

## **Epiphenomenalism**

**Sven Walter**

Institute of Cognitive Science

University of Osnabrueck, Germany

Email: s.walter@philosophy-online.de

The idea that our mental states can causally affect our bodily behavior, and thus indirectly affect our environment, is an integral part of what one could, following Wilfrid Sellars (1962), call our ‘manifest image of the world.’ We are, it seems, agents who act because of our beliefs, desires, sensations, intentions, perceptions etc.: a headache makes us frown, the intention to make a bid at an auction causes us to raise our hand, and the desire to hear a loved one’s voice leads us to make a phone call. That our mental life is causally effective is hard to deny. How it can be so, however, is far from clear. Four centuries have passed since Descartes’ pioneering discussion of the problem of mental causation, but we still lack a satisfying account of how our mental life fits into the causal structure of the world. Our failure to understand the How of mental causation may be a reason to reconsider Thomas Huxley’s (1874) suggestion that our mental life is a mere epiphenomenon—a by-product of the neurophysiological causes of behavior that does not itself contribute anything to ‘the go’ of the world.

However, epiphenomenalism is not only at odds with our intuitive conception of

ourselves as autonomous agents. It also faces a whole series of theoretical difficulties. Among other things, it appears to undermine freedom of the will, the possibility of an evolutionary account of the mind, our conviction that others enjoy a mental life similar to ours, the application of epistemic norms like justification, warrant, or reasonableness to processes of belief formation, the distinction between reasons for an action and the reasons for which it was performed, and our ability to refer to, have knowledge of, and memories about mental states. In this short chapter, there is no room for a comprehensive discussion of all these objections to the view that mental phenomena are epiphenomena (see Walter [2007a] and [2008a]). I will only briefly sketch two of the most important of them below, saying why the epiphenomenalist's standard response to them appears unsatisfactory. Then I consider an issue that has so far been mostly neglected, viz., the question which account of causation would allow for a coherent formulation of the epiphenomenalist's position. Finally, I will suggest an alternative version of epiphenomenalism, which, though not free from problems, may be superior to the traditional version.

## **1. Epiphenomenalism**

Epiphenomenalists typically maintain that every mental event has a complete physical, in particular: neurophysiological, cause, while no mental event is ever a complete or even a partial cause of any other event. It seems as if our behavior is caused, or causally influenced, by our beliefs, desires, sensations etc., but in fact the regular succession of

mental and physical events—our headache being followed by our frowning, our desire to call a loved one being followed by our making a phone call etc.—is the result of causal processes at the underlying neurophysiological level. Epiphenomenalism evolved in the late eighteenth and nineteenth century as a consequence of two apparently discordant beliefs about the world: (1) the growing scientific confidence that our world is a world of purely physical causes governed by physical laws and driven by physical forces only, and (2) a decidedly dualistic trust in the distinctness of mind and brain. Epiphenomenalism managed to reconcile these two conflicting convictions. The view that modern science allows only for physical causation is compatible with dualism if the mental has no causal impact upon the physical.

Traditional epiphenomenalism can thus be characterized by the three claims of Irreducibility, Causal Dependence, and Causal Impotence:

(IR) No mental event is identical with or reducible to a physical event.

[Irreducibility]

(CD) Every mental event that has a cause has a (set of) physical event(s) as complete cause. [Causal Dependence]<sup>1</sup>

---

<sup>1</sup> (CD) allows for the possibility of uncaused mental events. Epiphenomenalism is thus

(CI) No mental event is a complete or even a partial cause of any other event.

[Causal Impotence]

Thesis (CD) plays a pivotal role in the epiphenomenalist's typical response to standard objections. (CD) ensures that whenever the epiphenomenalist's opponent appeals to a mental cause m in order to explain some phenomenon, there is a physical event p, viz., m's physical cause, which, the epiphenomenalist can claim, actually plays the causal role her opponent attributes to m (see sects. 2 and 3 for examples of this strategy). Nor, obviously, can the epiphenomenalist give up (CI) and remain an epiphenomenalist. Finally, apart from the fact that something like (IR) is accepted by most philosophers of mind, there would be little or no reason to endorse epiphenomenalism in the first place, if mental events were identical with or reducible to physical events. Arguably then, (IR), (CD), and (CI) form the core of traditional epiphenomenalism. Yet, we will see in sect. 4 how they may cause trouble for the epiphenomenalist. First, however, let us consider two of the most prominent objections against the view that the mental is a mere epiphenomenon.

