

## PhiloSTEM-6: “Attention and Perceptual Organization”

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Ultimate Claim: *top-down* attention is necessary for conscious *perception*.

Overview: How does attention contribute to perceptual experience? Within cognitive science, attention is known to contribute to the organization of sensory features into perceptual objects, or object-based organization. But how does the perceptual system achieve the most fundamental form of perceptual organization: subject-based organization? This paper argues that subject-based organization is brought about and maintained through top-down attention. Thus, top-down attention is necessary for conscious perception in so far as it is necessary for bringing about and maintaining the subject-based organization of perceptual experience.

Subject-Based Organization:



Tea meditation example: the steam is in the foreground when interested in the steam, and the breath is in the foreground when interested in the breath. One might experience this in terms of *epistemic proximity*: the stimulus of interest might appear more available for knowledge, whereas the background stimulus might appear less available for knowledge. Or one might experience it in terms of *importance, meaningfulness, or richness*: the background stimulus might seem less subjectively important, meaningful, and rich than the foreground stimulus. However one experiences the difference between foreground and background, the difference reveals a structural feature of experience that corresponds with the subject’s interests, which I am calling “subject-based organization.”

Background Assumptions: i) conscious perception shares some structural correspondence with its physical underpinnings and ii) each instance of conscious perception depends for its existence on the processing of sensations.

Empirical and Conceptual Background: The Feature-Integration Theory (FIT) seeks to explain the organization of perceptual objects (Treisman & Gelade 1980). Although FIT has been widely criticized in philosophy and cognitive science, some of its claims withstand those criticisms. Specifically, it is generally accepted that 1) certain visual features are first processed in relative isolation and only later grouped into objects, 2) salience information is processed alongside this feature-based information, enabling visual search, and 3) top-down attention stimulates and/or suppresses this salience information according to the current goals of the subject. These claims leave open the question of how early sensory processing relates to perceptual experience. That is, if we assume that perceptual experience is rooted in early sensory processing, we might ask whether that processing is sufficient for perceptual experience (e.g. Lamme 2004; Block 2007) or whether some further processing, such as the top-down feedback of attention, is required to bring about conscious perception (e.g. Dehaene & Naccache 2001).

My Addition: Top-down attention is necessary for *subject-based* organization, and subject-based organization is essential for conscious perception. Importantly, although subject-based organization is argued to be essential to conscious perception, it is not here argued to be essential to consciousness, in general.

Conceptual Reasoning: the concept of perception essentially includes the concept of subject-based organization. That is, the concept of perception is normally understood in contrast with the concept of sensation, and the key difference between these is that perception, unlike sensation, is informational to the subject of perception. For perception to be informational to the perceiving subject, it must have some minimal degree of organization that accords with the perspective of the subject. In other words, it must have *subject-based organization*.

Why think subject-based organization is the form of organization in conscious perception that makes sensory input informational to the perceiving subject?

**Feature-based organization** is the organization of sensory input into sensory features. This type of organization, seemingly basic, actually presupposes other forms of organization: we perceive a bright red line or a dull gray cross, but not simply redness or dullness. Further, conscious perception does not always involve feature-based organization.

**Object-based organization** is the organization of sensory features into perceptual objects. Although an important feature of conscious perception, this form of organization is neither universal nor fundamental to conscious perception.

**Space-based organization** is the organization of features, patterns and objects into a common space-time matrix. This form of organization is nearly universal to conscious perception, but it is not the most fundamental form of perceptual organization, since it cannot account for whether a percept is or is not perceived when viewing, for example, a bistable stimulus.

**Field-based organization** is the organization of parts of a perceptual field by other parts of the perceptual field or by the perceptual field as a whole. However, even if field-based organization can explain organic switching between bistable percepts, it fails to explain the subject's apparent control over this switching.

**Subject-based organization** can account for perceptual differences that other forms of organization cannot, such as the difference between a split experience and a switch experience, and seems to be present in all of the above cases. Thus, subject-based organization is the best candidate for the most fundamental and universal form of perceptual organization.

The Argument

- 1) Every perceptual experience must have some degree of subject-based organization to count as an instance of perception.
- 2) Early sensory processing does not have subject-based organization.
- 3) Some process is required to bring about subject-based organization for sensory input in order to bring about conscious perception.
- 4) Only top-down attention can organize sensory input according to the current tasks or interests of the subject.
- 5) Top-down attention is required to bring about subject-based organization for sensory input in order to bring about conscious perception.
- 6) Therefore, attention is necessary for conscious perception.