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Why Concepts Should Not Be Pluralized or Eliminated

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Abstract. Concept Pluralism and Concept Eliminativism are two positions recently proposed in the philosophy and the psychology of concepts. Both of these theories are motivated by the view that all current theories of concepts are empirically and methodologically inadequate and hold in common the assumption that for any category that can be represented in thought, a person can possess multiple, distinct concepts of it. In this paper, I will challenge these in light of a third theory, Conceptual Atomism, which addresses and dispels the contentious issues. In particular, I contend that Conceptual Atomism, when properly understood, is empirically adequate and can overcome difficulties that plague Pluralism and Eliminativism.

1. Introduction

Concept Pluralism and Eliminativism are two recent positions that have been introduced in the philosophy and the psychology of concepts (Machery, 2005, 2009; Weiskopf, 2009a, 2009b). From the standpoint of current psychological theories, these positions advance rather radical conclusions. For example, Concept Pluralism, the view according to which a person can have multiple, distinct kinds of concepts for any category that can be represented in thought (e.g., prototypes, exemplars, and theories), challenges the long standing assumption that all concepts belong to the same representational kind and that there is only one concept to possess for any particular category. Concept Eliminativism agrees with the pluralist observation that for any category, a person can make use of different kinds of concepts (or more precisely, bodies of knowledge) in the performance of various cognitive tasks. However, unlike pluralism, it argues that these bodies share very few properties in common and proposes that we stop using 'concept' as a catch-all term to refer to them. Since the extension of 'concept' as a scientific notion fails to be a natural kind, eliminativism therefore recommends that the term 'concept' be banished from the theoretical vocabulary of psychology and the cognitive sciences.[1] Despite

[1] As I will soon make clear, Concept Eliminativism does not deny that we have concepts, which it construes as bodies of knowledge used in the performance of specific

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these different conclusions, pluralism and eliminativism are motivated by the same conviction that no current theory of concepts is empirically and methodologically adequate, as all of them fail, in one way or another, to account for the psychological data concerning conceptual resources with which people perform cognitive tasks.

In this paper, I aim to show that Concept Pluralism and Eliminativism are problematic. In particular, I will argue, in the first section, that their criticism that no prior or current theory of concepts is empirically and methodologically adequate is misguided, because both of them overlook Conceptual Atomism as an exception. Roughly, Conceptual Atomism is the view that most of our lexical concepts are like 'atoms' in that they lack constituent structure. My contention is that this theory is well equipped to tackle issues raised by pluralists and eliminativists. Next, I will argue that these latter theories are faced with an additional twofold challenge. Specifically, their central thesis that a person can have multiple concepts (or bodies of knowledge) for any particular category is premised on a misunderstanding of the functional nature of a concept and runs into problems when explaining how novel information is acquired. Lastly, I conclude that Conceptual Atomism has the resources to overcome this twofold challenge and to be a more viable theory of concepts.

2. Concept Pluralism and Concept Eliminativism

According to Daniel Weiskopf, current theories of concepts are at an impasse (2009a, p. 146). Philosophers and psychologists have sought to uncover the kind of structure that concepts possess and to explain how such a structure can be used to illustrate the ways in which people perform cognitive tasks such as categorization, conceptual combination, and inductive and deductive reasoning. So far, concepts have been postulated to have many different kinds of structure, each of which is individuated by the type or body of information that is encoded in the representation. For example, they may be constituted by a definition (e.g., Hull, 1920; Bruner, et al. 1956), a prototype (Rosch 1978; Rosch, Mervis, 1975), a set of exemplars (Medin, Schaffer, 1978; Nosofsky, 1988), or a theory (Murphy, Medin, 1985; Gopnik, Wellman, 1994). Even hybrid theories that combine one or more of these structures have been proposed (Osherson, Smith,

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cognitive tasks (e.g., prototypes, exemplars and theories). What it proposes to eliminate is simply *the term* 'concept' which psychologists have been using to refer to all of these heterogeneous bodies of knowledge. Instead, eliminativism suggests that it is more fruitful to refer to these bodies by their designated theoretical terms (i.e., 'prototype', 'exemplar' and 'theory').

1981; Smith, et al. 1974). However, Weiskopf points out that none of these theories can claim wide consensus among researchers, as all of them fail to satisfy the "empirical and methodological constraints on a theory of concepts" (2009a, p. 146).

