

Fregean Equivocation and Ramsification on Sparse Theories: Response to McCullagh

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Abstract: The paper, which begins with a brief summary of my anti-functionalism 'Argument from Self-consciousness', has two main goals. First, to show that this argument is not guilty of a Fregean equivocation regarding embedded mental predicates, as has been suggested by Mark McCullagh and others. Second, to show the argument cannot be avoided by weakening the psychological theory upon which reductive functional definitions are based. Specifically, it does no good to excise psychological principles involving *embedded* mental predicates. Why? Because reductive functional definitions based on the resulting sparse theories are exposed to an interesting new family of counterexamples.

The goal of my paper on self-consciousness (1997) was to establish two main theses. Thesis (1): Self-conscious thought constitutes a fatal obstacle to the primary tenet of reductive functionalism—that the standard mental properties and relations can be defined wholly in terms of the general pattern of causal (or functional) interaction of ontologically prior realizations. The problem may be put as a dilemma. Either reductive functional definitions imply that the wrong sorts of things must be the contents of self-conscious thought: those contents would have to be propositions involving realizations rather than the mental properties themselves. Or else the right-hand sides of such 'definitions' must contain undefinable psychological expressions, in which case reductive functionalism would fail for that reason. Thesis (2): The only way out of the problem is to *revise* the functionalists' definitions, specifically, to give *nonreductive functional definitions* in which the values of the predicate variables must be the very mental properties being defined (vs. their realizations). As a result, these definitions violate reductive functionalism's primary tenet (just stated), for they endow mental properties with an ontological primacy inconsistent with reductive functionalists' metaphysical picture. What makes this retreat to nonreductive functionalism important is that it undermines reductive functionalism's main payoff—a materialist explanation of the relationship between

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our physical and mental properties and, in turn, a materialist solution to the Mind-Body Problem.

In 'Functionalism and Self-consciousness' Mark McCullagh (this volume) proposes a way in which functionalists might try to avoid the damaging effects of the Self-consciousness Argument. In the course of developing his proposal, he also defends the auxiliary thesis that this is 'the *only* way in which the functionalist can respond to [the Self-consciousness Argument]'. The argumentation for this auxiliary thesis is clear and persuasive (for example, the reasons why various 'easy fixes' fail). I agree that reductive functionalism is driven to something like the positive proposal that McCullagh suggests. Nevertheless, I will argue that this proposal is subject to an interesting new family of counterexamples and, therefore, that functionalists still have no alternative but to reject reductive functionalism and to retreat to nonreductive functionalism. Before turning to these matters, we must first clear up a confusion over Fregean equivocations which has beguiled many commentators, including McCullagh, and whose analysis sets the stage for McCullagh's positive proposal.

1. Intensionality and Fregean Equivocation

The argument for Thesis (1) proceeds in two stages—the first aimed at reductive functional definitions given in the form of second-order 'Ramsified definitions' and the second aimed at 'language-of-thought' functional definitions. Since McCullagh focuses on the first stage, in the present paper so will I. In the original argument I considered the following Principle P:

If a person is in pain and engaging in introspection, the person will be self-consciously aware that he is in pain.¹

(As McCullagh correctly emphasizes, p. 492, the Self-consciousness Argument 'concerns not so much the details of this or that psychological principle, but the general possibility that our overall psychological theory will include statements in which mental predicates occur within the scope of mental predicates.') I then supposed that the reductive functionalist's standard recipe for constructing Ramsified definitions would have us replace the psychological predicates in Principle P in the following way:

If x is R_1 and R_3 , then x will be related by R_4 to the proposition that he is R_1 .

¹ Qualifiers may be added: 'sharp pain', 'carefully and attentively engaging in introspection', 'ceteris paribus', etc.; and P may be reconstructed as a subjunctive conditional or a conditional probability statement.

This results by replacing the two occurrences of 'is in pain' with 'R₁', 'introspects' with 'R₃', and 'is self-consciously aware' with 'R₄'.²

Many commentators have suggested that this way of dealing with Principle P—and, in turn, the entire Self-consciousness Argument—rests on an intentional error. But, not only is this suggestion mistaken as a point about intentional logic (see Bealer, forthcoming), it betrays a misunderstanding of the dialectic of the larger argument. I will explain these two points in turn.

