

Misrepresentation and Robustness of Meaning

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Abstract: According to Fodor, robustness of meaning is an essential aspect of intentionality, and his causal theory of content can account for it. Robustness of meaning refers to the fact that tokenings of a symbol are occasionally caused by instantiations of properties which are not expressed by the symbol. This, according to Fodor, is the source of the phenomenon of misrepresentation. We claim that Fodor's treatment of content and misrepresentation is infected with a couple of flaws. After criticizing Fodor's theory of content, we propose a new theory of content which explains how misrepresentation is possible as a result of meaning-forming causation, and extend it to account for the property of robustness of meaning.

Keywords: intentionality, causal theory of content, meaning, misrepresentation, asymmetric dependence, disjunction problem.

1 Introduction

The relation of causation is a promising conceptual base on which to build a naturalistic theory of content. Various causal theories of content have been proposed,¹ but none of them enjoy wide acceptance among philosophers. According to one naïve version of the causal theories, known as "the crude causal theory," a symbol "S" refers to

¹ The theories we have in mind are not the historical-causal theories of reference which were proposed by Kripke, Putnam, and others, but rather the informational theories of content which were proposed by, among others, Stampe (1979), Dretske (1981), and Fodor (1990a).

the property P if instances of P reliably cause “S” tokens.² This assertion immediately leads to the notorious disjunction problem. For sometimes tokens of “S” are caused by instantiations of properties which are not expressed by “S.” For example both cows and, on some dark nights, horses can cause “cow” tokens, and hence, according to the crude causal theory, “cow” means *cow or horse-on-a-dark-night* (Fodor 1990b, 59). Although horses on dark nights sometimes cause “cow” tokens, we don’t want *horse-on-a-dark-night* to be part of the meaning of “cow.” That is, some tokenings of a symbol are misrepresentations and the causes of such tokenings should not be included in the symbol’s content.

According to Fodor, the phenomenon of misrepresentation is one facet of the disjunction problem, and a satisfactory account of what tokenings of a symbol are representations and what tokenings of it are misrepresentations requires a solution to the disjunction problem. The disjunction problem also brings to the fore the property of robustness of meaning: there can be both semantically relevant and semantically irrelevant causes of a symbol. The challenge is to find out how the meaning of a symbol can be sensitive to some of its causes and insensitive to some others, in other words, how the meaning of a symbol can be robust against those causes of the symbol that are not expressed by the symbol.

All this is a very brief statement of the problems of the crude causal theory and the subtle nature of content that are pointed out by Fodor. Fodor’s own solution to the disjunction problem is via his theory of asymmetric dependence (Fodor 1990c). In the next section we will take a look at Fodor’s solution. But before discussing his theory of asymmetric dependence let us turn our attention to the disjunction problem itself. Although the theory of asymmetric dependence has been widely discussed after Fodor introduced it,³ his formulation of the disjunction problem did not receive much scrutiny. We think that

² Following Fodor and some other authors, we hereafter use double quotes for symbols in “Mentalese,” and italics for properties. Thus the quoted expression “‘cow’” stands for a type of mental symbol, and the italicized word ‘*cow*’ stands for the property of *being a cow* in what follows.

³ See, for example, the papers in Loewer and Rey (1991).

the disjunction problem as formulated by Fodor involves an important misconception.

One type of example that Fodor has often used to illustrate the disjunction problem is causation of "cow" tokens by horses. In addition to cows, horses also, given certain background conditions, reliably cause "cow" tokens. Common sense easily classifies such "cow" tokenings by horses as misrepresentation. However, it turns out that it is extremely difficult to specify satisfactorily (and in purely naturalistic terms) under exactly what conditions a tokening of a symbol is a misrepresentation. One plausible reason, which Fodor failed to pay due attention to, why horses sometimes cause "cow" tokens is because they possess some of the properties of cows. To put it in another way, the properties in virtue of which horses cause "cow" tokens are not outside of the meaning of the symbol "cow." In fact this kind of situation is very common. For example, a mirage can cause a "water" token, a rat can cause a "mouse" token, or a piece of rope can cause a "snake" token. In all of these cases a common pattern can be discerned. Mirages sometimes cause "water" tokens because some of the properties of water, such as the property of reflecting light in a certain way, are shared by mirages. Rats sometimes cause "mouse" tokens because both rats and mice have a pointed nose, a hairy skin, a thin long tail, etc. And ropes sometimes cause "snake" tokens because both ropes and snakes have a long-cylindrical shape, etc. These examples show that some false tokens of a symbol are caused by instantiations of properties which *are* expressed by that symbol.