Weiskopf attributes the impasse to two mistaken assumptions inherent in these theories. The first is the 'Uniformity Assumption', which states that "all concepts belong to a single psychological kind" (p. 149). For example, prototype theories state that all concepts – whether they are of individuals, events, natural kinds, or artifacts – exhibit the same kind of structure, namely, a summary representation which encodes statistically significant properties possessed by members subsumed under a particular category. In contrast, exemplar theories postulate that all concepts possess a different kind of structure, one that is constituted by information about specific members. A central debate among theorists of concepts has thus been over what kind of mental representation should be identified with which concepts. The second error that Weiskopf points out is the 'Singularity Assumption', which holds that "for any category that can be conceptually represented, there is such a thing as the unique concept of that category" (ibid.). To use an example, the 'classical' theory holds that a person possesses TRIANGLE if and only if she has a mental representation that encodes the definition of a triangle.[2] Failure to represent triangles in this specific way would result in the person's lacking the concept TRIANGLE.

According to Weiskopf, the problem with these two erroneous assumptions is that they are falsified by available psychological evidence. For example, when people reason about ad hoc concepts (that is, occasion-specific concepts such as THINGS TO BRING ON A CAMPING TRIP), they tend to access a structure that is produced on the fly and which typically encodes ideals (i.e., things that they perceive to be most suitable for the specific occasion). But when they make judgments about counterfactual or causal scenarios, they resort to a different kind of representational structure, one that is more stable and retrieved from long-term memory. For example, they are likely to appeal to the central properties in a causal model in order to reason about dependency relations that hold among properties in a given category.

In Weiskopf's view, these examples demonstrate that our conceptual system does not simply rely on one kind of structure. Instead, it employs "a variety of different kinds of category representations" (e.g., prototypes, exemplars, ideals, theories), where these representations are "created and

[2] Concepts are denoted by SMALL CAPS.

retrieved [from long term memory] depending on the particular sort of task that is relevant for the moment" (158). To illustrate, he provides the following example:

> Having encountered many particular cats, Amira has many cat exemplars stored in memory. As she has encountered particular cats and learned more about cats in general she has constructed a cat prototype that represents the statistical features of catkind. At the same time, she believes various things about cats as a natural biological kind, such as that what makes them cats has something to do with what's inside them and what their biological origins are, plus what kinds of transformations they can undergo. Perhaps she regards some of this knowledge as being about what is essential to cats. She also believes that some properties of cats causally depend on others (e.g., PURRING depends on HAPPINESS, MEOWING depends on HUNGER). All of this vast body of information coexists in long term memory, but not all of it is activated at a single time. Portions of it, though, are available for ready extraction and use in categorization, building new representations, and guiding actions. When some portion of this information is activated and tokened in working memory, it constitutes one of Amira's CAT concepts (p. 156).

Weiskopf thus concludes that for any category that can be represented in thought, a person can have a plurality of distinct concepts, with no particular kind of concept enjoying a privileged status over others. In other words, the Uniformity and the Singularity assumptions are mistaken, and theories premised on them are therefore empirically and methodologically inadequate. To break out of the aforementioned impasse, Weiskopf proposes that we adopt this pluralist thesis about concepts.

Edouard Machery makes similar observations on the current state of psychological theories of concepts. In his view, no single theory of concepts can explain all of the known empirical phenomena. Like Weiskopf, Machery also thinks that the "best available evidence suggests that for each category (for each substance, event and so on), an individual typically has several concepts" that are constituted by different representational kinds (p. 75). However, this is where his agreement with the pluralist ends, for he goes on to argue that the term 'concept' should altogether be expunged from the vocabulary of psychology. According to Machery, the basic kinds of concepts as identified by current theories – prototypes, exemplars, and theories – have very little in common, as they differ in the bodies of information they encode, the mechanisms required for their acquisition, the psychological processes that access them, and so on. Since the class of concepts consists of these heterogeneous representational kinds, Machery notes that the term 'concept' does not refer to a natural kind. Insofar as a central goal of a science is to pick out natural kinds, he concludes that 'concept' in the singular is a useless term and should be banished from the vocabulary of psychology. Instead, it would be much more productive for psychologists to talk specifically of prototypes, exemplars and theories, and to develop particular theories of concepts (instead of a general one for all

concepts). To be clear, then, Machery does not think that there are no concepts; the evidence clearly suggests that for any category, we make use of different bodies of information in the performance of various cognitive tasks. Rather, his view is that we should resist referring to all these bodies of information as 'concepts', and instead refer to each of them by its theoretical term ('prototype', 'exemplar' and 'theory').

