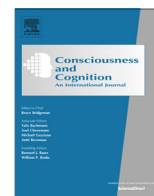




ELSEVIER

Contents lists available at ScienceDirect

## Consciousness and Cognition

journal homepage: [www.elsevier.com/locate/concog](http://www.elsevier.com/locate/concog)

# The relationship between cognitive penetration and predictive coding<sup>☆</sup>

Fiona Macpherson

Centre for the Study of Perceptual Experience, Department of Philosophy, University of Glasgow, Glasgow G12 8QQ, Scotland, United Kingdom

## ARTICLE INFO

### Article history:

Received 1 February 2016

Revised 29 March 2016

Accepted 4 April 2016

Available online xxx

### Keywords:

Cognitive penetration

Predictive coding

Perception

Cognition

Perceptual experience

Early vision

## ABSTRACT

If beliefs and desires affect perception—at least in certain specified ways—then cognitive penetration occurs. Whether it occurs is a matter of controversy. Recently, some proponents of the predictive coding account of perception have claimed that the account entails that cognitive penetrations occurs. I argue that the relationship between the predictive coding account and cognitive penetration is dependent on both the specific form of the predictive coding account and the specific form of cognitive penetration. In so doing, I spell out different forms of each and the relationship that holds between them. Thus, mere acceptance of the predictive coding approach to perception does not determine whether one should think that cognitive penetration exists. Moreover, given that there are such different conceptions of both predictive coding and cognitive penetration, researchers should cease talking of either without making clear which form they refer to, if they aspire to make true generalisations.

© 2016 The Author. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

Some advocates of the predictive coding account of perception have said that if the predictive coding account of perception is correct then cognitive penetration occurs. If true, this would provide a new route to arguing for the existence of cognitive penetration: argue for a predictive coding account of perception. In this paper, I investigate whether the predictive coding account of perception does entail that cognitive penetration occurs. I establish that there are different versions of cognitive penetration and different versions of predictive coding. I map out the relationship between these different versions. I show that some versions of predictive coding entail that there are some forms of cognitive penetration, some versions of predictive coding are compatible with, but do not entail, that there are some forms of cognitive penetration, and some forms of predictive coding entail that some forms of cognitive penetration do not exist.

Mapping out these relationships helps us to understand the predictive coding account of perception and cognitive penetration in depth. It also serves to warn us that we should be clearer which version of the predictive coding account of perception and which version of cognitive penetration we are referring to when we make claims about them. And it serves to show that an argument for cognitive penetration that appeals to the existence of predictive coding has to appeal to a specific version of predictive coding, the establishment of which may turn on just the same issues as the establishment of cognitive penetration itself.

<sup>☆</sup> This work was supported by a grant from the Arts and Humanities Research Council (grant number AH/L007053/1). Thanks to audiences in Bochum and Tokyo who heard a version of this paper for their helpful comments, and to Clare Batty for reading a draft of the paper and providing very many helpful suggestions to improve it.

E-mail address: [fiona.macpherson@glasgow.ac.uk](mailto:fiona.macpherson@glasgow.ac.uk)

<http://dx.doi.org/10.1016/j.concog.2016.04.001>

1053-8100/© 2016 The Author. Published by Elsevier Inc.

This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

This paper is divided into seven further sections. Section 2 defines and examines the different forms of cognitive penetration. Section 3 outlines a minimal account of the predictive coding account of perception. In Section 4, I consider possible relationships between predictive coding and cognitive penetration and examine the claims that people have made about this relationship. In Section 5, I look at whether predictive coding is committed to cognitive states playing a role in the predictive coding account, and what this means for the relationship between various versions of predictive coding and cognitive penetration. In Section 6, I examine whether a predictive coding account that is committed to the idea that cognitive states play a role in predictive coding entails one version of cognitive penetration, namely the cognitive penetration of perceptual experience—that is a conscious, personal-level state. In Section 7, I consider whether a predictive coding account that is committed to the idea that cognitive states play a role in predictive coding entails another version of cognitive penetration, namely the cognitive penetration of early vision—that is, an initial level of visual processing that has been defined in different ways by psychologists and neuroscientists. I give three accounts of what early vision might be taken to be and I spell out what predictive coders should say about the penetration of early vision conceived of in each of them. Finally, in Section 8, I summarise what the various accounts of predictive coding and cognitive penetration are, and the relationships between them, in a table, and I comment on the broad picture that emerges of the relationships between them. Readers may wish to consult this table while they are reading the sections below.

