**Radical Embodied Cognitive Science and Problems of Intentionality**

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**Abstract:** Radical Embodied Cognitive Science (REC) tries to understand as much cognition as it can without positing contentful mental entities. Thus, in one prominent formulation, REC claims that content is involved neither in visual perception nor in any more elementary form of cognition. Arguments for REC tend to rely heavily on considerations of ontological parsimony, with authors frequently pointing to the difficulty of explaining content in naturalistically acceptable terms. However, many classic concerns about the difficulty of naturalizing content likewise threaten the credentials of intentionality, which even advocates of REC take to be a fundamental feature of cognition. In particular, concerns about the explanatory role of content and about indeterminacy can be run on accounts of intentionality as well. Issues about explanation can be avoided, intriguingly if uncomfortably, by dramatically reconceptualizing or even renouncing the idea that intentionality can explain. As for indeterminacy, Daniel Hutto and Erik Myin point the way toward a response, appropriating an idea from Ruth Millikan. I take it a step further, arguing that attention to the ways that beliefs’ effects on behavior are modulated by background beliefs can help illuminate the facts that underlie their intentionality and content.

**Keywords:** Embodied • Cognition • Indeterminacy • Intentionality • Content • Explanation

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**0. Introduction:**

Embodied approaches to the study of cognition view cognition as consisting in dynamic, back-and-forth interaction between an organism’s cognitive system, body, and external environment. In recent years, these approaches have made waves in philosophy of mind, raising significant questions about the role of content in various kinds of cognition and the nature of methodological naturalism in science. Below, I will focus two rewarding, representative cases in point: Daniel Hutto and Erik Myin’s recent books, *Radicalizing Enactivism* (2013) and *Evolving Enactivism* (2017). Therein, Hutto and Myin give two arguments to the effect that the most elementary forms of cognition can be explained only in terms of intentionality, without invoking contents (see below for definitions). One argument leverages naturalistic scruples against the appeal to contents in these explanatory contexts, while the other, better argument tries to show that content-attributions can be harmlessly removed from these explanations (Section 1).

For all I will show, there may well be cognition that involves intentionality but not content. However, Hutto and Myin’s arguments for this share a defect: they both generalize to intentionality (Sections 2 and 3). That is because many classic problems for accounts of content, be they teleological (Section 2) or functionalist accounts (Section 3), fundamentally target intentionality. Although the point is seldom recognized, nothing in these problems is specific to content *per se*. After arguing this, I conclude by illustrating a functionalist approach to one of these problems—that of radical indeterminacy (Section 4). Developing an idea that Hutto and Myin salvage from a (reputedly) refuted teleosemantics, I argue that a mental state’s subject matter is fixed not only by how it relates to the external world and by its most direct effects on behavior, but also by the ways that other states modulate its effects on behavior in response to a variety of external conditions. This, I suggest, is also how embodied theorists who posit intentionality without content should conceive of intentionality. I end on a theme that recurs throughout: one very thorny issue for accounts of intentionality can be avoided by dramatically reconceptualizing or even renouncing the idea that intentionality can explain. Though unsettling, this move merits further consideration.

Before diving any deeper, let us orient ourselves in the theoretical landscape. Embodied approaches to cognition contrast with a more traditional method, which models cognitive abilities as consisting in the manipulation of *representations*.[[1]](#footnote-2) As typically conceived, representations are discrete entities internal to the organism which mediate between it and its external environment. Representations are frequently taken to possess contentin the sense that they, for example, refer to objects or properties, or represent certain objects as having certain properties. (See below for more on what exactly having content involves.)

The embodied approach to cognition can conflict with the traditional approach in two importantly different ways. Thompson (2018) distinguishes between denying that cognition consists in manipulation of any discrete internal items, content-bearing or otherwise, and denying that cognition consists even partly in the possession of content, be it by discrete, internal items or in any other way.[[2]](#footnote-3) Arguably the primary concern of the embodied approach is to reject representations, but it is a substantive question whether one can cleanly separate content from representations. Indeed, Hutto and Myin hold (2017, p. 37) that ridding one’s theory of content-possession also rids it of representations. At any rate, in practice a number of prominent embodied theorists have made the rejection of content an important part of their program. My principal criticism below is that these theorists’ rejection of content ties their work to older, unresolved debates[[3]](#footnote-4) in the philosophies of mind and language in ways that need deeper consideration: many of the classic problems for accounts of content do not evaporate once we turn to intentionality.

I interpret Hutto and Myin as centrally concerned to reject content because of how they argue: they give central place to concerns about the difficulty of *naturalizing* the possession of content—explaining it in appropriately naturalistic terms. (See Section 1 for more on what ‘appropriately’ means.) Emphasis on concerns about naturalization makes the most sense when the desired conclusion is the following, which closely follows Hutto and Myin’s own formulations:

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| (Radical Embodied Cognition (REC)) | There can be intentionally directed cognition, and even perceptual experience, without the possession of content. |

Here and throughout, I use Hutto and Myin’s acronyms, and I follow Hutto and Myin in framing matters in modal terms. Thus, the claim that cognition does not constitutively involve content-possession becomes REC above.

It is important to clarify that REC allows for liberal appeal to contents in at least some areas of cognitive science, because it is consistent with CIC below:

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| (some Cognition Involves Content (CIC)) | Some varieties of cognition involve the possession of content by mental entities of some kind or other. |

For all that REC says, some kinds of cognition necessarily involve content. It is just that not all of them must. Still, REC does clearly contradict what many take to be a driving idea behind the representation-friendly approach to cognition: that manifesting any cognitive ability consists in performing mental operations on contentful representations, and accordingly, that content-possession is part of what cognition is.[[4]](#footnote-5) In modal form:

|  |  |
| --- | --- |
| (Unrestricted CIC (uCIC)) | Cognition (of any kind) necessarily involves the possession of content by mental entities of some kind or other. |

Clearly, if Radical Embodied Cognition is right, then uCIC is mistaken.

Having displayed Unrestricted CIC and Radical Embodied Cognition, I’ll now unpack their key terms. Hutto and Myin define *cognition* as “mental activity that exhibits intentional directedness” (2013, p. x). Contrast *mentality*,which involves “both intentional directedness and phenomenality”. Following Hutto and Myin, I will use ‘mental activity’ as an informal catch-all term for phenomena of the general sort that cognitive scientists might study. Thus “mental activity” need not involve mentality in the strict sense just defined. Since my concern is only with intentionality and content, I set aside phenomenality, consciousness, and mentality strictly-so-called. Except where this would beg important questions, I’ll follow Hutto and Myin in referring to the most elementary forms of mental activity as ‘basic cognition’. Thus, I will mostly follow them in assuming that the most elementary forms of mental activity involve intentionality, though not necessarily phenomenality. In these terms, the question at issue for REC is whether even basic cognition necessarily involves the possession of content, or whether the phenomenon of content-possession is particular to sophisticated forms of cognition and not constitutive of cognition itself.

The most central notions in the debate between Cognition Involves Content and Radical Embodied Cognition are those of *intentionality* and *content*. An entity E has *intentionality* if E has a subject matter—something that E is of or about. A person’s belief that dogs bark is about dogs and barking; and my desire for chocolate is for(about) chocolate. Similarly, when you see a tomato, your act of seeing (or, perhaps, some state-token of your visual system) has that tomato, perhaps among other things, as its subject matter.

Now for *content*. Throughout *Radicalizing Enactivism* and *Evolving Enactivism*, Hutto and Myin write as though their concern were with contents themselves. But the way that these authors define contents renders them entirely unobjectionable. Contents of beliefs, desires, declarative sentences, and imperative sentences are just ways that the world could be; contents of predicates are properties, contents of referring terms are objects, etc. Thus, I take Hutto and Myin’s real concern to be with *content-possession*, or *having-the-content-that*,a relation that can hold between a mental or linguistic entity and a worldly entity (a content in their sense). (Furthermore, recall from above that although Hutto and Myin deny that cognition is necessarily mediated by internal representations, my focus will be on their views about content-possession.)

As for what having content amounts to, I will follow Hutto and Myin in assuming that “there is content wherever there are specified conditions of satisfaction” (2013, p. x). This remark points to the classic examples of things that philosophers take to have content: beliefs and desires, and sentences of related types. Worldly conditions can render a desire satisfied (or unsatisfied), and can render a belief satisfied in the sense of being *true* (or unsatisfied in the sense of being *false*). Similarly, respectively, for imperative and declarative sentences, relative to contexts of utterance. Hutto and Myin also take *referring* and *ascribing a property* to be ways of having content (2017, p. 95). This view coheres with the emphasis on satisfaction, since reference and property-ascription contribute to truth- and satisfaction- conditions in well-known ways. Thus, I will assume that referring terms and predicates that ascribe properties have content, and likewise for concepts that refer or ascribe.

For the debate between Unrestricted CIC and Radical Embodied Cognition to be non-trivial, it must be at least *prima facie* possible to distinguish between having intentionality and having content. For if having intentionality trivially entails having content, then Unrestricted CIC has won at the outset. To avoid prejudging outcomes, therefore, I will do my best to distinguish these phenomena—though I likewise do not presume that such efforts can ultimately succeed. A reasonable starting point is to resist the temptation to apply the word ‘content’ “simply [to] whatever object a given intentional attitude targets or is directed at” (Hutto & Myin 2017, p. 102). Instead, where an entity has intentionality I will speak of its *subject matter*.

Still, unless this usage finds support in the opening characterizations of intentionality and content, we have merely a distinction without a difference. In particular: even if having a subject matter need not involve having satisfaction-conditions, as sentences and beliefs have, why is intentionality not just reference? For Hutto and Myin, the key to differentiating intentionality from reference and from other varieties of content-possession is that only talk of content gives rise to inten*s*ional (with an ‘s’) contexts (Hutto & Myin 2013, pp. 79–80). An *intensional context* is one in which substitution of coextensive expressions can affect truth values. Talk of beliefs and desires has this feature: the sentence ‘Lois Lane believes that Superman is Superman’ is true, although ‘Lois Lane believes that Clark Kent is Superman’ is false.[[5]](#footnote-6) By contrast, any attitude E of Lois Lane’s that is intentionally directed toward Superman is also in some (*de re*) sense directed toward Clark Kent. In more general terms: one could believe that *a* is F without believing that *b* is F, even though *a* = *b*; whereas, there is a sense of ‘*x* has *y* as its subject matter’ such that if E has *a* as its subject matter and *a* = *b* then *ipso facto* E alsohas *b* as its subject matter.

Above, I introduced intensionality (with an ‘s’) as a feature of *talk* of beliefs; but this feature puts constraints on what belief itself can be: whatever belief is, it has to be such that Lois Lane can believe that Superman is Superman without believing that Clark Kent is Superman, even though in fact Clark Kent = Superman. To clarify how one might handle this requirement in one’s account of belief, consider how one influential view addresses it. According to *neo-Fregeanism*, for a thing to have content,it must not only have a subject matter but also must present its subject matter *under some guise or other* (p. 79).[[6]](#footnote-7) Guises are famously hard to define, but at least some of them have been thought of as definite descriptions: the expression ‘√4’ presents 2 under the guise “*the n such that n\*n = 4*”, whereas ‘1+1’ presents 2 under the guise “*the result of adding 1 and 1*”. As a neo-Fregean would explain things, a person who has not mastered square roots could believe that 1+1 = 1+1 without believing that √4 = 1+1, in virtue of standing in different relations to the distinct guises associated with ‘1+1’ and ‘√4’.

Turning to intentionality, how can we distinguish it from full-blown content? Clearly there is a *de re* use of ‘about’ on which one person’s beliefs involving the guise “*the n such that n\*n = 4*” and another’s beliefs involving the guise “*the result of adding 1 and 1*” count as being “about” the same thing: 2. Aboutness in this *de re* sense would be, Hans Muller’s words, a kind of intentionality “to which the sense-reference distinction does not apply” (2014, p. 178). Even if this aboutness can contribute to truth-conditions,[[7]](#footnote-8) the example would at least show that there can be intentionality that, by itself, involves neither intensional contexts nor guises. This is also how Hutto and Myin would describe the intentionality that is involved in even the most basic mental activity.

For another potential example of intentionality without content, consider the concepts employed by such “sentient” but “non-rational” animals as cats and bats, as described by Carl Sachs (2012, pp. 139–41). These creatures, Sachs explains, are most properly viewed as “using concepts but not forming judgments” (p. 139). They are “perceivers and responders” but not “judgers and agents” (p. 142). For Sachs, sentient-but-non-rational animals count as possessing concepts, since they are capable of “classifying different occasions of perceptual stimuli…as similar” and then responding to these stimuli in similar ways (p. 139). But because these animals are incapable of forming judgments, their concepts “have neither senses nor referents.” To be clear, Sachs himself does not explicitly affirm that these concepts possess intentionality. Still, they are suggestive of the kind of phenomena that Hutto and Myin have in mind: something with intentionality but not content. In any case, having illustrated the key terms of the debate with some would-be examples, I now turn to Hutto and Myin’s arguments for Radical Embodied Cognition.

**1. Naturalist Argument and Excision Strategy**

**1.1. Content-Possession**

Lurking in the background of many debates about Radical Embodied Cognition is the specter of a certain extreme view, the negation of CIC (again, I use Hutto and Myin’s acronyms):

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| (*Really* Radical Embodied Cognition (RREC)) | There is no kind of cognition that necessarily involves anything’s having content. |

Even advocates of REC rarely adopt the *Really* Radical view. Indeed, Hutto and Myin emphatically “do not say that cognition is never informed by or never involves content” (2013, p. xviii), and they concede that content is necessarily involved in various forms of cognition that are “associated with and dependent upon the mastery of language” (2013, p. xviii). Their main claim is merely that “a surprising amount of mental life (including some canonical forms of it, such as human visual experience) may well be inherently contentless” (2013, p. xviii; 2017, pp. 88–89).

Yet despite the unpopularity of the *Really* Radical view, advocates of Radical Embodied Cognition often rely heavily on worries about naturalizing content-possession that threaten to generalize, forcing these theorists into the arms of *Really* Radical Embodied Cognition. These worries arise from the fact that it has proven very difficult to ground content-possession in any other, uncontroversially naturalistic phenomena. But if the absence of a naturalistic grounding account of content-possession raises a persuasive ontological worry, then, one would think, that worry threatens all invocations of content-possession, not just invocations that are made in the course of explaining basic cognition. Call this the *radicalism problem*.

A cursory reading, especially of (Hutto & Myin 2013), easily gives the impression that Hutto and Myin invite the radicalism problem. For they frequently emphasize that “proponents of [Unrestricted CIC] currently lack any naturalistically credible account of content upon which to ground their theorizing about basic minds” (2013, p. 57). In particular, they give central place to the *Hard Problem of Content* (HPC), which is

an intractable theoretical puzzle for those explanatory naturalists who hold that information can be distilled from the world through environmental interactions, where such distillation contentfully informs concrete representational vehicles.

(2017, p. xviii)

The problem, Hutto and Myin explain, is that “we lack any reputable scientific account of how to understand the idea that cognition is literally a matter of trafficking” in informational contents that can be “encoded and decoded, conveyed and communicated” (2017, p. 31). In another suggestive passage, they write,

questions of metaphysics matter in science….Until a solution to the HPC is firmly in hand, we can’t know whether the metaphysics of content is in order. Consequently, we can’t know now that contentful properties [invoked in various allegedly successful explanations in cognitive science] explain the successes of cognitive science….Realists [about content-possession] are placing a bet—a bet on which bookmakers would be forgiven for offering only long odds, given the long history of unsuccessful attempts to naturalize content and the growing skepticism about the explanatory credentials of content-involving mental representations in accounting for much intelligent activity. (2017, pp. 47–49)

Such remarks bring radicalism to mind: if the lack of a “reputable scientific account” and “the long history of unsuccessful attempts to naturalize content” de-legitimize the appeal to content in explaining basic cognition, then presumably they de-legitimize all other appeals to content.

However, a more careful reading reveals a subtler line of reasoning, which I call *the naturalist argument*:

(1) Given what we know about the kinds of cognitive systems that enjoy only basic cognition, we have good reasons to believe that basic cognition must be explicable using only the resources of the informational and biological sciences.[[8]](#footnote-9)

(2) Content-possession is not explicable using the resources of either the informational or biological sciences. (See Fodor’s problem about guises in Section 2.1.)

(3) Therefore, we have good reasons to be skeptical of any attempts to explain basic cognition which proceed by invoking contents.

By relativizing naturalistic standards to the operative subfield of cognitive science, the naturalist argument avoids radicalism: the argument militates only against the appeal to contents in explaining basic cognition, without generalizing to all invocations of content. For even if there are still requirements on what resources can be used to explain more advanced cognition, for all that has been said, those resources may suffice to furnish an adequate account of content-possession.

Indeed, this is precisely Hutto and Myin’s view. For them, it is acceptable to appeal to content-possession when explaining socially situated, language-involving varieties of cognition, precisely because (they think) content-possession can be naturalistically explained, provided that one appeals to “the findings of a wide variety of sciences that include not just the hard sciences [such as, presumably, the biological and informational sciences,] but also cognitive archaeology, anthropology, developmental psychology, and so on” (2017, p. 124). Here they reference an account of content-possession advanced in (Hutto & Satne 2015).[[9]](#footnote-10)

A minor criticism: reasonable as the naturalist argument may be, treating it as decisive on its own is a methodological mistake. Consider premise (1). In general, such restrictions on what resources are acceptable for explaining a given phenomenon are at best *pro tanto*: however reasonable they may be, they cannot overturn explanations that scientists have thought to be useful in practice. Therefore, the properly decisive question is whether or not talk of content figures essentially in many successful explanations. If so, then talk of content is arguably legitimate regardless of whether it can be cashed out using only the resources of the informational and biological sciences. At least, this attitude is reflected in the common practice of many sciences.

To decide whether talk of content figures essentially, the best strategy is to try to do without it. Call this *the excision strategy*. Sometimes the excision strategy is easy to conflate with the naturalist argument. For on some popular views in the philosophy of explanation, showing an explanation to be innocent of appeals to content-possession involves showing that its explanantia do not in any sense explain (ground, reduce, define, or constitute) any phenomena that involve content-possession.[[10]](#footnote-11) (See my discussion of Field’s pilot in Section 3.2 below.) Thus, pointing to the lack of a definition of content-possession in terms of uncontroversially naturalistic phenomena can serve either the naturalist argument or the excision strategy. Still, it is worth distinguishing these two ways of arguing, because, again, only one of them should properly count as decisive.

To be fair, at various points Hutto and Myin do engage in the excision strategy, directly addressing whether talk of content figures essentially in any explanations that scientists have thought useful. An example is their discussion of Eric Kandel’s (2001) research on learning and memory (2017, pp. 26–29; see also 2013, p. 82). Kandel himself characterizes the problem that he was trying to solve in what Hutto and Myin concede to be a content-friendly way, in terms of memory storage. But Hutto and Myin argue that this characterization can harmlessly be purged of content-talk. Now, a crucial step in their argument is that what replaces talk of memory storage does not amount to a definition of anything involving content-possession; and so, one might take the strategy here to be that of leveraging naturalistic scruples. But, read more charitably, what supports REC in such passages is not some general principle to the effect that any posit insusceptible to naturalistic definition is ontologically suspect. Rather, it is simply that Kandel’s problem can be stated without in any sense talking about memory storage.

The point of the preceding remarks is to concede that despite how Hutto and Myin prominently present matters, in practice their case for REC does not always involve leveraging naturalistic scruples against invocations of content; sometimes they pursue the excision strategy. But, even if that strategy is superior to the naturalist argument, it, too, can be used to threaten intentionality. Or so I will attempt to show.

**1.2. Intentionality**

Radical Embodied Cognition is firmly realist about intentionality, as evidenced by REC’s invocation of “intentional directedness” and by the identification of the most elementary forms of mental activity with basic cognition, which by its definition involves intentionality.[[11]](#footnote-12) However, both the naturalist argument and the excision strategy can easily be altered so as to threaten intentionality. Start with the naturalist argument. Suitably modified, the argument runs thus:

(1I) Given what we know about the kinds of systems that exhibit only the most elementary forms of mental activity, we have good reasons to believe that such activity must be explicable using only the resources of the informational and biological sciences.

(2I) Intentionality is not explicable using the resources of either the informational or biological sciences.

(3I) Therefore, we have good reasons to be skeptical of any attempts to explain the most elementary forms of mental activity which proceed by invoking intentionality.

If premises (1) and (2) entail (3), then arguably premises (1I) and (2I) entail (3I), which most advocates of REC would reject. So, although the naturalist argument improves on a blanket “reduce it or eliminate it” by allowing naturalistic standards to be discipline-relative, it still runs a risk of generalizing to intentionality.

Clearly, the generalization problem also afflicts the excision strategy. If premise (2I) is true, and if one can explain the most elementary forms of mental activity using only the informational and biological sciences, then talk of intentionality can presumably be purged from the explanations of these forms of mental activity. Or, what amounts to the same, it need not be invoked to begin with. (That is, on certain views about explanation—recall fn. 10.)

Hutto and Myin do not concede that there is a generalization problem, because they hold that a suitable explanation of intentionality has been given, namely, in (Hutto 2008: Chapter 3) and (Hutto & Myin 2013, pp. 57–82). However, in Sections 2 and 3 I’ll argue that some of the classic problems for accounts of content-possession apply, if cogent, equally well to intentionality. Each section dives into a prominent strategy for naturalizing content-possession, examines some objections and responses thereto, and applies that strategy, and its problems, to intentionality.

**2. Teleo-approaches**

**2.1. Teleosemantics**

*Teleosemantics* is the attempt to explain content-possession in terms of biological functions (Millikan 1984; Dretske 1988; Papineau 1993; Neander 1995), and is widely regarded as the most promising strategy for naturalizing content-possession, by friends and foes of content alike (Hutto & Myin 2013, p. 75). In its simplest, most prominent iteration, and restricted to the case of truth-conditions,[[12]](#footnote-13) teleosemantics says the following:

(Simple Teleosemantics) For any *p*,[[13]](#footnote-14) any entity E, and any biological system S, E has

as its truth-condition the condition that *p* if and only if E has

the *biological function*, for S, of *indicating*[[14]](#footnote-15) that *p*.

Hutto and Myin reject teleosemantics. Their concern relies on the Neo-Fregean view that to have content,a thing must present its subject matter under some guise or other (recall Introduction). While I will not dispute that view here, note that it has sophisticated critics (Heck 2012). Following Fodor (2008), Hutto and Myin hold that the notion of biological function by itself “lacks the resources for specifying under which guise [cognitive states that have contents] might represent what they target” (2013, p. 79; see also 2017, pp. 43–46). Here we need not go into details; just observe that Hutto and Myin are employing the naturalist argument: their motivation for rejecting talk of content relies on the unavailability of an appropriately naturalistic explanation of the grounds of content-possession—that is, an account in terms of biological function.

When it comes to intentionality, however, Hutto and Myin are more confident about what biological functions can achieve: they endorse *teleosemiotics*,the attempt to explain intentionality in terms of biological functions. To have an example on the table, a simple variant of teleosemioticsmight claim that for any kind of thing X and any entity E, E is *about* Xs—that is, E has Xs as its subject matter—if and only if E has the biological function of indicating that an X is spatially nearby.[[15]](#footnote-16) For Hutto and Myin, teleosemiotics is more successful than teleosemantics because having intentionality does not (by itself) involve presenting-under-a-guise. Of course, I’ll soon argue (Section 2.2, Section 3) that if one takes concerns about naturalization seriously, then one has reasons to be concerned about intentionality independent of Fodor’s argument. This is because many of the other classic obstacles to naturalizing content-possession do not evaporate once we turn to intentionality. Let us begin by seeing how those obstacles arise for accounts of content.

Consider the notion of biological function, central to both teleosemantics and teleosemiotics. Biological functions have been variously understood. Dretske (1988) construes having a function in the following way: an item E in a system S has the function, in S, of ϕ-ing if and only if E acquired its current causal role in S as a result of having ϕ-ed, in S, in the past. By contrast, Millikan (1984), Neander (2006), and Papineau (1993) all understand biological function in terms of natural selection. Millikan’s view is especially complex, but modulo details that are irrelevant here, she, Neander, and Papineau all hold that an item E has the function of ϕ-ing if and only if E owes its existence to the fact that its evolutionary predecessors did ϕ.

These accounts of biological function have sparked lively debates in philosophy of biology that need not concern us here. Rather, my concern is with how well these accounts can meet the demands on accounts of content-possession and intentionality. Dretske-, Millikan-, Neander-, and Papineau-functions are all *backward-looking*, in the sense that for E to have such a function at *t* is a matter of what took place prior to *t*—be it events in E’s past or events involving E’s evolutionary precursors. In this section I’ll follow the literature and focus on versions of teleosemantics that use backward-looking functions. I briefly discuss forward-looking functions in Section 3.

