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Propositional Attitudes and the Language of Thought

FRANCES EGAN
Rutgers University
New Brunswick, NJ 08903
USA

In the appendix to *Psychosemantics*,[1] entitled 'Why There Still has to be a Language of Thought,' Jerry Fodor offers several arguments for the language of thought thesis. The LOT, as articulated by Fodor, is a thesis about *propositional attitudes*. It comprises the following two claims:[2] (1) propositional attitudes are relations to meaning-bearing tokens — for example, to believe that P is to bear a certain relation to a token of a symbol which means that P;[3] and (2) the representational tokens in question are quasi-linguistic — in particular, they have the constituent structure appropriate to a language.

My concern in this paper is to argue that two arguments recently advanced by Fodor — one based on a general methodological principle, the other citing empirical support — do not support the LOT. A third argument, the so-called 'systematicity' argument, is beyond the scope of the present paper.

Before I turn to Fodor's arguments, I shall make a few general remarks about the LOT. Claim (1) is equivalent to a thesis which Fodor articulates

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1 J.A. Fodor, *Psychosemantics: The Problem of Meaning in the Philosophy of Mind* (Cambridge, MA: MIT Press 1987)

2 Ibid., 135-6

3 Each attitude type is construed as a computational relation to a symbol token; so believing will be one computational relation, and desiring another.

and defends elsewhere,[4] a view which has come to be known as the Representational Theory of Mind (hereafter, RTM). The RTM has been explicitly offered as a vindication of folk psychology, allegedly underwriting the attribution of intentional states as materialistically respectable. It has been further claimed that the RTM provides the preferred foundation for research in the cognitive sciences; indeed, that current work in cognitive science provides empirical evidence for the RTM. This latter claim will be addressed in what follows.

It is important to note that the RTM (that is, thesis [1]) may be true independently of thesis (2). Stephen Schiffer[5] formulates a version of the RTM which is explicitly neutral with respect to thesis (2). On Schiffer's schematic formulation, there is a mechanism in the head corresponding to each propositional attitude relation-type. For ease of exposition, each of these mechanisms is just assumed to be a *box*; so there is a belief box, a desire box, etc. For each attitude tokening of a propositional content P, a symbol that means that P is placed in the appropriate box. To believe that P, then, is just to have a symbol token that means that P in the belief box. Propositional attitudes have their causal roles in virtue of whatever processing their associated symbol tokenings undergo in the boxes. On the assumption that the boxes are a simple way of talking about computational relations, Schiffer's story is just a picturesque formulation of the RTM. It is not, however, committed to the LOT, because there is no requirement that the symbol tokens have constituent structure. They might be images, or indeed, as Fodor points out, rocks; all that is required is that they be semantically evaluable. The LOT involves the additional claim (thesis [2]) that the symbols that are processed in the boxes are quasi-sentential objects; that is, they have semantically evaluable sub-parts as constituents. Accordingly, if a token has the content *P & Q* then it has a constituent that means that P and a constituent that means that Q. The symbol tokens, according to the LOT, constitute an internal system of *linguistic* representation, i.e., a language.

I turn now to the first argument for LOT. Fodor claims that the following is a plausible rule of nondemonstrative inference:

> Principle P: Suppose there is a kind of event c1 of which the normal effect is a kind of event e1; and a kind of event c2 of which the

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4 See especially Fodor, *Representations* (Cambridge, MA: MIT Press 1981) and ch. 1 of *Psychosemantics*.

5 Stephen Schiffer, 'Truth and the Theory of Content,' in H. Parrett and J. Bouverese, eds., *Meaning and Understanding* (Berlin: Walter de Gruyter 1981) 205-24

> normal effect is a kind of event e2; and a kind of event c3 of which the normal effect is a complex event e1 & e2. Viz.:
>
> c1 → e1
>
> c2 → e2
>
> c3 → e1 & e2.
>
> Then, *ceteris paribus*, it is reasonable to infer that c3 is a complex event whose constituents include c1 and c2. [6]

Fodor takes Principle P to be a special case of a general principle that requires us to prefer theories that *minimize accidents*. In defense of P he argues 'if the etiology of events that are e1 and e2 does not somehow include the etiology of events that are e1 and not e2, then it must be that there are *two* ways of producing e1 events; and the convergence of these (*ex hypothesi*) distinct etiologies upon events of type e1 is, thus far, unexplained.'[7] To avoid an unexplained convergence of causes, Fodor concludes, we should infer that c3 has c1 and c2 as constituents.

Principle P is then applied to psychological states. Behavior, Fodor argues, is manifestly complex: it exhibits constituent structure. Verbal behavior is the paradigm case — verbal forms are put together from recurrent elements — but even animal behavior, bird song for example, exhibits constituent structure. Principle P, therefore, requires us to assume that the causes of behavior have constituent structure.