From the above discussion, it is tempting to think of Machery as a pluralist because he also endorses the idea that concepts are constituted by multiple representational kinds. But this would be hasty. As Machery notes, "pluralism should not be confused with scientific eliminativism. Pluralism is the view that a natural kind K divides into several natural kinds, K_1…, K_n. Importantly, pluralism is not committed to deny that the kind K is a natural kind" (p. 240). What differentiates pluralism from eliminativism, then, is that the former is committed to the claim that the class of concepts constitutes a kind, whereas the latter is not. Indeed, in his criticism of eliminativism (or what he calls 'nihilism'), Weiskopf proposes that there exists "a set of common overarching processes and generalizations [which indicate] that these sub-kinds [prototypes, exemplars, and theories] are a more coherent and systematic object of study than their differences might otherwise lead us to think" (2009, p. 167).

To recap, while they disagree on the status of concepts as a natural kind, pluralism and eliminativism do have the following in common: (a) they both agree that no current theory of concepts is empirically and methodologically adequate, and (b) they both hold the thesis that a person can have multiple concepts for any category that can be represented in thought. In the remainder of the paper, I will show that both (a) and (b) are problematic and argue that Weiskopf and Machery have overlooked a theory of concepts which, in my view, has adequate resources to account for the psychological data.

3. Conceptual Atomism and Collateral Information

Initially espoused by Jerry Fodor (1975, 1994, 1998), Conceptual Atomism argues that most lexical concepts lack constituent structure. According to Stephen Laurence and Eric Margolis (1999), there are two ways to unpack the notion of constituent structure. A concept has constituent structure if it literally contains other concepts as its parts. As an example, the concept BACHELOR, accordingly, would be a complex mental representation composed of defining concepts, namely, UNMARRIED, MALE and ADULT. Alternatively, a concept has constituent structure if it enters into certain privileged inferential relations with other concepts. To use the same example, BACHELOR of this construal would have its content determined principally by its inferential relations with the above three concepts. In light

of either model of constituent structure, the identity of a concept is determined by its relations – whether mereological or inferential – with other concepts. Atomism rejects both of these senses of constituent structure of concepts and denies that the identity of a concept is determined in terms of its relations with other concepts. It holds instead that a concept's identity is determined entirely by mind-world causal or informational relations. For example, the concept DOG represents, or is about, dogs because it enters into a nomological relation with, or carries information about, these creatures. According to Fodor, these causal/nomological/informational relations are content-constituting. This is why Conceptual Atomism, at least as proposed by Fodor, is paired with Informational Semantics (resulting in what he calls Informational Atomism).

To date, atomism has not been endorsed by philosophers and psychologists. A central reason is that it is perceived to be a radical theory, with counter-intuitive and implausible implications. For instance, its thesis that most of our concepts are unstructured atoms goes against nearly all current theories of concepts, which hold that concepts exhibit some sort of constituent structure (be it a prototype, exemplar, ideal or theory). Critics have also pointed out that a fundamental weakness of atomism – one that in their view decisively takes it out of the running – is that it is explanatorily impotent or bankrupt (Prinz, 2002; Laurence, Margolis, 1999). As already noted, theories of concepts are motivated or rejected on the basis of how well they can, with their proposed constituent structure, account for people's performances of cognitive tasks. Thus, prototype theories, with their hypothesis of a structure constituted by statistically central properties, fare extremely well in explaining 'unclear cases' and the various typicality effects that the 'classical' theory cannot handle, but fall short of accounting for categorization tasks which involve an appeal to correlations among properties. In the case of atomism, since it maintains that concepts have no constituent structure *whatsoever*, it therefore seems to lack the requisite resource with which to explain how people perform cognitive tasks.

