

Visual spatial representations in cognition

Dr. Verena Gottschling

The topic this talk is concerned with, is the question how visual spatial representations and pictorial representations should be characterized and what their role within cognition could be. My focuses are three issues:

1. Which are the relevant visual and which are the relevant spatial properties and relations we have to take into account?
2. How are these properties and relations internally represented, so that we are justified to regard the representations in dispute as spatial and/or visual and/or pictorial representations?
3. What distinguishes pictorial, visual and spatial representations regarding the first two questions?

In my view, a convincing characterization and demarcation of the concepts in question is the most urgent desideratum and will have large effects for the whole debate about visual spatial cognition.

The imagery debate gave a good deal in insight regarding these questions. The controversial matter in this debate is whether there are "mental pictorial representations" also called "images" besides the language like representations. They are basically visual spatial representations and are supposed to play an important role in many high level cognitive capacities. The so called pictorialists and their leading researcher Stephen Kosslyn think empirical findings from psychology and neuropsychology make it necessary or at least highly probable that these representations exist. The opponent group of descriptionalists – and their front man Zenon Pylyshyn - denies this. In their view it is not necessary and even conceptual problematic to propose these images. They state it is possible to find other explanations for the empirical findings which seems to support pictorialist theories at first glance.

Within the imagery debate it has been argued by some cognitive scientists and many philosophers that the most promising candidate a successful pictorialist strategy is the postulation of images only in a weaker sense. I label this strategy as the "functional reading" (FR) of pictorialism. My interest is to analyze what that could mean and where the weaker and stronger aspects of this strategy lies.

In my opinion Michael Tye presented the most prominent characterization for a candidate along these lines. His account is strongly influenced by accounts in AI. I will present his account and some readings of it. I argue that what Michael Tye discusses as "pictorialism" is in fact pictorialism in the functional interpretation. I argue that his characterization shows promise but is nonetheless not successful in its recent form. As I show the problem with Tye's defense of pictorialism and the functional strategy in general is, that it is consistent and compatible with classical cognitive science but its explanatory power isn't as strong as desirable. In this context I also discuss Michael Tye's "pictorialist descriptivism", the position Tye regard as an enhancement of Kosslyn's theory. I argue **that** and why this is not true. Afterwards I present some ways to achieve improvement.

I end up describing some of the implications and effects a successful characterization of the concepts pictorial, visual and spatial representation enables us to achieve. In my opinion here is the source of many misunderstandings in the debate about visual, spatial and pictorial cognition.

Literatur

Gottschling, V. (in press). Bilder im Geiste. Die Imagery Debatte. Paderborn, to appear 09/2003

Gottschling, V. (2003). Functional versus real space: Is pictorialism hopeless? Commentary on Pylyshyn, Behavioral and Brain Sciences, 25(2), 193-194.

Kosslyn, S. M. (1980). Image and mind, Cambridge Mass.

Kosslyn, S. M. (1994). Mind and brain. The resolution of the imagery debate, Cambridge Mass.

Kosslyn, S. M., Thompson, W. L., and G. Ganis (2002). Mental Imagery doesn't work like that, Commentary on Pylyshyn, Behavioral and Brain Sciences, 25(2), 198-200.

Kosslyn, S. M., Ganis, G., and W. L. Thompson (2002). Mental imagery: Against the nihilist hypothesis, Trends in Cognitive Sciences, 7(3), 109-111.

Pylyshyn, Z. W. (1984). Computation and Cognition. Cambridge Mass.

Pylyshyn, Z. W. (2002). Mental imagery: In search of a theory, Behavioral and Brain Sciences, 25(2), 157-237.

Pylyshyn, Z. W. (2003a). Return of the mental image: Are there really pictures in the head? Trends in Cognitive Sciences, 7(3), 113-118

Pylyshyn, Z. W. (2003b). Explaining mental imagery: Now you see it, now you don't. Reply to Kosslyn. Trends in Cognitive Sciences, 7(3), 111-112

Tye, M. (1991). The imagery debate. Cambridge Mass.