Fodor offers no inductive evidence for P, although instances of it are not hard to find. Neither are counterexamples: suppose that the normal effect of a particular bacterial infection is a sore throat, and the normal effect of a particular virus is a fever. Now suppose that a patient exhibits both a sore throat and a fever. Principle P would seemingly have us infer that the cause of the sore throat and fever is a complex condition consisting of both the bacterial infection and the virus! It might be argued, against Fodor, that we are not normally tempted to assume a complex cause *simply* to minimize accidents. The sciences do sometimes postulate distinct etiologies converging on similar (identical) effects (e.g. wind and water both cause erosion), often leaving 'accidents' to be

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6 Fodor, *Psychosemantics*, 142

7 Ibid.

explained by other theories. If an explanation is not antecedently in place, it might simply be assumed that an explanation of the 'accident' will eventually be forthcoming, perhaps from a yet to be developed micro-theory.

Nonetheless, even if principle P is treated as a legitimate, though defeasible, principle of scientific theorizing, its application in the psychological domain confers no support on LOT. Let *p* stand for the event that is the utterance of 'p,' *q* for the event that is the utterance of 'q,' and *p & q* for the event that is the utterance of 'p & q.' Principle P would seem to apply to verbal behavior as follows: assuming that the normal cause of *p* is the belief that p, and the normal cause of *q* is the belief that q, then we should infer that the normal cause of *p & q* is the belief that p and the belief that q. Actually, this is not quite right. According to Principle P, the cause of *p & q* would have to be a complex state consisting of the belief that p, the belief that q, and whatever causes the event that is the utterance of '&.' But even if it were right, it would not give Fodor what he requires. He needs the conclusion that *p & q* is caused by the belief that p & q. This, however, does not follow from Principle P alone.

Fodor considers the above objection in a footnote to the discussion. Engaging his crafty imaginary interlocutor, Aunty, he says the following:

> It remains opens to Aunty to argue in the following relatively subtle sort of way: "All right, so principle P requires that the causes of complex behaviors should themselves be complex. But that still doesn't show that there's a Language of Thought, because the required complex causal objects could be the *propositional attitude states themselves* rather than the (putative) formulas of this (putative) mental language. *Believing that P & Q is itself a complex state* of which the simple parts are the state of believing that P and the state of believing that Q."... This, however, will not do. Believing that P is *not* a constituent of, for example, believing that P or Q (or of believing that if P then Q ... etc.); for it is perfectly possible to believe that P or Q (or if P then Q) and not to believe that P. [8]

Fodor here accuses his critic of misapplying P by mistakenly assuming that it is propositional attitude states themselves, rather than the tokens which according to the RTM express their propositional contents, that are complex. But the critic need assume no such thing — she is committed only to the claim that Principle P does not give Fodor what he requires, viz. tokens with complex structure as the causes of verbal behavior.

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8 Ibid., 166-7

To see this, suppose that /p/ is the token in the belief box that causes the event *p* (that is, the utterance of 'p'), and /q/ is the token in the belief box that causes the event *q*. According to Fodor, we can conclude, by Principle P, that the event *p & q* is caused by a complex token /p & q/. But this is not right. P *does* support the idea that *p & q* is caused by a complex whose components include /p/, /&/, and /q/ (P, it should be noted, would require that there are tokens in the belief box corresponding to the logical connectives), but Principle P does not necessarily preserve constituency relations among these tokens: specifically, it requires no particular ordering of /p/, /&/, and /q/. To the extent that P supports /p & q/ as the cause of the event *p & q*, it also supports /p q &/, /& q p/, etc.

The point here is this: at most, Principle P supports the claim that the causes of complex utterances are themselves complex, and have the causes of simple utterances as components. It does not, however, support the claim that verbal behavior is caused by mental states that have constituent structure in the sense required by LOT, for the simple reason that it enforces no constituency relations, i.e. no structure, upon the components of complex causes.

Fodor's second argument for LOT is based on current psychological research. He argues as follows:

> ... [Psycholinguists] say things like this: "When you understand an utterance of a sentence, what you do is construct a *mental representation* of the sentence that is being uttered. To a first approximation, such a representation is a parsing tree; and this parsing tree specifies the constituent structure of the sentence you're hearing, together with the categorles to which its constituents belong. Parsing trees are constructed left to right, bottom to top, with restricted look ahead..." and so forth, depending on the details of the psycholinguist's story. Much the same sort of examples could be culled from the theory of vision (where mental operations are routinely identified with transformations of structural descriptions of scenes) or, indeed, from any other area of recent perceptual psychology.[9]

Fodor points out that such theories appear to quantify over mental representations — in the case of psycholinguistic theories over parse trees — and so insofar as the theories are well-supported, Fodor argues, we should recognize their commitment to mental representations. Even if Fodor is right, however, his argument does not support the LOT.

