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Concepts Exist. More about Eliminativism

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Abstract

According to the recent trend of concept eliminativism in cognitive science, the term 'concept' is of no explanatory value and should be banned from scientific use. I argue that the version of eliminativism due to Edouard Machery does not individuate the referent of 'concept' at the right level of abstraction; in other words, it confuses concepts with their realizers. I recommend is that concepts are individuated at the level of functional kinds, and suggest some of their explanatory functions.

1 The Heterogeneity Argument

Machery's argument for the conclusion that the term 'concept' ought to be eliminated from the theoretical vocabulary of cognitive science is composed of an assumption and five tenets, as follows: (Assumption): a concept is

> a body of knowledge about x that is stored in long-term memory and that is used by default in the processes underlying most, if not all, higher cognitive competences when these processes result in judgments about x (Machery 2009, p. 12).

Tenets:

1. The best available evidence suggests that for each category an individual typically has several concepts.

2. Co-referential concepts have very few properties in common. They belong to very heterogeneous kinds of concept.

3. Evidence strongly suggests that prototypes, exemplars, and theories are among these heterogeneous kinds of concept.

4. Prototypes, exemplars, and theories are typically used in distinct cognitive processes.

5. The notion of concept ought to be eliminated from the theoretical vocabulary of psychology (Machery 2009, p. 2).

Machery's five-tenets argument is driven by the most agreeable consideration that none of the psychological theories of concepts of the last five decades has proved to be adequate to explain all the phenomena and effects connected with categorization, reasoning, induction, language understanding, problem solving, and imagination. The empirical literature that he assesses thoroughly in the book provides plenty of evidence for this consideration. Even without the support of empirical data, anyone could verify that, to a certain extent, we possess different kinds of representations for the same category, and employ them differently. There are at least prototype-based, exemplar-based and theory-based processes in categorization, reasoning and imagination. To exemplify, when I recognize on the spot my neighbour's pet as a dog I am likely to employ my dog prototype, or my exemplar knowledge of the dogs I encountered in the past. I do not need, and do not use, a dog-definition. However, if my daughter asks me how puppies are born I rather resort to my theory about dogs (according to which they animals, mammals, etc.), and this works well even if I actually have no exemplar of dog-births to recall. On the other hand, when I imagine how it would be to have a little dog on my lap here now, I employ perceptual information about dogs previously stored, not a theory about the species of dogs. What is the significance of this

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kind of data and insights? As Gregory Murphy (2002) concluded in his brilliant overview *The Big Book of Concepts*, each so-called 'theory of concepts' (with the inclusion – why not?– of the definitional view and of the embodied cognition theory, rejected by Machery) has revealed to be a perfectly adequate explanation of some uses of concepts, not of all of them. This variety involves many dimensions. It is plausible that different theories are likely to be needed to take into account the variety of conceptual *domains* – for example, it is plausible that exemplar and prototype theories have little explanatory potential when it comes to very abstract domains, like mathematical concepts, or simply concepts that fall out of one's own sensory experience, such as my concept *capital of South Sudan*. Also, it may also be that people's concepts evolve over time, as a function of experience and expertise – typically, but not necessarily, from prototype and exemplar knowledge to more counterfactual-supporting knowledge, as development psychologists explain in detail (Carey 2009). The thought backed by this kind of evidence and considerations, however, is about the *variety* of conceptual representations – I have just mentioned three dimensions of variety: in dependence of use, of domain and of expertise respectively - not yet about their *heterogeneity*, let alone about the explanatory idlessness of the term 'concept' itself. In fact, from variety one can infer a claim of Pluralism, namely, that concepts can have different representational formats – or, in Gualtiero Piccinini's words, "concepts split" (Piccinini & Scott 2006, Weiskopf 2009, Lalumera 2009). Machery makes two more steps, from variety to heterogeneity, and then to eliminativism. Let us see them in more detail. Notice first that variety and heterogeneity are different. Potatoes, roses, gym shoes, and chocolate cookies all come into varieties, but we wouldn't say that an Alba rose and an Austin rose are heterogeneous things. "Heterogeneous", as Machery explains, means having no interesting properties in common, or, more precisely, not being a natural kind. The notion of natural kind he employs here is Richard Boyd's, according to which a natural kind is characterized by typical properties brought about causally by an inner mechanism. To simplify, on this definition blue things do not count as a natural kind, as many different conditions may bring about the similarities among blue things, that is, our perception of blue. Differently, dogs are a natural kind, because the similarities among dogs, are causally determined by their common genes. In short, the mark of natural-kindness on this view is the presence of a causally active mechanism, which is responsible of similarity among members. The explanatory importance of natural kinds is inductive fruitfulness: if we know that item A, with properties p and q, belongs to the kind K, we are (fallibly as it may be) justified to infer that A is likely to possess also the yet unknown properties r and s, due to the presence of a mechanism that brings about them in all kind-members (Boyd 1999, Millikan 1999). So now we have a complete account of what heteroheneity is meant to be - Machery thinks that prototypes,