Atomists, however, do have a response to this objection. As Laurence and Margolis point out, an atomist could invoke, for any concept, "as much structure as [necessary] to explain its deployment, but with one serious qualification: This structure is to be treated as being merely associated with the concept rather than constituting part of its nature" (1999, p. 64). They refer to such non-constitutive structure as 'collateral information.' In case this sounds like an ad hoc response, Laurence and Margolis go on to note that nearly all theories of concepts draw the distinction between a structure's being merely associated with the concept and its being constitutive of it. Indeed, Medin and Smith make precisely this distinction in discussing the 'classical' theory (1981). According to them, any property

that is not integral to the concept's definitional core but that is accessed for identification purposes is to be viewed as 'ancillary knowledge.' For example, the property 'lives alone,' neither a necessary nor a sufficient property of bachelors, would count as an instance of ancillary knowledge that is associated with BACHELOR.

In this vein, conceptual atomism regards any body of knowledge acquired about a category – be it a summary representation of stereotypical properties, a set of exemplars, or a theory (naïve or otherwise) – as collateral information that does not affect the concept's identity. Incidentally, this is why Fodor sometimes characterizes atomism as a non-epistemic theory of concepts: Having a concept is not a matter of knowing any particular body of knowledge, of being disposed to make or assent to certain inferences, or of recognizing members of the concept's extension. Instead, concept possession is entirely a matter of having a mental representation, the identity and content of which are determined by the relevant mind-world, content-constituting relation. These tenets of atomism are admittedly contentious, requiring defense and elaboration that lie beyond the scope of this paper (For some recent defenses, see Fodor, 2008; Laurence, Margolis, 1999; Margolis, 1998; Millikan, 1998, 2000). Suffice it to note that my present goal is simply to sketch its efficacy as an empirically adequate theory.

In response to the charge of explanatory impotency, an atomist can point out that atomism has adequate resources to account for various psychological phenomena and that it can, for such purposes, appeal to any body of information that is merely associated with the concept. Depending on the sort of interactions a person has had with members of the category, she may, upon acquiring the concept, obtain a prototype, a set of exemplars, an ideal, a causal model – basically, any kind of constituent structure proposed by existing theories. With access to these bodies of information, she can then perform the relevant cognitive tasks. Again, the only stipulation atomism imposes is that none of these bodies is constitutive of the concept's nature or identity. Contrary to its critics, then, Conceptual Atomism, with the arsenal of structures at its disposal, is anything but explanatorily incompetent.

As mentioned earlier, this response can be used to show that Weiskopf and Machery are mistaken to think that no current theory of concepts is empirically and methodologically adequate. Recall that their concern is that no theory of concepts, with its proposed singular constituent structure, can account for the psychological observation that our conceptual system employs a wide variety of representational structures. In my view, this concern does not implicate atomism. By denying that concepts have constituent structure, atomism *ipso facto* denies that there is a single structure (and thus, a single psychological mechanism) that is required in

explaining all of the known cognitive phenomena. Without such a requirement, atomism makes room for the possibility that a multitude of representational structures can be used for explanatory purposes. Indeed, by treating all bodies of information – including prototypes, exemplars, ideals, and causal models – as collateral information, with no particular structure enjoying a privileged status, atomism is free to appeal to any of them to explain the cognitive task at hand. In short, atomism suggests that our conceptual system has access to multiple representational structures for the performances of cognitive tasks.

To illustrate, here is a sketch of how an atomist might describe Amira's situation in Weiskopf's example discussed above. Having encountered many particular cats, Amira acquires a mental symbol, the content of which is locked onto (or carries information about, or is nomologically linked to) the property of being a cat. Once she is in possession of CAT, she acquires all sorts of information about cats, including beliefs about these creatures as a natural biological kind, statistical features of catkind, properties that are causally depending on others (e.g., MEOWING and PURRING), essential and hidden properties of cats, trivial properties of felines, specific members, etc. None of this vast body of information is constitutive of the identity of CAT, but all coexists in long-term memory under the concept CAT (or is associated with CAT), even though not all of it is activated at a single time. Depending on the context, Amira can activate and access portions of this body of information in order to perform the relevant cognitive task.