Now let us show the flaw in Fodor's formulation of the disjunction problem. As Fodor mentions (Fodor 1990b) there are other sorts of examples that involve disjunction problems. Not only horses but also things like milk sometimes cause "cow" tokens. And in those cases the connection between *milk* and "cow" is certainly a nomic connection. So it follows from the crude causal theory that "cow" means *cow or milk*. The flaw in Fodor's thinking in this connection is that he treats both types of nomic connection in the same way. He sees no fundamental difference between the causation of "cow" tokens by milk and the causation of "cow" tokens by horses. Accordingly, he thinks that his theory of asymmetric dependence will account for both cases. However, there is an important difference between the two: while

there is no (causally relevant) common property between milk and cows, horses share some of their properties with cows, such as having four legs, having a large size, and so on. It is in virtue of these common properties that horses sometimes cause “cow” tokens. But this, of course, is not the case with milk. Milk does not cause “cow” tokens in virtue of possessing some of the properties of cows. There has to be a totally different story to be told to explain the causation of “cow” tokens by milk and to solve the disjunction problem *it* creates. Moreover, if the content of a symbol is to comprise properties as opposed to, say, objects, as Fodor thinks, there is no disjunction problem in the case of causation of “cow” tokens by horses! This is because, as we have pointed out, the properties in virtue of which horses cause “cow” tokens are indeed expressed by “cow.”

Let us now formulate, as we see it, the “problem space” and make some terminological remarks. For the purposes of the present discussion we will assume, following Fodor, that there are basically two types of causes of symbols: wild and meaning-forming. We take wild causes to be the causes of a symbol which are not expressed by that symbol, and meaning-forming causes to be the causes of a symbol which are expressed by the symbol. But we differ from Fodor in two ways. First, misrepresentation for us is a result of meaning-forming causes. It is one of the aims of this paper to explain how this can happen. Second, although we agree with Fodor about the existence of wild causes, we claim that a different theory is needed to exclude them from the meaning of the symbol that they cause. In sum, we have three types of causation cases to consider:

- Type I: Meaning-forming causes of a symbol which lead to true tokens.
E.g., causation of “cow” tokens by cows.
- Type II: Meaning-forming causes of a symbol which lead to false tokens.
E.g., causation of “cow” tokens by horses.
- Type III: Wild causes of a symbol.
E.g., causation of “cow” tokens by milk.

Type I cases are the most unproblematic ones and we shall assume, as does almost everyone else, that they can be handled even by

the crude causal theory. The problematic cases are Type II and Type - III. Fodor formulated his theory of asymmetric dependence to solve the problems created by both Type II and Type III cases. But, as we shall argue, his theory of asymmetric dependence can at best purport to apply to Type II cases, and not very successfully at that.

In the rest of this paper we will proceed as follows. First we will briefly describe Fodor's theory of asymmetric dependence and explain why it cannot handle Type II and Type III cases. Next we will develop a new theory which can successfully handle Type II cases. Then we will extend our theory to solve the problems related with Type III cases.

2 Fodor's Theory of Asymmetric Dependence

Fodor's own solution to the disjunction problem rests on his criterion of asymmetric dependence (Fodor 1990b). The notion of asymmetric dependence constitutes a crucial component of his naturalistic theory of content. Although Fodor's theory of content has gone through several revisions by him, the following account seems to capture the core of it:⁴

A symbol "S" represents the property P if,

- (i) instances of P lawfully cause "S" tokens;
- (ii) sometimes tokens of "S" are lawfully caused by instances of non-Ps;
- (iii) non-P-caused "S" tokens asymmetrically depend on P-caused "S" tokens.