The most formidable worry for teleosemantics, acknowledged by Millikan (1993/1993, 2007) and briefly by Hutto and Myin (2017, pp. 107–111), turns on its backward-looking feature. In its simplest form, the concern is that facts about the past cannot play the explanatory role demanded of content-possession, and for this reason, grounding content-possession in facts about the past renders content-possession incapable of playing this explanatory role (Godfrey-Smith 1996; Shea 2007; Gładziejewski 2015, p. 66). To see the point, consider that certain reasonable explanations of how NASA scientists are able to send probes to Saturn invoke the fact that these scientists believe certain theorems of orbital mechanics. To adequately explain how NASA scientists are able to send probes to Saturn, it is not necessary to describe these scientists’ evolutionary predecessors or individual learning histories. Describing such facts might be necessary for giving a historical explanation of how this ability came about, but it is not necessary for the kind of explanation that seems to be called for here, where what concerns us is a question of the form “How is X able to do Y?”. Yet these are the kinds of questions that often concern cognitive scientists. Call this *the explanation problem*. Before applying the explanation problem to teleosemiotics (Section 2.2), let us examine some teleosemanticist responses. This will confirm that there is a genuine, unresolved issue here, and will save labor later on, since these responses—and their shortcomings—also apply to teleosemiotics.

The most promising response involves rejecting the conception of cognitive science on which the problem rests, so I should make that conception explicit. Thus far and in the remainder of the paper, I follow Robert Cummins (1983, 2000) in thinking that the primary explananda in most areas of cognitive science are *abilities*—complex dispositional properties.[[16]](#footnote-17) Cummins (2000) argues that there is a general method for explaining abilities, which he calls *functional analysis*:

Functional analysis consists in analyzing a disposition into a number of less problematic dispositions such that programmed manifestation of these analyzing dispositions amounts to a manifestation of the analyzed disposition. By “programmed” here, I simply mean organized in a way that could be specified in a program or flowchart. (p.125)

The point here is that on Cummins’ view, the explanantia of functional analysis are dispositions (and, ultimately, their bases), not what happened in the organism’s individual or evolutionary past.

Now return to the explanation problem. Perhaps the most sophisticated response is Millikan’s (1993/1993, pp. 171–92; 2007). Millikan concedes that if her view is correct, then talk of content-possession, or of the properties underlying it, cannot serve directly in functional analysis (1993/1993, p. 186; 2007, pp. 440–1). However, Millikan lays out an alternative conception of explanation in psychology—a vision that explicitly contrasts with Cummins’ (Millikan 1993/1993, p. 178). On Millikan’s view, psychology properly construed, dubbed *biopsychology*, is a special branch of biology, trafficking in explanations of a distinctive style characteristic of its parent discipline. These *normalizing explanations* operate by “subsuming” their explananda, in this case episodes of behavior, “under biological norms rather than [causal or statistical] laws and/or by noting departures from these norms and perhaps causes of these departures” (1993/1993, p. 187). In particular, Millikan claims, because beliefs and desires are defined by historically-constituted norms,[[17]](#footnote-18) explanations that attribute beliefs and desires count as normalizing explanations.

Two responses to Millikan’s claims. First, even if there is a robust biopsychology that traffics in normalizing explanations, this discipline would exclude much of what cognitive scientists and other psychologists actually do. (Indeed, it would exclude some of the empirical work that motivates the embodied approach to cognition (see Section 2.2).) Millikan concedes this:

Biopsychology is not…all of what has traditionally been labeled “psychology”. There are many industrial psychologists…and many…who work for…advertising…and even the education industry…who…study certain average behavioral dispositions of people quite apart from reference to the teleofunctional aspects of these behaviors….But to study organisms in that…way, even for…the promotion of effective and efficient education, or…fostering…effective psychotherapy, is surely not the core job of the biological sciences….The subject of the biopsychologist’s study is the stages of an ongoing cyclical historical process….As such, it is not…even the study of a…natural kind. (1993/1993, p. 178)

What is more, although psychotherapy, advertising, and educational psychology would supposedly be excluded from biopsychology, in practice all of these disciplines liberally invoke content, by employing folk-psychological concepts such as those of belief and desire.

A closely related issue is that if teleosemantics is correct, then “intentional psychology…as a biological science…does not aspire to be predictive” (p. 182). As Millikan elaborates,

Prediction and control do…play an important role under parts of the wide umbrella called psychology—I have mentioned psychological testing, human engineering, psychotherapy, etc.—but prediction and control are not required biproducts of intentional psychology. (p. 182)

However, psychotherapy, advertising, and educational psychology not only employ content-attributions but often do so in the service of prediction and control, with some remarkable successes, as we likewise do in everyday life (Fodor 1989, pp. 1–26).[[18]](#footnote-19)

These reflections lead to a second problem: anyone who escapes the explanation problem by embracing Millikan’s vision of psychological explanation shoulders a burden of explaining how intentional talk manages to serve in the various areas of psychology in the ways that it in fact does. This burden may prove bearable in the end. Millikan sketches a way that attributions of historical properties might gesture at functional analyses:

An exhaustive analysis of the way, given its history, that any functional item operates when operating [biologically] normally arrives eventually at a description of normal physical structure for such a device and normal physical conditions for its operation such that physical laws generate performance of this function, given this structure and these conditions. By making implicit reference to such causal explanations, normalizing explanations may thus circumscribe quite specific physical explanations without detailing them. (1993/1993, p. 190)

One could also run this view with learning history rather than evolution. Suppose that having undergone a certain pattern of conditioning in the past (e.g., having been through graduate school in physics) is tightly correlated with being internally structured and related to one’s environment in ways that enable one to send probes to Saturn. Then attributing this history of conditioning to a person could point the way toward a functional analysis of how she is able to send probes to Saturn. Thus, we have an account of why it is (at least provisionally) useful to attribute contents.

Three points about this response. First, it relinquishes Millikan’s original vision of normalizing explanation as a robust style of explanation, independent of functional analysis. Rather, at bottom it is all functional analysis and causal explanation: “History…is no part of the explanation proper. History (i.e., purpose) is used as a convenient way to give a definite description of the mechanism that is causally involved” (2007, p. 441; see also 1993/1993, p. 190). Talk of content ends up being merely a convenient, in-principle-eliminable shorthand for gesturing toward the phenomena that feature in functional analyses and causal explanations.

The second point is that everyday talk of content-possession is typically not very explicit or detailed about the historical facts that would ground the possession of the contents that it invokes (Amundson & Lauder 1994). Very few attributions of content, in folk psychology or in cognitive science, provide an “exhaustive analysis of the way, given its history, that any functional item operates when operating [biologically] normally”. Admittedly, above Millikan expresses confidence that “By making implicit reference to such [historical] explanations, normalizing explanations may thus circumscribe quite specific physical explanations”. Millikan may be right about this, but that is not obvious. The matter needs further study.

Thirdly, content-attributions need not take a detour through historical properties in order to gesture at physical explanations. Rather, if content-attributions get what explanatory usefulness they have from their relationship to various non-historical properties, then, other things equal, it is more charitable to interpret them as referring to those properties, or at least something grounded in them. Call this charity principle *the explanation constraint*: one should take content-attributions to refer to what does (or is grounded in what does) the explanatory work that we pre-theoretically take content to do. Admittedly, this constraint need not be decisive; accounts of content-talk must also vindicate other elements of our pre-theoretical notions of content,[[19]](#footnote-20) and success in that regard could outweigh an account’s violation of the explanation constraint. But still, it is a flaw of Millikan’s account that it violates the constraint.

Much of what I have said about Millikan’ applies also to Dretske, who (1988) provides his own account of explanations that invoke content, focusing primarily on the explanation of past episodes of behavior.[[20]](#footnote-21) Dretske’s central distinction is between a *triggering explanation* and a *structuring explanation* of a piece of behavior. A triggering explanation identifies the immediate, proximal causes of that behavior: “what triggered mental state C to cause bodily motion E?”. By contrast, a structuring explanation explains how the agent’s cognitive system came to be structured in such a way as to give rise to the behavior: “How did states of type C acquire the power to cause bodily motions of type E?”. For Dretske, the facts that bestow content upon an agent’s mental states are facts about how her cognitive system became structured as it is; and so attributing content amounts to giving a structuring explanation.

Like Millikan’s, Dretske’s view suffers from the explanation problem: it is not obvious that the explanatory need to which content-attributions respond is a need for structuring explanations. This concern arguably holds for folk psychology (recall my discussion of individual learning history in the NASA example), but it is especially pressing when it comes to the attribution of contents in cognitive science. Consider Shepard and Metzler’s (1971) assertion that the way that humans are able to discern whether one figure is the result of rotating another is by forming a representation of the latter figure and “mentally rotating” it. The question at issue is how humans are able to do a certain thing—not how they historically acquired this ability.

Before moving on to intentionality, I will examine one more teleosemanticist response to the explanation problem. Implicit in some of Millikan’s reflections (1993, p. 190) is that teleosemantics invokes historical facts only as groundsof facts involving content-possession, and it is unreasonable to insist that if A grounds B then talk of A must explain whatever talk of B explains. Such insistence would fly in the face of actual scientific practice: facts of fundamental physics might ground general economic principles without being fit to replace these principles in the explanations that economists give. Call this the *grounding defense*.

Two replies to the grounding defense. First, although one may see teleosemantics as giving grounding explanations, one may also reasonably see it as asserting fact identities: any fact involving possession of content is identified with a historical fact of a certain sort. Indeed, this is a natural way to read most prominent teleosemanticists. (And this interpretation has its virtues. A teleosemantics that trafficked in fact identities would be crystal clear about how the phenomena that it invokes are supposed relate to the phenomena that it seeks to explain. Whatever the theoretical usefulness of grounding, this notion is less clear than that of identity (Kovacs 2017).) But, if teleosemantics provides fact identities rather than grounding explanations, then the grounding defense is unavailable.

Secondly, even if teleosemantics is construed as giving grounding explanations rather than fact identities, it still must explain why talk of content is useful. For a desideratum on an account of the grounding of a phenomenon X is that the account should shed some light on why talk of X is useful in explaining the things that it apparently explains. And we just considered an argument that teleosemantics fails this desideratum: grounding belief in historical facts sheds little light on why saying “they believe the theorems of orbital mechanics” is useful for explaining how NASA scientists are able to send probes to Saturn. If this objection is cogent, then teleosemantics accounts for content-possession only at the cost of making its apparent explanatory value mysterious.

At this point I should reiterate: my goal in this section is not to show that teleosemantics is untenable. It is just to show that there are reasonable worries here, and evaluating them is a complicated job. Moreover, the worries here are not specific to Simple Teleosemantics, but rather affect all prominent versions of teleosemantics. For all such views seek in one or another way to put historical facts to work in shoring up explanations that invoke content-possession, whether by replacing talk of content in a vindicating rather than eliminating way, or by explaining its usefulness.[[21]](#footnote-22) And the objection, if good, shows that historical facts cannot do this.

**2.2. Teleosemiotics**

Returning to intentionality and teleosemiotics, I will now show that the explanation problem applies with equal force in that setting. Consider Hutto and Myin’s example:

the frog’s tongue-snapping behavior is…directed at flies and flies alone. This is because ingesting the flies, as a matter of fact, met the needs of this type of frog’s ancestors. Consequently, ‘targeting flies’ alone enters into a full explanation of why the frog’s perception-action responsiveness was first forged and then proliferated. (2017, p. 115)

These historical facts “fix what the frog is directed at and explain why it is so directed” (p. 115). And later, “The…attunements between organisms and their environments in the past,” either evolutionary or in the life of the organism as a result of learning, “fix what is intentionally targeted” (p. 116). But if that is what fixes intentional targets, then describing the facts that fix intentional targets is not necessary for explaining how frogs are able to feed themselves. Rather, describing these facts is only necessary for explaining how frogs acquired their tongue-snapping behavior.

My NASA example raises the same point. In that case, intentionality as well as content-possession was posited: certain reasonable explanations of how NASA scientists are able to send probes to Saturn invoke the fact that these scientists believe certain things *about* planets, their orbits, and gravity. To problematize teleosemiotics in the same way as teleosemantics, the objector would simply insist that, to adequately explain (relative to the standards of explanation that operate in that context) how NASA scientists are able to send probes to Saturn, it is not necessary to describe either these scientists’ evolutionary predecessors or histories of conditioning—these being the things that make their beliefs be about the phenomena of orbital mechanics. Here we can envision the same pattern of replies and responses as we had with teleosemantics.