The similarity of this sketch to the one offered by Weiskopf is intentional in order to show that atomism captures exactly the same advantage that pluralism and eliminativism have over current theories of concepts, namely, the provision for our conceptual system to access as many, and as many kinds of, representational structures as necessary in order to perform the relevant cognitive task. The reason atomism can do so is that it, too, denies the Uniformity and the Singularity assumptions, albeit in a different way from pluralism and eliminativism. To an atomist, concepts are not reductively identified with any particular constituent structure because they lack this kind of structure in the first place. Moreover, no particular kind of representational structure qualifies as *the* concept because an atomist construes a concept not as a structured entity but as an unstructured mental symbol with the primary function of collecting and organizing collateral representational structures. If pluralism and eliminativism are considered empirically and methodologically adequate because of their explanatory advantage over most other theories, then atomism must also be seen as having the same edge and taken just as seriously.

There is one final consideration to be addressed: Does the psychological evidence rule out atomism as a viable alternative? In my view, the sort of

data to which Weiskopf and Machery appeal to motivate their positions is consistent, or can be made compatible, with that enabling atomism. For instance, to argue that the Uniformity Assumption is false, Weiskopf cites experiments that "indicate that people do in fact tend to select and retrieve from memory only those category representations that will be useful given their background, current goals, and the requirements of the task" (2009a, p. 156). Here is a characteristic example:

> Using an on-line priming technique, Malt (1989) found that participants could be induced to retrieve either exemplars or prototypes, depending on the particular task demands. She found that where using memorized exemplars was possible but not required, people tended to rely on abstracted prototype instead. Where stimuli varied in their typicality, though, people tended to split their categorization decision between prototypes (for typical members) and exemplars (for atypical members). So the strategic choice of a representation type depends on both the task and structure of the materials (p. 157).

This, along with other examples, aims to establish that different cognitive tasks call for access to specific representational kinds. While these examples go against theories of concepts that insist on a singular kind of representational structure doing all the work, they do not do the same against atomism. The reason, to repeat, is that atomism makes no such insistence, open as it is to the idea that cognitive processes can access whichever collateral structures that may be suitable. Moreover, these examples are silent on the issue of whether the representational structures involved in the experiments are constitutive of, or merely associated with, the concept;[3] they merely show *that* people employ a wide variety of representational structures when they perform cognitive tasks. But this, as we have seen, is a point on which the atomist would agree: a person is free to access any structure as is required by the cognitive task, with the stipulation that it is collateral. Thus, these examples may very well be cited to support the idea that the structures accessed in the experiments are collateral in nature. In short, the psychological evidence which Weiskopf and Machery use to advance their theories does not rule out atomism. On the contrary, it can be treated as compatible with the atomistic framework proposed above.

[3] Unless, of course, one interprets 'constitutive' to mean 'accessed in every task that deploys the concept,' in which case these experiments assuredly demonstrate that these structures are not constitutive.

4. Concepts as Representational Structures

I have so far argued that Weiskopf and Machery are mistaken to think that no current theory of concepts is as empirically and methodologically adequate as theirs. In this section, I will now argue that the thesis central to both pluralism and eliminativism, namely, that a person can have multiple concepts for a particular category, is based on a misunderstanding of the functional role of a concept and falters when called upon to explain how novel information (of a certain type) is acquired.

To begin, notice that the main issue of contention between atomism and pluralism and eliminativism is not over whether our conceptual system accesses multiple representational structures for executing cognitive tasks (for on this they all agree), but rather over whether these representational structures should in turn be construed as concepts. On the affirmative side stand the pluralist and the eliminativist, who argue that a person can have multiple concepts of a category by virtue of accessing multiple bodies of information about it. In contrast, the atomist prefers to think of these structures as collateral content that is merely associated with the concept *qua* unstructured mental symbol.

As regards the pluralist and the eliminativist thesis regarding multiple concepts, it is, I submit, based on a mistaken notion of a concept's functional role. In the following, I will focus my argument primarily on pluralism, though, with some modification, it also applies equally well to eliminativism. According to Weiskopf, a person possesses multiple concepts of *x* to the extent that she accesses multiple bodies of information of *x* to perform various cognitive tasks. But what warrants such an inference? Why think that a person has multiple concepts simply because that person can access multiple bodies of information under diverse conditions? The pluralist's answer seems to hinge on a concept's functional nature. As Weiskopf notes, "concepts should be identified with whatever entities or structures [that] best fill" the functional role as determined by psychological theories (2009a, p. 146). By "discovering precisely which structures are responsible for the various functions and effects delimited by psychological theories of concepts," we can uncover their "inner nature" (p. 148). Insofar as empirical evidence suggests that we employ a wide variety of representational structures to perform the said functions and to exhibit the said effects, Weiskopf concludes that we possess multiple kinds of concepts.