---

compatible with mental events that are not causally grounded in physical events, as long as they have no effects.

## 2. The objection from evolution

One leading line of objection to epiphenomenalism goes as follows: The human mind seems to be the result of a process of evolution by natural selection. But in order for natural selection to get a hold on a trait, that trait must make a causal difference to an organism's fitness. Since epiphenomena cannot be selected for, and since the mind was selected for in the course of evolution, epiphenomenalism must be false (see, e.g., Popper 1978).

The standard response on behalf of epiphenomenalism is that natural selection can propagate a trait that does not increase (or even decreases) an organism's fitness, as long as it is correlated with a sufficiently beneficiary trait. To take Jackson's (1982, p. 134) standard analogy, a polar bear's having a heavy coat decreases its fitness since it slows it down, thereby making it vulnerable. Nevertheless, a polar bear's having a heavy coat is the result of a process of natural selection, since having a warm coat increases the bear's fitness, and a polar bear cannot have a warm coat without having a heavy coat. There was selection of a heavy coat, but only because there was selection for a warm coat, and the latter was impossible without the former. Analogously, it is said, our mind, although it is an epiphenomenon, may have developed because it was a by-product of certain fitness-enhancing neurophysiological structures: for the epiphenomenalist, what is selected for in evolution are the neurophysiological structures of which our mind, which has no survival value of its own, is an effect.

Usually, that is all the epiphenomenalist has to say in response to the objection from

evolution (two laudable exceptions are Robinson [forthcoming] and Corabi [2007]).

However, that response seems wanting for several reasons.

First, suppose a university's admissions office proclaimed that an applicant's religion has no influence upon her chances of being accepted, but it turned out that all accepted students have the same religion. That would cry out for an explanation, and the same holds if it is claimed that our mind is an epiphenomenon but that as a matter of (brute) fact, evolution has seen to it that any (healthy) brain of sufficient complexity is accompanied by a conscious mind.

Second, the usual analogies show that evolution can propagate a trait that is neutral or detrimental for an organism's fitness. They do not show, however, that evolution can propagate a trait that does not make any causal difference whatsoever (after all, the polar bear's heavy coat affects its behavior: it slows it down). The mind, it seems, would be the only co-evolved trait which has no effect at all.

Third, we understand perfectly well why a selection pressure for a warm coat has lead to a heavy coat—the isolatory properties of a polar bear's coat depend upon its thickness, and the thicker the coat is, the heavier it is. In contrast, we do not have the slightest idea why a selection pressure for certain neurophysiological structures should necessarily have lead to a conscious mind (due, of course, in part to what Joe Levine calls the 'explanatory gap'; see his contribution to this volume).

This does not show that the epiphenomenalist's standard response is irreparably flawed, but it shows that the typical analogies alone are an insufficient response to the

objection from evolution. Although this is not the place to go into the details, let me suggest the outline of a different rejoinder. Our mind is no doubt the result of a process of evolution (we have one, but we have ancestors that did not have one). That does not entail, however, that our mind is the result of a process of natural selection. Natural selection is one of the mechanisms behind evolution (the change of allele frequencies within populations), but not the only one. That point was made famous by Gould and Lewontin (1979), and has recently been backed up by researchers in so-called ‘Evo-Devo’ (evolutionary development), who argue that factors in the embryonic development of an organism can affect evolution without there being any specific selection pressures, for instance because there is not enough variation in the gene pool for natural selection to be effective (e.g., Carroll 2005). This of course falls short of establishing that our mind is not a result of natural selection, but it shows that a crucial premise of the objection from evolution—that natural selection is the only mechanism that could explain the evolution of our mind—needs more support than it is usually given.

### **3. The objection from other minds**

Another important objection is that epiphenomenalism undermines any justification for our confidence that others enjoy a conscious mental life similar to ours (see Benecke 1901; Jackson 1982, pp. 134–135). The problem is that the typical solution of the so-called ‘other minds problem’—that we are justified in believing in other minds since we can observe

others' similar behavior and can infer from their similar behavior similar underlying mental causes (see Anita Avramides' contribution to this volume)—is not available to the epiphenomenalist since she denies that the mental plays any causal role in the production of behavior.