In the body of my paper I chose to use a Russellian framework for discussing Principle P (This is made clear in note 14.) In Russell's intensional logic PM (for *Principia Mathematica*) embedded and unembedded predicates do not differ in semantic value; semantically, they correspond to intensions (formally, propositional functions; informally, properties). Accordingly, in PM it is easy to prove that Principle P:

$$(\text{Pain}(x) \ \& \ \text{Introspect}(x)) \rightarrow \text{Self-conscious}(x, \text{Pain}(x)).$$

is equivalent to:

$$(\exists f)([(fx \ \& \ \text{Introspect}(x)) \rightarrow \text{Self-conscious}(x, fx)] \ \& \ f = \text{Pain}).$$

Here the predicate 'Pain' occurs just once, and no longer within the scope of a psychological predicate. Replacing this occurrence of 'Pain' with predicate variable 'R₁', 'Introspect' with 'R₃', and 'Self-conscious' with 'R₄', we get:

$$(\exists f)([(fx \ \& \ R_3x) \rightarrow R_4(x, fx)] \ \& \ f = R_1).$$

which in PM is provably equivalent to:

$$(R_1x \ \& \ R_3x) \rightarrow R_4(x, R_1x).$$

But this is just the symbolized version of the Ramsification of Principle P considered in the original Self-consciousness Argument! So no possibility of an intensionality slip in Russell's framework.

I also indicate (again in note 14) that, when functionalists who are Fregeans try to Ramsify Principle P, the outcome is effectively the same though inevitably more complicated: 'They would, for example, rewrite P with a "that"-clause in the antecedent: if it is true *that* a person is in pain and engaging in introspection, the person will be self-consciously aware *that* he is in pain.' In Alonzo Church's notation for the logic of sense and denotation (1951):

² See Putnam (1970, section VI) and Shoemaker (1981) for the 'American functionalist' recipe, and Lewis (1983, especially p. 80) for the 'Australian functionalist' recipe. My argument is aimed in the first instance against American functionalism but with suitable modifications applies equally against Australian functionalism. In Bealer (1997) both of these forms of reductive functionalism were called 'ontological functionalism'.

$$[\text{True}_{001}(\text{Pain}_{011}, x_1) \ \& \ \text{Introspect}_{00}, x_1] \rightarrow \text{Self-conscious}_{001}(x_1, \text{Pain}_{011}, x_1).^3$$

(Since the two occurrences of the predicate 'Pain' are of type 0₁₁, they denote the intension which Fregean functionalists are interested in—namely, the ordinary sense of 'is in pain'. Many people forget that in Fregean semantics the ordinary reference of the predicate 'Pain' is just an extensional function from individuals to truth values, i.e., a mere characteristic function.) I then go on to say, 'In fact, functionalists who are Fregeans would want to deal with *all* unembedded occurrences of predicates in [psychological theory] *A* in some such manner. The reason is that they want all their predicate variables to range over intensions (that is, the sort of entities *expressed* by predicates), not over extensions (that is, the sort of entities predicates *refer* to).' On perhaps the simplest implementation of this idea, one arrives at the following logically equivalent formulation of Principle P:

$$[\text{True}_{001}(\text{Pain}_{011}, x_1) \ \& \ \text{True}_{001}(\text{Introspect}_{011}, x_1)] \rightarrow (\exists p_2)[\text{Pain}_{011}, x_1 \ \Delta \ p_2 \ \& \ \text{True}_{001}(\text{Self-conscious}_{01021}, x_1, p_2)].$$

(In Church's notation 'Pain₀₁₁, x₁ Δ p₂' is short for 'Pain₀₁₁, x₁' is the extension of p₂.) To ramify this formulation of P, our Fregean functionalists would then simply substitute, say, the predicate variable 'f₀₁₁' for the two occurrences of 'Pain₀₁₁', 'g₀₁₁' for 'Introspect₀₁₁', and 'h₀₁₀₂₁' for 'Self-conscious₀₁₀₂₁':

$$[(\text{True}_{001}(f_{011}, x_1) \ \& \ \text{True}_{001}(g_{011}, x_1)] \rightarrow (\exists p_2)[f_{011}, x_1 \ \Delta \ p_2 \ \& \ \text{True}_{001}(h_{01021}, x_1, p_2)].$$

From this Ramsification of Principle P, however, the Self-consciousness Argument goes through essentially unchanged: reductive functionalism implies that the wrong sorts of things are the contents of our everyday self-conscious awareness; they would be the sort of contents expressed by predicates for first-order physical realizations (e.g., 'has firing C-fibers') rather than standard mental properties (e.g., 'is in pain').

How do these points bear on McCullagh's commentary? McCullagh suggests that, in dealing with Principle P, I committed a kind of intensionality slip in that I wrongly equivocated between ordinary Fregean reference and indirect Fregean reference. The foregoing shows that this is not so. This is

³ It is understood that x₁ is the extension of x₁. Naturally, there are a number of other ways for Fregean functionalists to deal with Principle P. But they are all at least as complicated (indeed, typically more complicated), and they all lead to the same conclusion.

clear as soon as one properly distinguishes Russellian intensional logic and Fregean intensional logic (in accordance with note 14).⁴

Earlier I said that the usual (though not McCullagh's) allegation that the Self-consciousness Argument rests on an intensionality error betrays a misunderstanding of the larger dialectic. In the argument I simply followed what I take to be the reductive functionalists' standard recipe for constructing Ramsified definitions from the psychological theory *A* (which contains Principle *P*). In making this supposition I was trying to be faithful to their stated intentions in the published literature. But my argument does not require me to take any stand on this matter. Why? Because it is the reductive functionalists (not I) who need some method for constructing a Ramsified definition from psychological theory *A* which (1) yields the correct results and (2) is consistent with the defining tenets of reductive functionalism. Therefore, given that the familiar recipe for dealing with *P* does not yield the correct results, reductive functionalists need an alternate method that meets these two conditions. Do they have one? This brings us to the second horn of the dilemma posed by Thesis (1).

One proposal is simply to leave embedded occurrences of psychological expressions untouched. But in this case the resulting 'definitions' have *non-physical* expressions occurring on the right-hand sides and so do not count as genuine definitions. Hence, the ontological functionalist's definability thesis is again defeated. This is the second horn of the dilemma.

Besides a variable (like ' R_1 ') whose range is restricted to first-order realizations, is there no other sort of variable which reductive functionalists may substitute for the indicated occurrences of 'is in pain' (or 'the property of being in pain') when they construct their Ramsified definition from psychological theory *A*? Trivially, no. For using any other sort of variable would violate the defining tenet of ontological functionalism—that the standard mental properties may be defined *wholly* in terms of the general pattern of interaction of first-order realizations.⁵

⁴ For related reasons, McCullagh's discussion of the 'Formalization Principle' and the 'Semantic Principle' does not represent my views on these matters.

It is worth noting that, if Principle *P* were analyzed in the style of the Chisholm-Lewis self-attribution theory, the entire issue of intensionality would never even arise, and the Self-consciousness Argument would still go through. For a more detailed examination of the entire intensionality issue, see my (forthcoming).

⁵ Of course there is one candidate sort of variable that, although strictly in violation of this tenet, would nevertheless be in the spirit of reductive functionalism. I have in mind replacing 'is in pain' with a variable whose range is restricted to first-order *concepts*, rather than first-order *properties*. But this is no advance at all. For this proposal would lead to an obvious variant of the first prong of the dilemma: the resulting definitions would wrongly imply that the typical contents of our self-consciousness awareness are propositions involving, not the standard mental concepts (e.g., the concept of being in pain), but rather first-order physical concepts which are necessarily equivalent to the first-order physical properties that realize the standard mental properties (e.g., a first-order physical concept that is necessarily equivalent

In view of this, what alternative do reductive functionalists have? Evidently, there is only one: to construct their Ramsified definitions from a psychological theory that simply omits Principle *P*, and kindred principles involving embedded psychological expressions. This is in effect McCullagh's positive proposal.⁶