It is primarily the clause (i) which serves to reduce the representation relation to the naturalistic relation of causation. It is commonly held to be the most unproblematic part of Fodor's theory, and hence in this section we will deal only with the clauses (ii) and (iii). Let us

⁴ Fodor introduced his theory of content in Fodor (1987), Fodor (1990a), and Fodor (1990b), and he replied in Loewer and Rey (1991) to numerous objections, where he explained his theory further. In his later writings he continued to defend an informational/causal approach to the semantics of symbols in the Mentalese (for example, in Fodor 1998, 12 - 15 and in Fodor 2008, 196 - 220).

start with (iii), which is where the notion of asymmetric dependence comes in. We think that although this notion contains an important insight, it does not afford a solution of the problem of misrepresentation. Below is Fodor's own description of this notion:

Here's a first approximation to the proposal that I favor: Cows cause "cow" tokens, and (let's suppose) cats cause "cow" tokens. But "cow" means *cow* and not *cat* or *cow* or *cat* because *there being cat-caused "cow" tokens depends on there being cow-caused "cow" tokens, but not the other way around*. "Cow" means *cow* because, as I shall henceforth put it, noncow-caused "cow" tokens are *asymmetrically dependent upon* cow-caused "cow" tokens. "Cow" means *cow* because *but that "cow" tokens carry information about cows, they wouldn't carry information about anything*.

(Fodor 1990b, 91; emphases his.)

To spell out Fodor's insight here is not an easy matter. Fodor sometimes uses the notion of "breaking the nomic connection" between *cow* and "cow" to explicate his notion of asymmetric dependence. According to this rendering of asymmetric dependence, "cow" means *cow* and not *cat* or *cow* or *cat* because if you break the nomic connection between *cow* and "cow" then the nomic connection between *cat* and "cow" also gets broken, but not the other way around; i.e., even if you break the connection between *cat* and "cow" the connection between *cow* and "cow" remains. One would be right to complain that the notion of breaking nomic connections is still vague and can be understood in at least two ways. In one way of breaking the nomic connection between *cow* and "cow," the properties in virtue of which cows cause "cow" tokens cease to exist or cease to be instantiated in the world. This first interpretation is presumably not what is intended. In another way of breaking the said connection, the properties in virtue of which cows cause "cow" tokens simply stop causing "cow" tokens. This second interpretation is probably on the right track. From a Humean viewpoint at least, since causation does not involve necessary connection, it is not hard to imagine our world turning into one in which the properties in question still exist but their usual causal connections do not hold.

Now let us take a look at another attempt to clarify Fodor's notion of asymmetric dependence, which will help us understand this notion and its shortcomings better. We have claimed that Fodor's theory of

representation fails to explain the robustness of meaning. Moreover, his theory falls short of accounting for misrepresentation in relation to meaning-forming causes. Our argument to justify these claims will rely on H. R. Cram's (1992) interpretation of Fodor's idea of asymmetric dependence.⁵ We think that Cram's rendering of asymmetric dependence, is, first, simple and intelligible, and secondly, it lays bare Fodor's insight, even if this insight is not entirely adequate, as we shall show, for accounting for misrepresentation.

Cram illustrates his explication of Fodor's notion of asymmetric dependence with a diagram of the kind shown in Figure 1:

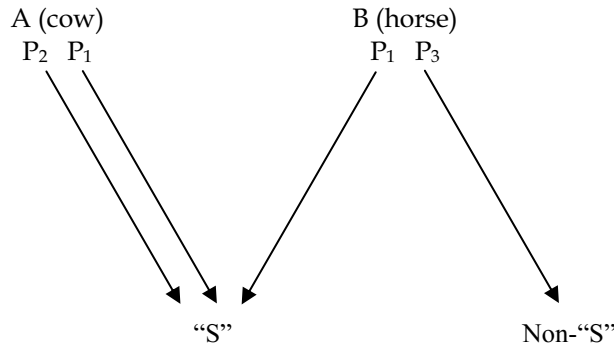


Figure 1

Figure 1 shows a situation in which two individuals, A and B, can cause a token of "S." Let us suppose this "S" token to be a mental symbol which represents cows. The individual A, say a cow, has two properties, P₁ and P₂, each of which is capable of causing an "S" token, while the individual B, say a horse, also has two properties, P₁ and P₃, where P₃ does not cause any token of "S."⁶