I agree with Weiskopf that "what will make a type of psychological structure count as a concept … is determined by the role that concepts are supposed to play in our well-developed theories of cognition" (p. 148). Indeed, this view seems to be widely shared among cognitive psychologists. In discussing issues related to cognitive economy and efficiency, Lloyd Komatsu, using the example of chairs, observes that our possessing the

concept CHAIR explains, among other things, our abilities to "reason about chairs, recognize instances of chairs, and understand complex concepts such as high chair and sentences such as 'the mouse is under the chair'" (1992, p. 500). Similarly, Smith and Medin point out that there are "some aspects or functions of a concept that seem generally agreed upon," including categorization, conceptual combination, and constructing and interrogating propositional representations, so that possessing such a concept would help simplify our mental lives (1981, p. 7-8). It is important to note that what these cognitive psychologists have in mind is that a concept's functional role is comprised of *all* of these cognitive tasks, such as reasoning, recognition, combination, etc.. Accordingly, a concept's functional role is constituted not by any specific or particular function but by the *totality* of diverse functions. From this perspective, then, a concept is thought of as a theoretical entity that happens to satisfy or play this total functional role. Incidentally, this understanding of a concept's functional role is what has driven these psychologists to uncover some singular and uniform representational structure in order to account for all of the psychological tasks.

The problem with Weiskopf's argument is that under the pluralist framework, a concept fails to meet this desideratum. As mentioned above, he cites experiments which demonstrate that causal models, when available, are the preferred representational structure for use when people engage in counterfactual and modal reasoning, whereas prototypes are typically accessed for quick categorization tasks. From this, he concludes that causal models and prototypes constitute two different kinds of concepts. But this conclusion is not warranted, as each of these types of representational structures only has a limited application; counterfactual and modal reasoning and quick categorization judgments are but subsets of a concept's overall functional role. Despite this limitation, Weiskopf refers to each as a full-fledged concept. Contrary to what he maintains, then, the pluralist's construal of a concept fails to serve the causal/explanatory role as posited by psychological theories. As such, causal models and prototypes, along with any representational structure that does not fulfill the total functional role, should not count as a concept.

Here is another way to illustrate the problem. For something to be a concept, Weiskopf notes, is "just for it to function in the right way in cognition – for it to represent a category, be capable of combination with other representations, and be causally central in categorization" (2009a, p. 155). In order to know what concepts are, he instructs that we can either "[spell] out the functional role that defines those things, or [specify] the structures that realize that functional role in a particular kind of organism" (p. 146). Opting for the latter path, Weiskopf cites empirical evidence, which demonstrates that causal models, prototypes, exemplars, and ideals

are accessed by people when they perform categorization tasks. That the evidence suggests such diverse use of bodies of information is not surprising, since 'categorization' as used by cognitive psychologists refers to a cluster of psychological tasks. These include making inductive and deductive inferential transitions and quick identification tasks, where these tasks in turn further divide into different types depending on the properties involved and the contexts in which they are performed. For an entity to be "causally central in categorization," it has to play a prominent role in *all* of these tasks.

In light of Weiskopf's argument and of the empirical evidence, the proper conclusion to draw is that the *totality* of these structures constitutes the concept; after all, what realizes the functional role – that is, what is causally central in categorization – is not any particular representational structure but the sum total of these tasks taken together. However, this is not Weiskopf's own conclusion. Instead, he considers any representational structure that plays some role in categorization to be a concept, provided that it also satisfies the other two conditions (i.e., that it represents a category and can combine with other representations). That is the reason why a prototype, in his view, counts as a concept, even though it is used to account primarily for quick identification tasks involving superficial/observable properties. But as we have seen, this is misleading. Quick identification tasks form only a subset of all the categorization tasks to be explained. Since a prototype is not 'causally central' with respect to the remaining categorization tasks subsumed under the concept's functional role, it thus fails to meet the third condition of a concept and should not be construed as one.

