Inductive parsimony and the Methodological Argument ☆

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A R T I C L E   I N F O

A B S T R A C T

Studies on so-called Change Blindness and Inattentional Blindness have been taken to establish the claim that conscious perception of a stimulus requires the attentional processing of that stimulus. One might contend, against this claim, that the evidence only shows attention to be necessary for the subject to have access to the contents of conscious perception and not for conscious perception itself. This "Methodological Argument" is gaining ground among philosophers who work on attention and consciousness, such as Christopher Mole. I find that, without the supporting evidence of inaccessible consciousness, this argument collapses into an indefensible form of inductive parsimony. The Methodological Argument is thus shown to be unsuccessful when used against the claim that attention is required for conscious perception, though I suggest that it may be successful against the more ambitious claim that attention is necessary for all conscious experience.
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1. Introduction

It has been argued elsewhere, largely on empirical grounds, that conscious perception of a stimulus requires the attentional processing of that stimulus (e.g. Mack & Rock, 1998). I call this the "Necessity Position." Here I examine an objection to this understanding of the empirical evidence that is based on Ned Block's Methodological Puzzle: at best, attention has been shown to be necessary for access to the contents of conscious perception and so cannot be claimed necessary for conscious perception. Chris Mole says, for example, "attention isn't necessary for *consciousness*, but it is necessary if one's experience is to provide one with knowledge of the sort probed by the experimenter's questions" (Mole, 2008, emphasis original). My response to this objection has two parts. First, I deny that the plausible existence of inaccessible conscious perception has been established. Second, I assert that without evidence in favor of inaccessible conscious perception this worry amounts to indefensible inductive parsimony. I conclude that the Necessity Position will require a more direct attack to remove it from its current foothold in attention research.

2. The empirical background

The evidence in favor of the Necessity Position correlates attention with reports and other outward signs of perception, rather than with conscious perception itself. Take the famous experiment by Simons and Chabris: when control subjects in normal conditions watch a video involving a person in a gorilla suit (the "gorilla") walking amongst a group of people playing ball, the subjects report perceiving the gorilla. However, when test subjects are distracted by an attention-involving task, such as tracking the passing of a ball between players, they often fail to report perceiving the gorilla (Simons & Chabris, 1999). As it seems to be the dimunition of attention that causes the failure to perceive the gorilla, Simons and Chabris reason in favor of the Necessity Position. That is, for stable conditions where we assume that the only difference between control and test subjects is the dimunition of attention,

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1. All control subjects report consciousness of the gorilla ($C(g)$).
2. Some test subjects do not report $C(g)$.
IC3. Thus, diminished attention is sometimes sufficient for a failure to report $C(g)$.
4. If diminished attention is sometimes sufficient for a failure to report $C(g)$, then some attention is necessary for the report of $C(g)$.
IC5. Thus, some attention is necessary for the report of $C(g)$.
6. Failure to report $C(g)$ indicates an absence of $C(g)$.
IC7. Thus, some attention is necessary for $C(g)$.
8. For any x, if attention is necessary for $C(g)$, then it is necessary for $C(x)$.
C. Some attention is necessary for $C(x)$.

This representation of Simons and Chabris' argument has at least two main points of weakness. First, against the sixth premise, the failure to report a percept does not necessarily indicate an absence of the relevant percept in consciousness, even when we assume the honesty of the subjects. This criticism is partially answered by Simons and Chabris when they claim that subjects who failed to report perceiving the gorilla also did not show other signs of having perceived a gorilla. They did not, for instance, laugh or show surprise as the control subjects did. However, more extensive observations of the subjects would be necessary to answer this worry. Second, against the eighth premise, even if conscious perception requires attention in the conditions of the experiment, this does not show that attention is necessary for all conscious perception. Both of these weaknesses, common to arguments in favor of the Necessity Position, are exposed by the Methodological Argument.

3. The development of the Methodological Argument

Ned Block's division of phenomenal from access consciousness (Block, 2005) and his Methodological Puzzle (Block, 2008a) inspire the development of the Methodological Argument against the Necessity Position. Block understands phenomenal consciousness as the experiential aspect of consciousness: "Phenomenally conscious content is what differs between experiences as of red and green" (Block, 2005). This quote refers to the Inverted Spectrum Argument, where it is argued that behavioral and functional accounts of consciousness fail to distinguish between a normal subject experiencing red and an inverted-spectrum subject experiencing green (Block, 1990). Thus, phenomenal consciousness is the experiential aspect of consciousness that is left out of behavioral and functional accounts. Access consciousness, on the other hand, is the functional aspect of consciousness. This is contrasted with functionality outside of consciousness (e.g. sleepwalking), which evinces "indirect control... but not direct control of the sort that happens when a representation is poised for free use as a premise in reasoning and can be freely reported. (It is this free use that characterizes access-consciousness.)" (Block, 1995). Block argues that conscious functionality occurs when we are able to access our mental states, in the sense that we are able to reflect and act on them. Thus, phenomenal consciousness is the more basic aspect of consciousness, which Block claims can occur with low-level neural processing, whereas access consciousness is thought to require higher-level neural areas (Block, 2008a).