Now we can easily see how the notion of asymmetric dependence solves the disjunction problem, according to Cram. Breaking the con-

⁵ Cram remarks that his interpretation was inspired by Dretske (1986).

⁶ We use the expression "property P causes a token of symbol 'S'" as short for "instances of property P causes a token of mental symbol 'S'." Sometimes we omit the phrase 'instances of' for brevity.

nection $A \rightarrow "S"$ means that the properties P_1 and P_2 no longer cause (let's suppose) any "S" token. Since the only property in virtue of which the individual B causes an "S" token is P_1 , the connection $B \rightarrow "S"$ is also thereby broken. But the converse is not true: even if we break the connection $B \rightarrow "S"$ which is to say that P_1 does not cause any "S" token any more, since the causal route from property P_2 to "S" remains untouched, the connection $A \rightarrow "S"$ through P_2 is still there. This is why the connection $B \rightarrow "S"$ is asymmetrically dependent on the connection $A \rightarrow "S"$, and why tokenings of "S" represent only A's and any tokening of "S" by B's is a misrepresentation.

While Cram thinks that this is a precise and intelligible account of asymmetric dependence he is skeptical of its adequacy. But he does not give any reasons for his skepticism. We too think that Cram's rendering of the notion of asymmetric dependence has the virtue of being intelligible, but it falls short of explaining representation. For the asymmetric-dependence criterion works only when the individuals A and B are each capable of causing a token of "S" independently of each other. When this is not the case, that is, when the individuals A and B can both cause an "S" token but the properties instantiated by A and B overlap so much that their non-shared properties are not enough to cause "S," then asymmetric dependence does not obtain. (This point will become clearer shortly.)

Other authors also saw a similar flaw in the theory of asymmetric dependence. For example in Cummins' criticism of Fodor's theory, although Cummins does not explicitly state it, the kind of interpretation he seems to have in mind is similar to Cram's (Cummins 1989, 58 - 62). Cummins tests the criterion of asymmetric dependence with an example involving mice and shrews. A correct theory of representation should say that "mouse" tokens represent *mice*, and if a shrew causes a token of "mouse" this should be a case of misrepresentation. But, as Cummins points out, in the case of shrews and mice, instead of an asymmetric dependence, we seem to have a symmetric dependence holding. Shrew-caused "mouse" tokens don't seem any more asymmetrically dependent on mouse-caused "mouse" tokens than the other way around. The reason Cummins gives for this is that most of the properties in virtue of which an individual causes a "mouse" or a

“shrew” token are common to both shrews and mice. Breaking one connection will break the other.

Another philosopher who makes a similar point is Putnam. The following passage clearly shows that his criticism comes very close to that of Cummins’:

Wouldn't it be reasonable to suppose that the closest possible worlds in which it isn't a "law" that cat pictures cause "cat" tokenings are possible worlds in which most people have no idea what cats look like? If we take those to be the closest possible worlds in which cat pictures don't cause "cat" tokenings, then it would be the case that if cat pictures didn't cause "cat" tokenings, then cats wouldn't cause "cat" tokenings either, and the dependence would be *symmetric*. (Putnam 1992, 38 - 39; emphasis his.)

Let us use Cram's interpretation to illustrate the kind of situation that gives rise to such objections. Suppose there are two individuals, A and B, and three properties, P₁, P₂, and P₃, as shown in Figure 2.