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exemplars and theories are heterogeneous (and not just varieties of a superordinate item), and that they do not form a natural kind – the kind 'concept' should refer to – because there are not sustained by the same *mechanism*. More precisely, he argues, by presenting empirical evidence, that processes involving prototypes, exemplar and theories sometimes produce different outputs, that is, categorization judgements. To exemplify, I couldn't judge that some sample of stuff is water from prototype-based recognitional processes, and then judge that it is not water when presented with its chemical composition, if the same mechanism were active both in prototype-based processes and in theory-based processes. Also, Machery cites evidence for the claim that the neural system implementing the cognitive processes that use prototypes, exemplars and theories are dissociable. This means that one can be active when the other is not. Finally, he submits that such processes are described by different algorithms (Machery 2010, p. 202). As difference of output, of neural basis and of algorithmic description are plausible indicators of difference in mechanism, the conclusion is that prototype, exemplars and theories do not belong to a single natural kind called 'concept'. The step to eliminativism is now easy to explain. The heterogeneity claim is that the class of concepts is formed by prototypes, exemplars and theories, which do not form a natural kind, and therefore do not support many causally grounded generalizations. Following Quine (1969), Machery holds that picking out natural kinds is the primary function of theoretical terms in many sciences. Thus, when it is found out that a scientific term fails to pick out a natural kind, there is a presumption that it should be eliminated from the relevant science. He believes that the no-success story of the psychology of concepts is evidence enough to back such presumption, and therefore 'concept' should be eliminated in favour of 'prototype of C', 'exemplar of C' and 'theory of C', where C is a category. Each of them refers to a natural kind, as each of them is plausibly sustained by the same mechanism.

2 Concepts as Functional Kinds

As the literature about concept eliminativism shows, there are different ways to resist the final sweeping claim (Margolis & Laurence 2012, section 2.5). One can question heterogeneity, and try to show that prototypes, exemplars and theories do have mechanisms, and therefore properties, in common. Or one can tackle the view that a natural kind needs an underlying mechanism for its individuation – and therefore concepts end up being genuine natural kinds after all. This is not the path I am taking here. I grant that Machery's evidence for heterogeneity is sound, and I have no qualms about Boyd's widely employed notion of a natural kind. Rather, as I argued elsewhere, I contend that concepts are functional kinds. This view is shared by Hampton (2010), and Strohminger & Moore (2010). Intu-

