



## Varieties of perceptual improvement

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### Abstract

In this short comment on Dustin Stokes's *Thinking and Perceiving*, I attempt to clarify what is at stake in the debate between Fodorian modularists and Stokean anti-modularists.

### Keywords

Modularity · Perceptual Learning · Expertise

*This article is part of a symposium on Dustin Stokes's book "Thinking and Perceiving" (Routledge 2021), edited by Regina Fabry and Sascha Benjamin Fink.*

Distinctions are the lifeblood of philosophy. One of the many virtues of Dustin Stokes's *Thinking and Perceiving* is the wide array of distinctions it introduces for understanding the nature of the relationship between thinking and perceiving. These distinctions help to clarify what, exactly, is at stake in debates between Fodorian modularists (FMs) and Stokean anti-modularists (SAMs). In this short comment, my goal is to encourage Stokes to refine a distinction he introduces between two types of perceptual improvement, in order to achieve greater clarity about the precise point at which FMs and SAMs disagree. My hope is that this will better direct our attention towards the sorts of evidence that would help decide between these views. To this end, I will introduce two accounts of the debate between FMs and SAMs—a coarse, overly simplistic account, and a more nuanced, fine-grained account—as a way of illustrating the progress Stokes has made in articulating what is really at stake in this debate. I will then introduce two problem cases for Stokes, cases that don't fit neatly on either side of the distinction he draws between two types of perceptual improvement, as a way of raising the question of whether he has drawn this distinction in the right place.

On a first, overly simplistic, account of the debate between FMs and SAMs, it is a debate between *modularity* and *malleability*. FMs hold that perception and cognition are distinct mental faculties and that perception, unlike cognition, is fixed and

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immutable. SAMs, by contrast, hold that perception is akin to cognition in allowing for improved performance as the result of experience. On this first construal of the debate, diachronic changes to perception that allow us to better discriminate different items, group similar items, and focus our attention all support SAMs over FMs (Connolly, 2019).

The problem with this first account of the debate, as Stokes himself recognizes, is that FMs readily acknowledge the existence of diachronic improvements to perception as the result of experience (Pylyshyn, 1999). They merely hold that these changes are wholly intra-perceptual: they are developmental changes to the perceptual module itself that are triggered by exposure to the environment. For example, in the case of color vision, there is evidence of “improvement in color discrimination from infancy up until late adolescence, with saturation thresholds approximately halving (i.e., sensitivity improving) with every doubling of age until adolescence” (Maule et al., 2023, pp. 91–92). This perceptual improvement might simply be the result of the slow maturation of the neural pathways underlying color discrimination (Crognale, 2002).

On a second, more nuanced, account of the debate between FMs and SAMs, one endorsed by Stokes, it is a debate between *acquisition* and *learning*. It rests on a question about the factors that lead to perceptual improvement: are they exclusively the result of developmental changes (i.e., *acquisition*) or can they result from “agent-driven, accuracy enhancing training” (Stokes, 2021, p. 182) (i.e., *learning*)? FMs hold that the informational encapsulation of perceptual processing implies that it cannot be influenced by central cognition and, as such can only be improved by developmental changes. SAMs, by contrast, hold that in addition to developmental changes, perceptual improvement can also result from “cognitive or conceptual learning” (Stokes, 2021, p. 151). SAMs, but not FMs, can claim that “perceptual expertise is a genuinely cognitive phenomenon, dependent on the conceptual information [in] the domain of expertise” (Stokes, 2021, p. 165). In short, for SAMs but not FMs, “thinking improves perceiving” (Stokes, 2021, p. 202).

The clarity with which Stokes states this conclusion is admirable. But there is an aspect of his view that I wish he had said more about: namely, what, exactly, is involved in “cognitive or conceptual learning” and why is it required for *learning*? Some sense of the difficulty here becomes evident when one notes that Stokes does *not* think that (what he calls) “low-level perceptual learning” suffices:

Repeated exposure to colour chips or flavour testers as one finds in a sommelier kit may suffice, without any category or concept learning, to enhance one’s perceptual capacities to recognize relevant differences in those stimuli tokens. (Stokes, 2021, p. 109)

Expert training, in and outside of laboratory circumstances, requires more than mere exposure to stimulus types (in contrast to many examples of low-level perceptual learning, such as colour discrimination). (Stokes, 2021, p. 165)

As these quotations make clear, Stokes thinks that in order for “conceptual learning” (i.e., *learning*) to occur, “expert training” must be involved. This immediately raises the question: what exactly is “expert training” and why is it required for *learning*? As a way of pressing this question, it will help to focus on two examples that Stokes himself returns to multiple times: color vision and language learning.

First, Lewis Forder and Gary Lupyan have recently argued that color words have a “warping effect” on the perception of colors (2019, p. 1109). They found that after hearing a color word, people more accurately discriminated objects of that color from objects of nearby color categories. They concluded that color words lead to enhanced categorical perception, to an increased sensitivity to the differences between objects of different categories (Goldstone & Hendrickson, 2010). This is relevant because it seems to be an example that cuts across Stokes’s characterization of the distinction between *acquisition* and *learning*; it is an example of an improved perceptual ability to categorize objects that is neither merely the result of a developmental process nor one that requires “expert training.” One response open to Stokes would be to revise his characterization of *learning* to abandon the requirement that it must involve “expert training.” A better response, I think, would be to introduce a *threefold* distinction between acquisition and two different forms of “conceptual learning”: the sort studied by Forder and Lupyan (which involves enhanced categorical perception without “expert training”) and the sort discussed by Stokes (which requires “expert training”). If this is on the right track, I am curious how Stokes himself would characterize this new threefold distinction.

Second, as many have noted, learning a new language brings with it a significant perceptual change with regard to utterances in that language: simply put, a language that you understand *sounds* different from a language that you don’t. One response you could have to this example of perceptual change would be a version of Stokes’s own “thinking improves perceiving” view: you could hold that the perceptual change results from being able to think about the meanings of utterances in the new language (cf. Brogaard, 2018). An alternative response, however, might involve distinguishing between the perceptual and cognitive components involved in learning a new language. You might think that the perceptual change is limited to learning how to parse the phonemes in the new language, and that the cognitive change involves becoming able to retrieve lexemes from long-term memory and to use them to generate the meanings of utterances (cf. Gross, 2022). The problem is that it is hard to know where to locate this alternative response in Stokes’s characterization of the debate between FMs and SAMs. It doesn’t fit neatly on either side of his distinction between *acquisition* and *learning*. This problem becomes especially acute when one realizes that Fodor himself seems to have held a version of this sort of alternative view. Fodor held that linguistic comprehension involves the combination of two capacities: a perceptual capacity to parse an utterance into its phonemic constituents and a cognitive capacity to understand what that combination of phonemes means (Fodor, 1983, pp. 88–90). This raises the question of why Stokes thinks that the debate between FMs and SAMs can be adequately characterized in terms of the

distinction between *acquisition* and *learning*, and not in terms of a choice between some more complicated combinations of both.

My hope is that if Stokes can refine his account of different types of perceptual learning in a way that better accommodates these two problem cases, we will be left with a characterization of the debate between FMs and SAMs that focuses on what exactly is at stake in this debate, as well as what sorts of evidence would decide between them.

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