The standard response on behalf of epiphenomenalism is that instead of inferring a similar mental life that serves as the cause of behavior, we can infer similar neurophysiological causes of behavior, and then conclude that these similar neurophysiological causes are accompanied by a similar mental life as a further effect. That is, instead of inferring similar mental causes directly from similar behavioral effects, the epiphenomenalist first infers similar neurophysiological causes, and then in a second step similar mental effects from them. Again, however, this is unsatisfactory.

First, the epiphenomenalist's version is phenomenologically much less adequate than her opponent's story: it is obvious that the attribution of mental states to others depends upon their behavior, but it is not at all obvious that it depends upon the assumption of a similar neurophysiological make-up (see e.g., Dennett 1987, pp. 17–25).

Second, the epiphenomenalist's response is once again backed up by misleading analogies. According to Jackson (1982, p. 134), the epiphenomenalist's solution to the other minds problem is analogous to the following uncontroversial inference: My reading in The Times that the Spurs won justifies my belief that The Telegraph has also reported on the Spurs' victory, because from the report in The Times I can infer that the Spurs won, and from that I can infer that The Telegraph has reported on the Spurs' victory. However, what

justifies the inference from the inferred cause (the Spurs' victory) to the inferred effect (the report in the Telegraph) is no doubt the fact that we have frequently observed events similar to the former followed by events similar to the latter. That is where the analogy fails, however. For how often have we observed that neurophysiological states similar to ours were followed by mental states similar to ours? At best, we could observe such correlations in our own case, but even there few if any of us have done it.

Third, since the epiphenomenalist's story contains one more inference than her opponent's, viz., the one from a similar neurophysiological make-up to a similar mental life, and since this inference is not at all obvious, her alternative line of justification is epistemically less secure. Everyone must hold that the inference from behavior to the underlying causes is justified. But the epiphenomenalist must also hold that the inference to similar mental states as further effects is justified, and that seems risky, especially since we have little idea of why neurophysiological states should be accompanied by mental states at all. Hence, the epiphenomenalist's appeal to apparently uncontroversial cases where we infer one effect from another via a joint cause does not show that her alternative solution to the other minds problem is satisfactory.

This and the preceding section have shown how important (CD) is for the epiphenomenalist. (CD) ensures that for any mental event there is a physical event of which the epiphenomenalist can claim that it actually plays the causal role usually attributed to the mental event in question (enhancing our fitness, causing our behavior etc.). And as said in sect. 1, (CI) and (IR) are essential for the epiphenomenalist. Yet, sect. 4 will show that the

combination of (CD), (CI), and (IR) can lead to some unexpected problems concerning the epiphenomenalist's account of causation.

#### 4. Epiphenomenalism and causation

Apart from theses (IR), (CD), and (CI), the epiphenomenalist must endorse a principle of Physical Closure like the following:

(PC) Every physical event which has a cause has a (set of) physical event(s) as complete cause. [Physical Closure]<sup>2</sup>

If there is at least one caused physical event, (PC) entails physical-to-physical causation. Moreover, if there is at least one caused mental event, (CD) entails physical-to-mental causation. Since the epiphenomenalist is making these causal claims, she thus ought to have some theory of causation, even though she maintains that mental-to-physical and mental-to-mental causation are impossible. What has gone largely unnoticed so far in discussions of

---

<sup>2</sup> Given (CI), no mental event is a complete or even a partial cause of a physical event; hence, if a physical event has a cause at all, it must have a physical cause.

epiphenomenalism (but see Lachs 1963) is that it is far from clear what conception of causation could account for the causal transactions posited in (PC) and (CD), while at the same time also respecting (CI). Given the limited space, it is impossible to consider each and every account of causation in detail, but the following should at least illustrate the nature and force of the problem for the epiphenomenalist.

Obviously, adopting a simple regularity account of causation which dispenses with any kind of causal necessity and analyzes causes as sufficient conditions of their effects will not do for the epiphenomenalist (a point noted by Broad [1925]). Roughly, the idea would be that if c and e are distinct events (and c is earlier than e), c causes e iff there are event-types C and E such that c is of type C, e is of type E, and events of type C are regularly followed by events of type E. Yet, according to the epiphenomenalist, a mental event m will regularly be followed by a behavioral event b: since m and b have a common neurophysiological cause p, p will be regularly followed by both m and b, so that m will be regularly followed by b, too. Hence, if the epiphenomenalist invokes a regularity conception of causation to account for physical-to-physical and physical-to-mental causation, she is thereby violating (CI).

