How far, if at all, do our cognitive beliefs influence our perceptions?

For this essay I compare Macpherson and Fodor’s positions regarding whether or not cognitive beliefs influence our perceptions. I define cognitive beliefs as brain-states which can be truth-assessed/assigned a truth-value (as opposed to brain states such as desires, attitudes, emotions etc.) and perception as the interpretation and identification of sensory information/data from sensory experience. MacPherson argues that cognitive penetration (her favoured expression for the notion of cognitive beliefs influencing perceptions) is necessary to explain instances in which humans commit bizarre and brute perceptual errors. Conversely, Fodor argues that cognitive beliefs do not affect perception, citing ‘knowingly experienced illusions’ as a nigh irrefutable argument against any theory positing cognitive penetration. I conclude that the disagreement between both thinkers stems from each respective theory invoking a different notion of what constitutes cognitive penetration. Fodor’s denial of cognitive penetration invokes cognitive beliefs that we are currently aware of/that are currently present to our mind. MacPherson’s argument for the existence of cognitive penetration concerns standing beliefs, beliefs that any given individual may hold but may not presently consider. Upon distinguishing between the two, any disagreement collapses.

Fodor takes ‘knowingly experienced illusions’ to be a strong argument against any theory proposing cognitive penetration. A famous example of such a ‘knowingly experienced illusion’ is the Müller-Lyre illusion below:

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To most individuals (myself included), the lines look to be different lengths.

They are in fact all the same length.

Knowing that the experience is an illusion (i.e. knowing that all three lines are the same length) does not make the illusion go away, the lines still look to be of different lengths. Fodor takes this to demonstrate that our cognitive beliefs (in this case the true belief that all three lines are of the same length) do not affect our perceptions, since knowing that the experience is illusory does not make the illusion go away. Thus for Fodor, cognitive penetration is not possible. Fodor takes perceptions to be modular, describing them as crude sub-systems/mechanisms in the brain. Being crude sub-systems, these perceptions are encapsulated and don’t know what we know. Perceptions have no way of knowing/accessing the true belief that the three lines are in fact all of the same length. Consequently our cognitive beliefs cannot penetrate and influence our perceptions.

MacPherson’s position contradicts that of Fodor, arguing that cognitive penetration is essential to explaining some forms of brute and bizarre error that humans commit in sense perception. MacPherson cites a colour counterexample (discovered in an experiment by Delk and Fillenbaum), in which individuals’ “beliefs about the characteristic colour of an object can affect the colour that they experience that object as having”. The counterexample runs as follows: Delk and Fillenbaum asked subjects to match various shapes – all of which were cut out of orange paper – to a background whose colour they (the subjects) could adjust, along a colour spectrum of reds and oranges. Some shapes cut out of the orange paper were ones that are characteristically red (lips, hearts, apples etc.), some were not (ovals, horse

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3 Fodor, “Observation Reconsidered”, 15
4 Fodor, “Observation Reconsidered”, 15
5 MacPherson, “Cognitive Penetration of Colour Experience”, 15
6 MacPherson, “Cognitive Penetration of Colour Experience”, 15
heads, bells, mushrooms etc.) The results of the experiment appear to show the following: because the subjects of the experiment held prior cognitive beliefs that shapes such as lips, love-hearts and apples are characteristically red – when asked to match the colour of these shapes to a background – they matched them to a more red background, even though all the shapes used in the experiment had been cut out of the same orange paper. The shapes that are not characteristically red were not matched to a more red background, instead they were matched more accurately to an orange background which matched the orange paper out of which the shapes were cut. In the case described, the subjects appear to be making a special type of error. MacPherson argue this type of error is bizarre and brute: the subject “has an accurate experience of an orange colour (of the cut-out) and ... of a shade of red (of the background) ... looking at both the shades simultaneously... judge[s] that the shade of red and the shade of orange are the same shade”\(^7\). This amounts to an error of judgment despite the subject’s accurate experiences. Rather than just accept such an unnatural error at face value, MacPherson argues cognitive penetration can rationalise it. A cognitive belief (certain shapes are characteristically red) penetrated the subjects’ perceptions (causing them to match the shapes to a more red background when they should have matched the shapes to an orange background).

An objection to Fodor may stem from the suggestion\(^8\) that certain groups of individuals do not fall prey to/are less susceptible to the Müller-Lyre illusion. Here cognitive penetration offers an explanation, contradicting Fodor’s proposition that cognitive penetration does not occur in the first place. The societies these individuals live in are said to contain less rectangular – or ‘carpentered’ – architecture than that of, say, individuals living in a city such as London. Less rectangular architecture results in less cognitive beliefs that angles pointing inwards or outwards signify objects of different sizes, thus less of these individuals fall prey to the Müller-Lyre illusion as these cognitive beliefs would usually affect their visual perceptions. Paradoxically it appears that cognitive penetration can and cannot occur; a later distinction resolves this.

\(^7\) MacPherson, “Cognitive Penetration of Colour Experience”, 17


A possible objection to MacPherson is that she is wrong to assume that only cognitive penetration can explain the bizarre and brute error encountered in Delk and Fillenbaum’s colour counterexample. Associative conditioning – roughly summarised as the notion that neurons that fire together, wire together\textsuperscript{10,11} – also explains the link between cognitive beliefs concerning what colours certain shapes characteristically have, and the subjects’ errors during the experiment. The shape of lips are associated with the colour red, the subject (having been conditioned thus, and having its neurons wired in such a manner) then associates the two erroneously in the experiment. Even if I stop believing things such as ‘lips are red’, ‘hearts are red’, and ‘apples are red’, I might still succumb to the mistake of matching the shapes – cut out of orange paper – to a red background. Regardless of whether I believe these things or not, the very fact that my past sensory experience has led to a neural association will still cause me to succumb to this brute error. Cognitive penetration is not necessarily implied by the colour counterexample, neural association may offer an alternative explanation.

It appears as though the conflict between Fodor and MacPherson stems from each thinker invoking a different type of cognitive belief; each concerning two different aspects of cognitive penetration respectively. When Fodor deliberates cognitive penetration, he is speaking about current beliefs: beliefs that we presently consider/those that are currently present to our mind. An example of such a belief is “The three lines are of identical length”, the belief in question when Fodor considers ‘knowingly experienced illusions’. When MacPherson considers cognitive penetration her focus is standing beliefs, beliefs that any given individual may hold but ones that we do not consider presently. Such beliefs include ‘lips are red’, ‘love-hearts are red’ and ‘apples are red’, the beliefs in question in the colour counterexample. This distinction resolves the conflict between Fodor and MacPherson’s respective stances on cognitive penetration. The distinction also explains the issue Fodor faces of reasoning why certain individuals do not fall prey to the Müller-Lyre illusion when they lack the relevant cognitive beliefs concerning angles and the subsequent beliefs concerning sizes of objects. Following the distinction, standing beliefs can penetrate our cognition: the standing belief that certain angles are correlated with certain sizes gives rise to the Müller-Lyre illusion, the standing belief that lips are characteristically red gives rise the colour counterexample.

\textsuperscript{11} For the less crudely defined, original account see reference 10.
Equally, current beliefs cannot penetrate our cognition: the current belief that the experience of the Müller-Lyre lines is illusory does not make the illusion go away, having an accurate experience (thus also true current beliefs) of both the orange cut-out shapes and the red background does not prevent the brute error from occurring.

In response to the objection concerning neural association, I do not deny that neural association explains the phenomena of brute error equally as well as the notion of cognitive penetration of standing beliefs. One possible solution which rescues the notion of cognitive penetration – which does not deny neural association but instead incorporates it – might be to posit neural association as the source of standing beliefs. On this account, one succumbs to the brute perceptual error, because, in spite of the lack of any current beliefs that ‘lips are red’, ‘hearts are red’, and ‘apples are red’, the neural association of linking these shapes with the colour red (in past sensory experience) causes the standing belief that ‘lips are red’, ‘hearts are red’, and ‘apples are red’, which in turn causes the brute perceptual error. Construed like this, neural association need not compete with cognitive penetration as an explanation for the brute perceptual error in question. A response to this might be that I have made a mistake in assuming that neural association is necessarily linked to standing beliefs. Instead, I may form a neural association between two things (certain shapes and a certain colour) without any corresponding beliefs (standing or current). Imagine we strap a young adult into a chair and force them to stare at red lips, hearts and apples every day, a la Clockwork Orange. After this torment, we inject them with a certain formula X, which causes them to forget any current or standing beliefs they hold concerning what colour certain shapes usually take. After years of torment and memory, they may succumb to the brute error in Delk and Fillenbaum’s experiment. But this is not to say that they have formed any beliefs concerning shapes and their characteristic colours. Neural association between shapes and colours may conceivably occur without the formation of any beliefs whatsoever. It might be that they succumb to the brute error in Delk and Fillenbaum’s experiment, even if they hold no current or standing beliefs whatsoever concerning which colour certain shapes traditionally take. I concede that this essay does not rule out the possibility of neural association triggering brute perceptual errors in the absence of any beliefs, both standing and current.
I conclude that upon distinguishing between current and standing beliefs, MacPherson and Fodor’s views of cognitive penetration do not conflict. Fodor argues that cognitive penetration of perception by current beliefs does not occur, MacPherson argues that cognitive penetration of perception by standing beliefs does occur; the two are not incompatible. Fodor’s admission of diachronic cognitive penetration (cognitive penetration over an extended period of time) essentially follows the spirit of MacPherson’s argument, his denial of synchronic cognitive penetration (cognitive penetration at a given moment in time) does not contradict MacPherson. Aside from uncertainties concerning neural association, both MacPherson and Fodor suggest that cognitive beliefs influence our perceptions.