Perhaps one can understand the phenomenal-access distinction by seeing that, for a stimulus x, conscious perception of x consists of both access to x and phenomenal experience of x. If this distinction holds, the accessibility or inaccessibility of x does not depend on the presence or absence of phenomenal experience. Furthermore, for phenomenal experience to be itself accessible, it would have to become an object of conscious perception (an x), and thus would no longer itself be conscious perception. For this reason, phenomenal consciousness, qua phenomenal consciousness, is not only un-accessed, but inaccessible.

The Methodological Puzzle is introduced by Block as an apparent problem for the phenomenal-access distinction (which he later attempts to solve). The Methodological Puzzle is that of finding a method that can detect pure phenomenal consciousness. As Block states the problem:

It does not seem that we could find any evidence that would decide one way or the other [whether the neural correlate of consciousness necessarily includes the correlate of access consciousness] because any evidence would inevitably derive from reportability of a phenomenally conscious state, and so it could not tell us about the phenomenal consciousness of a state which cannot be reported. So there seems a fundamental epistemic limitation in our ability to get a complete empirical theory of phenomenal consciousness. This is the Methodological Puzzle that is the topic of this paper (Block, 2008a).

This language of "report" is soon after replaced with "access" to cover cases where patients cannot report (but can access) their conscious states. With this change, the idea is that to find evidence of pure phenomenal consciousness we would need the subject to be able to access this mental state, but pure phenomenal consciousness is inaccessible by definition. That is, pure phenomenal consciousness comprises only the aspects of consciousness outside of function, including access.

Where the Methodological Puzzle is the puzzle of finding experimental methods that will isolate pure phenomenal consciousness, the Methodological Argument claims that without such a method our research on consciousness is incomplete. Thus, even if the puzzle is insoluble, one might use it as an objection to the view that a failure to exhibit consciousness indicates a lack of consciousness. Although Block does not make this argument, it is a natural extension of his Methodological Puzzle. The Methodological Argument could go as follows:

1. One might fail to exhibit consciousness of x ($C(x)$) if one lacks access to x.
2. One might (separately) fail to exhibit $C(x)$ if one lacks both access to x and phenomenal consciousness of x.
IC3. Thus, one might fail to exhibit $C(x)$ because of a failure of access or because of an additional failure of phenomenal consciousness.
4. The claim that a failure to exhibit $C(x)$ represents a failure of phenomenal and access consciousness is a stronger claim than that it represents a failure of access consciousness alone.
5. Given two distinct claims that can be inferred from the same evidence, one should adopt the weaker of the two claims (inductive parsimony).
C: The failure to exhibit $C(x)$ only entails a lack of access to x.

If successful, the Methodological Argument can be used to argue against nearly any instance of asserting the absence of consciousness from evidence of its absence, including the evidence in favor of the Necessity Position. The argument hinges on two points: that phenomenal consciousness is separable from access consciousness (second premise) and that one should exercise parsimony in inductive inference (fifth premise).

If we apply the Methodological Argument to the Necessity Position, we can argue that the methods of testing the relationship between attention and conscious perception leave out phenomenal consciousness, yielding incomplete findings. Thus, any of our current tests that show attention to be necessary for conscious perception at most exhibit necessity for accessible conscious perception. Mole suggests, for example, that "inattention leads to a lack of accessibility, rather than a lack of consciousness" (Mole, 2008). As a failure of access can cause both an absence of outward signs and an absence of report, this would explain the observable differences between Simons and Chabris' two groups. Further, Mole claims, "in order for the hypothesis that attention is necessary for perception to be established, it will be necessary to rule out the story outlined above" (Mole, 2008). Thus, according to Mole, the burden of proof rests with the Necessity Position so long as conscious perception outside the grasp of access cannot be ruled out. To assess the Methodological Argument I will look at support for the inclusion of the second and fifth premises. That is, I will look at evidence, first, that phenomenal consciousness is separable from access consciousness and second, that we should use inductive parsimony in this case.