I’ll turn now to some possible responses, focusing on matters specific to Radical Embodied Cognition.[[22]](#footnote-23) Following Millikan, teleosemioticists might try to avoid the explanation problem by envisioning a new psychology that traffics in normalizing explanations. However, it is not clear that advocates of REC can embrace Millikan’s vision. For some of the empirical work that has motivated the embodied approach to cognition (Thelen & Smith 1994; Van Gelder & Port 1995; Kelso 1995, Port 2003; Silberstein & Chemero 2012; Riley, Shockley & Van Orden 2012) is clearly concerned with questions that cannot be directly answered by appealing to historical facts—be they grounds of intentionality or of content-possession. For just one representative example, Riley, Shockley, and Van Orden’s (2012) aim is to explain how humans are able to make lightning-fast correct judgments about “whether a novel picture contains an animate being or exclusively inanimate objects” (p. 22). This is a question of the form, “How is X able to do Y?” which does not obviously demand a normalizing explanation or an appeal to historical facts.

A different teleosemioticist response arises from the fact that my NASA example involves attribution of content as well as intentionality—the NASA scientists are said to have beliefs. The response is that examples involving content are inappropriate when one is considering teleosemiotics, because whenever we attribute only intentionality and not content, talk of intentionality plays a distinct explanatory role. This would be a role, such as, for example, the role of function-talk in normalizing explanations, that can indeed be vindicated by grounding intentionality in historical facts. Call the view just described the *dual role view*.

My first objection to the dual role view is dialectical, stemming from my remarks above: insofar as the empirical work that motivates the embodied approach concerns “how” questions, the normalizing explanations involving intentionality-but-not-content would presumably be of little interest to advocates of the embodied approach. But, having seen that objection, let us set it aside. A second objection is that if there are cases in which talk of intentionality, but not content, is appropriate for answering a “how” question, then those cases are counterexamples to the dual role view. (Interestingly, those cases would provide support for REC, but at the expense of teleosemiotics! Again, my aim in this section is not to refute REC (recall Introduction) but rather to problematize arguments for it that seek to leverage concerns about naturalization.)

For a potential example, imagine a creature, Alvin, who is too primitive to have contentful states. We want to know how Alvin is able to feed itself. Part of a good explanation of this might be that Alvin enjoys neurological states that are intentionally directed toward objects in the vicinity. E.g., perhaps Alvin’s nervous system enters a certain state-type, X, when and only when Alvin encounters food, and the tokening of X causes Alvin to make feeding motions. Here the dual role theorist would have to claim that the facts about Alvin’s ancestors or individual history that led X to have the causal role that it now has explain how Alvin is able to feed itself. (Note: the key point here is not that Alvin is a simple creature but that only intentionality and not content is being invoked. Advocates of the dual role view would make similar claims whenever a sophisticated organism’s ability seems to be explicable by invoking intentionality but not content.) But this proposal is implausible. If Cummins (2000) is right, then organisms’ abilities quite generally are to be explained by functional analysis; the method is not limited to explanations in which it is reasonable to invoke contents. And the explanantia in functional analyses are mechanisms and dispositions, not properties having to do with what happened in the organism’s individual or evolutionary history. This picture gives little motivation for the claim that when it comes to certain abilities, such as Alvin’s, the proper explanantia are not dispositions but historical properties.

Fully evaluating either the dual role view or a unified account of psychological explanation such as Cummins’ would require probing the science more deeply than I can here. For this reason, it is worth noting that however plausible one may find the dual role view, the problem remains when it comes to explanations that do invoke content-possession. For as we saw above, having content necessarily involves having intentionality: if E has the content that *a* is F, then E’s having this content consists at least partly in E’s being about *a* and F-ness. But then, presumably the fact that E has the content that *a* is F consists, at least in part, by whatever facts make E be about *a* and F-ness. So, if teleosemiotics is right then the fact that E has the content that *a* is F would consist partly in historical facts, inviting all of the concerns about explanation that arose for teleosemantics.

In response to this, advocates of teleosemiotics might complement their distinction between two explanatory roles with a distinction between two kinds of intentionality: on the one hand, intentionality of a very elementary sort, and on the other hand, distinct forms of intentionality that arise only in connection with full-blown content-possession. (Crucially, this would not merely be a distinction between having intentionality but not content and having both, but rather a distinction between two genuinely different kinds of intentionality.) Indeed, Hutto and Myin present teleosemiotics primarily as an account of *Ur*-*intentionality*—the simplest, most biologically primitive kind of intentionality (2013, pp. 57–82). On this reply, the dual role view would claim that Ur-intentionality can be grounded in historical facts, and that this is sufficient to underwrite the distinct explanatory role that talk of intentionality plays when it occurs independently, not wrapped up in content-attribution.

A concern about this line of response is that disunifying the account of intentionality in this way robs it of some of its interest. Part of what makes teleosemiotics exciting is its promise to illuminate a fundamental, unifying feature of cognition, one that figures interestingly and significantly in abilities of many different kinds, and about which we can make interesting generalizations. One would hope, in particular, that accounts of Ur-intentionality would also explain the kind of intentionality enjoyed by familiar, contentful mental states. However, if Ur-intentionality is radically different from the kind of intentionality involved in the possession of content, and if these two varieties of intentionality play very different explanatory roles, then it makes little sense to continue thinking of them as forms of a single phenomenon, the “intentionality” or “aboutness” familiar from everyday discourse. *A fortiori*, it makes little sense to think of intentionality as a fundamental, unifying feature of cognition, as suggested by Hutto and Myin’s definition of ‘basic cognition’. Call this the *disunity problem*.

REC advocates would be ill-advised to respond by insisting that there is after all some feature F common to both Ur-intentionality and content-involving intentionality in virtue of which both count as varieties of intentionality. For in that case the concern about whether intentionality can be naturalized would immediately manifest as the question of whether F can be naturalized. Insofar as REC advocates rest their case against Unrestricted Cognition Involves Content on concerns about naturalization, they would have to take this question seriously. And since F would by hypothesis be a common feature of Ur-intentionality and content-involving intentionality, they would not be able to respond to concerns about F by positing two different F-properties.

Still, one can envision RECers taking a radical line, refusing to be swayed by the disunity problem. They would simply welcome the outcome that there are two phenomena to be distinguished here, along with two separate explanatory roles for these phenomena to play. And they might insist that it is Ur-intentionality, not intentionality proper, that serves as a fundamental unifying feature of cognition. As noted earlier, one cannot refute this kind of position from the armchair; one must dive into the science. For now, it may be worth noting that while Hutto and Myin (2017) do often speak of a significant jump between basic and content-involving cognition, they do not openly go as far as the radical position just outlined. But perhaps they would if pressed.

Now consider a final reaction to the explanation problem. In stressing this problem, I rested considerable weight on the claim that facts involving intentionality must explain agents’ abilities. Otherwise, to observe that a given account vitiates intentionality as an explainer of abilities could hardly count as an objection. But then one can avoid the problem by renouncing the requirement that intentionality (or facts involving it) must explain agents’ abilities. Millikan did something similar already (2.1), retreating to the idea that talk of content plays a merely heuristic explanatory role, serving to “circumscribe quite specific physical explanations without detailing them” (1993/1993, p. 190). In response, I worried that content-talk is too inexplicit about the historical facts that would “circumscribe quite specific physical explanations”, and that by violating the “explanation constraint”, teleo-approaches offer uncharitable interpretations of talk of content. Since these worries carry over straightforwardly to the case of intentionality, let us set them aside and discuss a further issue that is specific to Radical Embodied Cognition.

REC, recall, defines cognition as mental activity that involves intentionality. This invites the interpretation that REC claims to explain what cognition is in terms of intentionality. Indeed, this interpretation enjoys textual support: quoting Lawrence Shapiro (2014, p. 218), Hutto and Myin write: “appeal to a modified teleosemantics is REC’s way of ‘explaining and understanding a contentless mind’” (Hutto & Myin 2017, p. 104). However, objectors might reasonably insist, if intentionality plays at best a heuristic role in explaining agents’ cognitive abilities, then it is not a fundamental, constitutive feature of cognition and does not belong in the definition.

Troubling as it is, perhaps this objection can be met. REC advocates could insist on a distinction between two ways that intentionality might explain: (1) as part of a general, philosophical explanation of what cognition is, versus (2) as part of the explanation of organisms’ specific abilities, the way that the appeal to contentful representations has often been thought to explain. On this response, then, talk of intentionality explains in the philosophical way, rather than explaining agents’ abilities (or possibly: in addition to explaining agents’ abilities in a merely heuristic sense). Along similar lines, Hutto and Myin sympathize with *enactivism about intentionality*, the view that engaging in cognition consists in manifesting intentionality by interacting with the environment in interest-driven ways (2013, p. 36). One might read enactivism as giving a general explanation of what cognition is, without claiming that intentionality plays much of a role in explaining how organisms are able to do things. In other words, intentionality explains not how organisms’ cognitive abilities work, but what is cognitive about them.

For their part, objectors might doubt that the concept of intentionality provides great illumination here. Why not simply say that cognition consists in interacting with the environment in interest-driven ways? What does it add to say that this creates about-ness? A second objection, as far as it goes, is that the view on offer arguably does relinquish the idea that teleosemiotics serves the purposes of cognitive science, given that the latter seems primarily concerned with explaining abilities. However, perhaps these objections can be met. One interesting possibility is that framing matters in terms of intentionality serves as a bridge between (a) biological and information-theoretic descriptions of agents and (b) more colloquial characterizations. And as for the second problem, Hutto and Myin claim that the explanation problem poses little danger to teleosemantics, because teleosemantics is not out to serve the purposes of cognitive science in the first place (pp. 111–2). So, perhaps they would happily concede the same for teleosemiotics. At any rate, I leave further development of this intriguing position to advocates of REC.

A different response is for REC to offer its definition of cognition in a pragmatic rather than explanatory spirit. That is: the definition does not provide an explanation of what cognition (as antecedently understood, however dimly) is, but rather stipulates what one is henceforth to mean by ‘cognition’. Advocates of REC would argue that their stipulation is felicitous, in that it proves useful for demarcating a range of phenomena that are susceptible to informative generalizations, and that include certain canonical examples, such as visual perception. One might capture this outlook with the slogan, “intentionality unifies without explaining”. Compared to the way that Hutto and Myin often present matters, this view dramatically reconceptualizes the role of intentionality in cognitive science. But the view might prove defensible nonetheless.

Before leaving teleo-approaches, let us recall the big picture. In this section, I presented teleosemantics, the project of defining content-possession in terms of biological function. We saw that while Hutto and Myin reject teleosemantics, they favor teleosemiotics, which appeals to biological functions to explain intentionality. I then articulated the explanation problem, a serious objection to teleosemantics, and showed that this problem also applies to teleosemiotics. If correct, this observation supports my claim that intentionality as well as content-possession resists straightforward attempts at naturalization: it can be naturalized only at the expense of its explanatory importance. This extends the naturalist argument to intentionality. Finally, I observed that the problem can perhaps be circumvented, at the cost of significantly reconceptualizing or even relinquishing the idea that intentionality can explain. Such moves need further discussion.

**3. Functionalist Metasemantics**

Having seen some problems for teleosemantics and teleosemiotics, let us now see what happens when non-historical, disposition-based accounts of content-possession are mobilized to explain intentionality. Here a promising source is Cummins’ (1975) discussion of what it is for an entity E to *function as a* ϕ*-er* in a system S—this to be distinguished from E’s *having the function, in* S*, of doing* ϕ. For Cummins, for E to function as a ϕ*-*er in S is not a matter of past facts about E or its evolutionary predecessors, but rather of the role that E currently plays in S. (For this reason, Cummins’ discussion is not commonly considered as characterizing biological functions strictly so-called, but rather a certain kind of causal role that an entity can play in a system that contains it.) E *functions as a* ϕ*-er in* S if and only if (i) E ϕs, and (ii) E’s ϕ-ing contributes to the abilities or behavioral dispositions of S that are being analyzed. Thus, on Cummins’ account, E functions as a ϕ-er in S only relative to an analysis of a given ability or pattern of behavior of S.

Before turning to intentionality, start with *functionalist metasemantics*—accounts of content-possession that appeal to Cummins-style functioning. To have a concrete view on the table, consider the functionalist analogue of Simple Teleosemantics: *simple functionalist metasemantics* claims that E has the truth-condition that *p* relative to some system S and ability C of S, if and only if E functions as a *p*-indicator in S, relative to C. That is, if and only if E indicates *p*,and this fact combines with other facts about E’s role in S in a way that gives rise to S having the ability C.

