking Stich's STM to be the revolutionary view it purports to be, not the mildly revisionist view (holism aside) that allows "fat syntax" into psychology. See note 22.

xxvi. If NARROW PSYCHOLOGY is right, fully intentional descriptions of input and output are unsuitable for the laws of psychology. I have argued that the descriptions must be "proto-intentional" (1989a: 393-4).

xxvii. Fodor 1975a: 42-51; 1983: 38-52; 1987d: 112-22; Fodor and Pylyshyn 1981; Pylyshyn 1984: 147-91. It also helps enormously to talk to Fodor. That's how I found out.

xxviii. To say this is not, of course, to cast any aspersions on the importance of seeking psychophysical I-T and T-O laws. The psychological must be related to the physical somehow and nothing can be settled a priori about the best way to do this. It will clearly

be profitable to seek psychophysical I-T and T-O laws for any species which implements thoughts in many ways but has a uniform implementation of intentionally described inputs and outputs. If Fodor's modularity thesis (1983) is close to right, the human species is like this.

xxix. But see note 14 and accompanying text.

xxx. This is, in effect, a direct-reference semantics. I have offered detailed arguments against such a semantics; 1989b.

xxxi. I think that the narrow functional-role meaning of 'Maggie' determines the function that yields Maggie as value on Earth, but I avoid direct reference by not taking the meaning to be identical to that function (1989).

xxxii. @foot[This raises another puzzle. Fodor thinks that mental states are individuated by their causal powers (1987d: 27-45). A mental state is a complex consisting of an attitude and a content. So contents must be individuated by their causal powers. How does this differ from individuation by functional roles?

xxxiii. Cf Davidson (1980, 1984: passim) and Dennett (1978: particularly, 3-22). See Levin 1988 for a strong argument against principles of rationality. I have argued against them in 1981: 115-18; 1984: 172-9; Devitt and Sterelny 1987: 247-9.

xxxiv. See Stich 1985 for a nice summary of the evidence.

xxxv. Earlier versions of this material were parts of seminars I gave at the University of Sydney in 1987 and the University of Maryland in 1988. I am indebted to the members of those seminars; also to at least the following for comments: John Bacon, Fiona Cowie, Hartry Field, Denise Gamble, Bill Lycan, Kim Sterelny, Stephen Stich, and especially Jerry Fodor and Georges Rey.