ABSTRACTS

C4.7 Philosophy of the Cognitive and Behavioural Sciences

Mental Imagery as a sign system?

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The query on the nature of mental imagery (MI) is one of the most controversial and yet important questions for cognitive science to solve. This issue was addressed by several theories – quasi-pictorial, descriptive and enactive (S. Kosslyn 1994; Z. Pylyshyn 2002, 2004; N.J.T. Thomas 2010, 2013). However, there is significant evidence that neither of these theories can give an exhaustive and coherent explanation of the cognitive role and nature of MI (e.g. M. E. Arterberry, C. Craver-Lemley & A. Reeves 2002; Bartolomeo 2008).

In my view, the most plausible and comprehensive explanation of mental imagery phenomenon can be given via signs. I believe that mental imagery can be interpreted as a sign system, which consists of various types of signs (indices, icons, symbols). Since there is a finite number of signs and their combinations, MI as a sign system is used by our Mind to economically encode the enormous flow of information from the outside world and further to solve different cognitive tasks. I find this role of MI as one of the most crucial in human cognition.

In my view, the approach to the explanation of the nature and cognitive role of MI in terms of signs is the most beneficial, since it not only explains in more detail the operation of mental imagery in human mind, but it also sheds some light on the cognitive role and function of MI. Thus, explanation of mental imagery phenomenon via signs deals more successfully with the divergent empirical data about MI and might suggest a new perspective on other issues in cognitive science, such as perception, learning mechanisms, memory, creativity phenomenon, decision-making etc.

A Naturalistic Theory of Perceptual Representations

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One of the marks of cognitive science is the widespread use of the notion of representation. Indeed, many have argued that an appeal to representations is required for the explanation of a wide range of phenomena, such as human behavior or off-line capacities. However, a standing difficulty in developing these ideas is that we currently lack a satisfactory theory of why certain states are representations and others are not. If
such an account could be provided, theoretical debates on the nature and content of brain states would stand on a much firmer ground.

The goal of this paper is to provide the bare bones of such a theory. More precisely, I will argue that a particular theory of representation (SR-Teleosemantics) can explain why many states produced in the perceptual system are representations. Two striking virtues of this approach is that it has independent motivation and that it has already been used in other domains such as animal signaling or human communication. Accordingly, if successful, it will not only account for the representational nature of perceptual states, but it will also provide an explanatory unification of apparently distinct phenomena.

More precisely, SR-Teleosemantics defines representations by appealing to biological functions and sender-receiver systems. I will argue that both notions can be used to provide a theory of what makes perceptual states representational. Furthermore, I will show that there are good reasons for thinking it can also be used in the naturalization of other cognitive representations postulated by cognitive science. Yet, as I will show, completing this project turns out to be much more difficult than some teleosemanticists have thought.

Transitivity of visual sameness

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One of the important aspects of psychological considerations concerning vision regards the representations of objects’ persistence. Investigations have focused on criterions of visual objects’ sameness and the place of relevant mechanisms within the perceptual process. However, the formal properties of the visual sameness relation have not been sufficiently explicated. In the presentation I address, from empirical and philosophical perspective, one aspect of this problem: transitivity.

As we know from philosophical works, the ‘sameness’ can name various relations. The obvious question is whether visual sameness is the classical identity. The investigations concerning transitivity are highly relevant for this issue: being transitive is a necessary condition for being identity.

In the contemporary philosophy, the transitivity of sameness is tested by considering splitting-like cases, where an object A is continuous with two objects, B and C, existing at the subsequent moment. There are three solution in such a situation: (1) no sameness between A, B, and C, (2) sameness only between A and B or only between A and C, (3) sameness between A and both B and C. The occurrence of the third case shows that the sameness is not transitive, as transitivity would lead to paradoxical identification of different objects B and C.

I analyze results obtained by using Multiple Object Tracking and Object-Specific Preview Effect experimental paradigms, to consider whether they inform us about patterns of visual sameness in splitting-like cases. I argue that such situations do not break the sameness,
but the occurrence of spatiotemporal continuity does not entail sameness (option (2)).

This result has twofold significance. First, it suggests that visual sameness is transitive and so is more similar to identity. Second, it shows that spatiotemporal continuity is not sufficient for the identity of visual objects and provokes the question concerning the proper characteristic of their identity criterions.

False Belief Attribution in Early Infancy and Its Neural Correlates

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In developmental psychology, the false belief task is used to measure children’s ability to attribute beliefs, intentionality etc., to others. Because children typically pass this test around four years of age, most researchers agree that by 4 years old children possess a theory of mind (ToM). The debate in ToM research lies in the discrepancies of implicit vs. explicit task passing. Researchers have reported that infants are passing the false belief task implicitly, via eye gaze measurement, as early as 13 months, though they cannot explicitly, or verbally, pass it until 3 1/2 or 4 years of age. Multiple, and often contradictory, theories exist in an attempt to explain why there is this gap, or the illusion of a gap, between implicit and explicit passing, as demonstrated by the false belief task. Most of these accounts are psychological ones that use mental states, representation, belief and desire as explanatory forces. However, some psychologists like Ruffman and Perner (2005), Clemens and Perner (1994), and Sirios and Jackson (2007) have claimed that, in addition to these accounts, there is a rival theory that supposedly could incorporate brain regions, active/latent memory systems, and/or inhibitory mechanisms, etc. in explaining ToM. These psychologists seem to believe that psychological accounts of ToM are separate from, and incompatible with, neuroscientific ones. Following Marr's (1982) original idea that there can be levels of explanation in psychology, we looked into the neuroscientific accounts explaining the gap in ToM acquisition. This paper focuses on the implications, and ultimate invalidity, of a neural pattern account proposed to explain the implicit passing/explicit failing gap.