The pluralist might object by pointing out that since the cognitive psychologist's desideratum is not supported by empirical evidence, it cannot be satisfied and should therefore be abandoned. As mentioned, the psychological data show that no single type of representational structure can be used to explain all known empirical phenomena. The proper conclusion to draw, according to the pluralist, is to drop the desideratum in favor of a 'disjunctivism' that identifies a concept with any psychological structure that is accessed to perform some cognitive function (as opposed to the entire set of them), with the implication that there will be a multitude of these structures. This suggestion, I submit, has some merit but is ultimately premature: if it were the case that the desideratum cannot be satisfied at all, then we ought to reconsider it as an explanatory or theoretical goal and move towards the pluralist's recommendation. However, this is not the only viable option. As it turns out, there are alternative ways in which the desideratum can be met.

Here are two tentative suggestions. The first, as hinted above, is to think of the *totality* of the representational structures, as opposed to any

individual one, as the concept. Again, the reason is that what explains all of the tasks encompassed in the concept's functional role is all of these structures taken together and not any particular one. The second is to abandon the presupposition, held not only by the pluralist but also by most psychological theorists, that a concept is to be equated with or reducible to a body of information. Instead, we should construe a concept as a theoretical entity whose content is constituted by various representational structures (i.e., prototypes, exemplars, ideals, theories). Under this proposal, a concept would play the role of a vehicle (perhaps as an unstructured mental symbol or mental 'label' of a file folder), which primarily collects, organizes, and expresses various collateral representational structures/bodies of information about things of a category and claims these as its content. The concept *qua* mental symbol or label would then serve as the singular entity that satisfies the total functional role, for it would be responsible for deploying the relevant collateral representational structures so as to perform the specific task at hand.

This second option, of course, is in line with what atomism has to offer. It is admittedly speculative and tentative, but it offers a possible recourse by which to satisfy the cognitive psychologists' desideratum. Before we take up the pluralist's suggestion to abandon the desideratum and to pursue the disjunctivist route, we ought to give the atomist option due consideration. Indeed, I contend that there are additional reasons for adopting the atomist's way of construing concepts, which can eschew some of the problems that arise from the pluralist presupposition. The remainder of this section will outline some of these problems. Recall Weiskopf's discussion of Amira's multiple distinct CAT concepts and the way in which she acquired them. Her prototype of cats, for instance, was generated from various exemplars of cats stored in her long-term memory (p. 166). Similarly, causal knowledge may be obtained from cognitive tasks involving a prototype. As a provisional hypothesis about how novel information is stored in long-term memory, Weiskopf speculates that "the operative rule might be: when a novel kind of information is acquired about something that falls under a concept C, and that information can be used for categorizing or reasoning about Cs in general, store that information as a concept C' that is co-referentially linked with C" (p. 167).

The problem with this proposal is that it fails to make room for information that a person may acquire but falls short of being a recognized psychological structure. Suppose that the only CAT concept Amira possesses at time t is an exemplar of a cat that is stored in her memory. Suppose also that she acquires, at $t + 1$, a general belief about cats, the content of which is idiosyncratic and which is not, by itself, of much use for categorizing or reasoning about cats. For instance, she may believe that cats prefer bedroom nooks as opposed to living room ones. How might a pluralist explain the

inclusion of this new piece of information? Notice that Amira's new belief does not constitute a prototype, a causal model, or any of the representational structures so far uncovered by psychologists. By Weiskopf's operative rule, it will *not* be stored as a separate CAT concept (C'). But if it does not qualify as a distinct CAT concept, it will then have to be incorporated in some way into her existing CAT concept; after all, the belief is one about cats. This, however, does not seem to be an option, since the belief, *qua* a general belief about cats' preferences, does not encode the same sort of information as that which is usually stored in an exemplar concept (especially on views that construe an exemplar as a list of salient superficial/observable features). The pluralist then faces the awkward consequence that Amira's belief is about cats but is not stored under the concept CAT. If the belief is neither a concept nor part of a concept, it is difficult to see what place it has within a pluralist framework.