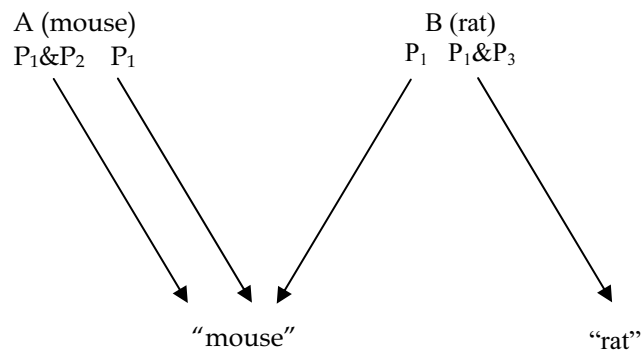


Figure 2

Suppose P₁ is the property *house-rodent look*, P₂ is the property *small*, and P₃ is the property *large*. Mice instantiate the properties P₁ and P₂ whereas rats instantiate the properties P₁ and P₃. We use the symbol ‘&’ to indicate a complex property.⁷ Each one of P₁ and P₁&P₂ is a

⁷ We use the term ‘complex property’ in the sense introduced by Armstrong (1997, 31 - 38). We will denote complex properties by the conjunction of properties and/or relations (e.g., P₁&P₂&P₃ where P_i stands for a property or a relation). Note that each

(complex) property which, when instantiated in an object, is capable of causing a token of "mouse." Now, according to Cram's interpretation of the relation of asymmetric dependence, mouse-caused "mouse" tokens and rat-caused "mouse" tokens turn out to be *symmetrically* dependent on each other. To see this, note that there are two ways to break the nomic connection between the individuals in question and the "mouse" tokens: you can either break the $P_1 \rightarrow$ "mouse" or the $P_1 \& P_2 \rightarrow$ "mouse" connection. Whichever connection you break, both mice and rats lose their ability to cause "mouse" tokens. The theory of asymmetric dependence therefore fails to yield the result that we have a case of misrepresentation in this example, for the reason that the properties of rats and mice overlap so much that the properties of mice that are not shared by rats (such as *small size*) are insufficient by themselves to be capable of causing "mouse" tokens.

Having seen the inadequacy of the criterion of asymmetric dependence in accounting for misrepresentation with respect to Type II cases, let us now explain why it cannot handle the disjunction problem in Type III cases with an example. Consider a situation in which a "cow" token is caused by the presence of milk. Fodor's causal theory of content is supposed to exclude *milk* from the meaning of "cow" by showing that the *milk* \rightarrow "cow" connection asymmetrically depends on the *cow* \rightarrow "cow" connection. But since milk and cows have no (causally relevant) common properties, breaking either connection will leave the other one unaffected. That is to say, the *milk* \rightarrow "cow" connection does not asymmetrically depend on the *cow* \rightarrow "cow" connection.⁸

Fodor may still insist that as long as there are nomic connections such as *horse* \rightarrow "cow," which do asymmetrically depend on the *cow* \rightarrow "cow" connection, his theory correctly includes only *cow* in the meaning of "cow." But this would not work since there may also be nomic connections which depend asymmetrically on the *milk* \rightarrow "cow" connection. For example, some fluid other than milk but which

constituent of a complex property may itself be complex. The notion of complex property will be important in our analysis of the content of mental representations in the following sections.

⁸ This follows directly from Cram's interpretation. Also see Adams and Aizawa (1994) for a similar argument against Fodor's theory of asymmetric dependence.

looks like milk, say, coconut juice can cause “cow” tokens. Since the *coconut juice* \rightarrow “cow” connection asymmetrically depends on the *milk* \rightarrow “cow” connection, *milk* would have to be included in the meaning of “cow.” So, according to Fodor’s theory of content, “cow” means *cow* or *milk* – which is not a result that we want.

3 Misrepresentation Resulting from Meaning-Forming Causes

As we have stated before, one of our aims is to account for those cases of misrepresentation for which meaning-forming causes are responsible, i.e., Type II cases. The critical thing to observe is this: although in meaning-forming causation all the properties which are the causes of a symbol are by definition expressed by that symbol, *there are proper-part-of relations among those properties.*⁹ Let’s consider again the mice-and-rats example of Figure 2. The following is the list of the causal laws involved:

- (i) $P_1 \rightarrow$ “mouse”
- (ii) $P_1 \& P_2 \rightarrow$ “mouse”
- (iii) $P_1 \& P_3 \rightarrow$ “rat.”