4. Evidence for inaccessible consciousness

As mentioned above, Block thinks the Methodological Puzzle can be solved. That is, he thinks there is evidence that points to the existence of inaccessible consciousness. Such evidence would count against worries surrounding the second premise of the Methodological Argument, that there is a separable type of consciousness outside the grasp of access. Namely, Block thinks evidence of experiential overflow, or experience that overflows the capacities for access, supports the existence of inaccessible or pure phenomenal consciousness.

This experiential overflow can be found in studies on working memory limits (Block, 2008b, 2008a). The limit to working memory, which is shared by access consciousness, is sometimes set at around four bits of information, where the grain of a bit is contextually determined. This limit is evinced, for instance, when a subject is flashed a random set of twelve letters for a fraction of a second, as in the Sperling experiments, and is only able to access and report around four individual letters (Sperling, 1960).

The grain of a bit depends on the subject's conceptual toolbox and past experience. For example, if a Sperling subject familiar with reading the English language is flashed "four-letter word," he or she should be able to report all 14 letters, as these letters are grouped into three bits. If, on the other hand, a subject who is not familiar with reading Czech is flashed "ctyri-slova dopisu," he or she will probably only be able to remember four of the 16 letters, as though they were a random set. Likewise, most adult humans can correctly choose the fuller of two buckets of candy after watching how many pieces have been put into each bucket. An infant however, is unable to choose correctly if more than four candies are placed in either of the two buckets (Feigenson & Carey, 2003). The difference is in the ability to count: the infant is forced to use one bit of information for each candy (maxing out at four candies), while the adult can reduce multiple candies into a single number concept, or bit.

As the working memory limit of four bits is also a limit to access, Block argues that we have indirect evidence for pure phenomenal consciousness anytime we experience more than four bits of information. Specifically, he claims that because we experience all of the letters in a Sperling letter display but can only report four of them, the capacity of the mechanism for phenomenal consciousness must overflow that of access consciousness (Block, 2008a).

An analysis of Block's claim depends on how we understand the sense of "overflow." If we understand the claim to concern an overflow of *information*, then we have to show that there is more total information available to phenomenal consciousness than to access consciousness. However, as bits can be formed at different levels of grain, showing that a subject has phenomenal consciousness of all the letters at one time and access to only four of the letters at a later time does not necessarily evince informational overflow. That is, the subject could have phenomenal and access consciousness of all the letters as a single, low-resolution bit at one time and have phenomenal and access consciousness of four distinct letters at the other, maintaining the limit of four bits. Sid Kouider demonstrates this informational limit by showing that when a subject claims to experience all the letters in a flashed display he or she does not notice when the letters are reversed or replaced with non-letters (Kouider, de Gardelle, & Dupoux, 2008). This suggests that the subject has only low-grain information about all of the letters until accessing them as individual letters. In this case, the limit to working memory may be an

informational limit to both access consciousness and phenomenal consciousness. Thus, we do not necessarily have evidence of informational overflow in the Sperling experiment. In fact, as information is a functional concept and phenomenal consciousness exists outside of function, it is difficult to imagine how phenomenal consciousness could overrun access consciousness in informational terms.

If we instead understand "overflow" in the sense of quality or aspect, then Block may have a point. In this understanding, phenomenal consciousness is an aspect or quality of consciousness that overflows the informational aspect of consciousness, which is contained in access consciousness. One might think, for instance, that consciousness has a presentational aspect that is separable from its informational aspect. This intuition – that access and function do not seem sufficient for consciousness, indicating that some further quality or aspect of consciousness overflows this informational aspect – is captured in Block's China Brain example (Block, 1980) and, more completely, in Chalmers' Zombie World example (Chalmers, 1996). This understanding of overflow would not be overturned by the worries given against informational overflow. However, as conscious perception is inherently informational, this version of the overflow claim could not be used to support the idea that conscious perception is *separable* from access. That is, consciousness *of* anything is already informational, and so must involve access and function. Thus, this version of the overflow claim does not help us to find purely phenomenal conscious perception.

Recall that the purpose of attempting to establish evidence for inaccessible conscious perception is to support the second premise of the Methodological Argument. If the reasoning given so far is correct then we do not yet have this evidence. The next step of my paper will be to show that without evidence for inaccessible conscious perception the Methodological Argument collapses into an indefensible form of inductive parsimony.

5. Indefensible use of inductive parsimony

Inductive inference, as I understand it, provides the link from evidence of particulars to general claims. For example, from the evidence that a significantly large number of plants require water to grow, one might inductively conclude that plants generally require water to grow. Inductive parsimony limits the justification of this inference.