Perhaps the pluralist can insist, on an ad hoc basis, on admitting this belief into Amira's existing cat concept by treating it as peripheral to the 'core' that encodes information about her specific cat exemplar. On this view, then, whenever Amira performs a cognitive task that accesses her CAT concept, this entire body of information will be activated (since the pluralist construes a concept as a body of information). This version of the 'hybrid' view, as we noted in the first part of the paper, is not a new strategy, as it has long been employed by psychological theories of concepts. For example, Medin and Smith appealed to it as a way to salvage the classical theory of concepts. Although this solution is somewhat plausible when applied to this single belief, it ultimately fails when Amira begins to amass additional beliefs about cats that also do not individually qualify as distinct concepts and do not play much of a role in reasoning about cats. For instance, suppose that she later learns that cats are crepuscular animals, cannot taste sweet things, purr at roughly 26 cycles of vibration per second, and so on. None of these beliefs (or for that matter, the entire set of them) constitutes a prototype, causal model, or theory, and so, does not qualify as a distinct concept. Like her earlier idiosyncratic belief, all of this novel information therefore will have to be incorporated into her exemplar as ancillary knowledge. The result is that Amira's CAT concept would become unnecessarily inflated and unwieldy. The crucial question thus becomes: Will this entire body of information be accessed whenever Amira deploys her CAT concept? Put another way, will Amira have to retrieve her exemplar *and* her newly acquired beliefs each time she performs any cognitive task that calls for her CAT concept, even if this task, say, is a simple one of recognizing her pet cat? I do not think so. If she did, it would unduly place a burden on her cognitive resources and reduce efficiency. For instance, she would have to call up more (irrelevant) information to perform the task and thereby decrease the speed with which it is to be executed. Moreover, it

would simply not be very adaptive for our conceptual system to activate a wealth of information that is not necessary for performing the cognitive task at hand. In short, the pluralist faces difficulties when trying to account for how such novel information can be included (for additional reasons against hybrid views, see chapter 3 of Machery, 2009, especially pp. 64-74).

In contrast, the atomist can easily steer clear of these problems by rejecting the pluralist presupposition that a concept is to be identified with a body of information or a representational structure. Under the atomist framework, a concept is not construed as a body of information but as a theoretical entity that has the primary functions of collecting and organizing information acquired about entities of a particular category. A concept serves as a file folder into which we can store all sorts of information about these entities (provided that they are treated as collateral structures). To account for Amira's scenario, the atomist can simply hold that the idiosyncratic beliefs she amasses will be stored in her 'cat' file folder as collateral information. In fact, any information she subsequently acquires about cats will also be similarly stored. For the atomist, there is therefore nothing especially problematic about handling information that does not by itself constitute a recognized psychological structure or cannot be immediately used for categorization and reasoning purposes. Again, the atomist treats all information as collateral.

Additionally, this treatment does not have the consequence that the entire file folder – no matter how large it becomes – will be activated each time the concept is deployed. The reason again is that the atomist does not identify a concept with a body of information or a representational structure. Without such identification, there is no requirement as to how much or which part of it will be deployed whenever the concept is accessed. To repeat, the atomist holds that a concept is a theoretical entity or a labeled file folder that expresses representational structures that can be selectively activated to perform the relevant cognitive task at hand. To this end, I speculate that the file folder, in addition to storing information about cats, may also store information about which distinct body of information is, or has been, used to execute which cognitive task so that it can be simply deployed in like cases in the future (or conversely, for adaptive reasons, be prohibited from doing so). In this way, whenever the concept is deployed, the file folder may be activated to trigger the relevant body of information for the cognitive task at hand.

5. Concluding Remarks

As noted in the first part of this paper, the claim advanced by Concept Pluralism and Concept Eliminativism that no current theories can account for a person's possession of multiple, distinct concepts for a category, to

which they appeal as justification for their positions, is a misguided one. My contention is that Weiskopf and Machery have overlooked Conceptual Atomism as a viable alternative that can address their worries. By denying that concepts have constituent structure and by treating all bodies of information as collateral, atomism has the resources to accommodate the psychological evidence that our conceptual system employs a wide variety of representational structures. As such, pluralism and eliminativism are not the only theories with this capability. Yet, as pointed out in the second half of this paper, pluralism and eliminativism entail problems of their own. Their central thesis that a person can have multiple concepts for a particular category is based on a misunderstanding of the functional role of a concept and runs into difficulties when explaining how novel information is acquired. Both of these problems, I argue, can be resolved once we abandon the view that concepts are to be identified as bodies of information or representational structures and adopt the atomist view that concepts are theoretical entities or file folders of stored information. I conclude therefore that atomism comes out as the more feasible theory of concepts.

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