If we assume that all the nomologically possible causal relations involving “mouse” and “rat” tokens are the above three, then we will say that the content of “rat” is the complex property $P_1 \& P_3$, and the content of “mouse” is the complex property $P_1 \& P_2$.¹⁰ That is, as a first approximation, we propose that the content of a symbol “S” is the *maximal complex property* which is capable of causing “S.” (In a set of complex properties, we define the maximal complex property as the

⁹ A complex property P is a proper part of a complex property Q if and only if there is a proper-subset relation between the sets comprising their constituents. For example the complex property $P_1 \& P_2 \& P_3$ is a proper part of the complex property $P_1 \& P_2 \& P_3 \& P_4$ because the set $\{P_1, P_2, P_3\}$ is a proper subset of the set $\{P_1, P_2, P_3, P_4\}$.

¹⁰ One important point that we should make explicit is that when we talk about the content of the, say, “mouse” symbol, we mean the content of the “mouse” symbol for a *particular* person (or organism) in whose mind/brain the symbol is formed. In other words, what we are after is a naturalistic account of – to use Putnam’s (1975) words – individual- (and not social-) meaning.

one which is not a proper part of any other complex property in the set.) In the example above, since the property $P_1 \& P_2$ is the maximal property in the case of the symbol "mouse," the content of "mouse" turns out to be the property $P_1 \& P_2$ according to our proposal. Note that among the complex properties which can cause a certain symbol there may be more than one maximal property. We will consider this possibility shortly.

Now, let us see how misrepresentation arises. A key factor in misrepresentation is the existence of (complex) properties which can cause a certain type of symbol and which stand in part-of relation to a maximal complex property that can cause the same type of symbol. A natural suggestion would be that misrepresentation in relation to meaning-forming tokenings occurs when an individual A, in virtue of possessing a complex property P, causes a symbol "S," but A does not possess all the properties expressed by "S." For example, rats in virtue of having the complex property P_1 sometimes cause "mouse" tokens. But rat-caused "mouse" tokens are misrepresentations because rats do not instantiate all the properties expressed by "mouse"; viz. they don't instantiate P_2 .

Now let us look at another complication. One might object that the analysis of representation we just gave leads to the classical theory of concepts, i.e. the view that concepts are characterized by a set of necessary and sufficient properties. And that should be avoided, for Wittgenstein convincingly argued that some concepts, like the concept of game, cannot be defined by a set of properties that are necessary and sufficient for something to be a game. But in fact the theory we are proposing naturally accommodates family resemblances. We have claimed that the content of "S" is the maximal complex property which can cause "S." Now suppose that each one of the following three complex properties can cause "S" as shown below:

- (i) $P_1 \& P_2 \& P_3 \rightarrow "S"$
- (ii) $P_1 \& P_2 \& P_3 \& P_4 \rightarrow "S"$
- (iii) $P_1 \& P_2 \& P_3 \& P_5 \rightarrow "S."$

If there were only the causal relations (i) and (ii), since $P_1 \& P_2 \& P_3$ is a proper part of $P_1 \& P_2 \& P_3 \& P_4$, we would say that the content of "S" is the maximal complex property $P_1 \& P_2 \& P_3 \& P_4$. However, there is no

proper-part-of relation between the complex properties in (ii) and (iii). If there is no other cause of “S” than (i)-(iii), then this means the content of “S” is the disjunction of maximal complex properties in question, namely, $P_1 \& P_2 \& P_3 \& P_4 \vee P_1 \& P_2 \& P_3 \& P_5$. In other words, we allow disjunctive contents, as we must account for the content of the word ‘game,’ for example. How does misrepresentation arise when the content of a symbol is disjunctive? Suppose that instances of the property P cause a token “S.” We will say that misrepresentation occurs when the object which instantiates P is not an object which instantiates *at least* one of the disjuncts.