The same holds for Mackie's (1974) INUS account according to which causes are Insufficient but Non-redundant parts of an Unnecessary but Sufficient condition. My belief that I have forgotten my laptop at the check-in counter may not by itself be sufficient for my returning to the check-in counter (I may be convinced that catching my flight is more important), but only in combination with other conditions, where in addition I would not

have returned to the check-in counter under these conditions had I not believed that I had forgotten my laptop there. My belief would then be an INUS condition of my return to the check-in counter. Hence, if the epiphenomenalist invokes an INUS conception of causation to account for physical-to-physical and physical-to-mental causation, she is once again violating (CD).

Counterfactual accounts of causation typically treat causes as necessary conditions of their effects. Roughly, c is a cause of e iff, if c had not occurred, e would not have occurred.<sup>3</sup> Consider thus the counterfactual ‘ $\neg \underline{m} \square \rightarrow \neg \underline{b}$ ’, where m and b are again a mental and a behavioral effect of a common neurophysiological cause p. Given (CD), had m not occurred, its cause p would not have occurred, and since p caused b, b would apparently not have occurred either (ceteris paribus). Had I not believed that I had left my laptop at the check-in counter, then, in the circumstances given, my belief’s neurophysiological cause that according to the epiphenomenalist made me return to the check-in counter had been absent as well, so that, ceteris paribus, I would not have returned, had I not believed that I had left my laptop there. Thus, if the epiphenomenalist

---

<sup>3</sup> ‘Roughly’ because since counterfactuals are not in general transitive, causation should not be defined as counterfactual dependence per se, but rather as a chain of counterfactual dependencies (see Lewis 1973).

invokes a counterfactual conception of causation to account for physical-to-physical and physical-to-mental causation, she is again violating (CI).<sup>4</sup>

Finally, the idea behind so-called 'conserved quantity' accounts of causation is that causation is best understood as essentially involving the transfer of some conserved physical quantity like energy or momentum (for more on this and the role of such accounts for the debate about mental causation, see Jaegwon Kim's contribution to this volume and

---

<sup>4</sup> There is a lot more to say on this issue though. Lewis has argued that if m and b are effects of a common cause p, '¬m □ → ¬b' is false (see Lewis [1979] and the Postscripts to Lewis [1973] and [1979] in Lewis [1986]). According to Lewis, p is not sufficient for m in the relevant possible worlds. When assessing similarity across worlds we must weigh the degree to which there are violations in the fundamental laws against the size of departure from particular matters of fact. Lewis argues that a possible world in which m does not occur but (due to a minor miracle) p occurs and causes b is closer to the actual world than any possible world in which m and p are both absent and we have to change the entire causal history of the world in question. These are contested issues, however. Suffice it to say that if the epiphenomenalist adopts a counterfactual account of causation, she at least owes us a detailed explanation for why counterfactuals like '¬m □ → ¬b' are supposed to be false.

Walter [2008b]). Such an account may seem attractive to the epiphenomenalist since, in contrast to the other approaches above, it nicely accounts for (CI). For if one accepts (IR) and conceives of the mental as something which is completely distinct from the physical, it is hard to see how mental entities could even be the kinds of things which are able to transfer a physical quantity like energy or momentum to physical entities.

On the other hand, however, if it is unintelligible how the mental could transfer energy or momentum to the physical, then for the very same reason it is also unintelligible how the physical could transfer energy or momentum to the mental, so that the kind of physical-to-mental causation required by (CD) would be impossible, too. Hence, if the epiphenomenalist invokes a conserved quantity conception of causation to account for the impossibility of mental-to-physical and mental-to-mental causation, she is violating (CD). Apart from that, (CI) and (CD) together entail the existence of ‘causal dead-ends’—unidirectional causal chains leading from the physical to the mental, but not back again to the physical. Hence, if causation consisted in the transfer of some physical magnitude, then (CI) and (CD) would apparently lead to a ‘drainage’ of energy, momentum etc. that would violate physical conservation laws.