Inductive parsimony can come in two forms: logical and pragmatic. In what I call its logical form, inductive parsimony is based upon an allegedly unbridgeable gap between particular and general claims in virtue of the numerical distinctness of the particulars. Thus, for logical inductive parsimony, the claim that all tokens of a type share a certain property requires confirmation of the instantiation of this property for every token, and not just for a significantly large number of tokens that are members of the same type.

One uses what I call pragmatic inductive parsimony when there is a pragmatic reason to doubt the extension of the available evidence to other tokens, such as positive evidence that distinguishes the untested from the tested tokens. Importantly, not every distinction between the tested and untested tokens causes concern for the pragmatic – the distinction must be relevant to the extension of the property in question. For example, despite admitting a distinction between Kansas and Oklahoma, the pragmatic would not bar an inductive move from the claim that some flowers in Kansas require water to grow to the claim that flowers in Oklahoma also require water to grow because the difference between Kansas and Oklahoma is not relevant to the property of requiring water to grow.

A practical concern about logical inductive parsimony is that accepting its force greatly restricts the types of claims that can be justified. To see this, consider the evidence we have for the claim that plant growth requires water: plant ψ^n at location λ^n and time τ^n changes height when given water ω^n (for any plant n between one and some significantly large number). According to logical inductive parsimony, we are not justified in making inductive inferences across times and locations, much less across individual plants and samples of water. Thus, the most we can do in informing others of this evidence is to state the combination of particulars; the logically parsimonious could not even say that water was required for the first plant to grow, but only state the co-presence of water and plant growth at a particular time and place. Conversely, in order to treat particulars as tokens of a type, logical inductive parsimony must be set aside. That is, to draw an inference from the particular evidence of plants ψ^1 and ψ^2, for example, one must claim that plants ψ^1 and ψ^2 are tokens of the same type. One must, therefore, move beyond logical inductive parsimony to embrace the use of types.

One way of satisfying this problem is to accept the use of types for practical reasons while limiting the scope of logical inductive parsimony to metaphysical claims. Logical inductive parsimony is suited to this limited application because it is based upon the unqualified (i.e. metaphysical) contention that a new token might not instantiate a property solely because it is numerically distinct from the tested tokens. This worry is illegitimate when applied to claims that remain metaphysically neutral about induction. For instance, logical inductive parsimony should not be applied to discussions about claims in the domain of particular sciences or the philosophies of particular sciences, since the use of terms like "necessity" in these domains is metaphysically neutral. That is, for the research scientist, it suffices that our best knowledge points to x as necessary for y in all observable cases where natural laws are held to be constant, without taking a stand on whether x is necessary for y in every metaphysically possible case. In other words, logical inductive parsimony may usefully put into question the justification of inductive inferences in general, but not the status of a particular inference, qua particular inference.

If one accepts the arguments given above on the defensible use of inductive parsimony, then the fifth premise should be modified: "given two *pragmatically* distinct claims that can be inferred from the same evidence, one should adopt the weaker of the two claims." In that case, the Methodological Argument will only be successful if it can produce a pragmatic distinction between phenomenal and access consciousness. However, because of our failure to find evidence of inaccessible conscious

perception, we do not have a pragmatic reason to suspect the Necessity Position. That is, without evidence (conceptual or empirical) of percepts left out by the methods used to test the Necessity Position, we do not have reason to set aside the claim that attention is necessary for conscious perception. The mere possibility of conscious percepts that do not require attention does not count as evidence against the claim that conscious perception requires attention.

As a final push for the Methodological Argument one might contend that the addition of access is not relevant to the presence or absence of conscious perception and so we should expect the existence of inaccessible conscious perception. This is analogous to the claim that we should expect the existence of unobservable galaxies, since the addition of observation is not relevant to the presence or absence of a galaxy.[1] Against this contention, we have some reason to believe that conscious perception, unlike galaxies, does constitutively rely on accessibility (though not necessarily access), as suggested by Dehaene's Global Workspace Model (Dehaene & Naccache, 2001; Dehaene, Changeux, Naccache, Sackur, & Sergent, 2006) and Tononi's Integrated Information Model (Tononi, 2008). At least, the character of *conscious perception* seems to rely on the inclusion of information, where without information we would not have consciousness-of. Thus, the subject's access does seem to make a difference for conscious perception, even if not for other forms of conscious experience.

6. Conclusion

The Methodological Argument is not a legitimate criticism of the Necessity Position because it merely stipulates the possibility of a type of consciousness that might not require attention without offering evidence for this type of consciousness. Without such evidence, this possibility cannot motivate a valid form of inductive parsimony.

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[1] I am grateful to John Campbell for raising this worry.