The theory that we have been developing in this section is not entirely at odds with Fodor’s theory of content. We share his basic insight, as can be seen from our analysis of content more formally stated below:

- A symbol “S” represents the disjunction of properties $P_1 \vee P_2 \vee \dots \vee P_n$ if,
- (i) instances of P_i lawfully cause “S” tokens;
 - (ii) sometimes instances of proper parts of P_i lawfully cause “S” tokens;
 - (iii) P_i is maximal, i.e., there is no complex property such that P_i is a proper part of it and its instances lawfully cause “S.”

The clause (i), also found in Fodor’s theory, is simply there to reduce the relation between a symbol and its reference to the naturalistic notion of causation. But it is not sufficient by itself to allow for misrepresentation. Clause (ii) allows that properties among which there is proper-part-of relation can cause the same symbol. Causation of a symbol by a certain (complex) property does not mean that the symbol represents that property only; in fact it usually represents more. It is almost always the case that a mental symbol “S” is caused by less complex properties than the maximal complex property which is the content of “S.”

Note that the clause (ii) also prevents pan-semanticism—the view that meaning is everywhere. For a symbol to have meaning at least two different complex properties should be capable of causing that symbol, and there should be a proper-part-of relation between the two. There is plenty of causation in nature but only some cases of it satisfy this condition.

If there are different complex properties which lawfully cause a certain symbol then one might naturally ask which one constitutes the content of that symbol. The clause (iii) is to answer this question. The maximal complex property is the one which constitutes the content. And if there are more than one maximal property capable of causing the symbol, then the content is the disjunction of these maximal properties.

4 Wild Causes

Even if the account given in the previous section for meaning-forming causes of a symbol is correct, wild causes of a symbol still pose trouble, for we haven't solved the problem created by Type III cases yet. Wild causes, by definition, are not meaning-forming, i.e. the properties that do the causing are not constitutive of the meaning of a symbol they cause, and hence we have to find a way to exclude them from the meaning of the symbol. The account thus far is unsuccessful in this respect. For example, since milk occasionally causes the mental symbol "cow," the property *milk* will also have to be included in the meaning of "cow," according to the account we gave, although *milk* is obviously not expressed by "cow." How are we to exclude properties involved in wild causes from the meaning of the symbol they cause? Note that our task is simpler than Fodor's. According to Fodor, causation of "cow" tokens by horses and milk are both wild. But we distinguish the two types: horses share some of their properties with cows but milk does not. As we have explained, it is not the whole complex property *horse*, but some parts of the property *horse* that are shared by cows which are responsible for causing "cow" tokens. That is to say, causation of "cow" tokens by horses is not wild but meaning-forming. Our challenge then is to solve the problem posed by this more restricted notion of wild causes. In this section we will provide a sketch of a possible solution.

A natural strategy to follow for a solution of this problem would be to look for something common among all the wide variety of wild causes. This may sound like a hopeless task, but when we look closer, we can discern something they all share: all wild causes cause the symbols they do via the associative connections in our minds. Sup-

pose that you have seen a certain friend of yours always accompanied by her dog. If one day you see your friend without her dog, you will be likely to token “dog” even though there is no dog around. Why does your friend cause a “dog” token in your brain? The reason is that, since you have always seen them together, your mental symbol representing your friend’s dog and your mental symbol representing your friend have formed an associative link in your mind. Similarly, since we usually link the mental symbol for milk with the mental symbol for cows, when we come across some milk we may token “cow.” How is this observation going to help us to exclude the property *milk* from the meaning of “cow”? Here is a possible way of dealing with wild causes: Exclude all properties from the meaning of “S” whose instances cause “S” only via activating (or causing) another symbol. Accordingly, let us add a fourth condition to the analysis of content we offered earlier:

- (iv) Instances of P_i do not cause “S” via causing another symbol.

Now for an illustration, let P_c be the property *cow* and P_m be the property *milk*. Figure 3 shows the causal relations involving these properties and the mental symbols “milk” and “cow.”