In order for a psychological theory to provide evidence for the LOT, the following three conditions must be satisfied: (1) the theory must

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9 Ibid., 143-4

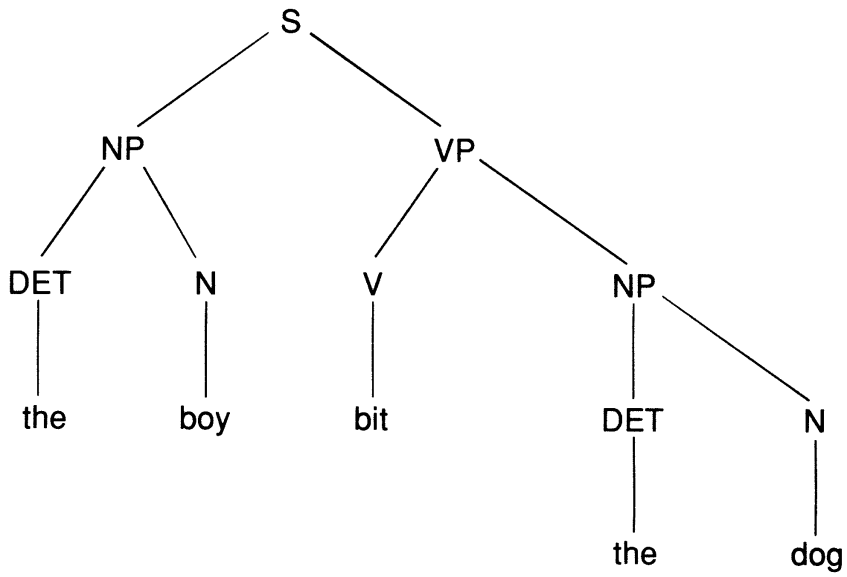
posit mental representations which have *psychological reality*; (2) such representations must have appropriate contents — in particular, they must be interpreted *in the theory* as the contents of independently ascribable propositional attitudes; and (3) they must have the constituent structure appropriate to a *language*.

A psychological theory meeting conditions (1) and (2) would support the RTM; (3) must also be satisfied if a theory is to support the stronger LOT thesis. I shall argue that neither psycholinguistic nor perceptual theories meet all three conditions, and hence do not provide empirical evidence for LOT.

Let us look at psycholinguistics first. Fodor claims that psycholinguistic theories posit the existence of structural descriptions or parsing trees that are constructed in the course of sentence comprehension; moreover, that the mental processes underlying sentence comprehension and production are construed as computational processes defined over such representations. Let us grant that at least some psycholinguistic theories incorporate a processing account that roughly matches Fodor's story. The issue then is whether the posited representations are interpreted in the theory as bearing the contents of propositional attitudes (condition [2]), and whether they have constituent structure appropriate to a language (condition [3]).

To count as evidence for LOT, it is not sufficient simply that the postulated mental representations be interpretable as expressing the contents of certain propositional attitudes. If a psycholinguistic theory is to provide evidence for LOT, as opposed to merely being consistent with it, then it must identify such representations as the contents of certain propositional attitudes that we are prepared to ascribe to a subject *independently* of any commitment to the LOT. It is not enough simply that the theory posits structures which, if we were to accept the LOT, we would be prepared to construe as propositional attitude tokenings. There must be grounds, independent of the truth of LOT itself, for ascribing the propositional attitudes in question.

According to psycholinguistic theory, the process that eventuates in the subject's understanding of the sentence 'The boy bit the dog' involves the construction of a structural description of the following sort:



Call this parse tree 'R.' To support LOT, R must express the content of an independently ascribable attitude. But what *is* the content of R? There seem to be two possibilities: (1) R expresses a distal state of affairs, viz. that of the boy's biting the dog; or (2) R expresses the constituent structure of the sentence 'The boy bit the dog.' There is no support for (1). R is constructed by the parser, which takes a sentence as input and delivers a parse tree, R, as output. Nothing in the account of how the sentence is parsed involves (or requires) interpreting R as referring to a distal state of affairs. The parser is blind to any content that the parsed sentence might express. (2) is more plausible. R would indeed seem to represent the constituent structure of the sentence. But if this is so, it can hardly provide support for the LOT, since R does not express a content to which the subject bears an antecedently ascribable attitude. Independent of any commitment to the LOT, we would not ascribe to the subject any propositional attitudes towards the constituent structure of sentences being parsed.