As I have defined it, functionalist metasemantics naturally lends itself to a certain conception of the explanatory role of talk of content. The idea is that talk of content constitutes a particular level or stage in the functional analysis of agents’ abilities (recall Section 2.1). (Likewise, presumably, for other behavioral dispositions that are not properly characterized as abilities; but for simplicity I will focus on abilities). The ability being explained is decomposed into, among other things, facts of the form “E has the content that *p*”. In the folk-psychological case these might be the facts that the agent believes that *p* and desires that *q*. See the pilot case below for an example. For some explanations, the content-level decomposition may suffice, whereas other explanations may require the content-involving facts to be decomposed in turn, along the lines given by one’s preferred functionalist metasemantic theory. This need not constitute a problem for functionalist metasemantics. After all, few philosophers are out to claim that content-possession is metaphysically fundamental; functionalist metasemanticists need not insist that iterating functional analysis repeatedly will result in talk of contents at every level. What is needed is that attributions of content are cashed out in a suitably vindicating way—e.g., ‘has the content that *p*’ is cashed out in terms of the properties that reduce *having the content that p*. (Whether anything short of a reduction base would vindicate is a controversial issue that I cannot settle here.) Having sketched functionalist metasemantics, I now turn to its problems.

**3.1. The Problem of Error**

Even if Cummins’ account of functioning captures much of the function-talk that goes on in science, it has a feature that creates serious trouble for simple functionalist metasemantics. The problem, of which Hutto and Myin are aware (2017, p. 106), stems from the fact that in Cummins’ account, it is impossible for something to function as a ϕ-er and yet fail to do ϕ; rather, if E functions as a ϕ-er in S, then by clause (i), E does ϕ. In other words, the notion of Cummins-functioning leaves no room for dysfunction.

Applied to simple functionalist metasemantics, the problem is that there is no room for error—for the possibility of tokening a belief in a circumstance in which its truth-condition (content) does not obtain. Call this *the* *problem of error*.[[23]](#footnote-24),[[24]](#footnote-25) Hartry Field (1994) skillfully illustrates the problem. He invites us to imagine that, due to dishonest journalism about Bosnia, “my beliefs of the form ‘In Bosnia, *p*’ don’t stand in any interesting correlations with the actual facts about what’s happening in Bosnia, but just reflect what appears in the newspapers I read” (p. 255). Relativizing the example to functional analysis of an ability, we get the following. Suppose that we are trying to explain some ability C that Field owes to these beliefs. C cannot be analyzed into, among other things, indication relations between (tokenings of) these beliefs and real events happening in Bosnia. Rather, C would only be analyzable into indication relations holding between Field’s beliefs and what’s written in the newspapers that he reads. Thus, according to the simple version of functionalist metasemantics, what we would normally call Field’s belief that everything is going fine in Bosnia turns out to have the truth-condition that the newspaper says “Everything is going fine in Bosnia”. That is to say: if we accept simple functionalist metasemantics, then the content of a great many states differs radically from what we pre-theoretically take it to be.

There is a large literature on the problem of error, mostly responding to the problem as it arises in the linguistic case (Kripke 1982). Translated to the mental case, the most popular response is to identify the content of a mental state E not with what E actually indicates, but rather with what E would indicate in ideal conditions (Boghossian 1989 pp. 528–30). And clearly the Bosnia example involves non-ideal conditions. Thus, the suggestion would be that Field’s belief has the content that in Bosnia, *p* because this is what his tokening the belief would indicate in ideal conditions—in particular, when there is no war in Bosnia.

The well-known problem with this response is that ideal conditions are exceedingly hard to specify in an informative way. E.g., for Field’s tokenings of ‘In Bosnia, *p*’ to indicate that in Bosnia, *p*, not only must Bosnian journalists be scrupulous, but Field must also not be traveling in Greece under the illusion that he is in Bosnia…and so on, with indefinitely many other conditions needing to be ruled out. Because innumerably many factors can lead to a mental state being tokened when its content fails to obtain, it is impossible to spell out ideal conditions in a finite way (Kripke 1982, p. 27; Boghossian 1989, pp. 528–30; Brandom 1994b; Field 1994, p. 255; Wikforss 1999, p. 207). No philosopher has succeeded in spelling out ideal conditions informatively, and most are pessimistic about the possibility of doing so. Exacerbating the situation is the fact that a fully reductive account would also have to specify ideal conditions in terms that do not invoke content or intentionality; yet, as the Greece illusion reveals, some of the interfering conditions that have to be ruled out are most naturally described in terms of contentful mental states.[[25]](#footnote-26)

In turn, this objection has been dismissed by numerous philosophers. Boghossian (1989) likens the appeal to ideal conditions to the appeal to the ideal gas laws in chemistry, stressing that explanations in science frequently appeal to idealized models (p. 529). He concludes (p. 530) that the burden of proof rests on the opponent of functionalist metasemantics to show that the appeal to ideal conditions is unacceptable. Taking a different angle, Martin and Heil (1998) accuse the objection of falsely assuming a conditional account of dispositionality, and so mistakenly saddling functionalism with the burden of constructing a true conditional relating the tokening of a mental state to its content. Instead, Martin and Heil identify dispositions with physical states that can also be characterized non-dispositionally, in terms of an object’s physical structure and components. For example, salt’s solubility (a dispositional property) can be described in terms of the charge properties of the sodium and chloride ions and the way they are arranged. And clearly “a salt crystal suspended in an ice cube or surrounded by a strong electro-magnetic field does not cease to be water-soluble” (p. 290). Applied to the Bosnia case, the claim would be that just as being suspended in an ice cube does not keep salt from being water-soluble, so dishonest journalism in Bosnia does not undo Field’s disposition to token ‘In Bosnia, *p*’ when in Bosnia, *p*.[[26]](#footnote-27)

Setting ideal conditions aside, it is also worth noting that although the most prominent accounts of biological function are backward-looking, there have been numerous attempts to develop non-historical accounts, finding ways to make sense of dysfunction. In defining what it is for an item to have a given biological function, these attempts appeal variously to its contribution to potential survival and reproduction (Bigelow & Pargeter 1987),[[27]](#footnote-28) to the item’s being a token of a Cummins-functioning type (Godfrey-Smith 1993; Krohs 2009, 2011; Gray-Hardcastle 2002),[[28]](#footnote-29) to statistical norms (Boorse 2002; Garson & Piccinini 2014), to modality (Nanay 2010), to the item’s place in the organization of the system (Mossio et al. 2009), and to the explanatory context of the function-attribution (Conley 2018). If such an account can work, then, like its backward-looking cousin, *functionalist teleosemantics* could try to explain content-possession in terms of biological function, and error in terms of dysfunction. E.g., Field’s mental state has, but fails to fulfill, the function of indicating that in Bosnia, *p*. Here is not the place to evaluate these accounts; my point is simply that there are serious *prima facie* obstacles to naturalizing content-possession that are independent of Fodor’s problem about guises, and so apply, if good, to intentionality.

Let us, then, verify that the problem of error indeed threatens *functionalist metasemiotics*—accounts of intentionality that invoke Cummins-functioning. On the simplest version of this approach, E is about *a*,relative to some system S and capacity C that S has, if and only if (i) E indicates some state of affairs or other that involves *a*, and (ii) this fact combines with the causal role of E in S in a way that gives rise to S having the capacity C. Here we have the same problem that we had for functionalist metasemantics: nothing about the Bosnia example relies on the difference between intentionality and full-blown content. The key point is just that (tokenings of) Field’s beliefs are correlated with facts about newspapersrather than with facts about Bosnia; it need not matter what exactly Field’s beliefs indicate about these newspapers. Thus, if Field’s argument against functionalist metasemantics is good, then it likewise threatens the claim that Field’s beliefs are aboutBosnia rather than about these newspapers.

Having canvassed some functionalist metasemanticist responses to the problem of error, let us briefly consider whether adopting the less ambitious goal of explaining only intentionality buys any advantages. An obvious suggestion is tomimic Hutto and Myin and enlist functions, but appeal to a non-historical account thereof. On the simplest version of this view, Field’s beliefs are about Bosnia because they have, but fail to fulfill, the function of indicating something about Bosnia. I will not develop this view here; just note that by Hutto and Myin’s reasoning, since the target is only intentionality, here too Fodor’s problem about guises causes no trouble.

A different strategy starts with an even more modest project: explain what it is for mental state-type E to be applied to a given object on a particular occasion, setting aside all other varieties of intentionality (here we assume that there is a non-intentional way to identify mental states). A simple proposal here is that if an external entity X causes Eto be tokened, with this contributing to the manifestation of an ability being explained, then that tokening of E is an application of E to X—and so X (together with E’s referent) is one of the subject matters of that tokening of E. This proposal at least avoids the problem of error in the classic ‘horse’ case (Boghossian 1989, p. 531). In that example, simple functionalist metasemantics claims that my concept ‘horse’ refers to whatever I am disposed to apply ‘horse’ to.[[29]](#footnote-30) The problem of error says that, because I apply ‘horse’ not only to horses but also to cows when visibility is poor, it follows that my concept ‘horse’ refers to *horse-or-cow*. But now consider the account on offer. Although I err in predicating equine-ness of Bessie-the-cow, the account yields the correct result that what I apply my concept to is Bessie.

Other cases raise more complications, of varying difficulty. Mistaking Devon for Sarah, I say to my friend: ‘I miss Sarah’. On a simple assessment, Devon is not the subject matter of my utterance, despite having prompted it, and so the account on offer gives the wrong result. However, invoking Kripke’s (1977) distinction between speaker’s reference and semantic reference, one might insist that in uttering ‘Sarah’ I speaker-refer to Devon, although I semantically refer to Sarah. In at least that sense, Devon emerges as one of the subject matters of my utterance. Another complicated case is non-veridical perception. In the desert, sunlight on a patch of sand causes me to experience a mirage. The objection is that it would be wrong to say that the subject matter of my visual experience is the sand; rather, the subject is a (non-existent) puddle of water. But on a different characterization, I indeed perceive the sand; I simply perceive it (inaccurately) as water. The hardest example here is the Bosnia case. The account on offer would have to say that the dishonest newspaper is a subject matter of Field’s tokens of ‘In Bosnia, *p*’, since it was a fact involving the newspaper that caused him to token ‘In Bosnia, *p*’. (Here I assume that the account on offer can be successfully scaled up to propositional thoughts via compositional principles.)

The problem of error may not incapacitate functionalist metasemantics and metasemiotics, but it does complicate the way forward. The Bosnia case is a particularly thorny counterexample to the necessity[[30]](#footnote-31) of indicating that *p* for having the content that *p*; and similarly, to the necessity of indicating something about *a* for being about *a*. Thus, any improved functionalist metasemantics (or metasemiotics) must say more about the role of indication in fixing contents (subject matters). Moreover, as we just saw, the example also poses a challenge to functionalist metasemiotics. Still, these problems need not be insuperable; my point for now is simply that if indeed there is a problem here, then it appears to be a problem for intentionality as well as content.

**3.2. Indeterminacy**

Just as Field’s Bosnia example is a putative counterexample to the necessity of indicating that *p* for having the content that *p*, there are also counterexamples to sufficiency. The most sophisticated is also developed by Field (2001). First, I will present the example, then I will show how it generalizes to intentionality.

Field’s argument is a version of the excision strategy. He begins by considering the task of explaining how an agent(s) has a certain cognitive ability: in his case, explaining how pilots are, in general, able to land planes:

the explanation [of a generic pilot’s capacity to land planes] involves the existence of some class C of internal representations in the pilot and two subclasses C1 and C2 of C such that

|  |  |
| --- | --- |
| (Behavioral Effects) | when she believes a representation in C1 she slows the plane and when she believes one in C2 she speeds it up, and |
| (Relation to Airspeeds) | there is a 1-1 function *f* from C to a certain set of real numbers such that   1. C1 is that subclass of C that is mapped into numbers above a certain threshold and C2 is that subclass of C that is mapped into numbers below a certain (slightly lower) threshold, and 2. she tends to believe a representation *r* in C when the airspeed in knots is approximately *f*(*r*). |

(2001, pp. 153–155, formatting and labels mine)

(The “certain thresholds” are the threshold above which the pilot’s speed is too fast for her safely to land, and below which it is too slow.) Given the dialectical context, the only charitable interpretation is that Field’s “representations” and “believing a representation” are not immediately assumed to involve content—rather, that is something that would have to be demonstrated.