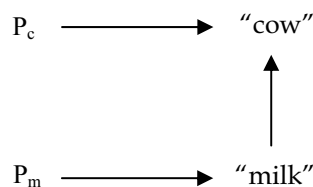


Figure 3

Here P_c is a meaning-forming cause of “cow” tokens and P_m is a meaning-forming cause of “milk” tokens. Since P_m can cause “cow” tokens only by first causing “milk” tokens, P_m is not a meaning-forming cause of “cow” tokens and hence should not be included in the meaning of “cow”s. Note that this simple and straightforward solution is not available to Fodor since he does not distinguish between Type II and Type III cases. And this solution can only be applied to

Type III cases. It is not possible to exclude the property *horse* from the meaning of “cow”s in this way, since horses do not cause “cow” tokens through activating the “horse” mental symbol.

Let us look at a possible objection to our proposal. It might be thought that clause (iv) makes our analysis of the notion of content circular because of the occurrence of the term ‘symbol’ in clause (iv). A symbol is something with a semantic import, and our theory is trying to be an analysis of (or give sufficient conditions for) how a symbol acquires a semantic import. This circularity objection stems from a confusion of two related but different things. To find out *which* physical (syntactic) structures have semantic value is one thing, and to determine the *content* of these structures is another thing. In the theory we have given above, the clauses (i) and (ii) already decide whether a certain syntactic structure has any semantic import or not. We don’t need clause (iv) for this task. Clause (iv), together with the others, is needed to determine that structure’s content. Hence, our account is not open to the charge of circularity.

5 Concluding Remarks

Fodor’s (1990c) theory of content analyzes intentionality by reference to the notions of information and robustness of meaning. According to Fodor, information boils down to causation, and robustness can be explained by his theory of asymmetric dependence. He considers misrepresentation as an inevitable consequence of robustness of meaning. We have tried to show that misrepresentation is not an inseparable aspect of robustness but rather it arises in certain cases of meaning-forming causation. We also argued that Type II and Type III cases (exemplified by the causation of “cow”s by horses and by the causation of “cow”s by milk, respectively) have different features and they need to be treated separately. Fodor proposed his criterion of asymmetric dependence to keep the unwanted properties causing a symbol out of the meaning of that symbol both for Type II and Type III cases. However, as we tried to show, it can only purport to apply to Type II cases and not to Type III cases, and is, moreover, inadequate to handle them. For it cannot afford us an explanation of how *rat*, for example, is excluded from the meaning of “mouse.” We

offered an alternative theory to explain how misrepresentation is possible in relation to Type II cases, and extended our theory by adding a new condition to cope with Type III cases.

Fodor's theory of content has been criticized in many different ways after its debut. Our theory may not be immune to all the criticisms directed towards Fodor's theory. But we think that our version of the theory of content is at least a significant improvement over Fodor's. The project of naturalizing intentionality is a difficult one and there are many complications on the way. We want to conclude this paper by mentioning a couple of them.

There has been much debate on the nature of concepts both in philosophy and in cognitive science. It would be of interest if we could evaluate our theory with respect to some of the concerns in those debates. For example, how does the theory we are proposing account for concept acquisition? Can it explain the fuzziness of concept boundaries? Is it compatible with the prototype theory of concepts? No doubt these are important questions but an adequate treatment of these issues is not feasible within a single paper. But we are optimistic that the theory we have proposed can prove to be fruitful in helping explain many phenomena involving concepts, like the phenomena of family resemblances, for which we have given a preliminary account in this paper.

It might be thought that the theory we are proposing is a species of empiricist theories of meaning since we identify the content of a mental symbol in terms of its causal relations to the world. But this would be a hasty conclusion to draw. We do not claim that *all* mental symbols acquire content in accordance with our theory. In particular, we do not want to claim that our account extends to mental symbols for logical connectives, mathematical objects, or other abstract entities. We should be pleased if it did extend to them, but showing that it does would take a lot more further work. If our theory can explain how an important class of mental symbols, *viz.*, those referring to items in the empirical world, acquire content, or if it can reveal at least a *part* of the process of their content fixation, our task is accomplished.

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