Although these brief remarks are far from exhaustive or conclusive, they show that it is unclear how a coherent overall account of the various causal claims to which the epiphenomenalist is committed would look. This objection goes deeper than the usual ones which purport to demonstrate that epiphenomenalism is incompatible with some apparently undeniable feature of our manifest image of the world. If correct, it shows that

epiphenomenalism cannot even be coherently formulated—not, at least, by adopting one of the currently leading accounts of causation. If epiphenomenalism is to have any chance of being credible, then—regardless of how it fares with regard to other objections—much more attention has to be paid to explaining what exactly causation is supposed to be according to the epiphenomenalist than has hitherto been paid.

### **5. Epiphenomenalism: An alternative conception**

The claim that the mental depends upon the physical is important for the epiphenomenalist. Traditionally, that claim is spelled out as (CD), i.e., as the claim that the mental is causally dependent upon the physical. In the light of the difficulties raised in the previous section, however, it may be legitimate to ask why the kind of dependence in question must be causal. What matters to the epiphenomenalist is not that the physical causally necessitates the mental, but that it necessitates it (so that selection for complex brains leads to a selection of conscious minds, and we can infer the presence of a similar mental life in others from the inferred similar neurophysiological causes of their behavior etc.). The idea that the mental non-causally depends upon the physical is familiar in the philosophy of mind where it has been discussed under the label of ‘supervenience’ or ‘realization’ during the past decades. Hence, why not replace (CD) by some principle that relies on a kind of non-causal determination like realization?

(NCD) Every mental event is realized by a (set of) physical event(s). [Non-causal Dependence]<sup>5</sup>

The position spanned by (IR), (CI), (NCD), and (PC) avoids any problematic ‘causal dead-ends.’ Although there still is a unidirectional dependency of the mental upon the physical, that dependency is non-causal, so that (NCD) and (CI) do not violate physical conservation laws if a conserved quantity conception of causation is adopted. Moreover, adopting such a conception still accounts for the truth of (CI), but once (CD) is replaced by (NCD), it no longer conflicts with alleged cases of physical-to-mental causation, for there aren’t any.

---

<sup>5</sup> Of course, being a realizer here cannot mean being a filler of a causal role, as a functionalist would usually hold, for the mental has no causal role to play according to the epiphenomenalist. An epiphenomenalist account of realization would have to comprise, at a minimum, the claim that realization is a relation between properties such that a property G (a set of properties G<sub>1</sub>, ..., G<sub>n</sub>) realizes a property F only if the instantiation of G in an object o (of G<sub>1</sub>, ..., G<sub>n</sub> in objects o<sub>1</sub>, ..., o<sub>n</sub>) is sufficient for the instantiation of F in an object o’, but not vice versa (see, for instance, Shoemaker’s [2001] subset model of realization according to which G is realized by any property individuated by a set of causal powers that includes the causal powers bestowed by G).

Finally, if a conserved quantity conception of causation works at all, it arguably works best for the kind of physical-to-physical causation posited by (PC). Hence, if the epiphenomenalist could defend a conserved quantity account of causation (which is admittedly no easy task, but not unprecedented either; see, e.g., Kistler [1998], Hall [2004]), replacing (CD) by (NCD) would make her position consistent. Moreover, it seems that there would not be any disadvantage. The standard strategy for dealing with objections remains unaffected, as seen above (although it is still not altogether convincing; see, e.g., sects. 2 and 3), and since realization is standardly taken to be compatible with a broadly physicalistic attitude, a general dismissal of dualism does not do as an objection against this alternative version of epiphenomenalism.

However, why would one adopt such a position? If one is prepared to accept that the mental is realized by the physical, and thus in some broad (non-reductive) sense part of the physical, then why would one still hold that it is an epiphenomenon? Generally speaking, the motivation for adopting the alternative version of epiphenomenalism is the same as the motivation for adopting traditional epiphenomenalism. On the one hand, there is the intuition that the mental and the physical are in some robust sense distinct; on the alternative version of epiphenomenalism, that intuition is accounted for by (NCD) and

(IR).<sup>6</sup> On the other hand, there is the intuition that as far as causation is concerned, the primacy is with the physical; on the alternative version of epiphenomenalism, that intuition is accounted for by the conserved quantity account of causation, which arguably restricts causation to the (fundamental) physical level. As a consequence, it seems that the mental cannot contribute anything to ‘the go’ of the universe, i.e., mental events cause neither physical nor mental events. One will be lead to such a position if one thinks that traditional epiphenomenalism is untenable (for instance for the reason stated in sect. 4), but also finds the various accounts of mental causation that have been offered by so-called ‘non-reductive physicalists’ unconvincing. It is a position for all those who (like me) are reluctant to endorse traditional epiphenomenalism and instead replace its unabashedly dualistic worldview with a more naturalistic view according to which the mental is realized by the physical, but at the same time find mental causation problematic because they just cannot see how an adequate account of mental causation would go.<sup>7,8</sup>

---

<sup>6</sup> Indeed, on a plausible understanding of (NCD) it entails (IR), since realization is arguably a non-reductive relation.