## 2. What is cognitive penetration?

There are two related, but nonetheless distinct, alleged phenomena that go under the name ‘cognitive penetration’. That they are clearly distinct emerges in the rest of this paper by consideration of their relation to predictive coding.

The first of these phenomena is the penetration of *early vision*. It is the phenomenon discussed in Pylyshyn’s (1999) much cited paper on the topic. Early vision is defined functionally by Pylyshyn as the system that takes attentionally modulated signals from the eyes (and perhaps some information from other sensory modalities) as inputs, and produces shape, size and colour representations as output. These representations are then categorised and identified by the cognitive system making use of memory, knowledge and judgment. The question of whether cognitive penetration occurs, conceived of as the penetration of early vision, is the question of whether the function that the early visual system computes “is sensitive in a semantically coherent way, to the organisms goals and beliefs, that is, [whether] it can be altered in a way that bears some logical relation to what the person knows” (1999: 343). Pylyshyn explicitly denies that the output of early vision either is, or determines, one’s visual experience, or equivalently, that the representational content of the output of early vision is the representational content of one’s perceptual experience (1999: 362).

In contrast to this notion of cognitive penetration, which has mostly been the subject of study by psychologists and neuroscientists, another notion of cognitive penetration, that of the penetration of *perceptual experience*, has been a major subject of study by philosophers, although the division in what researchers study is far from exceptionless, and increasingly so. ‘Perceptual experience’ refers to the conscious state that we typically go into when we perceive the world—the conscious state of awareness of the world that has a distinctive phenomenal character compared to typical beliefs or judgments about the world. In my (2012) paper on cognitive penetration, I defined the cognitive penetration of experience as follows: in any case of perception, hold fixed what it is that is perceived (the objects properties and relations seen, heard, touched, and so on), the perceiving conditions (the level of light, shadow, mistiness, for example), the state of the sensory organ (perfect human vision, shortsighted human vision, for example) and the location of one’s focus of attention. With those conditions fixed, if it is possible for two subjects (or one subject at different times) to have different perceptual experiences due to the differing content of the states of their cognitive systems, and moreover, there is a semantic or intelligible link between the content of the cognitive states and the content of the perceptual experience, then perceptual experiences are cognitively penetrable. States of the cognitive system include beliefs, judgments and desires, and should likely also be taken to include the concepts that we possess. For further discussion of the terms used in this definition see my (2012) paper.

There are several issues with both of these definitions of cognitive penetration. I address the two most pressing ones. The first concerns attention. The second concerns the semantic or intelligible link that is posited as necessary for cognitive penetration to occur.

Despite giving the above definition of cognitive penetration in my (2012) paper, later in the paper, I go on to question whether we should include attention in the conditions that we hold fixed. I noted that one rationale that someone might have for thinking that we should hold fixed attention is that a shift of attention is akin to a shift of the location to which one’s eyes point. A shift in the direction that one’s eyes look changes one’s perceptual experience by changing which objects and properties are processed, but if such a shift were driven by one’s cognitive states, such a shift should not count as cognitive penetration occurring, simply a shift in what is perceived. One might think of shifts of attention in a similar manner: a shift of spatial attention, driven by one’s cognitive states, might affect how clearly, or in how much detail, certain objects and properties are experienced, but that is just a shift in what is perceived and shouldn’t count as cognitive penetration. However, as I noted in my (2012) paper, there are forms of attention other than spatial attention, so even if one was persuaded that changes of spatial attention driven by cognition should not count as cognitive penetration, it is not clear that shifts in other forms of attention should also not count. One form of a non-spatial shift in attention is a shift in what properties one attends to. For example, one can shift from attending to the red things in one’s visual field to attending to the yellow things, and that might change one’s experience in certain ways. For example, it may lead one to have

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات