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Cognitive Penetration and Implicit Cognition

Lucas Battich and Ophelia Deroy

1 Introduction

In *The Bluest Eye* by Nobel Prize laureate Toni Morrison, the young black heroine, Pecola, keeps finding herself and her family physically unattractive, which creates terrible feelings of distress and insecurity. Later, she starts to understand that her impression comes from her having internalised the idea that African-Americans could not be as beautiful as Europeans:

> You looked at them and wondered why they were so ugly; you looked closely and could not find the source. Then you realized that it came from conviction, their conviction. It was as though some mysterious all-knowing master had given each one a cloak of ugliness to wear, and they had each accepted it without question.

Pecola's plight illustrates the pernicious effects that implicit views can have on people. The racist views that the young heroine has come to accept, or at least internalise, shape not only her judgements and decisions, but her perception of herself and others. In Morrison's novel, we are encouraged to think that if Pecola had not internalised the racist canon of beauty around her, she would be able to see herself in the mirror differently.

Whether and how cases like this one occur in the real world remains an animated debate (see, e.g., Burnston 2017; Cermeño-Aínsa 2020). But almost all the cases that are discussed in the philosophical and scientific literature resemble Pecola's case, in that the cognitive influence bypasses the perceiver's awareness: people are not conscious that the way they see the world is shaped by how they already expect the world to look (section 2). In some specific cases, people are also not aware of what precisely the content of the influencing cognitive state is (section 3). The distinction between the process and the content of

cognitive influence helps us distinguish between two sides of the epistemic risk introduced by cognitive penetration (section 4): one is the *epistemic threat*, which comes from the perceiver not being capable of detecting that her perception is shaped by prior beliefs, and the other is the *epistemic fault*, which comes from the perceiver failing to prevent problematic contents to bear on their perception, and subsequent beliefs and decisions. If the perceiver has no awareness of the content of the cognitive state shaping their perception, are they then free of epistemic fault? We conclude by highlighting some issues standing in the way of this epistemic absolution (section 5).

2 Cognitive influences are implicit

Establishing whether cognitive states such as beliefs can influence perception or only the judgements based on perception, is a challenging experimental question. Nevertheless, the possibility remains: perception may be *cognitively penetrated*, if the contents of the higher cognitive states directly and causally affect low-level perceptual processing or perceptual experience, so that, had the higher-level contents been absent or different, the perception of basic aspects of the world would have been different (Siegel 2012; Stokes 2013). To count as cognitive penetration, the effects must concern how perceptual properties and objects are experienced. Canonically, these would be colours, shapes, sizes, slopes, brightness, loudness, weight, sweetness, etc. However, if one embraces a richer view of perceptual content, the affected properties can also be object-kinds, moral or aesthetic properties such as elegance, grace, balance, etc. (Bergqvist and Cowan 2018). In Pecola's case, we may suppose that both could be at stake: her internalised critical views could affect her perception of the shape, size, colour of her face, or it could affect how harmonious it looks to her.

The first way in which cognitive penetration is implicit is therefore when the top-down *process of influence* of cognitive states on experience is involuntary and unconscious: the subject does not have any explicit awareness or understanding that their perception has been influenced by their cognitive states. This is typically assumed to be the case for most candidate instances of cognitive penetration. Awareness of such influence does not necessarily require awareness of all the processing steps through which perception has been influenced, only of that fact that some influence has occurred.

This focus arises in part from the stipulation that for cognitive penetrations to occur, the causal connection between the influencing state and the influenced percept must be *internal* and *direct* (Stokes 2013). If you have a blurred perception and put on your glasses because you believe you will see better with them, your perception changes as a result of your belief. Here you are certainly aware that your belief that glasses will make you see things better has led you to put them on, and that, as a result, your experience has changed. But this is not a case of cognitive penetration. The direct cause of the change is something external (the glasses), and not your internal mental states.

Attention can have the same mediating role to play as the glasses, and act as an intermediate between cognitive states and perception. If you are presented with an ambiguous duck-rabbit drawing and made to realize that the drawing can be seen in two ways, you can voluntarily intend to see the drawing as of a duck or a rabbit, by attending to either duck- or rabbit-like features. Again, you may be aware that your beliefs or intentions have led you to attend to the drawing differently and, as a result, have shaped your perceptual experience. But the cause of the change occurs indirectly, mediated by attention. Classically, if a cognitive state influences attention, and attention, in turn, affects experience, no cognitive penetration has occurred (Pylyshyn 1999). The case of attention, however, is different from cases involving an external mediator. While attention can be voluntarily allocated, it can also be involuntarily affected by desires, intentions, or cognitive expectations. If so, attention itself could be cognitively penetrated. In such cases, the effects of the cognitive states on perception may be indirect, but they raise the same epistemic worries as cases where cognitive penetration occurs directly on perception itself, without an attentional mediation. Whether this counts as a mechanism of cognitive penetration, or constitutes another categorical phenomenon remains debated (see Mole 2015; Marchi 2017, for discussion).

The cases discussed so far suggest that cognitive penetration occurs without explicit awareness that some influence has occurred. You could still have reasons to believe that your perception is highly susceptible to certain kinds of top-down influence (Lyons 2011), for instance if someone else warns you that this is the case or because you have the feeling that there is something suspect or impure about your perceptual experience. Because we are not talking about awareness of the precise mechanisms of influence, but only of its occurrence,

such indirect warnings or inner suspicions are sufficient to show that cognitive influences are not necessarily implicit.

Notably, it is in principle possible for the perceiver to gain access to the fact that their perception is being, or has been, influenced through second-order or metacognitive awareness. Metacognition provides information about how well certain cognitive and perceptual are performing in a given context or how different processes interact (e.g., Deroy et al. 2016), and could well indicate whether cognitive penetration has occurred in a given case. In many cases, metacognitive awareness is manifested consciously, including explicit judgements that something is wrong or unreliable, for example, but in others, it may only come as a sense or feeling that things are not going smoothly (Proust 2010). Whether it leads to a judgement or a feeling, metacognitive reflection suggests that people can become reflectively aware of how sub-personal processes are running or interacting, and eventually of their perceptual processes relying on cognitive states.

To test this, Travers et al. (2020) examined the race-lightness bias. Levin and Banaji (2006) found that faces with features typical of an African person appear darker than faces with typical features of a European person, even when both faces have equal luminance. Whether all instances of this bias occur because of cognitive penetrability of perception is debated (Firestone and Scholl 2016), but the results from Travers et al. (2020) suggest that theirs were partly under cognitive influence. Their main question was to test whether subjects had metacognitive access to the fact that their responses about luminance are being affected by facial morphology. In other words, would people report or feel less confident when their perception of brightness is strongly biased by the task-irrelevant feature of morphology, compared to cases when they don't rely on such irrelevant cues? Results show that this was not the case: people were not able to detect that their percepts were biased when reflecting on their confidence. Opacity to metacognition seems to be here the sign that the fact that an influence has occurred (let alone the mechanism behind this influence) is implicit through and through. This metacognitive opacity stands in sharp contrast with decades of experiments in perception showing that people's confidence ratings can accurately track whether their responses were correct or not when performing classic visual tasks (e.g. Song et al. 2011).

3 Not all influencers are implicit

The process of influence in cognitive penetration should be considered as implicit, as it operates without the agent's will and awareness. But what about the influencing state? There seems to be no restrictions on whether the influencer state should be implicit or explicit, as long as the influence on perceptual content occurs, and qualifies as coming from a cognitive state. Suppose that you are searching for wild strawberries along the forest trail, and are rehearsing in your head how much you desire to find strawberries. Suppose that this desire causes you to see something red where, in fact, there is no more than shadowy green leaves. The influencing state here is explicit in the strongest sense of being (i) consciously manifested, (ii) accessible to introspection, report and rational examination, (iii) generated voluntarily, and (iv) under voluntary control (e.g., by deciding to stop desiring strawberries, because you think you found enough already).

Not all candidate cases of cognitive penetration will satisfy these four conditions. Take the case where your belief that most bananas are yellow influences your current colour perception, and makes you see bananas as more yellow than they really are (assuming this is the case; Hansen et al. 2006, but see Deroy 2013, and Valenti and Firestone 2019, for conceptual and empirical objections, respectively). You are not consciously aware or deliberating about that belief every time you see a banana. You may also not be able to change this belief at will, by stopping to believe that bananas are yellow. Nevertheless, you can report and bring the belief that most bananas are yellow into consciousness, satisfying at least the condition (ii). As pointed out by Dummett (1991), an informational state is explicit when that state allows for the possibility of eliciting a verbal statement about it when prompted. Even when the informational state is not actually verbalized, the mere possibility of being able to do so suffices to call it explicit (see Davies 2015 for an overview).

On this dispositional reading, explicit sources at stake in cognitive penetration are those of which the agent can gain direct access to, given her current mental make-up, and without acquiring any new external information. Conversely, implicit influences and sources are such that the agent cannot be aware of, or gain direct access to, the implicit content that influences her perception, given her current state. For instance, in the case of Pecola, the idea that black people cannot be beautiful is not something she (i) is currently conscious of

when she looks at herself in the mirror, or (ii) could report on, and examine rationally at this time, unless she acquires new information. Neither is it something she has (iii) chosen or (iv) could change at will. The state that influences Pecola's perception then fully qualifies as implicit.

One question is whether the way this idea has been internalised still counts as cognitive enough to qualify as a cognitive penetration. If the implicit states influencing perception are akin to beliefs (Carruthers 2018), then there is no issue in including them among cases of cognitive penetration: the representation distorting Pecola's perception could be the generic proposition that "Black isn't beautiful". Implicit attitudes and biases could also differ from beliefs, and consist of non-propositional contents or associations. This may not be an issue as long as those states still count as cognitive. However, if the influence on perception comes from a non-conceptual source, such as an affective state or another perceptual state, then the influence would not count as cognitive. Some biases in behaviour may be thus explained if, for example, the mere perception of a Black face triggers an affective response that biases behaviour (Azevedo et al. 2017), or if the visual perception of mouth movements influences which phoneme is heard (McGurk and MacDonald 1976). Determining whether the influencing states or associations are "cognitive enough" to count as cognitive penetration is increasingly at odds with current views where there is no sharp distinction between cognition and perception (Newen and Vetter 2017). Nevertheless, the distinction could be maintained as a matter of degree by determining whether the effect is responsive to other clearly cognitive states, such as explicit beliefs or intentions (Deroy 2019).

4 Implicit cognitive influence pose epistemic threats, but not equally epistemic blame

One key philosophical motivation to focus on cases of cognitive penetration where the influence is not accessible to the subject is because they pose specific epistemic challenges (e.g., Lyons 2011). Perceptual experience should provide epistemic justification for our beliefs, intentions and desires. Barring extreme scepticism, what we believe about the external world is grounded on what we see, hear, touch, smell and taste. I perceive the banana in front of me to be yellow, and that perceptual experience makes it *reasonable* for me to believe that the banana is yellow:

> It is because perceptual experience has the phenomenal character of confronting one with objects and properties in the world around me that it justifies forming beliefs about those objects and properties. (Smithies 2014: 103)

Perceptual experiences thus influence cognitive states such as beliefs, which in turn can influence what we desire, or decide to do. If perceptual experiences are themselves influenced by cognitive states, their justificatory role is in part jeopardised. If my previous belief that most bananas are yellow determines my current perceptual experience of the banana in front of me as being yellow, then it becomes suspect to justify my current belief regarding the colour of the banana on that perceptual experience. Cognitive penetration introduces a circular justificatory structure (Siegel 2017). It does not seem epistemically rational to rely on our perceptual experience to justify or increase the credence in our pre-existing beliefs, if these experiences are already influenced by the very beliefs they are meant to justify. Arguably, not all cases of cognitive penetrability have this circular structure. When my perception is modulated by desire so that I see something because I want it to be true, then I have a cognitively penetrated experience, albeit no circular one (Lyons 2011). A more general problem is that some forms of cognitive penetration diminish the reliability of perception, although other forms could increase it. A different, though related, epistemic worry is that, if cognitive penetration occurs, perception conforms more to the penetrating cognitive state than to the evidential data provided by the environment (Raftopoulos 2019; but see Burnston 2017). Adopting Smithies' formulation above, a cognitively penetrated perceptual experience no longer confronts me with objects and properties in the world around me as they are, which threatens its justificatory role in forming accurate beliefs about those objects and properties.

The implicit or explicit character of both the influencing state and the process of influence allows us to better distinguish between two different epistemic issues. The first one is the general *epistemic threat* that comes from the fact that the agent is not explicitly aware that her perception is influenced. The second is the *epistemic fault* of the agent when she becomes aware of the influencing content and/or the process of influence on perception, but fails to counteract this influence.

Arguably, the epistemic threat is the same independently of whether the content of the influencing state is explicit (like the belief that bananas are yellow) or implicit (like the representation that Black people cannot be as beautiful as White people). In both cases, we have the epistemic worry that perceptual experience fails to represent the external facts accurately, and the worry of a circular justification of beliefs. The epistemic threat of cognitive penetration occurs, however, when the process of influence on perception is not internally accessible to the perceiver. Even if the influence comes from an accurate cognitive representation, the perceiver does not realise that their perception is shaped by background cognitive expectations, and takes it to represent reality as it is.

Not all would agree on this threat. According to a specific internalist theory of perceptual justification, known as accessibilism, only factors that are consciously accessible to the believer can be relevant to epistemic justification (Feldman and Conee 2001). If the influence of cognitive states on perceptual experience is always implicit, it would then be irrelevant to determining the epistemic value of the penetrated experience. However, the intuition that perceptual experience should have more epistemic weight when it accurately represents the world, rather than our background cognitive states, suggest that cognitive penetration on perception should count as relevant to epistemic justification. If this is so, then accessibilism does not have the resources to account for the epistemic threats posed by the implicit cognitive penetration of experience (Siegel 2012; Puddifoot 2016).

As we saw above, an agent may gain access to the fact that their perception is influenced, though this access needs to come from instructions or metacognitive inference. Once they realise that their perception is epistemically threatened, however, the epistemic threat opens a question of epistemic responsibility. If the agent realises that their perception is influenced, they seem epistemically responsible for the judgments or beliefs formed on the basis of this percept. If someone has access to the fact that they have a cognitive state that is currently influencing their perceptual experience, and if they realise that this cognitive state is inaccurate or unjustified, then they would have reasons — understood here as epistemic obligations — to stop holding the influencing state, diminish its influence on experience, or/and stop relying on that experience to make judgements or support beliefs. All these options rely on the conscious, deliberative agency of the person. Having reasons to act, however, arguably depends on being aware of such reasons and on whether one *can*

perform the action at all. Determining the epistemic faultiness in cases where an inaccurate or unjustified cognitive representation bears on perception depends on two factors: whether the person can be aware that their perception is being influenced, and whether the person has ways to intervene on this state (Rettler 2018).

Voluntary control is here key in determining the epistemic faultiness of cognitive penetration: if people are aware of the influence or its source, but cannot counteract the influence or intervene on the source, then they are also not much at fault. Many beliefs, desires and intentions are often hard to hold back. I may not be able to deliberately change racial biases, for example, even when I consciously repudiate them. In many cases, we don't have agential control over the influencing cognitive state, nor over the process of influence, even when we are aware of them both. Some philosophers, however, argue that direct voluntary control is not necessary: some beliefs may still be under indirect control (e.g., Rettler 2018); and even when voluntary control is lacking, accountability to other agents may be sufficient to determine epistemic blame (see Brown 2019 for an overview). Even when voluntary control is possible, epistemic blameworthiness will depend on how difficult it is to exercise this control (Nelkin 2016). Once Pecola is made aware of the unjustified view affecting her perceptual experience, she has good reasons to try and stop herself from holding such views, and, at least, to stop these views from shaping her experience. If exercising such control is feasible, then we could find her at fault for continuing to hold these views or let them shape her perception. If, however, at it is often the case, exercising control requires special skills, effort, or repeated attempts, we may find her less epistemically faulty for failing to counteract the cognitive penetration of her experience.

5 Further complexities in attributing blame to implicit influencers

On this reading, when Pecola believes that she is not beautiful, because her perception of herself is influenced by a representation that she has no awareness or easy control of, she is not under an epistemic fault. Shall we grant the same epistemic absolution to all kinds of cognitive penetration, when the influencing state is implicit? Here we consider in turn three different considerations that may change this verdict: awareness checks, moral obligations, and access to social interventions.

1. *Awareness checks*. An agent is under epistemic blame if they are aware of an inaccurate, or unjustified representation influencing their perception, and have *reasons* to diminish the influence itself or the consequences of that influence. If a state is implicit, then the first condition cannot be fulfilled. Several lines of research suggest, however, that one of the canonical examples of implicit cognition, such as implicit biases, are at least partly accessible to consciousness (Gawronski et al. 2006). If this is so, implicit influences on perception would always be epistemically blame-worthy to some degree. For example, people can correctly predict their score in an Implicit Association Test presenting Black and White faces, before taking the test (Hahn et al. 2014). People also tend to misreport their biases when explicitly asked, as they may be concerned with appearing prejudiced (Hall and Payne 2010), an interpretation which supposes that they realise that they have certain biases. One issue with conclusions based on verbal self-reports and predictions is that they are not a robust way to assess whether people have introspective or conscious access to the content of the implicit biases, even less if they possibly can. For example, people could merely guess how they would perform, rather than introspectively access the content of their supposed implicit attitudes (Carruthers 2018).

2. *Moral obligations* are never far away when discussing implicit biases. Pecola's example is partly chosen to avoid mixing the moral wrongness of implicit representations bearing on perception, from the epistemic risk they introduce. But consider a white person who has internalised the same views as Pecola, and is not aware of them. While they do not explicitly believe that Black people cannot be as beautiful as White people, their perception, like Pecola's, may still be biased by this implicit representation. Shall they also be absolved epistemically of any fault? Surely, their perception is also threatened by the same epistemic risks as Pecola's, but the fact that this influence does not hurt them directly, but hurts others, seems to call for more blame. The precise boundaries between epistemic and moral blame are still a matter of debate (Brown 2019). On one approach, even when one is not epistemically responsible for beliefs based on experiences that have been influenced by implicit states, one may still be morally responsible for the outcomes of these beliefs. Attributions of moral responsibility raise the stake for epistemic obligations. If our implicit states put us at a greater risk of a morally reprehensible action, because they influence our

perception, we seem to bear a greater responsibility for learning about them, or doing something about them.

3. *Role of social feedback*. Voluntary control of own's cognitive states and how they might affect perception can be assumed to rely on an agent's direct internal access to those states. But this is not necessarily the case. Importantly, there are several means through which perceivers could become aware that their perception is influenced, or even of the specific cognitive contents which are influencing it. These include direct internal means, such as self-reflection and metacognition. But their awareness may also be externally mediated, obtained through other people's trusted testimony or warning. In this sense, both individual reflective awareness and social influences will affect the epistemic fault arising from cognitive penetration. If such externally-mediated access is easy, then, again, the agent may be considered more epistemologically faulty than if it is difficult.

Can we then diminish the cognitive influences over our perceptions, if we only have access to this influence through others' testimony? Travers et al. (2020) tested for this, by telling participants halfway through the experiment that their responses were biased by either 'racial stereotypes' or 'facial features', and encouraged them to do better. They found that when so informed the race-lightness effect was reduced: participants were less influenced by the facial morphologies in their judgements, compared to a control group which had no social feedback. The fact that third-party information can be sufficient to make people realise that their perception is influenced by implicit states, and intervene to diminish this effect, delivers a mixed verdict. On the one hand, people could not, at least under these experimental conditions, fully suppress the effects of morphology on their perception of brightness, suggesting that implicit representations continued to exert some influence (or that all the remaining effects were due to low-level differences, see Firestone and Scholl 2016). On the other hand, social intervention was successful in partly alleviating the influence and making people perform better.

6 Conclusions

Cognitive influences on perception operate implicitly and sometimes come from an implicit cognitive state. These two characteristics explain why these influences are epistemic threatening, and help determine how much epistemic fault rests with the agent.

Independently of whether the influencing state is explicit or implicit, the fact that perception can be influenced by cognitive states without us directly being aware of this influence raises an epistemic threat. Importantly, if it is possible and easy for perceivers to indirectly realise that their perception is influenced, their epistemic responsibility seems to be engaged.

Cognitive penetrability and its epistemic consequences have been studied and debated as a phenomenon affecting the individual. The role of social factors, however, highlights that both awareness and the possibility or difficulty of control need to be assessed at the level of the individual and the level of cultures and groups. Groups may be epistemically appraisable, rather than individuals themselves, for normalising ill-founded beliefs, and failing to investigate and propagate awareness of the implicit influences that distort individuals' perceptions and viciously shape their beliefs (see Siegel 2017). Even individual metacognitive awareness, which individuals lack when it comes to implicit influences on perception (Travers et al. 2020), may eventually be shaped by social factors (Pescetelli et al. 2016). Though perception is an individual state and process, cognitive penetration makes it socially dependent in two important ways. Social feedback may be needed for us to realise that our perception is influenced, and it may also be needed for us to realise what states exactly influence it.

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