2. Ramsification on Sparse Theories

As I understand it, McCullagh's proposal has two stages. First, to find a procedure for converting a first-order psychological theory into a theory in which (1) there occur no psychological expressions, (2) in which the range of values of all predicate variables is restricted to physical properties, and (3) which captures the "functional roles" of the mental states specified in the original [psychological theory] (p. 482). Second, to vindicate reductive functionalism's primary tenet (that mental properties be definable wholly in terms of the pattern of interaction of their ontologically prior realizations) on the grounds that 'definitions of the individual mental properties may be constructed from [the resulting theory] in a mechanical way' (p. 482). An essential premise in McCullagh's justification of the procedure he finally arrives at is his 'Content Assumption' (p. 489):

If one believes that one has mental property *M*, one's belief is *that one has a physical property that in one plays the *M* role*.

(where the '*M* role' is to be spelled out wholly in terms of physical properties and quantification over first-order physical properties). This implies:

The propositional content of the belief that one is in pain is identical to the propositional content of the belief that one has a physical property that in one plays the pain-role.

This identity claim is not even faintly plausible unless the constituent properties are identical—that is, unless the property of being in pain = the property of

to the property of having firing C-fibers). Once again, an absurd result. See Bealer (forthcoming).

⁶ There is another alternative. It is to try solving the problem along the lines McCullagh suggests in his section 8. McCullagh takes this solution to be unacceptable because it leads to vicious regress (in much the same way that the proposal in my note 18 in my article leads to a kindred kind of circularity).

The characteristic way the standard mental properties function with respect to one another is given by the full theory A , which includes as conjuncts both Principle P^* and Unembedded- A . Therefore, the indicated functionalist tenet implies that there must exist first-order physical properties $R_0, R_1, R_2, R_3, \dots$ that simultaneously satisfy Principle P^* and Unembedded- A . (R_0 is a first-order physical property that plays the belief-role in this sequence.) But the extension of the Ramsified definition of belief based on Unembedded- A is the union of the extensions of the relations R_0 that (along with other first-order physical properties R_1, R_2, R_3, \dots) satisfy Unembedded- A . We just saw, however, that among such relations R_0 is a first-order physical relation which (together with some first-order physical R_1 and R_3) satisfies P^* . This would be so, for example, on any occasion in which a man on the street x is in pain and engaging in introspection. So on such occasions x would be related by R_0 to the proposition that he is R_1 . It follows that on such occasions our man on the street x believes that he is R_1 (where R_1 is, say, the first-order physical property of having firing C -fibers). Once again, the wrong content.

The only way reductive functionalists who Ramsify on sparse theories like Unembedded- A are able to avoid this problem is to abandon their central tenet which drove the preceding argument. Even if they do this, however, they are still stuck with the second, and ultimately fatal, problem.

The problem is that, when all principles involving embedded psychological predicates are omitted, the resulting Ramsified definitions do not place sufficiently strong restrictions on the ranges of the propositional attitudes (belief, etc.). Consider, for example, the following Cartesian Principle: one can believe that one is conscious only if one is conscious. (As before, you may add qualifiers if you think they are needed; see note 1. Surely some such principle holds.) This principle rules out being nonconscious at times one believes one is conscious. Suppose $\langle R, R_0, R_1, \dots \rangle$ is some sequence of first-order physical properties that satisfies Unembedded- A , where R plays the consciousness-role and R_0 the belief-role. Consider some unreflective creature x who at t happens not to be conscious but who nonetheless has various (nonconscious) standing beliefs. Suppose that at t x does not have property R but is nonetheless related by R_0 to all the various propositions x believes at t . Define *unCartesian- R_0* to be the relation whose extension, for each possible world and time, is like that of R_0 except that in the actual world at time t its extension also includes the pair $\langle x, \text{the proposition that } x \text{ is conscious} \rangle$ and together with associated pairs required by the purely logical principles in Unembedded- A .⁹

⁹ Perhaps unCartesian- R_0 's extension should also include pairs associated with principles of belief-persistence (e.g. the principle that, if at t x believes p , then absent new contrary beliefs x normally will tend to continue believing p in the temporal neighborhood following t). Doing so would not affect our argument.