<sup>7</sup> See Walter (2005) for an argument against Jackson and Pettit’s attempt to ground mental causation in the mental’s ability to figure in so-called ‘program explanations,’ Walter (2007b) for an argument against Lynne Baker’s attempt to ground mental causation in the

## References

- Benecke, E., 1901. On the aspect theory of the relation of mind to body. Proceedings of the Aristotelian Society, 1, 18–44.
- Broad, C.D., 1925. The Mind and its Place in Nature. London: Routledge.
- Carroll, S., 2005. Endless Forms most Beautiful: The New Science of Evo Devo and the Making of the Animal Kingdom. New York: Norton.
- Corabi, J., 2007. Evolutionary Arguments and the Mind-Body Problem. Unpublished dissertation, Rutgers, 2007.
- Dennett, D., 1987. True believers. In: Dennett, The Intentional Stance. Cambridge, MA: MIT Press, 13–35.
- Gould, S. and Lewontin, R., 1979. The spandrels of San Marco and the panglossian
- 

mental's special explanatory status, and Walter (2007c) for an argument against Stephen Yablo's appeal to the determinable/determinate distinction in the attempt to prevent a preemption of the mental by the physical.

<sup>8</sup> I'm indebted to Brian McLaughlin for his helpful comments on earlier drafts of this paper and to Lena Kästner.

- paradigm: A critique of the adaptationist programme. Proceedings of the Royal Society London, B205, 581–598.
- Hall, N., 2004. Two concepts of causation. In: J. Collins, N. Hall and L.A. Paul, eds. Causation and Counterfactuals. Cambridge, MA: MIT Press, 225–276.
- Huxley, T., 1874. On the hypothesis that animals are automata, and its history. Fortnightly Review, 22, 555–580.
- Jackson, F., 1982. Epiphenomenal qualia. Philosophical Quarterly, 32, 127–136.
- Kistler, M., 1998. Reducing causality to transmission. Erkenntnis, 48, 1–24.
- Lachs, J., 1963. Epiphenomenalism and the notion of cause. Journal of Philosophy, 60, 141–145.
- Lewis, D., 1973. Causation. Journal of Philosophy, 70, 556–567.
- Lewis, D., 1979. Counterfactual dependence and times arrow. Noûs, 13, 455–476.
- Lewis, D., 1986. Philosophical Papers, vol. 2. Oxford: Oxford University Press.
- Mackie, J., 1974. The Cement of the Universe. Oxford: Clarendon Press.
- Popper, K., 1978. Natural selection and the emergence of mind. Dialectica, 32, 339–355.
- Robinson, W., forthcoming. Evolution and epiphenomenalism. Journal of Consciousness Studies.
- Sellars, W., 1962. Philosophy and the scientific image of man. In: R. Colodny, ed. Frontiers of Science and Philosophy. Pittsburgh, PA: University of Pittsburgh Press, 33–78.
- Shoemaker, S., 2001. Realization and mental causation. In: C. Gillett and B. Loewer, eds. Physicalism and its Discontents. Cambridge: Cambridge University Press, 74–98.

Walter, S., 2005. Program explanations and mental causation. Acta Analytica, 20, 32–47.

Walter, S., 2007a. Epiphenomenalism. In: J. Fieser and B. Dowden, eds. Internet Encyclopedia of Philosophy. URL = <<http://www.iep.utm.edu/e/epiphenomenalism.htm>>.

Walter, S., 2007b. The epistemological approach to mental causation. Erkenntnis, 67, 273–287.

Walter, S., 2007c. Determinables, determinates, and causal relevance. Canadian Journal of Philosophy, 37, 217–244.

Walter, S., 2008a. Ist der Epiphenomenalismus absurd? Ein neuer Blick auf eine tot geglaubte Position. Zeitschrift für philosophische Forschung.

Walter, S., 2008b. The supervenience argument, overdetermination, and causal drainage: Assessing Kim's master argument. Philosophical Psychology.