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itively, a functional kind is a class of objects that have same function – what they are used for. In this sense, knives, forks, spoons, vehicles, chairs, but also kidneys and eyes, eyelashes and enzymes are functional kinds. As it is well-known, functional kinds are central in cognitive science. A mental functional kind is to bring about some outcome, or to exercise some capacity (Kim 1992, Putnam 1967). We do not need to dwell into the mysteries of abstract objects, or the mysteries of brains, to agree with Armstrong that thoughts are states of a creature that play a causal role in mediating the creature's perceptions of the world and the action that it takes (1968, 82). What is a concept, then? A concept is a component of thoughts, and its individuating function is to refer to a certain category. So, for example, the concept *dog* is the component of my thoughts that refers to the category of dogs, whatever form it may take. This characterization is conceptually equivalent to the view that a concept is a specific capacity. My concept dog is whatever in my mind has the function to refer to dogs. This view is traditional enough – its most recent and convincing defender is Ruth Millikan (2000). The "whatever in my mind" can be spelled out, more precisely, in terms of multiple realizability. First of all, concepts as kinds are multiply realizable in a narrow sense. The narrow sense is the traditional sense associated with the phrase "multiple realizability" in philosophy of mind. It is the idea that different physical substances can bring about the same outcome in a system. Early functionalist argued that a state of pain can be multiply realized by silicon chips or C-fibers. To deny that concepts are multiply realizable in this narrow sense is very demanding. It requires a commitment to a strong form of physicalism. To say that concepts are multiply realizable, on the other hand, is to admit that having a different neurophysiological implementation is not sufficient for being a different concept. Contemporary neurophysiological research on concepts aims at individuating which areas of the human brain are involved in specifically conceptual tasks and explaining how this is done. It is not committed, however, to the further metaphysical claim that the specific area of the brain activated, say, when I imagine having a dog in my lap is identical with the concept *dog*. If neurophysiology is not, surely psychology need not be committed to a robust reductionist agenda. So Machery's evidence that different neurophysiological mechanisms are responsible for prototype-based, exemplar based and theory-based judgements are compatible with the functional kind view. More interestingly, all mental functional kinds are multiply realizable in a second sense. They are realizable by items characterized by different structural properties. There are plausibly many ways in which a human mind can organize itself in order to exercise them. A more intuitive characterization of this second sense of multiple realizability is that capacities can be individuated by their ends, not just by their means (Millikan 2000). So, for example, a chemist's capacity to abstract and project information about water may involve means that I do not possess. To go back to concepts –

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one's mental capacity to refer to dogs can be implemented by a prototype-based process, a theory, a reinstantiation of perceptual or motor schemes, and so on. The end, not the mean, does the individuating job. If this is so, data and intuitions about the variability of structures involved in cognitive contacts with the same category can be accommodated. Is this to say, that all the empirical evidence against the view that concepts are natural kinds can be employed as evidence for the different view, that concepts are a functional kind? Not really – and this point should be granted to Machery. If a concept is

> a body of knowledge about x that is stored in long-term memory and that is used by default in the processes underlying most, if not all, higher cognitive competences when these processes result in judgments about x (Machery 2009, p. 12).

then concepts cannot be functional kinds. What is stored and used I, inevitably, a token of a functional kind. Here's a plausible similitude. The pattern of sound I emit when I say 'dog' is just a token of the word 'dog', not the word itself. Identifying concepts with bodies of knowledge actually stored and used is like identifying words with sound patterns. This move has not much to recommend in its favour. Words as sound patterns are too variable among different individuals to explain how people understand each other. And some words are understood but just never uttered. If the similarity is plausible, then Machery's mistake is not in the five-step heterogeneity argument, but rather in the assumption, namely, in the choice of what is to be called 'a concept'.

3 Objections and conclusion

To the proposal that concepts are functional kinds, Machery has raised one main objection. He claimed that there are only a few useful generalization that can be made about a concept individuated as a functional kind – for example, about whatever in my mind allows me to refer to dogs (Machery 2010, pp. 238-39). In fact, he is right. If I know that item x is a concept *dog* (or chair, or *Mount Everest*) there is not much I can infer about x. I cannot infer in which area of the brain it is likely to be implemented, and it would be a leap in the dark to claim that x has prototype structure, or exemplar structure, etcetera. He concluded that concepts as functional kinds are just idle in cognitive science. If he is right, then we'd better go back to the individuation of concepts with concept-tokens, and accept the eliminativism that follows. I think there is a clear and convincing reply to this objection. The reply consists in pointing at the difference between *kinds as explananda* and *kinds as explanans*. This distinction is gaining some credit in philosophy of science (Brigandt 2003). Natural kinds are typically those science discovers properties of – we are interested in how they work, they have to be explained. Functional kinds can rather be those science uses in the explanation

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of phenomena that would otherwise be unconnected – they are useful as tools of explanation. This is a list of phenomena that the concept 'concept' contributes in describing, and explaining, as having something in common, or significantly different:

1. Correct and incorrect reference
2. fast categorization on the spot and reflective categorization
3. imagination and perception
4. inductive generalization
5. property projection
6. combination of prototype-like and exemplar-like structure
7. difference between unlexicalized and lexicalized thought
8. ...

I take the list to be too long to be contained within the limits of the present contribution. The final line is that thought-provoking as it is, concept eliminativism is backed by a faulty assumption that we have no pragmatic nor theoretical reason to adopt.

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