having a physical property that in one plays the pain-role.⁷ But if this identity holds, so would the following definition: one is in pain iff_{def} one has a physical property that in one plays the pain-role. Generalizing, all standard mental properties must have correct Ramsified definitions based on 'Unembedded- A ' (i.e., the theory that results from theory A once all clauses involving embedded mental predicates are deleted). If this chain of reasoning is correct, any counterexample to such Ramsified definitions would then constitute a refutation of the Content Assumption. Furthermore, even if such counterexamples failed to refute the Content Assumption (because of some sort of alternative construal), they would nevertheless refute the functional definitions arrived at in the second stage of McCullagh's proposal. So, even then, the overall proposal would fail.⁸

Now I critically assess this general sort of idea in 'Self-consciousness' (section 1.2.3 'Alternate Treatments of P '). Two of the points made there are relevant. First, reductive functionalism implies that Ramsified definitions based on sparse theories like Unembedded- A are no better off than the original definitions based on the full theory A . This is implied by the following central tenet of reductive functionalism:

There exist first-order physical properties which function with respect to one another in the characteristic way that the standard mental properties function with respect to one another.

To see this implication, consider the following analogue of Principle P for the belief relation:

P^* If x is in pain and engaging in introspection, x will believe that he is in pain.

⁷ Even given this identity, the Content Assumption cannot be correct, for it involves a classic intensionality error (akin to that which arises in the paradox of analysis). For example, the Content Assumption implies that the propositional content of the belief that you are in pain = the propositional content of the belief that you have a physical property that plays in you the pain-role. But if you are right now consciously and explicitly thinking the proposition that you are in pain, are you right now consciously and explicitly thinking the proposition that you have a physical property that in you plays the pain-role? Plainly not. This problem has an obvious solution (which is clearly more satisfactory than the two solutions McCullagh proposes), namely, to revise the Content Assumption as follows: If M is some mental property and F is the physical property that in one plays the M role, then if one believes that one has property M , one's beliefs is that one has property F . But this solution creates a problem for the second stage of McCullagh's proposal: the Ramsified definitions that would emerge in that stage would identify mental properties with *third order* properties rather than *second order* properties, as reductive functionalism requires (cf., Bealer 1997, section 1.2.6). So, even assuming the above identity, the proposal falters.

⁸ By the way, McCullagh assumes that there are creatures whose mental lives are not governed by principles involving embedded mental states. Someone might reply that principles like the following are counterexamples: *ceteris paribus* creatures who have felt pain try to avoid pain (though perhaps not consciously).

It is evident that $\langle R, \text{unCartesian-}R_0, R_1, \dots \rangle$ satisfies Unembedded-A. Why? Because, besides the indicated logical principles (which unCartesian- R_0 satisfies by stipulation), Unembedded-A contains nothing but embedding-free principles of the following sorts: (i) principles governing derived desires and rational decision, (ii) principles governing the formation of perceptual beliefs (e.g. x believes that there is a tomato in front of him), (iii) principles governing one's 'hardwired' beliefs and desires, (iv) unembedded principles linking conscious mental properties to consciousness (e.g., x is in pain only if x is conscious), and so forth. Plainly, such principles have no special relevance to embedded mental properties. They tell us nothing relevant about the conditions under which one can believe that one is conscious, and in particular, they are silent about whether one can fail to be conscious at times one believes one is conscious. Consequently, they do nothing to prevent x from lacking property R at times x is related by unCartesian- R_0 to the proposition that he is conscious. This would be prevented only if Unembedded-A included the Cartesian Principle (or some other such principle) which, by stipulation, is excluded.¹⁰

Now, according to the proposed Ramsified definition, the extension of the belief-relation at t is the union of the extensions at t of the first-order relations that play the belief-role in Unembedded-A. Since unCartesian- R_0 is such a relation and since the pair $\langle x, \text{the proposition that } x \text{ is conscious} \rangle$ is an element of unCartesian- R_0 's extension at t , the proposed definition implies that x believes that he is conscious at a time when by hypothesis he is not, once again admitting the wrong things into someone's beliefs.¹¹