I conclude that the representations constructed in the course of language comprehension and production do not support the LOT. Such representations do not express contents to which the subject bears an antecedently ascribable propositional attitude.

Theories of visual processing are also claimed by Fodor to provide empirical evidence for LOT. They will do so only if conditions (2) and (3) are met: the representations that are constructed in visual processing must be plausibly interpreted in the theories as token representations of propositional contents to which the subject bears an appropriate attitude (e.g. believing), and further, these representations must have the constituent structure appropriate to a language.

Let's take David Marr's theory[10] as an example of a promising theory of visual processing. The computational processes hypothesized by the theory are defined over token representations, so the theory is committed to internal representations, but can the token representations be construed as expressing propositional contents to which the subject bears an appropriate attitude? The answer isn't clear. The representational tokens which form the inputs to two of the hypothesized processing modules — the stereopsis and directional selectivity modules — are constructed from what Marr calls *zero crossings*. A zero crossing is a point where the value of a function changes its sign; it corresponds to a sudden intensity change in the image. Marr explicitly points out that zero crossings have no specifiable physical interpretation (they are not 'physically meaningful'), so these representational tokens are not plausibly construed as bearers of propositional content. The inputs and outputs to the other processes might be so interpreted, but not in a way that would lend support to LOT. The representational tokens postulated by Marr specify properties of *surfaces* — intensity values in the case of the image, intensity changes and their geometrical distribution in the case of the primal sketch, and orientation and depth in the case of the 2.5-D sketch. The construction of these representational tokens precedes the decomposition of the scene into objects or otherwise meaningful regions. Marr says the following about the computational processes which take representational tokens as inputs and outputs:

> Most early visual processes extract information about the visible surfaces directly, without particular regard to whether they happen to be part of a horse, or a man, or a tree. It is these surfaces — their shape and disposition relative to the viewer — and their intrinsic reflectances that need to be made explicit at this point in the processing, because the photons are reflected from these surfaces to form the image, and they are therefore what the photons are carrying information about. [11]

> They rely on information from the image ... and the information they specify concerns the depth or surface orientation at arbitrary points in an image, rather than the depth or orientation associated with particular objects. [12]

The content that the representational tokens have, therefore, concerns reflectance properties at arbitrary points in the image. If these repre-

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10 David Marr, *Vision* (New York: Freeman 1982)

11 Ibid., 272

12 Ibid., 275

sentational tokens are construed as expressing propositional contents to which the subject bears an attitude, then the subject bears an attitude toward such things as intensity changes in the image, discontinuities in surface orientation, etc. Nothing *precludes* the subject having propositional attitudes towards these contents, but we do not antecedently ascribe such attitudes. The representational tokens postulated by Marr as the inputs and outputs to the visual processes are not interpreted *in the theory* as expressing propositional contents to which the subject bears an attitude. Whether they *can* be so interpreted is an open question; but even if they can be, they would confer no support on LOT, because they do not correspond to any independently ascribable attitudes.

It is of course true that representations constructed in the course of perceptual or linguistic processing serve as inputs to more central cognitive processes. Nothing I have said precludes the possibility that these representations may receive appropriate interpretations (as the contents of propositional attitudes) somewhere 'downstream' of the modules that theories of perceptual and linguistic processing seek to describe. We would have to look to theories of more central processing — rational choice, problem solving, etc. — to settle this question. Unfortunately, the theories in these areas are neither as explicitly articulated nor as plausible, construed as actual processing accounts, as are theories of early processing, and so are unlikely, at this stage, to provide much in the way of empirical support for LOT. Thus it is not surprising that Fodor looks to theories of early processing for evidence for LOT. My point is simply that the representations posited by these theories are not interpreted in such a way as to lend any support to LOT.

There is a further reason for doubting that the representations posited by theories of *perceptual* processing provide the evidence that Fodor needs to establish LOT, since they do not obviously form a system of representations that is naturally interpreted as a *language* — that is, a system with a combinatorial syntax. Perhaps the representations postulated in Marr's theory can be construed as part of such a system, but this would need argument. The mere fact that perceptual theories posit structured representations is not enough to establish that perceptual states have constituent structure in the sense that Fodor's argument requires.

In conclusion, the empirical evidence adduced by Fodor in support of the Language of Thought thesis does not support LOT. Fodor has made a case that some psychological theories are committed to the existence of mental representations, but either there is no plausible construal of these representations as expressing propositional contents to which the subject bears an independently ascribable attitude (both the psycholinguistic and the vision examples), or there is no reason to think that the representations have the constituent structure appropriate to a language

(the vision example). Inasmuch as the posited representations fail to express appropriate propositional contents, they also fail to provide empirical support for the weaker RTM thesis.[13]

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