In response to his content-free explanation, Field anticipates an opponent insisting that *having a class C of internal “representations” that satisfies (Behavioral Effects) and (Relation to Airspeeds)* reduces *having available a set of beliefs one could adopt about one’s airspeed*; and *“believing” a “representation” in C* reduces *tokening a belief about one’s airspeed*. If that is true, then content-possession has been invoked “in fact if not in name” (1994, p. 254).

REC advocates also face this kind of response wherever they claim to explain something without positing content. They might reject explanations such as Field’s, which posit internal representations, in favor of explanations that completely avoid such posits;[[31]](#footnote-32) but the details of Field’s particular proposal are irrelevant. Whatever might be one’s strategy for giving content-free explanations, friends of content can in principle respond by insisting that one’s favored explanantia constitute some facts that involve the possession of content.

Of course, the prospects of this response depend on what the provided explanantia are, more specifically, on the extent to which the resulting account satisfies various pre-theoretical constraints on accounts of content-possession.[[32]](#footnote-33) And Field claims that the prospects of satisfying one such constraint—that of *determinacy*—are grim, both in this case, and, by parity of reasoning, all others. He grants that “part [(Relation to Airspeeds)(b)] of the explanation uses an indication relation,” but insists that

The function [*f*] mapping internal representations into airspeeds needn’t…give the intuitive truth conditions of [the pilot’s] representations in all cases: one could tell a story in which the pilot’s beliefs about what she was doing were so weird that it would be natural to assign quite different truth conditions to her representations. (Perhaps she believes she isn’t in an airplane at all, but is using the controls to direct U.S. ground forces on a foreign mission).

(2001, p. 154)

Again: Field claims that whenever we explain how an agent has a given ability, for no entity E and no *p* do we encounter either E’s having as its content the condition that *p* or even a reduction[[33]](#footnote-34) base for such, in the course of giving the explanation. Rather, the naturalistic facts that explain the agent’s ability are consistent with multiple, mutually incompatible attributions of content. Thus, even if there is a need to posit internal “representations”, there is no explanatory need to ascribe even remotely determinate contents to them. We might describe this as a failure to satisfy *the determinacy constraint*: for having property X to constitute having the content that *p*, having X must be incompatible with having content *q*, where *q* is radically different from *p*.

Field’s argument is just an especially sophisticated instance of the classic concern about a troubling degree of indeterminacy that has plagued all attempts to naturalize content-possession (Quine 1960, pp. 7–16; Quine 1992, pp. 37–59; Kripke 1982; Dennett 1991; Field 1994, pp. 254–259; Field 2001, pp. 153–155; McGee 1994). The concern is that whatevermay be the facts that one invokes to naturalize content-possession, be they facts about indication, biological functions, or what-have-you, these facts always leave room for multiple, radically different, mutually inconsistent attributions of content that serve equally well for purposes of explanation, as far as attributions of content can go in this regard. Thus, the argument goes, the facts that explain an agent’s behaviors and abilities do not force us to assign any even remotely determinate contents to her beliefs, desires, acts of perception, etc. This concern creates ontological worries about content-possession, insofar as the justification for positing content-possession in the first place derives in large part from the purported explanatory usefulness of doing so. If multiple, radically different attributions of content could serve equally well in explanation, then there is little justification for positing a content-possession relation that is anywhere near determinate.

So far, friends of Radical Embodied Cognition might be perfectly content. After all, their goal is to avoid positing content-possession as long as they can. (Though note that Field’s argument is meant to apply to all content-attributions, not just those belonging to the study of basic cognition.) However, although Field’s concern is with content-possession,[[34]](#footnote-35) his argument generalizes to intentionality. This is because when his story shifts the beliefs attributed to the pilot, it does so in a way that shifts the subject matter attributed to the pilot’s ideation (airspeeds vs. U.S. ground forces). This move of shifting the posited subject matter is not limited to ascriptions of content; it can be applied whenever any entity is presented as having a subject matter. One simply replaces the original characterization with one that attributes a radically different subject matter, and then claims that what results is an equally good explanation, as far as explanations that posit subject matters go. If arguments of this form are cogent, then they raise the same concerns about intentionality that they raise about content-possession—namely, that the given facts about indication and causal role do not even come close to determining unique subject matters for the agent’s states, raising questions about the possibility of naturalizing intentionality (the naturalist argument), and raising the concern that positing even remotely determinate subject matters is inessential for explaining the agent’s ability (the excision strategy).

And just as we had with Field’s argument, all of the other classic arguments of this form can likewise be generalized to intentionality, since all that they require is to shift the subject matter that one attributes. Compare the argument from Quine (1960, pp. 7–16), which shifts the attributed subject matter of a sentence from rabbits to undetached rabbit parts or rabbit-stages. Similarly, Kripke (1982)[[35]](#footnote-36) and Field (1994, pp. 256–60) shift not the truth-conditions ascribed to a sentence, but rather the referent ascribed to a word, ‘plus’ and ‘or’, respectively. If good, these arguments likewise threaten intentionality along the lines of the naturalist argument and the excision strategy.

Let us now consider how functionalist metasemiotics might respond to Field’s example, directed at intentionality. As we saw when discussing backward-looking accounts of intentionality, one response is to invoke a distinction between two different kinds of intentionality: on the one hand, Ur-intentionality, which can arise when there is no content, and on the other hand, another form of intentionality that arises only when there is full-blown content. With this distinction in hand, Hutto and Myin might claim that the pilot’s representations are Ur-about her speeds, e.g., because they have the biological function of indicating things about her speeds, even if they are about U.S. ground troops in the everyday sense of ‘about’.

In Section 2.2 I argued that disunifying the account of intentionality in this way robs it of some of its explanatory interest. But I also observed that Hutto and Myin might simply embrace this consequence. Now that I have raised concerns about indeterminacy, we are in a position to see a different objection: it needs to be argued that Ur-intentionality is itself immune to a troubling degree of indeterminacy. Perhaps the notion of biological function furnishes sufficient means to respond to this concern, but the case would have to be made. At any rate, even if appeal to biological functions can resolve indeterminacy worries, if functions are construed in a backward-looking way then we are stuck with the explanation problem of Section 2.1—although, again, I concede that this problem may not be insurmountable.

Turn, then, to a different kind of response. When discussing teleosemantics, Hutto and Myin consider Millikan’s idea that “the content of a representation is determined, in a very important part, by the systems that interpret it” (Millikan 2005, p. 100). Let the *Millikan maneuver* be the strategy, when trying to naturalize content-possession, of appealing to, possibly among other things, how a representation is “interpreted” by the containing cognitive system.[[36]](#footnote-37) Interestingly, although Hutto and Myin take teleosemantics to be undone by Fodor’s problem about guises, they concede that the Millikan maneuver “provides a clean way of avoiding the indeterminacy of content that plagues…teleofunctional accounts of the sort that Dretske (1988) propounds” (2013, p. 75). Presumably, then, they would also sympathize with the maneuver as a response to indeterminacy concerns about intentionality.[[37]](#footnote-38)

Two immediate issues here. First, if ‘interpreted’ is meant literally, as referring to a cognitive—and therefore intentionality-involving—act, then Millikan’s remark goes little way toward naturalizing intentionality. Second, if a system’s “interpretation” of a representation is defined in terms of facts about the system’s past or evolutionary predecessors, then that would solve the problem of indeterminacy only at the cost of inviting the explanation problem (Section 2.1). I won’t press this objection here; at this point in the dialectic, we have set historical facts aside and are considering accounts of intentionality that appeal to functional role instead.

The suggestion currently on offer, then, is to understand the “interpretation” of a representation in terms of its functional role in the system. In response to this, Field might point out that (Behavioral Effects) does this already, describing simple effects of the representations on the pilot’s speeding-up and slowing-down motions. If Field is correct, then at least that aspect of these representations’ functional roles fails to determine a single subject matter for them. To that extent, Field’s pilot case raises a respectable indeterminacy challenge for casual role metasemantics, and, we have seen, casual role metasemiotics. If this challenge cannot be met, then together with the problem of error (3.1), that constitutes another argument showing that intentionality as well as content-possession resists naturalization.

However, I think that there may be a way to proceed against the indeterminacy threat, setting aside the notorious problem of error. Presumably, in a sophisticated system such as the mind of a pilot, the functional roles of representations such as those that Field describes would be richer and more complex than (Behavioral Effects) and (Relation to Airspeeds) alone let on. Considering “interpretation”—where this is understood in terms of the complex ways in which a representation interacts with a wide variety of other representations and possible circumstances—is a step in the right direction when it comes to resolving concerns about indeterminacy, though this step needs substantial elaboration. Let us, then, turn from my criticisms of Hutto and Myin’s arguments for Radical Embodied Cognition to my friendly suggestion.

**4. Functional Role and Indeterminacy**

In this section, I will develop Millikan’s idea that the subject matter of a mental entity E can be determined by how E is “interpreted” by a cognitive system S that contains E. But I will do this in a functionalist setting, understanding “interpretation” not in terms of past facts about S or S’s ancestors but rather in terms of aspects of E’s functional role in S. Sticking with Field’s example, I will identify some aspects of the functional roles of the pilot’s representations that I take to contribute to fixing her representations’ subject matters.

**4.1. Counterfactual Spread**

Start by reflecting on the kind of explanation that we are giving when we explain how pilots are able to land planes. Field is arguably right that (Behavioral Effects) and (Relation to Airspeeds) do not reduce *having beliefs about one’s airspeeds*. But he would be wrong to suggest that one can, without any significant costs, replace the folksy explanation that attributes beliefs with the content-free explanation that he presents. There may be some kinds of explanation of how pilots are able to reliably land planes that need only describe the likes of (Behavioral Effects) and (Relation to Airspeeds), but there is an important feature that Field’s explanation lacks.

Both in everyday life and cognitive science, a common virtue of many good explanations is that they provide modal information about the agents whose behaviors and abilities they explain. In particular, define the *counterfactual spread* of such an explanation to be the information that it provides about how the agent would behave under various counterfactual circumstances.[[38]](#footnote-39) Folk-psychological explanations—which posit beliefs, desires, hopes, fears, etc.—enjoy a distinctive, wide counterfactual spread. This spread is *wide* in the sense that it contains information about a wide variety of different scenarios.[[39]](#footnote-40) For example, when we explain how a pilot is able to land a plane by saying that she has beliefs about her speeds, we get information about how she would react to radio announcements about her speedometer. So, to find out what makes a pilot’s beliefs be abouther speeds, one should identify not only (Behavioral Effects) and (Relation to Airspeeds), but also the facts about the pilot that ground her dispositions to react to such radio announcements.

This observation allows us to see what is wrong with Field’s alternative story, which attributes beliefs not about speeds but about U.S. ground troops. Let *r* be a representation that causes slowing-motions, and assume that a speed of *n* knots is too fast for landing that plane from *m* meters. If we attribute Field’s delusion, what answer do we get to the question, “Suppose the pilot were to hear a service announcement over the radio, to the effect that speedometers in that type of plane were defective, readings being typically 100 knots faster than the true speed. In that case, would seeing a speedometer reading of *n* knots at *m* meters still cause *r*?” We get a bad answer unless we tweak the delusion in some quite specific ways, for instance, by stipulating that—and how—the pilot interprets service announcements as code-talk for events taking place in the battle on the ground.[[40]](#footnote-41) Unless the pilot has some such specific delusion, such a service announcement wouldn’t change the typical causes of *r* in a delusional pilot.[[41]](#footnote-42) By contrast, a sane pilot would react to such an announcement by inhibiting a speedometer reading of *n* knots from causing *r*: that is, by inhibiting such a reading from causing her to believe that her speed is approximately *n* knots. Unless the delusion is tortuously tweaked, only the normal belief-attribution predicts that the pilot would react in some such way.

Now, Field might respond by tweaking away, claiming that the landing ability of most pilots whom we would normally describe as sane can be equally well explained by attributing an extreme delusion, tweaked to be consistent with the pilot’s dispositions to react to a wide variety of counterfactual scenarios. Let’s say that such a suitably-tweaked delusion is *specifically tailored* to these dispositions. If there is an extreme delusion specifically tailored to all of the dispositions about which the attribution of normal beliefs informs us, then one could insist that at least as far as modal informativeness goes, the attribution of a specifically tailored delusion can serve just as well as attribution of beliefs about speeds; it can guide us to the naturalistic properties that underlie the pilot’s ability to land the plane and make it responsive to changing circumstances. And the possibility of a person so deluded would refute the suggestion that one could naturalize *having beliefs about one’s speeds* by supplementing (Behavioral Effects) and (Relation to Airspeeds) with a description of the naturalistic bases of the pilot’s wider dispositions. For instantiating those naturalistic properties would also be compatible with having the tweaked delusion.