¹⁰ Two caveats. First, if you question whether R_0 is really a first-order physical relation (because its specification involves mention of a psychological proposition, namely, that x is conscious), an alternative counterexample may be constructed the other way round: start with someone x (say, yourself) who at t believes that he is conscious and subtract x from the extension (at t) of the first-order physical property R that plays the consciousness-role in Unembedded-A. Second, you might question whether unCartesian- R_0 can play the belief-role in Unembedded-A on the grounds that, unlike R_0 , various causal statements in Unembedded-A do not hold for it. The response is that unCartesian- R_0 is no more nor less able to satisfy causal statements in Unembedded-A than is R_0 itself. Suppose, for example, that Unembedded-A tells us that the event of x 's believing p causes x to believe q (for some appropriate p and q). Then, to play the belief-role in Unembedded-A, the event of x 's R_0 -ing p must cause x to R_0 q . But this is not so: x 's R_0 -ing p is a causally inefficacious Cambridge event: the cause of x 's R_0 -ing q cannot be an event like this, which involves a first-order relation to a proposition. Rather, the cause is a physical tokening of some Mentalese symbol, (or some causally efficacious physical event), or the cause is x 's believing q . The upshot is that, if Ramsified definitions are to be based on Unembedded-A, the latter may not include clauses stating that certain specific sorts of mental events are causes; it may at most include statements involving nomological (or causal) necessity operators (e.g., it is nomologically necessary that, if x believes p , then x believes q). But unCartesian- R_0 satisfies such nomological (or causal) statements iff R_0 does. (Note: these points do not cast doubt on the thesis that mental events are in fact causally efficacious.)

¹¹ Other counterexamples to these Ramsified definitions can be constructed by the technique used in section 3 of Bealer (1997). This technique does not require that people can have

Suppose McCullagh somehow avoids commitment to this mistaken Ramsified definition of belief and so is free to adopt a Ramsified definition based on his 'U-theory of A'. No matter. Since his surrogate for embedded occurrences of 'believe' has the wrong extension, this new Ramsified definition does, too.

A final point about basing Ramsified definitions on sparse theories. This proposal undercuts a common objective sought by many functionalists. This objective is neatly expressed by David Lewis: '[Functionalism] allows us to include other experiences among the typical causes and effects by which an experience is defined. It is crucial that we should be able to do so in order that we may do justice, in defining experiences by their causal roles, to the introspective accessibility which is such an important feature of any experience. For the introspective accessibility of an experience is its propensity reliably to cause other (future or simultaneous) experiences directed intentionally upon it, wherein we are aware of it' (1983, p. 103).¹² These Functionalists should include principles like P in the psychological theory upon which their functional definitions are based. For, if their definitions were instead based upon sparse theories like Unembedded-A, these functionalists would be forced to count as synthetic certain statements which they had previously hoped could be counted as analytic (i.e., statements about introspective accessibility and conscious awareness). In this way, the sparse-theory strategy would frustrate such an objective.

3. Nonreductive Functionalism

I wish to close by reiterating the other main thesis of the original article, namely, that the only way to avoid the Self-consciousness Argument is by means of *nonreductive* functional definitions—that is, Ramsified definitions in which the values of the predicate quantifiers are to be the standard mental properties themselves, including the very properties being defined. I am cautiously optimistic that there are successful functional definitions of this sort. But they come at a price: they undermine reductive functionalism's main payoff, namely, its materialist explanation of the relationship between our physical

'infinitely self-involving thoughts' (cf., McCullagh's note 12). It simply requires that people can have *type-free* thoughts about thinking (which McCullagh endorses in his note 7). In section 1.2.5, I explained why we are entitled to expect psychological theory of the future to countenance such thoughts. These considerations answer the sort of worry McCullagh suggests (but does not himself accept) at the close of his section 3. In fact, the entire Self-consciousness Argument may be reformulated in terms of thinking. So even if one accepts (if do not) McCullagh's suggestion that the relation of self-conscious awareness could be defined as a species of belief that is caused in a certain way, the reformulated argument would survive.

¹² Sydney Shoemaker (1994, p. 59) expresses much the same sentiment: '[I]n many cases it belongs to the very essence of a mental state (its functional nature) that, normally, its existence results, under certain circumstances, in there being such awareness of it.'

and mental properties and, in turn, its materialist solution to the Mind-Body Problem.

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