But it is simply unbelievable that a person could be deluded in this way. If the claim were merely that for all the dispositions in some small range, (e.g., dispositions to react to radio announcements,) there could be an extreme delusion specifically tailored to those, then perhaps that could be granted; though even this seems rather unlikely. But, if the relationship between beliefs and behaviors is anything like what we normally take it to be, then it is utterly implausible that there could be an extreme delusion specifically tailored to all of the dispositions about which the attribution of beliefs about airspeeds informs us. Rather: if someone is able to land planes because while landing she tends to token true beliefs about how fast she is going, then it is overwhelmingly plausible that there are some circumstances in which she would be disposed to behave differently from someone who is able to land planes because while landing she tends to token beliefs that happen to be systematically correlated with her speeds but are about U.S. ground troops. Granted, the relationship between beliefs and behaviors is highly complex, but beliefs do constrain behaviors in at least this minimal way. For this same reason, aberrant belief-attributions cannot guide us to the same naturalistic facts—in particular, to the same facts about agents’ dispositions—as normal belief-attributions can.

Admittedly, although my claim about how beliefs constrain behaviors is quite plausible from everyday experience, it is not beyond dispute. The simplest way to object would be to deny that beliefs are connected with behavior in anything like the way we normally take them to be. However, I will not pursue this line of reasoning any further; surely anyone who takes this position bears the burden of proof. Instead, a more sophisticated response is to reject my assumption that there is in the first place a unique notion of belief and way we normally take beliefs to be. For instance, several philosophers have recently argued that folk psychology contains at least two distinct belief-like concepts: *occurrent* versus *dispositional* belief (Rose & Schaffer 2013), or *thin* versus *thick* belief(Buckwalter et al. 2015). (See also (Murray et al. 2013) and (Schwitzgebel 2010).) But this sophisticated response can also be met. A look at the characterizations of all of these belief-like concepts reveals that any of the states that they posit would, if instanced, constrain behavior in at least the minimal way that I describe. Consider dispositional and thin beliefs. These are the objector’s best bet, since among the proposed states these are connected the most loosely with behavior. But turning to the pilot case, we may safely assume that the pilot’s belief that she is flying a plane is a dispositional or thin belief—a typical pilot need not explicitly affirm to herself that she is flying a plane. And yet the radio announcement example clearly shows that this belief influences her behavior nonetheless. Compare: you have the dispositional belief that your parents are not lions: though you believe it in some sense, this is a thing that you seldom explicitly affirm. Yet surely this belief exerts some definite influence on your dispositions. Surely, you and someone who dispositionally believes her parents to be lions would behave differently in at least some ways.

Before moving on, let us consider how the preceding observations relate to the excision strategy and the naturalist argument. For the excision strategy, the point is simple. Field proposed a way to excise content-attributions from a generic explanation of how pilots are able to land planes. In response, I identified a deficiency in Field’s proposal: his explanation provides less modal information about its subject than does the explanation that invokes beliefs.

Now turn to the naturalist argument. The general naturalization strategy on offer is: to find reduction bases for intentionality (or content-possession), look to the dispositions that justify the attribution of one subject matter (content) rather than another. In our specific case: what makes the pilot’s beliefs be about her speeds is not only that they are correlated with her speeds and cause landing-appropriate motions, but also that these beliefs’ effects on behavior are regulated in certain systematic ways by the agent’s background beliefs and perceptual experiences: if the pilot heard radio announcement X, then (because she believes she is flying a plane), seeing a reading of speed *n* at *m* meters would inhibit representation *r* from causing motion Y. This interaction with the pilot’s background belief is part of what it is for *r* to be interpreted. (For a full picture of what makes the pilot’s beliefs be about her speeds, we would likely also need to consider many additional background beliefs and their indication relations.)

In more general and reductive terms, the claim on offer is that a state’s subject matter is determined not only by its indication relations and effects on bodily motions, but also by the ways in which various further states mediate its effects on bodily motions, in response to a variety of external conditions. At the most abstract level, such regulation is characterizable thus: tokening state 1 (hearing the radio announcement) in the presence of state 2 (the background belief that one is flying a plane) blocks state 3 (seeing speedometer reading X) from causing motion M (plane-slowing motion). Here we have inhibition, but one could characterize excitation similarly. The claim that such control mechanisms help determine a state’s subject matter adds a measure of concrete detail to the abstract functionalist view that a state’s subject matter is determined by its position in the vast causal network of other states, together with the external environment.

One more observation. Although the example that I discussed involves talk of beliefs, for all that I have said, all of my positive claims are available to Radical Embodied Cognition. Firstly, REC advocates are free to naturalize intentionality in the way that I advocate: by looking to the dispositions that justify the attribution of one subject matter rather than another. Secondly, RECers are free to adopt my rendition of the Millikan maneuver. I argued that, at least in the case of contentful representations, when they have determinate subject matter, they owe this in part to being integrated into a vast casual network of other representations in the agent’s cognitive system, which regulate manifestation of the ability that is being explained, as a pilot’s disposition to respond to radio announcements regulates her landing of planes. But nothing that I said forces these states to be discrete or have satisfaction-conditions. Rather, *prima facie*, one can take a state’s subject matter to be determined in part by how other states mediate its effects on behavior, without conceding that a state so regulated thereby acquires content. This is important, since it suggests that RECers need not embrace (backward-looking) teleology; functionalism is an available option.

Still, to properly disentangle the defense of content against indeterminacy from the defense of intentionality, more should admittedly be said. The next step would be to consider an argument that compares two characterizations neither of which posits any content, but which, between them, attribute radically different subject matters. Since Hutto and Myin take visual perception to involve intentionality but not content, that seems a reasonable place to start.

**4.2. Explanation Problem Revisited?**

Having taken the Millikan maneuver to ward off indeterminacy, I will now address a concern about the maneuver’s potential side effects. Hutto and Myin note that if we take a state’s content to be fixed by how it is interpreted, then “we can’t think of cognitive agents as content-using, content-consuming, or content-interpreting systems, for to do so suggests that there is pre-existing content to be dealt with” (2013, p. 76). Rather, we can only speak of content-creating systems. Similar remarks apply to intentionality: if states come to be directed at things only in virtue of how these states are “interpreted” by the cognitive system, then one cannot speak of systems as using or interpreting intentionality, but only creating it.

This need not be an immediate problem. Whether it be content or intentionality, speaking only of X-creating systems is compatible with claiming that cognition necessarily involves X; one need only add that cognition necessarily involves creating X! Indeed, Hutto and Myin are decidedly open to a similar view about intentionality: enactivism (recall Section 2.2). However, one might worry that functionalists cannot comfortably embrace enactivism: if an item acquires content (subject matter) in virtue of its role and effects in a system, then how can the fact that the item has that content (subject matter) explain its role and effects in the system? This resembles the explanation problem: the Millikan maneuver threatens to vitiate content (intentionality) as an explanans. (Note that the worry clearly applies to both functionalist metasemantics and metasemiotics, reinforcing my claim that accounts of intentionality face many of the classic obstacles afflicting accounts of content-possession.)

In response: careful attention to functional analysis allows us to distinguish explanandum from explanans,[[42]](#footnote-43) at least in many cases. What we foremost explain in the pilot case is the pilot’s ability to land planes.[[43]](#footnote-44) Functionalist metasemiotics does not claim that the pilot’s ability (the explanandum) makes her states be about her speeds (explanans). True, à la enactivism, the lower-level properties that give rise to and regulate the pilot’s ability also endow her states with subject matters. But granting this is compatible with claiming that talk of intentional states constitutes a distinct, useful level of analysis of the pilot’s ability. Compare: at bottom, a computer consists of chips and wires, transistors and capacitors. Still, when explaining how a computer is able to, e.g., coordinate a robot’s movements, there is a distinct, useful level of explanation at which one describes the computer as performing computations and logical operations. In both cases, a complex ability is explained, at different levels of abstraction, by decomposing it first into intentional states and then into complex interactions among these states and the environment.

Functionalists lacking confidence in this response can resort to the two radical options offered to teleosemiotics in Section 2.2: insist that intentionality explains what cognition is without explaining organisms’ behaviors and abilities, or renounce the requirement that intentionality must explain in either sense. (And, as we had with teleo-approaches, functionalist fans of content can respond analogously.) The first view comports decently with enactivism: that the pilot’s dispositions make her representations about her speeds does not explain how she is able to land planes, but rather explains in what sense this ability is cognitive one. Here as with teleo-approaches, one worries that the concept of intentionality does little real work. But the response offered to teleo-approaches is, if good, also available here: perhaps talk of intentionality bridges the gap between scientific functional analysis and folk psychology.

On functionalist renditions of the second view, the intentional idiom is not a robust, independent style of explanation, but rather simply a shorthand for talk of dispositions: to say that the pilot has representations that are about her speeds is to do no more than loosely describe the dispositions that underlie and regulate her ability to land the plane. REC advocates of this persuasion would need to reconceive their definition of cognition in a pragmatic rather than explanatory spirit. Perhaps one can even repurpose enactivism in this way: enlisting intentionality-making as a proxy for cognition, the view goes, usefully demarcates a domain of investigation.

**5. Conclusion**

Above, I examined how Radical Embodied Cognition relates to several older, unresolved debates in the philosophy of mind and language, and made an REC-friendly suggestion as to how to resolve one of these problems, that of radical indeterminacy. I began by distinguishing two ways of arguing for REC (Section 1.1): the naturalist argument, which leverages naturalistic scruples, and the (superior) excision strategy, which simply tries to explain cognitive phenomena without invoking content. In the critical portion of the paper, I argued that both approaches generalize to threaten intentionality, because many classic, unresolved problems for accounts of content also threaten accounts of intentionality. For teleo-approaches (2.1 and 2.2), the problem was that biological functions, construed in a historical way, can account for intentionality (or content) only at the cost of vitiating it as an explanans. In response, I examined a radical line available to advocates of REC: dramatically reconceptualize, or even renounce, the idea that intentionality can explain. Turning to functionalist approaches to content, I described two classic problems: the problem of error (3.1) and indeterminacy (3.2). I argued that both problems extend to intentionality.

In the positive portion of the paper, I developed a functionalist version of the “Millikan maneuver” in response to the problem of indeterminacy (4.1). The key idea was that the subject matter of a mental state is determined not only by its connection to the environment and most direct effects on behavior, but also by the ways that further states mediate these effects. *Prima facie*,this observation is independent of commitment to content-possession, suggesting that fans of REC are not forced to embrace backward-looking teleology. Rather, functionalist teleosemiotics is an available option. Finally, I discussed the concern that my rendition of the Millikan maneuver generates an analogue of the explanation problem for functionalism (4.2), and sketched a way to address this problem by attending to the niceties of functional analysis. Failing that, here as with teleo-approaches there is the option of dramatically reconceptualizing, or even renouncing, the idea that intentionality can explain. Unsettling as they might be to some, such moves merit further investigation.

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1. For an illustrative example of the representation-friendly method, Shepard and Metzler (1971) argue that the way that humans are able to discern whether one figure is the result of rotating another is by forming a representation of the latter figure and “mentally rotating” it. [↑](#footnote-ref-2)
2. Thompson accuses Hutto and Myin of conflating these two positions, contrasting Dreyfus (2002) as someone who is clearly out to reject representations but not necessarily content. I suspect that Chemero (2009) is also more out to reject representations than content. [↑](#footnote-ref-3)
3. Here I refer to the literatures on Kripkenstein’s problem (Kripke 1982), Quine’s musings on indeterminacy (Quine 1960, 1992), and the explanatory role (if any) of truth (Quine 1970/1986; Leeds 1978, 1995; Putnam 1978a-b; Brandom 1984, 1994a-b, 2002; Field 1986, 1994, 2001). [↑](#footnote-ref-4)
4. Note: one could adopt a default strategy of modeling cognition by positing contentful representations without embracing this thesis about what cognition consists in. Such a theorist would simply allow exceptions to the strategy. [↑](#footnote-ref-5)
5. Likewise, a 5-year-old ignorant about square roots could believe that 1 + 1 = 2 without believing that 1 + 1 = √4. [↑](#footnote-ref-6)
6. For a dissenting view, see (Heck 2012). According to Heck, the phenomena that neo-Fregeans describe in terms of senses or guises can also be described in terms of certain kinds of linkages between content-bearing mental states. [↑](#footnote-ref-7)
7. The example points to a tension between the definition of content as that which involves satisfaction conditions and the claim that having content always involves presenting-under-a-guise: *prima facie*, these things can come apart. [↑](#footnote-ref-8)
8. Hutto and Myin anticipate that “when combined with other E-resources, scientifically respectable contentless notions of information-as-covariance and the norms of biological functionality offer all that is needed for understanding basic minds” (2017, p. 41). E-resources, Hutto and Myin explain, are “those that focus on embodied, enactive, extended, embedded, and ecological aspects of mind” (2017, p. 1). [↑](#footnote-ref-9)
9. It is worth noting that Hutto and Myin’s escape from the radicalism problem rests heavily on Hutto and Satne’s (2015) account of content-possession. Hutto and Satne’s account differs from most in that it appeals to a wider range of resources, and for this reason it may turn out to be more promising; but still, it is worth noting that in general, accounts of content-possession have met with persistent controversy. [↑](#footnote-ref-10)
10. This is the *ontic conception of explanation* (Craver 2014), which holds that what makes something an explanation is that it specifies the structures and causes at work in the system that one is explaining. On a contrasting view, what makes something an explanation is not the nature of the entities posited but rather various features of the language or concepts employed—e.g., whether they lead to useful predictions, promote understanding, or facilitate manipulation of the explanandum. On some versions of this latter view, even if A grounds (explains, constitutes, reduces) B, putting matters in terms of A does not amount to invoking B. Compare Chemero (2009), who rejects talk of representations not by arguing that representations do not exist (and so explanations that posit them fail to describe real structures and causes) but rather that talk of them serves no useful purpose in the explanations in which it figures. [↑](#footnote-ref-11)
11. Other advocates of REC share the commitment to realism about intentionality. Chemero (2009), for example, embraces an “ecological” approach to understanding perception, which takes the objects of perception to be not entities in the external world but rather *affordances*—environmental opportunities for behavior. But if perception is of affordances, then there is something that perception is of! So ecological approaches to perception are strongly committed to realism about at least some forms of intentionality. Compare also the view defended in (Dreyfus 2002). [↑](#footnote-ref-12)
12. The hope is that other contentful phenomena (such as desires) can also be explained in terms of biological function. [↑](#footnote-ref-13)
13. Here I use the 16th letter of the lowercase italic Latin alphabet as a substitutional variable ranging over context-insensitive, declarative English sentences. [↑](#footnote-ref-14)
14. Indication is variously understood, but the common theme is that the obtaining of one state (type) of affairs *indicates* the obtaining of another if and only if the two are in some sense reliably correlated (Stampe 1977), (Dretske 1981), (Stalnaker 1984, p. 18). Philosophers disagree over what degree of correlation suffices to count as sufficiently reliable, but the following example persists in the literature: if the cross section of a tree trunk has 54 rings, then that indicates that the tree is 54 years old (Hutto & Myin 2017, pp. 29–30). [↑](#footnote-ref-15)
15. Compare also Cummins (1996), who understands a contentful mental act as consisting in the application of a representation to some targeted entity. Among the tasks confronting this view is that of explaining in naturalistic terms what it is for a given entity to be “targeted” for the application of a representation. This targeting seems to be precisely the kind of intentionality that Hutto and Myin believe that they can explain by appealing to biological functions. [↑](#footnote-ref-16)
16. Rather than ‘ability’ Cummins uses the less colloquial synonym ‘capacity’, which he defines thus:

    Capacities are best understood as a kind of complex dispositional property. Standard treatments typically assume that dispositions are specified by subjunctive conditionals along the following lines:

    Salt is water-soluble = If salt were put in water, then, ceteris paribus, it would dissolve. (p. 122)

    See Section 3.1 for a non-conditional conception of dispositions. [↑](#footnote-ref-17)
17. For Millikan, one biological function of the brain is to token states that correspond to the world in accordance with certain systematic rules. As products of an organ with this function, these states acquire the function of corresponding with the world in accordance with those rules. Compare: the function of a copier is to, given an input, produce sheets that correspond to that input in certain systematic ways. Each sheet in the copier’s output tray therefore has the function of corresponding to its particular input in accordance with those rules. [↑](#footnote-ref-18)
18. Millikan (pp. 182–5) replies that even in these disciplines, it is not in fact talk of beliefs and desires that we use to predict behavior. Similarly, she later (pp.190–2) argues that although talk of functions does not amount to talk of the causes of behavior, such talk nonetheless indirectly identifies (“circumscribes”) such causes, “without detailing them” (p. 190). See below in the main text for further discussion of this point. [↑](#footnote-ref-19)
19. In particular, Millikan would argue that only teleosemantics can account for the normativity of content. I reject this response, since I reject the claim that content involves normative rules for behavior (see fn. 23). But I cannot resolve this matter here. To my mind, a more compelling constraint is that of accounting for error (see Section 3.1). [↑](#footnote-ref-20)
20. For my purposes the focus on past behaviors matters little, since dispositions and abilities also admit of structuring explanations. [↑](#footnote-ref-21)
21. Millikan (1984) insists that teleosemantics does not set out, and cannot reasonably be asked, to capture the everyday meaning of content-related phrases such as ‘believes that’ and ‘means that’. But even if Millikan is right about that, this is different from showing that the posits of teleosemantics need not be expected to do the explanatory work that is asked of content-possession, or to explain how content-possession does this work. Indeed, as argued above, the interest of teleosemantics lies precisely in its potential to either describe clearly naturalistic phenomena that can do this explanatory work, or at least that explain how talk of content does this work. [↑](#footnote-ref-22)
22. To be fair, Hutto and Myin acknowledge that the explanation problem threatens both teleosemantics and teleosemiotics (2017, p. 107). But the claim defended in this section is that this concession should give greater pause to advocates of Radical Embodied Cognition. [↑](#footnote-ref-23)
23. Fodor calls this the “disjunction problem” (1990, p. 59). The problem of error is sometimes characterized as the challenge of accounting for *semantic normativity*, a distinct kind of normativity that some philosophers attribute to semantic phenomena, and regard as a serious obstacle to naturalizing such phenomena (Kripke 1982, p. 24; Boghossian 2003; Brandom 1994a). However, Wikforss (1999, p. 208) distinguishes the problem of accounting for semantic normativity from the problem of error. Furthermore, Wikforss (1999) and Glüer and Wikforss (2009) argue that accounting for semantic normativity cannot be a criterion of adequacy for *metasemantic theories*—attempts to give naturalistic accounts of meaning and content-possession—because on scrutiny, there is no (metasemantic-)theory-independent sense in which semantic properties either arise from or constitutively carry with them any norms for behavior. See also (Steglich-Petersen 2008) for different arguments against the claim that mental content is normative. Since I find these arguments persuasive, I place no emphasis on the problem of normativity. [↑](#footnote-ref-24)
24. The problem of error is a version of the Hard Problem of Content in that it is an obstacle to simple accounts of how content-possession arises from uncontroversially naturalistic phenomena. But note that while Hutto and Myin are certainly out to reject appeals to indication in grounding content-possession, their formulations differ slightly from the problem of error as stated here. The problem of error does not concern the existence of would-be representational vehicles, discrete or otherwise; but (recall Introduction) Hutto and Myin blend skepticism about discrete representational vehicles with skepticism about content-possession (2017, p. 37). Thus, they articulate the Hard Problem of Content as a challenge to show how information (such as indication relations) can be “extracted” or “picked up” from the environment and “distilled” or “encoded” into “discrete” representational vehicles (pp. 30–3). [↑](#footnote-ref-25)
25. All of that being said, ideal conditions can be real even if unspecifiable in a finite, content-free way. So, the doubtful prospects for such a specification need not drive one to reject talk of content-possession, unless one is in the grip of the likes of the Naturalist Argument (Boghossian 1989, pp. 529–30). [↑](#footnote-ref-26)
26. *Prima facie*,Martin and Heil’s view must fend off the classic concerns about multiple realizability that motivate functionalist approaches to cognition in the first place (Putnam 1975). Whereas it is easy to see how water-solubility might be a unique chemical property, in other cases the same disposition can be instanced by objects with very different structures (Millikan 1993, 186–7, 192). E.g., fish and flatworms swim in different ways, using very different structures. One might respond that cognitive dispositions are identical with disjunctions of structural properties; but specifying the disjoined structural properties may prove no easier than specifying ideal conditions. [↑](#footnote-ref-27)
27. On this view, an item’s function is its contribution to inclusive fitness. This is essentially a Cummins-function, where the ability being analyzed is the ability to survive and reproduce. [↑](#footnote-ref-28)
28. Godfrey-Smith notes that if E is a *type* of entity, then it is possible for a *token* of type E to fail to do ϕ. But as he also recognizes, there cannot be an entity-*type* E such that Es function (for systems of type S) as ϕ-ers, yet Es on the whole fail to ϕ. By clause (i), Es would simply fail to function as ϕ-ers in the first place. This objection is relevant to the functional role analogue of Simple Teleosemantics, because indication is a relation borne by state-types, not tokens. [↑](#footnote-ref-29)
29. This statement of the problem takes for granted the notion of an application of a word to an object, which already involves intentionality. So, RECers might argue that the problem thus stated only threatens full-blown reference. [↑](#footnote-ref-30)
30. The point is: Field believes that in Bosnia, *p*, although his tokening this belief does not indicate that in Bosnia, *p*. [↑](#footnote-ref-31)
31. Again (recall Introduction), some advocates of embodied approaches to cognition are concerned with whether there are discrete internal representations (contentful or not) rather than with whether there are content-bearers (discrete and internal or not). [↑](#footnote-ref-32)
32. It is controversial what these constraints are and what satisfying them would require. Field’s remarks below express one such constraint. The explanation problem (Section 2) gives another: facts involving the possession of content must turn out to explain what we pre-theoretically take them to explain. Compare also my “explanation constraint” (2.1). [↑](#footnote-ref-33)
33. Admittedly, not everyone who seeks a naturalistic explanation demands that the explanation amount to a reduction. (And anyway, philosophers differ on what reduction even is.) So perhaps one might respond to the objections here by insisting that what we have are naturalistic explanations of content-possession that fall short of reduction. [↑](#footnote-ref-34)
34. Field targets the relation *having the content that* because it is a generalization of *having the truth-condition that*, and his ultimate aim is to motivate a “deflationary” attitude about truth (1994, p. 271; 2001, pp. 153–156). [↑](#footnote-ref-35)
35. Although Kripke’s discussion raises the problem of error, it can also be read as raising the problem of indeterminacy. Put in these terms, the point is that there are two equally good, radically different interpretations of the word ‘plus’, and nothing about my use of the word determines one of them to be correct. [↑](#footnote-ref-36)
36. By contrast, what Hutto and Myin call the *strengthened Millikan maneuver* appeals only to how the item is interpreted, leaving indication aside (p. 75). [↑](#footnote-ref-37)
37. They state, for instance, that “The real point of conflict between what is on offer from REC and what is on offer from teleosemanticists is the commitment to content” (2013, p. 79). But then it follows that there is no conflict concerning the strategy of resolving indeterminacy of subject matter by appealing to “interpretation”. [↑](#footnote-ref-38)
38. I owe this phrase to Harold Hodes. The term ‘counterfactual spread’ invites the idea that this information is expressible by counterfactual conditionals. But functionalists who reject conditional analyses of dispositions (Martin & Heil 1998) can still invoke counterfactual spread; it is just that they must spell it out in some other way. [↑](#footnote-ref-39)
39. Field recognizes this point (2001, p. 78). [↑](#footnote-ref-40)
40. I owe this observation to Richard Boyd. [↑](#footnote-ref-41)
41. Or, jumping ahead, even if there is a delusion that mimics a sane person’s reactions to service announcements, it is highly implausible that there is a delusion so thoroughly tweaked that a pilot thus deluded would behave in all the ways predicted by the attribution of beliefs about airspeeds. [↑](#footnote-ref-42)
42. See (Antony & Levine 1997) for a different functionalist response to a similar problem. [↑](#footnote-ref-43)
43. A snag: one would also naturally say that the attribution of beliefs about speeds explains why the pilot reacts to radio announcements in the ways that she does. Here we do invoke intentionality (her beliefs are about her speeds) to explain an effect (reactions to announcements); whereas the Millikan maneuver would have the explanation go in the other direction. Still, even here functionalists can make some progress: distinguishing the disposition to react in these ways from its manifestations, one might say that the disposition partly constitutes the intentional fact, whereas the manifestations are explained by it. Thus, we at least reduce the problem to that of vindicating the idea that the dispositions *per se* are explained by the intentional fact. [↑](#footnote-ref-44)